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1 Introduction

LARS HINRICHS, BAS AARTS, AND APRIL McMAHON

We are glad that you have found your way to this handbook! It contains overview chapters on 31 areas of research within the field of English Linguistics. As we wrote in the introduction to the first edition of the handbook, we understand English Linguistics (EL) to be the discipline "that concerns itself with the study of all aspects of Present-Day English (PDE) from a variety of different angles, both descriptive and theoretical." In studying PDE, historical linguistics always play an important role. We have chosen not to include topics from that domain, however, mainly because there is a separate *Handbook of the History of English* in this series (van Kemenade & Los, 2006).

The notion of, specifically, *English* linguistics is not a new one. It can be traced back to a number of publications that have the term in their titles, such as Allen (1966), Alston (1974), and Broderick (1975). However, as these titles show, the phrase is either used in a very wide sense, as in Allen's and Alston's books, or quite narrowly, as in Broderick's. In its present-day sense, the designator of EL is probably used more in Europe than in other parts of the world. In North America, there are programs and courses in EL, but hardly any departments or research centers dedicated to it. Meanwhile, things are quite different on the other side of the Atlantic: both in the UK and in continental Europe, where EL contributes to EFL curricula, there are numerous administrative units in universities with designators such as *Department of English Language*, *Seminar/Institut/Fachrichtung für Englische Philologie*, *Departamento de Filología Inglesa*, *Seminar für Englische/Anglistische Sprachwissenschaft*, *Vakgroep Engelse Taalkunde*, and others. Increasingly, the members of such departments now also publish textbooks that have the term "English Linguistics" in the title—see, for example, Kortmann (2005), Herbst (2010), and Plag et al. (2015).

In the wider academic community, there are a number of journals specifically devoted to the English language, such as *Journal of English Linguistics* (Sage, since 1972), *English Linguistics* (Kaitakusha, since 1983), and *English Language and Linguistics* (Cambridge University Press, since 1997). In addition, there are also now several specialist conferences in EL, both for those interested in the history of English, for example, the biannual *International Conference on English Historical Linguistics* (ICEHL), and in synchronic EL, for example, the *Biennial International Conference on the Linguistics of Contemporary English* (BICLCE). Computer-oriented studies are the focus of the annual *International Computer Archive of Modern and Medieval English* (ICAME) conference. Since 2008, the *International Society for the Linguistics of English* (ISLE) has also held regular conferences that are intentionally inclusive, appealing to all subfields of EL, and which consequently tend to be large.

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The demonstrable fact that EL is a field of research with its own identity does not, however, mean that this field is inward looking, or that its findings are irrelevant to colleagues working on other languages. Research in EL is always engaged with related issues in other subfields, and the articles in this handbook take great care in describing these modes of engagement.

In assembling these chapters, we have kept in mind the different audiences of the book—all scholars of EL, regardless of whether they are at the beginning, formative, or professional stage of their paths. The warm reception that the first edition of this handbook was given is evidence of the broad need among scholars of EL for such a book. The contributing authors are aware of this fact: when we approached them with our request to update their chapters for a new edition, they were more than happy to do so. Several experts joined the project with enthusiasm, contributing new chapters.

The first edition of this handbook was committed to a methodological outlook of EL that is firmly based in the working practices developed in modern contemporary linguistics. In this new edition, we have retained that focus, but have placed additional emphasis on recent developments and innovations in empirical EL. For example, the new chapter by Samuel K. Ahmed, Samuel Andersson, and Bert Vaux, titled "English Phonology and Morphology" (Chapter 18), shows how a range of theoretically relevant issues emanating from the type of data accessed and prioritized by phonologists can be addressed in one introductory chapter, and how differences here can shape assumptions and analyses. Overall, this insight sheds light on the need for students of the linguistics of English to consider the issue of linguistic variation, and indeed to normalize that practice.

The content of this volume has been significantly updated and redesigned in order to reflect ongoing changes in EL. Factors that have prompted such updates are partly methodological in nature, as in the case of the continuing and significant growth in computational capacity, which makes steadily available datasets and analytical capacity in those subfields that rely on digital resources. Other changes have to do with shifting research interests within EL and the consequent emergence, or increased activity, of certain subfields. In some cases, such changes have led us to include entirely new topics in this handbook that were not part of the first edition—such as the chapters titled "Experimental Approaches" (Lauren Squires, Chapter 4); "The English Language and Social Media" (Brook Bolander, Chapter 28); "Gender, Sexuality, and the English Language" (Evan Hazenberg, Chapter 29); and "Mobility and the English Language" (Amelia Tseng and Lars Hinrichs, Chapter 32). In other cases, we commissioned new authors to write chapters on topics that were already part of the first edition—such as the chapters titled "English Corpus Linguistics" (Benedikt Szmrecsanyi and Laura Rosseel, Chapter 3); "Complements and Adjuncts" (Alexander Bergs, Chapter 9); "Information Structure" (Martin Hilpert, Chapter 13); "Constructions in English Grammar" (Hans C. Boas, Chapter 15); "English Phonetics" (Jennifer Nycz, Chapter 17); "English Phonology and Morphology" (Samuel K. Ahmed, Samuel Andersson, and Bert Vaux, Chapter 18); "Lexical Semantics" (Éva Kardos, Chapter 25); and "Lexicography of English around the World" (Stefan Dollinger, Chapter 26). All other chapters were thoroughly updated by the authors to reflect innovations and new developments in the respective subfields. Editors, authors, and reviewers paid particular attention to the accessibility of the chapters: we tried to ensure that, as introductions to the various subfields of research in EL, they would have value for advanced researchers, while remaining accessible to students closer to the beginning of their studies. We hope that you find in this handbook the type of information that you need, and that you come to share with us the sense of EL as a vibrant and productive field of research.

We would like to thank all those who have helped with the production of this handbook. In particular, we owe our authors a special, if obvious, debt of gratitude—for their enthusiastic participation in the project; their (mainly) timely delivery of chapters; and their

good-humored and swift attention to the comments of reviewers. We also thank the reviewers, some (though not all) authors themselves, for their involvement and for their detailed, careful, and sensible reports. Leaving author-reviewers aside, we wish to thank, in particular, Lieselotte Anderwald, Sabine Arndt-Lappe, John Beavers, Axel Bohmann, Don Chapman, Östen Dahl, Katherine Demuth, Susanne Flach, Jason Grafmiller, Sebastian Hoffmann, Sandra Jansen, Brian Joseph, John Kirk, Merja Kytö, Natalia Levshina, Scott Myers, Raphael Salkie, Ole Schützler, Peter Siemund, Johan van der Auwera, and Valentin Werner.

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Section 1: Methodology

2 Description and Theory

KERSTI BÖRJARS

2.1 Introduction

As reflected in many chapters in this book, English is probably the most well-studied language in the history of linguistics, and hence there is a vast pool of examples of both excellent description and insightful theoretical analysis to be found in the literature. Still, concepts like "description" and "theory" are anything but clear. The issue of what the defining characteristics of a "theory" are has received a lot of attention in philosophy and the history of science. However, in terms of distinguishing a theory from a description, that literature is not particularly helpful. Even though "theory" may appear to be the more complex of the two notions, there are issues also with what constitutes a description of a language.

2.2 The Description of English

A description of any language should contain an inventory of the building blocks: sounds and morphemes, roughly. It should also contain the rules for how those elements can be combined: phonotactic constraints, information about which differences between sounds are distinctive, how morphemes can be combined to form words, and how words can be combined to form phrases. In spite of the attention that the language has received, no complete description of English in this sense has yet been provided. To take but one example, even though there are many insightful descriptions of the English passive, the exact rules have not been provided that allow for sentences such as "This road has been walked on," but not "*This road has been taken a walk on." The view of grammatical description just illustrated coincides with the original conception of "generative" grammar. Generative grammar in that sense takes the building blocks of a language and uses rules to combine them to "generate" all and only the grammatical sentences of that language. Needless to say, although there are impressive grammars that have been computationally tested, no complete such grammar has been defined, either for English or for any other language.

Associated with the question of what constitutes a description of English is the question of what such a description describes. Traditionally, the description was of a variety of English referred to as the "standard." Many grammars of course aim not only to *describe* this variety, but also to *prescribe* it—to describe a variety which native speakers and learners of English should aim to follow. Even though modern grammars of English such as Quirk et al. (1985) and Huddleston and Pullum (2002) avoid prescriptivism, descriptions which aim also to

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prescribe are still prevalent, as witness the popularity of books such as Trask (2002). Descriptions of dialects of English other than the standard do, however, also have a long tradition. More recently, varieties of English which have arisen in countries where English has not traditionally been the first language are also considered varieties in their own right and are described as such, and not as examples of "English not used properly." For collections of descriptions of varieties of English from across the globe, see, for instance, Kachru et al. (2006), Kortmann and Upton (2008), Schneider (2008), Burridge and Kortmann (2008), and Mesthrie (2008), and also Kortmann (Chapter 16, this volume) and Foulkes (Chapter 21, this volume).

A description of a language, regardless of how one selects the particular variety, has to be based on data, and a further issue involved in description then is how to select the data. A number of types of data collection can be distinguished, although most descriptions rely on a mixture of these. Approaches to data collection are described in more detail in Meyer and Nelson (Chapter 6, this volume), but given the direct way in which they impact on the relation between data and theory, we will discuss some of them briefly here. Each approach has advantages and disadvantages, and all of them involve some degree of idealization.

An approach that has not been uncommon in descriptions and in theoretical work is introspection; an author who is a native speaker of the variety to be analyzed considers whether he or she would accept a particular pronunciation, phrase, or sentence, and uses these judgements as a basis for the description. An advantage of this approach might be that a linguistically trained person can provide more subtle judgements, whereas non-trained native speakers might find it difficult to make the distinction between "is grammatical" and "makes sense"—a distinction which is crucial both for description and theory.[1] The disadvantages of this approach are, however, also obvious; even trained linguists might not have good awareness of what they actually say.

The introspective approach is particularly dangerous in theoretical work within a particular framework, where the desire to provide a neat analysis within the favored theory may cloud the linguist's native speaker intuitions. A more reliable way of collecting the data is then to elicit grammaticality judgements from a group of native speakers, or to get their judgements in a more subtle way through picture description tasks or similar processes. In an approach like this, a consensus view can emerge, and peculiarities of individual speakers can be ruled out. However, data collected in this way may deviate from naturally occurring data. The notion of a simple grammaticality judgement is not a straightforward one to most native speakers, particularly if the variety considered is non-standard. There may also be judgements that do not involve a simple binary distinction, "grammatical" vs "ungrammatical," and many linguists now work with subtler assessments, such as magnitude estimation (see Bard et al. 1996; and, for a comparison of different methods of assessing grammaticality, see Bader and Häussler 2010).

The use of corpora avoids many of the drawbacks identified with using native speaker judgements in that it allows large-scale studies of naturally occurring language. Especially with the existence of large electronically available corpora, this has become an important tool for the study of all varieties of English (see Szmrecsanyi and Rosseel, Chapter 3, this volume). Biber et al. (1999) is an example of a corpus-based large-scale grammar of English. There are, of course, drawbacks, especially in that the absence of a particular construction in a corpus cannot be taken as evidence that this construction is ungrammatical in the language. And being able to classify some constructions as explicitly ungrammatical is important in both descriptive and theoretical work. This is a familiar problem for those working on varieties for which there are no longer any native speakers, for whom corpus study is the only option. Similarly, constructions which would be described as ungrammatical by the vast majority of the language community may occur in corpora, say as speech errors, or in historical texts in the form of scribal errors.

Most descriptions of English are based on the written language—although modern grammars do refer to alternative constructions that occur in spoken language but which are infrequent in written form. This is particularly the case in Biber et al. (1999), since it is partially based on spoken corpora. Miller and Weinert (1998) go one step further and describe spoken language as a separate variety with a partially different grammar from the written language (see also Miller and Calude, Chapter 27, this volume).

2.3 Theory

Trying to establish a general definition of what is and what is not a theory would not be a fruitful exercise in this kind of publication. However, for the reader who is interested in such issues, Chalmers (1982) provides an eminently readable introduction and further references. Scholz et al. (2016) is an excellent point of reference for the philosophy of science as applied to linguistics. In this general area of enquiry, the most relevant questions for our purposes are: "When does a linguistic description turn into something more abstract, which we can call a linguistic theory?" and "What is the relationship between description and theory in linguistics?" In the text that follows, I will explore these questions with particular reference to morpho-syntactic theory.

With respect to the first of these questions, it is worth pointing out that every description that is not just a list of actually occurring strings of sounds involves some degree of abstraction, so that, for instance, as soon as we refer to a unit such as a "phoneme" or a "verb phrase," we are abstracting away from the pure data. A theory should of course predict (or generate, in the sense used in the preceding text) the correct set of data that it aims to deal with. However, it is often assumed that a good theory should do more than this. Chomsky (1965) defined three properties which a theory should have; they are known as "levels of adequacy" and have played a central role not only within the Chomskyan approach to linguistics.[2] The notion of generating the correct set of data which we have already discussed is referred to as the "observational adequacy" criterion. In addition, a theory must be "descriptively adequate," in that it must abstract away from the actual phrases and describe the principles or rules which allow a theory to make predictions about the grammaticality of strings. Finally, a theory must possess "explanatory adequacy": it must provide an explanation for why human languages are the way they are and how human beings can acquire the principles captured under descriptive adequacy. All linguists can be expected to agree on the necessity of observational adequacy. Even though there is some disagreement as to what the exact principles are which are captured under descriptive adequacy, the idea of a theory being required to have such principles is relatively uncontroversial. The idea that a linguistic theory should also explain processing and more generally the cognitive underpinning of language is also fairly widely accepted. However, exactly when a theory can be said to have explanatory adequacy in this sense is a controversial issue.

Within the Chomskyan tradition, there has long been a focus on the aim of linguistic theory involving explaining the knowledge of a language that is in a native speaker's head and how it came to be there:

> To put the matter in somewhat different but essentially equivalent terms, we may suppose that there is a fixed, genetically determined initial state of the mind, common to the species with at most minor variation apart from pathology. The mind passes through a sequence of states under the boundary conditions set by experience, achieving finally a "steady state" at a relatively fixed age, a state that then changes only in marginal ways. … So viewed, linguistics is the abstract study of certain mechanisms, their growth and maturation. (Chomsky 1980, pp. 187–188)

This general view of the ultimate goal of linguistic theory is shared by many theoretical approaches which differ from Chomskyan tradition in other ways, as we shall see in the next section. In an introduction to Head-driven Phrase Structure Grammar (HPSG), we find the following statement on the aim of linguistic theory:

> Indeed, we take it to be the central goal of linguistic theory to characterize what it is that every linguistically mature human being knows by virtue of being a linguistic creature, namely, universal grammar. (Pollard and Sag 1994, p. 14)

However, such assumptions are by no means a necessary part of a theory. Generalized Phrase Structure Grammar (GPSG), which to some extent can be said to be a pre-cursor to HPSG, very explicitly did not contain any such assumptions:

> In view of the fact that the packaging and public relations of much recent linguistic theory involves constant reference to questions of psychology, particularly in association with language acquisition, it is appropriate for us to make a few remarks about the connections between the claims we make and issues in the psychology of language. We make no claims, naturally enough, that our grammar is *eo ipso* a psychological theory. Our grammar of English is not a theory of how speakers think up things to say and put them into words. Our general linguistic theory is not a theory of how a child abstracts from the surrounding hubbub of linguistic and nonlinguistic noises enough evidence to gain a mental grasp of the structure of natural language. Nor is it a biological theory of the structure of an as-yet-unidentified mental organ. It is irresponsible to claim otherwise for theories of this general sort. (Gazdar et al. 1985, p. 5)

This approach would then not have the property of explanatory adequacy and hence would not be an acceptable theory according to the Chomskyan tradition, although, conversely, these authors would be critical of the extent to which the Chomskyan approach actually explains how the human mind deals with language.

In this context, it is important to keep in mind that, in spite of impressive advances in psycholinguistics, our empirical knowledge and understanding of how the human mind deals with language is still incomplete. Many accounts that claim explanatory adequacy only do so based on the assumptions made about the language faculty within their particular theoretical framework. To someone who does not share those assumptions, the theory would not be considered explanatory. Explanatory adequacy is then a contentious issue.

To place linguistics in a broader context, we can say that those entities which we refer to as *linguistic theories* are essentially models of systems, on a par with a model of a chemical compound or a traffic situation. Models in this sense provide an abstract description of a system, in our case a language or a subset of a language. They are, however, not assumed just to describe, but also to enhance the understanding of that which it models. This way of looking at linguistic theory leads us to consider the relation between the model and that which it models, which comes down to the issue of the relation between the data described and the theory.

In this section so far, I have used "theory" to describe whole frameworks, such as HPSG or Chomskyan theory. In a sense, this boils down to including both the actual theory and the machinery used to express the theory under the term. Even though this is the way the term tends to be used, it is not entirely accurate to include under "theory" the metalanguage which is used to express the theory. The distinction is articulated by Bresnan et al. (2015, p. 39) with respect to Lexical-Functional Grammar (LFG):

> Note, however, that the formal model of LFG is *not* a syntactic theory in the linguistic sense. Rather, it is an architecture for syntactic theory. Within this architecture, there is a wide

range of possible syntactic theories and sub-theories, some of which closely resemble syntactic theories within alternative architectures, and others of which differ radically from familiar approaches.

For the sake of simplicity, I will carry on using "theory" in the more common, less precise meaning.

Current syntactic theories share some of their metalanguage, but they also vary substantially with respect to some of their fundamental assumptions; there are different ways of modeling the same data set. At a more abstract level, different theories would all like to claim properties such as ontological parsimony. This means that is a principle known as Ockham's razor should apply; as little theoretical apparatus as possible should be used to explain a phenomenon within the theory. This is often captured in terms of a principle of economy in theories, but, as we shall see, the effect which this principle is assumed to have varies drastically. Theories will also claim to have *decidability*—formal procedures exist for determining the answer to questions provided by the theory, like whether or not a particular sentence will be generated by the grammar; and *predictability*—the theory makes predictions about what can or cannot occur.

2.4 Description and Theory

Unfortunately, in some linguistic circles, there is a history of mutual disrespect between those linguists who would refer to themselves as *descriptive* and those who would call themselves *theoretical* linguists. This is particularly unfortunate since there is a strong interdependence between description and theory formation, as we have seen. Clearly, without description there could be no valid theory. Using the terminology introduced above, to model something, we need to know what we are modelling. At the same time, it is also the case that linguistic theory has allowed us to ask some interesting questions about the described data that we might not otherwise have asked. Indeed, the insight added in this way is one important justification for theory construction.

Let us consider in a little more detail the link between a set of data and a theory. This involves a stage which we can refer to as *pre-theory* (cf. Lyons 1977, pp. 25–31). Pre-theory involves something more abstract and general than just data, but it is not yet something sufficiently systematic for it to be referred to as a *theory* under anybody's definition of the term. Pre-theory can be described in terms of a trichotomy between "problems," "issues," and "constructs." Problems are sets of data grouped together under the assumption that an analysis of one member of the set should also naturally extend to the whole set. Examples of core problem sets are English auxiliaries or *wh*-questions. This is then, in a sense, the first step on the path from a description to a theory. By *issues* is meant aspects of linguistic structure, abstracted from the data sets, which are generally recognized as being central to any theoretical approach to the data, even though the way in which they end up being dealt with in the syntactic theory may vary. Examples of such issues are the phoneme, syntactic constituency, and the classification of categories. Constructs are theoretical concepts set up in order to analyze and characterize the problems and to capture the issues. Some constructs are common to most theoretical approaches—for instance, phonological or syntactic features. Some would be present in most frameworks but with different instantiations, like phrase structure rules, whereas others still are posited in some theories but not in others—for example, movement rules. A set of interrelated theoretical constructs forms the building blocks for a theory.

Given that there is no complete description even of a well-studied language like English, theories will be based on partial data sets. Questions then arise as to the breadth of data one needs to take account of in order to formulate a sound theory of language. The answers to

such questions vary widely between theoretical approaches. One view taken of universal grammar within the Chomskyan tradition says that the basic underlying structure of all languages is essentially identical. In its pure form, this means that the underlying structure of all clauses is the same. The more superficial variation between languages is due to "parametric variation," something we shall return to below. If all languages are the same underlyingly, then an in-depth study of one language should suffice to formulate a theory of universal grammar. This is indeed the position sometimes taken within Chomskyan approaches:

> I am interested, then, in pursuing some aspects of the study of mind, in particular, such aspects as lend themselves to inquiry through the construction of abstract explanatory theories that may involve substantial idealization and will be justified, if at all, by success in providing insight and explanation. From this point of view, *substantial coverage of data is not a particularly significant result*; it can be attained in many ways, and the result is not very informative as to the correctness of the principles involved. (Chomsky 1980, p. 11, my emphasis)

To many descriptive linguists and typologists, a statement like this would be anathema. However, it should be added here that much good descriptive work on a variety of languages has been carried out within the Chomskyan tradition and has shaped its development; it is just that, as this quote makes clear, this is not considered an aim in itself and is not deemed to be a requirement for theory formation.

All other theoretical frameworks of which I am aware would disagree strongly with the suggestion that broad and thorough descriptive work has only a minor role to play in the development of syntactic theory. Quotes by proponents of GPSG and Role and Reference Grammar (RRG), respectively, illustrate the point:

> A necessary precondition to 'explaining' some aspect of the organization of natural languages is a description of the relevant phenomena which is thorough enough and precise enough to make it plausible to suppose that the language under analysis really is organized in the postulated way. (Gazdar et al. 1985, p. 2)

> Describing linguistic phenomena is one of the central goals of linguistics …. Developing serious explanatory theories of language is impossible in the absence of descriptions of the object of explanation. Understanding the cognitive basis of language is impossible in the absence of an adequate cross-linguistic characterization of linguistic behavior. (Van Valin and La Polla 1997, p. 3)

Given what has been said so far about description, pre-theory and theory, the best distinguishing criterion for deciding whether something is a description, or possibly a pre-theoretical description, or indeed a theory, seems to rest in its explanatory power. In the Chomskyan tradition, there is a strict dichotomy between, on the one hand, the abstract internal language ability, referred to as *I-language* ("I" for internal or individual; a similar, although not identical, concept in earlier versions of the theory was *Competence*), and, on the other, the physical and perceptible language, referred to as *E-language* ("E" for external; in previous version of the theory, *Performance* stood for a related concept). The latter also involves the communicative and social aspects of language. In this tradition, the explanations captured within the theory refer to I-language. In more recent writing, Chomsky (2005) defines three factors that determine I-language: (a) the genetic endowment or Universal Grammar (UG); (b) experience of language; and (c) "the third factor," that is, all factors that are not specific to language. An extensive range of factors has been included under "third factor" in the literature, central among them computational efficiency. On this view, a new potential level of explanation can be sought according to Chomsky, namely through the

question of whether language is "the optimal solution to the interface conditions"; in other words, if language is the most computationally efficient connection between sound and meaning. If computational efficiency plays a key role, the importance of UG in I-language would be reduced as compared to earlier versions of the theory.

A very different perspective on explanation in linguistics is found in Cognitive Grammar (see, e.g., Croft and Cruse 2004; Langacker 2008) and other usage-based approaches to language (see, e.g., Tomasello 2015). Here, it is argued that there is no distinction between language competence and language performance, or between our language-specific and general cognitive abilities. Within these approaches, an individual's language is a fluid system that is constantly reshaped by language use. Explanations make reference to the development of language, as seen both in language acquisition and in diachronic change.

2.5 Some Current Morpho-Syntactic Theories

Even though theories may disagree on the role of typological data, one property that all theories have in common is that work has been done on English within that theory. At the same time, linguistic theories will also want to have something to say about linguistic variation, and it is in this area that the differences between theories are most apparent. What I will have to say here will be based around analyses of English, but in order to illustrate differences in philosophy between the theories, in particular in their approach to typological variation, it will sometimes be necessary to refer to other languages. No one would want their theory to be applicable only to English.

Especially within the general research area of syntactic theory, there are too many well-established and interesting theories to mention or describe here. The approaches vary in the size of their research community. The reason for the more limited following of some approaches is rarely to be found in scientific merit, but rather in socio-geographic factors. Some approaches which I regret not to be able to include here, but for which I refer the reader to the literature, are RRG (Van Valin 2005), dependency grammars such as Word Grammar (WG, Hudson 2010) and Categorial Grammar (CG, Morrill 2010), Head-driven Phrase Structure Grammar (Pollard and Sag 1994), Construction Grammar (CxG, Croft 2001; Hilpert 2014), and Sign-Based Construction Grammar, a combination of HPSG and CxG (Boas and Sag 2012). I will instead concentrate on the Minimalist Program (MP or Minimalism) in Section 2.5.2; Lexical-Functional Grammar (LFG) in Section 2.5.3, and provide a brief outline of Optimality Theory (OT) in Section 2.5.5. In Section 2.5.1, I will explain some fundamental concepts that will aid the understanding of MP and LFG, and in Section 2.5.4, I will compare the two approaches. OT is included here because it involves the most radical paradigm shift in linguistic theory in recent times, although it appears to no longer play the role in morpho-syntax that it did earlier. MP and LFG have been chosen not only because they encapsulate different approaches to syntactic theory, but also because they illustrate how two approaches with very different-looking architectures can actually share some properties.

With any syntactic theory, researchers working within the same paradigm may interpret the details of a theory differently, and analyses may vary with respect to how the detailed technicalities are worked out. In the descriptions that follow, the focus is on those aspects of the theory on which there is broad consensus. The emphasis will also be on those aspects which illustrate the similarities and differences most clearly. By necessity, the account given here will be schematic and will avoid some of the technical details.[3] I refer the reader to Chomsky (1995) for the original statement on MP and to Adger (2003) for an accessible account of both the philosophy underlying the theory and the technicalities of MP. For LFG, see Bresnan et al. (2015) and Dalrymple et al. (2019)—or, for a more accessible introduction, Börjars et al. (2019). General introductions to OT are Kager (1999), McCarthy (2001), and Prince and Smolensky (2004).

2.5.1 Some Basic Concepts

Linguistic analysis of the kind we are considering here is, to a great extent, about understanding how form and meaning are linked. Since we are considering syntax, I will not go into the meaning of words, but consider how the meaning of units larger than words is influenced by the way in which words are put together. To take a simple example, how do we understand from (1) who tickles who?

1. **Fred tickled his brother.**

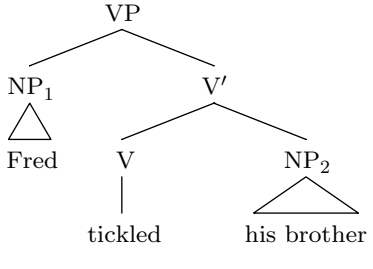
Tickle is the kind of activity that needs two participants—someone to do the tickling, and someone to be tickled. In formal frameworks, this is generally expressed as "*tickles* requires two arguments." There are other verbs that also require two arguments, but where the roles of the participants are quite different, like *admire*. A person tickling someone generally acts on purpose, and the person being tickled knows he or she has been tickled. *Admiring*, on the other hand, usually happens without the admirer having taken a conscious decision, and the person being admired may not even be aware of it. For this reason, arguments are classified according to semantic—or Thematic—roles: *tickles* involves an Agent and a Patient, whereas *admire* involves an Experiencer and a Stimulus. The argument structure of *tickle* is represented in (2).

2. ***tickle* < Agent, Patient >**

One question for syntactic theory is how the structure of a sentence allows the speaker to identify which noun phrase should be interpreted as Agent and which as Patient in a sentence like (1)—or, to put it differently, identifying who tickles who in (1).

In order to do this, a formal way of representing syntactic structure is required, and most syntactic frameworks, including the two we will look at here, use trees to do this. In particular, they use some version of an approach called *X-bar theory* (Jackendoff 1977). A simple example of a tree representing the example in (1) using a basic version of the X-bar notation can be found in (3); we will see that a more articulated version is used in MP and LFG.

3.



In a tree like this, each node (the point where two branches meet) represents a constituent (a string of words that belong together at a certain level). Each node is labelled with the category of that constituent, so *his brother* is a constituent of category NP—for *noun phrase* (the triangle underneath both NPs is there because we are not concerned with the internal structure of these constituents here, and we have numbered the NPs just so that we can distinguish them). The node labelled V′ represents the constituent *tickled his brother*. The category V′ (also written with a bar above the letter: $\bar{\text{V}}$) can be thought of as an "in between" category; it neither represents a word nor a full phrase.

Female kinship terms are used when talking about relations within a tree, so that NP_1 is a sister of V′, and they are both daughters of VP (a Verb Phrase). Certain positions within the

tree are special. In (3), the verb is the *head* of the phrase, which means the phrase as a whole is a VP. The sister of a word-level category is called a *complement*; this captures the fact that a head can select which elements it can combine with. In this case, *tickle* is an obligatorily transitive verb; it requires one object NP. The daughter of VP and sister of V′ is the *specifier* of the phrase; it also has a special status in that it completes the phrase.

In addition to the categories representing content words (Noun, Verb, Adjective, Adverb, Preposition), MP and LFG make use of categories representing words with formal or functional content, such as *Determiner* or *Inflection*; however, as we shall see, the two frameworks make use of functional categories in different ways. Within X-bar theory, the assumption is that all phrasal categories have more or less the same structure, so we can use a variable and say that there are three levels of categories: XP, X′, and X. This, in combination with the fact that X′ was originally written with a bar above the category, gave rise to the name *X-bar theory*. As we shall see, MP and LFG use this approach in different ways.

Another concept that is used in both MP and LFG, but in different ways, is *feature*. Although they are used as part of the formal architecture, the features themselves are quite intuitive—for instance, *tickled* would have a feature value TENSE = PAST, and *brother* would have a feature value NUMBER = SINGULAR. This background should make it easier to understand the formal frameworks to which we now turn.

2.5.2 *The Minimalist Program*

The modern roots of syntactic theory can be traced back to Chomsky's earliest work (Chomsky 1957), and even those linguists who are critical of recent versions of this theory will acknowledge the profound influence of this early work. The theory has gone through developments and renaming: *(Extended) Standard Theory*, *Government and Binding (GB)*, and, in the early 1990s, the *Minimalist Program*. Note that it is referred to as a program rather than a theory. The term *Principles and Parameters* (P&P) was used in parallel and referred to the assumptions that all languages have a common universal core and that the variation which is evident from even a small typological sample is the result of so-called *parameters* being set differently. In more recent versions of MP, typological variation is generally captured as differences in the feature specification of lexical items, so that parametric variation is restricted to features.

Different terms are used to capture all the stages of development within this line of syntactic research, and all of them have drawbacks in spite of their common usage. Here, I have used "Chomskyan," which seems reasonable, given that work by Noam Chomsky started the tradition, and every major change has been signaled by some publication of Chomsky's (e.g. 1965, 1982, 1986, 1995). However, the development and change of direction of the tradition does not, of course, depend solely on one person, and it may therefore appear inappropriate to use this term. "Transformational theory" is a common way of referring to this group of approaches, because the concept of transformation was central in the early stages. However, this terminology is not appropriate for more recent versions. "Generative theory" is also frequently used to mean Chomskyan syntactic theory. However, this term is wrong for two reasons. First, in the narrow sense of viewing a grammatical theory as a machinery which generates all and only the grammatical sentences of a language, it is an inappropriate representation of what modern Chomskyan theory is aiming to achieve. Second, if we take a broader interpretation of the term, to mean an explicit and precise approach to grammar, then all the theories mentioned here and a few more besides would be rightly described as *generative*, and hence it is not a useful term for singling out the Chomskyan tradition.

In Minimalism, each expression is assigned an interpretation at two interfaces: the sensory–motor (SM) interface and the conceptual–intentional (CI) interface. The two

interfaces correspond roughly to sound and thought; hence, a phrase can less formally be described as a hierarchically organized set of elements that correspond to a string of sounds, represented as *Phonological Form* (PF), and some meaning, represented as *Logical Form* (LF). These objects are built up from a list of elements taken from the lexicon. Such a list is referred to as the *numeration*. The lexical elements which are part of the numeration have the shape of feature bundles, and, as part of the derivation of a phrase, these elements are *merged*—or combined—in pairs to give a new unit, which can in turn be merged with another unit. Under this approach, the formal operation Merge is central; and, since Merge is defined as combining two elements at a time, only binary branching trees can be created by it.

In order to ensure that only grammatical phrases are built up in this way, there needs to be restrictions on which elements Merge can combine. This is captured in MP as constraints on the feature content of the elements which are to be merged. All features need to be checked, and a formal approach to feature checking is central to MP. *Checking* is a technical term here, and the essence of the checking procedure is to ensure that elements do not occur in an inappropriate environment. To take an example, an element with a nominative case feature may only occur in a slot in the sentence where a nominative element is permitted—or, in this terminology, a nominative element can only Merge in an environment which allows its nominative feature to be checked. I will provide a simplified account of the nature and role of feature checking here.

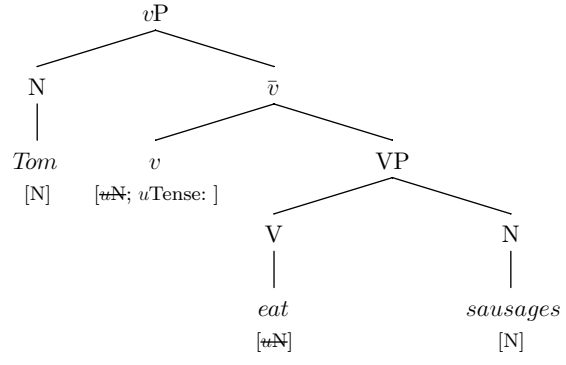
There are two different ways of classifying features: *with respect to their semantic content* and *with respect to their structural behavior*. The semantic distinction gives two types: "uninterpretable features," which are not relevant to the semantics, but are purely formal; and "interpretable features," which have semantic content. Both types of features need to be checked against a matching feature in an appropriate place in the tree. The difference lies in the fact that uninterpretable features are erased as they are checked. If such a feature is not checked and erased before LF, it would result in an illicit LF representation, since meaningless features would have to be assigned an interpretation. Another way of putting this is that uninterpretable features left at LF causes a derivation to "crash" at LF. Interpretable features have meaning, which will need to be included in the interpretation at LF. They are checked as part of the derivation of a phrase, but they are not deleted when they are checked; rather, they ensure that a value is assigned to an element. If all features are checked, the derivation is said to "converge" at LF, and we get a grammatical string. Examples of uninterpretable features are Case features and those features which capture selectional restrictions of the kind we saw hold between the head and its complement in (3).[4] For instance, a transitive verb such as *tickle* would contain some feature which requires it to combine with an element that is nominal. If *tickle* is successfully combined with a nominal, then that feature is checked and erased. Without merging with a phrase with the appropriate feature, *tickle* would retain an uninterpretable feature, and the derivation would crash. Examples of interpretable features are tense and the so-called *Φ-features* (person, number, and gender).

Uninterpretable features also differ in strength—they can be *strong* or *weak*. This distinction relates to the constraints on the structural position of the elements whose features are to be checked. A strong feature can only be checked "locally"—that is, if the feature against which it is to be checked is near it in the tree. It is not necessary here to go into what types of structural relations there are or what "near" means. The crucial point is that a strong feature can make an element move to a position in the tree from where its features can be checked. Weak features do not have this effect. Strictly speaking, weak features can cause movement, but so as to effect only LF and not PF—that is, for the purposes of pronunciation, the element occurs in its original position, but for the interpretation it has

moved to a new position. Whether a feature is strong or weak is not related to its semantics. It has been suggested in the literature that feature strength is connected to there being overt morphology marking the feature, but this connection is certainly not absolute. The difference between strong and weak features can be illustrated by *wh*-questions. In neutral *wh*-questions in English, the *wh*-constituent occurs at the front of the clause and not in its canonical position. Simplified, it can be assumed that this involves a strong feature, say [+*wh*], which can only be checked if the *wh*-constituent moves to the front, where the checking item is found. In Chinese, for instance, the *wh*-phrase is not fronted, and hence the Chinese [+*wh*] feature is assumed to be weak; it can be checked at a distance or the movement affects only LF.

Let us now turn to the way in which phrases are constructed. In the initial stages of this process—the derivation—lexical elements undergo Merge pairwise to form a new object. We illustrate with an example where we simplify the formalism in order to illustrate the main points more clearly. For a sentence like (4a), we get the initial tree in (4b).

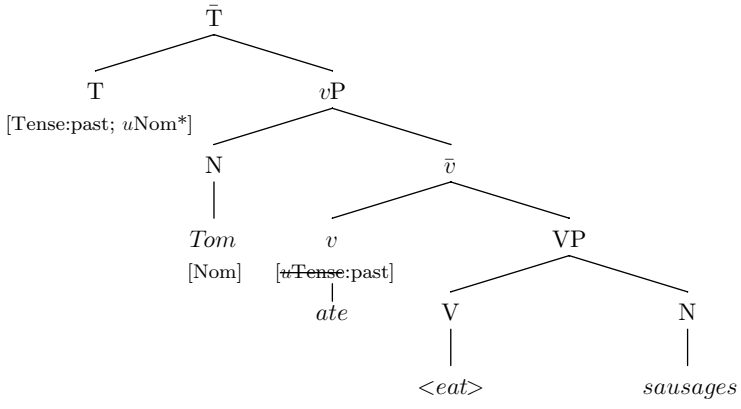
4. a. **Tom ate sausages**
   b.



We focus on the verb here, so we simplify node labels for the noun phrases. Starting from the bottom, *eat*, with the selectional feature *u*N, has combined with *sausages*, which has the categorial feature N. The two elements are in the right relationship for the *u*N feature to be checked, and, since it is an uninterpretable feature, it is deleted as indicated by the strikethrough. The element thus created by Merge—*eat sausages*—then merges with *v*, pronounced "little v," to form a $\bar{v}$ (note that the traditional bar above the category is used here, rather than *v*′). The *v* contains no lexical content, just features, one of which is *u*N, and once it merges with *Tom* to form the *v*P, that feature can be checked and deleted against the N feature associated with *Tom*. The category *v* is present for semantic reasons; it houses an Agent noun phrase in its specifier position, so once Merge has applied to form the *v*P with *Tom* in the specifier position, *Tom* will be associated with the thematic role of Agent.

Although the selectional feature [*u*N] on *v* has been checked in (4b), *v* is also associated with an interpretable feature, [*u*Tense:], which has not been checked. We see that the verb occurs in its base form, *eat*, in this tree since no feature related to tense has yet applied. In order for the checking to take place, a functional category, T, containing the appropriate feature with a value, in this case [Tense: past], must be added. This gives the tree in (5), where we have left out the already checked selectional features.

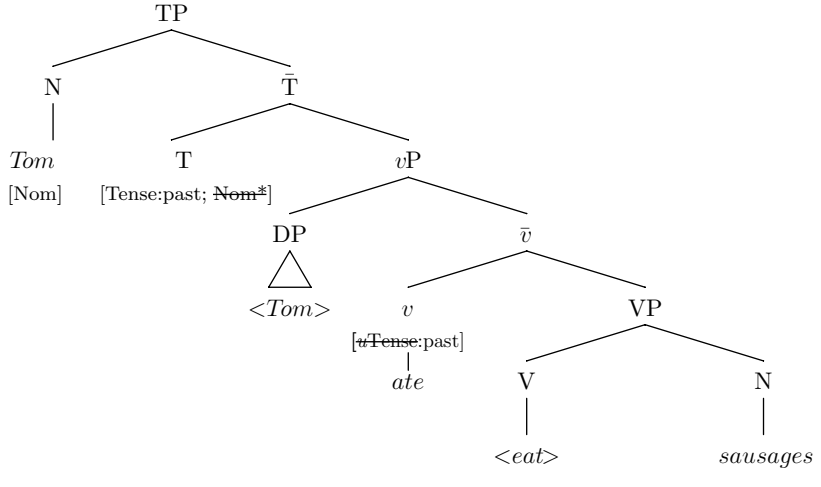
5.



In (5), T has the interpretable feature with a value [Tense: past]. Since it is interpretable, the checking must work differently from what we just saw with the selectional features. This is done through a process called *Agree*, which can check the unvalued feature under *v* and also assign it a value—in this case, past. Hence, a feature is struck out, but the value is assigned and can be associated with the verb that moves up to *v* to give the feature lexical content, and we represent it now as *ate*, although formally there is a little more to it. The angle brackets around *eat* indicates that it has moved.

The category T is also associated with an unvalued, uninterpretable Case feature. Case is a feature associated with nouns, and we have indicated this on *Tom* in (5) (we ignore the Case of the object *sausages* here). We might expect Agree to be able to value the Case feature here, in the same way that Tense was checked and valued, but the asterisk on the Case feature under T indicates that it is a strong feature and will need to be valued in a specific structural relationship (we will not go into the detail of this here). The strong feature then causes movement of *Tom* to the specifier of TP, as in (6), and the feature can now be checked and deleted. We should point out that some subject types require some modifications to this analysis, but this illustrates the general approach.

6.



In (6), all features are checked and, where appropriate, valued, and we have the final structure for the sentence in (4a). For this example, there is no lexical material under T. This is because lexical verbs in English do not move to T, but stay in *v*. Finite auxiliary verbs, on the other hand, because of their special properties with respect to negation would occur under T in English. For other interpretable features, like *perfect*, *progressive*, or *negation*, new projections are added which can house the features against which elements need to be checked. Thus, a hierarchy of functional projections is established. This hierarchy is assumed to be universal by some linguistics working within this framework, so that in principle all clauses have the same structure.

As discussed in the section 2.3, theories commonly espouse some principle of economy; as the name indicates, Minimalism is such a theory. Movement such as that illustrated here is assumed to be "expensive," and Minimalism's principle of economy rules out overt movement unless this is the only way to make a derivation converge—that is, to ensure that the resulting sentence is grammatical. Economy in this sense is not part of UG, but is an example of a third factor.

Before we turn from this brief and simplified description of the mechanics of the MP to an account of the fundamental properties of LFG, MP's reliance on structure should be highlighted. First, even though features are the locus of information—both formal and semantic—given feature checking and the close relation between structure and features, tree structure plays a key role in capturing information. In order to have a past tense interpretation or to express perfective aspect, the structure of a sentence needs to contain a TP headed by a *past* feature value or a PerfP headed by *perf*, respectively. Second, semantic roles rely on structure for their definition and presence. For instance, in order for a noun phrase to have the thematic role Agent, it must occur in a particular structural position, specifier of *v*P. We shall return to this issue below. Note also that grammatical relations such as subject and object do not play an explicit role here, although Case can be argued to capture the same information.

2.5.3 *Lexical-Functional Grammar*

In Lexical-Functional Grammar, any linguistic element is assumed to have associated with it information of different types: prosodic information, information about categories and structure, and information about the functional aspects, semantics and information-structural properties of the string. The different types of information are represented in separate dimensions: p(rosodic)-structure, c(onstituent/ategory)-structure, f(unctional)-structure, a(rgument)-structure, s(emantic)-structure, and i(nformation)-structure. LFG differs crucially from Chomskyan theory in that these dimensions of information are represented in different formal notations, not always a tree structure and are related by so-called *mapping relations*, which allow non-one-to-one correspondence. This means that, say, one word in c-structure may be mapped to more than one feature in f-structure, and conversely, a particular feature at f-structure can be associated with more than one word in c-structure. LFG is then described as a parallel correspondence architecture; different types of information about a linguistic element are represented in separate dimensions, and mapping relations ensure that there is appropriate correspondence between them. It is not referred to as a "theory," but as an "architecture," for reasons made clear in the quote in Section 2.3. The mapping relations, which are at the heart of LFG, are mathematically well-defined bi-directional functions. In what follows, we will concentrate on c-structure and f-structure. C-structure takes the form of trees, but, as we shall see, these trees need not be binary and may be non-headed. F-structures are unordered sets of feature-value pairs. C-structure varies across languages and is determined by constituency tests rather than information relating to thematic roles, for instance. F-structure, on the other hand, is reasonably invariant cross-linguistically.

Let us now consider the sentence in (4a) from an LFG perspective. Restricting ourselves now to two dimensions of information, with each string of words is associated a c-structure, capturing its category and constituent structure, and an f-structure, representing its functional features. As with MP, the lexical entries of words form a key source of information. The (partial) lexical entries required for (4a) are found in (7).

7.

Tom	N	(↑PRED)='TOM'
ate	V	(↑PRED)='EAT<SUBJ, OBJ>' (↑TENSE)=PAST
sausages	N	(↑PRED)='SAUSAGE' (↑NUM)=PLURAL

The arrows form part of the mapping between c-structure and f-structure; ↑ refers to the f-structure associated with the node under which the word is inserted. This means that, when inserted, the word contributes these feature-value pairs to the f-structure associated with the constituent represented by the node above it. PRED takes a semantic form as its value, marked by the quotes. Strictly speaking, this part of the PRED feature is a pointer into the semantics proper, but that level of detail need not concern us here. For lexical items that have an argument structure, the grammatical relations associated with those arguments are captured by the PRED feature, as exemplified here for *eat*. Subcategorization then involves functional selection; it is part of the f-structure, not the c-structure.

This has illustrated how lexical entries associated with words contribute f-structure information when they are inserted into the tree. The other source of f-structure information is the c-structure, which is determined by a set of annotated phrase structure rules. This is illustrated in (8) for the clause and the VP in English, the same parts of the clause we considered in Section 2.5.2.

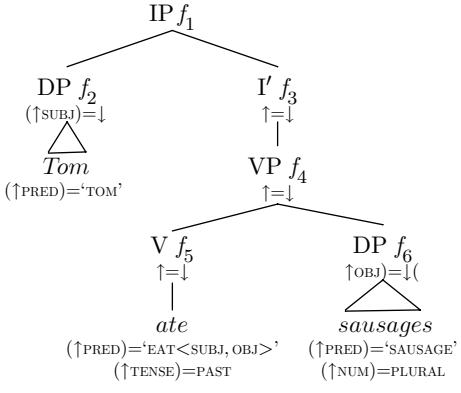
8.

a.	IP	→	DP (↑SUBJ)=↓	I′ ↑=↓
b.	I′	→	I ↑=↓	VP ↑=↓
c.	VP	→	V ↑=↓	DP (↑OBJ)=↓

Each phrase structure rule licenses a sub-tree, and any part of a full tree representation must be licensed by some rule. Informally, this can be thought of as the rules building a tree. The annotation under each category on the right side of the rule forms part of the mapping between c-structure and f-structure; as in the lexical entries, ↑ refers to the f-structure associated with the node above and ↓ to the f-structure of the node itself. The annotation on the DP in the rule in (8a) then states that the f-structure associated with the mother node, the IP, will have a SUBJ feature, and the value of that will be the f-structure associated with this DP. In other words, the DP in the specifier position of IP identifies the subject in English, and similarly with the DP and object in the rule in (8c). Hence, the grammatical relations subject and object are structurally defined in an LFG analysis of English. However, as we shall see, this is not the case for all languages. The annotation ↑=↓ indicates that the f-structure will be shared between the mother node and the daughter; any category with this annotation is then a functional head. It means that all information of the daughter will also be associated with the mother, and *vice versa*.

We can now draw a tree licensed by the rules in (8) and insert the lexical entries in (7) to give the tree in (9) for the sentence in (4a). Here, we have also informally given names to the f-structures associated with each c-structure node, so that the f-structure associated with the IP is named f_1, etc.

9.



One property of this tree that contrasts sharply with the assumptions of MP is that the I′ node lacks an I daughter, and hence lacks a head. In LFG, there is an assumption that all elements on the right side of a c-structure rule are optional unless there is some independent principle that requires them to be present. As in MP, only finite auxiliaries are assumed to have the special properties that motivate them occurring under a functional category, and since there is no finite auxiliary in (4a), there is no I in (9). Note that it is not possible to have the VP introduced directly under IP, since there is no rule in (8) that has IP to the left of the arrow and VP on the right side.

With the names for f-structures introduced in (9), the variables–the up and down arrows–in the annotations can be replaced to give the equations in (10).

10. (f_1 SUBJ) = f_2 (f_2 PRED) = 'TOM' $f_1 = f_3$
$f_3 = f_4$ $f_4 = f_5$ (f_5 PRED) = 'EAT < SUBJ, OBJ >'
(f_5 TENSE) = PAST (f_4 OBJ) = f_6 (f_6 PRED) = 'SAUSAGE'
(f_6 NUM) = 'PLURAL'

These equations then give rise to the f-structure in (11).

11.

$$\begin{bmatrix} \text{PRED} & \text{'EAT} \quad \text{<SUBJ, OBJ >'} \\ \text{TENSE} & \text{PAST} \\ \text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{'TOM'} \end{bmatrix}_{f_2} \\ \text{OBJ} & \begin{bmatrix} \text{PRED} & \text{'SAUSAGE'} \\ \text{NUM} & \text{PLURAL} \end{bmatrix}_{f_6} \end{bmatrix}_{f_1,\, f_3,\, f_4,\, f_5}$$

In (9), the annotations associated with c-structure play a crucial role; *Tom* is the subject because it occurs in specifier of IP. This structural identification of grammatical relations is

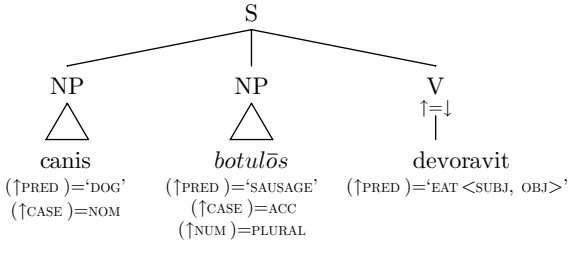
characteristic for a highly configurational language like English. The motivation for the functional category I is also language specific, and, as in MP, it is related to the difference between auxiliary and lexical verbs. However, the use of functional categories is much more restricted in LFG than in MP; generally, a functional category is used when there is evidence that some functional feature is associated with a particular position, as with finite auxiliaries in English. The presence of a functional feature is in itself not sufficient to motivate a functional category in the c-structure.

To illustrate the role of c-structure in LFG, we turn now to a language that is organized differently from English. Let us consider the Latin sentence in (12). Latin has a freer word order than English, and, given the right information-structural conditions, all word order permutations of (12a) are possible. There is no evidence that a feature like tense is associated with a particular position within the sentence, and hence no functional category is assumed. The resulting c-structure tree can be found in (12b), where some information from the lexical entries has also been inserted.

12. a. Canis botulōs devoravit.
dog.NOM sausage.ACC.PL eat.PERF.3SG

"The dog ate sausages."

b.



As (12b) illustrates, exocentric—or non-headed—categories are permitted within LFG. The S category in (12b) does not have a head in the way that the TP in (6) had a T head or the IP in (9) had an I head; neither the NP or the VP daughter is of the same category as the mother. The functional equation associated with the V in (12b), does ensure that the f-structure information associated with the verb becomes part of the main f-structure for this sentence. This means that the verb's PRED feature becomes the main PRED feature of the f-structure for the sentence. There is no structural annotation that determines which noun phrase is the SUBJ and which is the OBJ; instead, this is a direct result of the case features, although we will not go into the technicalities of this here. Note that the noun phrases are represented as NPs, rather than DPs, since there is no argument for a functional category in Latin noun phrases.

In (9), as mentioned earlier, the mapping is based on the structural position in c-structure; the subject is the DP, which is the daughter of IP and sister of I'; and the object is the sister of V. Given what we have said about the free word order and the c-structure of Latin, on the other hand, the mapping cannot be based on the structural position; instead, it is based on the morphological case features of the noun phrases.[5] We have provided two radically different clausal c-structures for the two languages here, but it is not the case that clause structure can vary infinitely; based on typological generalizations, a finite set of possible c-structure

rules are assumed to exist, and a language employs a subset of these. Note also that, even though the c-structures for (4a) and (12a) are very different, their f-structures would be identical, excepting the PRED value of the SUBJ and possible differences in values for TENSE.

Semantic roles such as Agent are not derived from structure in LFG; they form part of the a-structure, which is related to f-structure through a mapping referred to as *Lexical Mapping Theory* (LMT). There is not the space here to go into the formal workings of LMT, but the important thing for a comparison with MP is that the mapping between subject and Agent is independent of the structural properties of the noun phrase that fills the subject function, so would proceed in the same way in the English and Latin examples provided here.

2.5.4 Comparison of MP and LFG

A number of similarities and differences relating to assumptions about the phrase structure for English between MP and LFG have been pointed out already. In both approaches, the clause is headed by a functional category, and the subject is defined structurally through this category, although in different formal ways. Both MP and LFG assume that auxiliaries, but not lexical verbs, can occur under this clausal head. If there is no finite auxiliary, the T remains empty in MP and I is pruned in LFG.

However, there are also crucial differences between the two theories. They differ, for instance, in the way in which elements select the phrases which must obligatorily accompany it. In Minimalism, a transitive verb like *eat* carries a selectional feature to be matched by the categorial feature of its complement, namely N. In LFG, on the other hand, the selectional information is captured in terms of function through the PRED feature.

The use of features is central in both theories, but they differ in the nature of the features and in the roles they play. In Minimalism, features are associated with lexical entries and play a key role in capturing typological variation; the requirement for checking and the potential for this requiring movement accounts for word order variation. Features are then strongly associated with structure. In LFG, features are also associated with lexical entries, but from there can feed directly into f-structure. To take a simple example; the word *has* in a sentence like *The dog has eaten the sausages* captures two features (apart from agreement), *perfect* and *present*. Within Minimalism, the checking procedure would generally require both of these features to be represented under separate nodes in the tree, giving rise to a PerfP as the complement of T. Within LFG, both features would be mapped directly to the f-structure of the clause from the same word. In the case of English, this word is found under a functional node; however, in languages assumed not to have an I node, the word from which the same two features are mapped would be found under a lexical V node.

More generally, one main difference between the two approaches can be said to reside in the centrality of structure in MP; much semantic information, for instance, the thematic roles, is derived from structure. In LFG, constituent structure is just one dimension of information, and is only used to capture that which is assumed to be truly structural on the basis of criteria like constituency tests. Still, anyone acquainting themselves with the two theories may feel that it does not make much difference whether functions are read directly off structure or whether they are associated with structure through a mapping algorithm. However, if we return to the Latin sentence in (12a), the differences appear more clearly. For a number of reasons, not least to make sure that the association with semantic roles is appropriate—that is, to know "which noun phrase eats which noun phrase"—one of the two noun phrases needs to be associated with the subject function. We saw that, in an LFG analysis, this is done by direct mapping from the case marker, wherever it occurs in the c-structure, to the subject

function in f-structure. Within MP, on the other hand, the subject function is associated with a particular position within TP, which means that, regardless of the word order, the subject noun phrase must, at some stage of the derivation, appear in that position. If it does not appear there in the surface structure, it must still connect to this position at some stage of the derivation.

The fundamental difference between MP and LFG can at least partly be traced to their origins; the early development of the approach that led to Minimalism was initially based predominantly on English, a highly structure-dependent language. LFG, on the other hand, grew out of typological work, and languages which appear not to rely on structure fed into the early development of the theory. There is now work within MP on typologically diverse languages, and some proponents of the theory have a very explicit interest in accounting for typological variation. However, this variation is formally expressed as variation in types and strength of features which work within their standard assumptions about structure.

2.5.5 *Optimality Theory (OT)*

Work within OT started in the early 1990s and involved a radical departure from previous approaches. Since its introduction, it has had major influence particularly in phonology and to a lesser extent in morpho-syntax, but it is on its application to syntax that we will focus here. The fact that OT aims to use the same theoretical framework to cover several areas of linguistics makes it unusual, as does the fact that it can be applied to any of the approaches to grammar we have described here.

What makes OT's departure from traditional approaches to theory so radical is the way in which a grammatical sentence is assumed to come about. As we have seen, in the traditional use of generative grammar, a grammar should generate all grammatical sentences of a language and no ungrammatical sentences. In OT, by contrast, one part of the grammar component is assumed to generate a large—in fact, infinite—number of potential expressions which compete to express the same underlying idea. These are referred to as *output candidates*. Another part of the grammar then adjudicates in this competition. It does so by applying a number of *constraints* which rule out certain properties. The constraints are such that any candidate is unlikely to satisfy them all, but the constraints are *ranked*, so that it becomes more important for a candidate to satisfy the highly ranked constraints. Which constraints are most highly ranked varies between languages, and language variation is then the result of varying constraint rankings. An example using the formalism should clarify.

The procedure in OT starts from an INPUT—that is, the underlying form to be expressed. There is some variation as to what constitutes the input, but, in syntax, for a clause, it can be assumed to be roughly the verb, its arguments, and associated features. From this input, a set of output candidates are generated. This is done by a component called GEN. With regard to syntax, GEN generates structures like the ones we saw in Sections 2.5.2 and 2.5.3, and the exact type of rules that GEN contains will then depend on one's theoretical assumptions. From the set of potential output candidates that GEN produces for each input, one will be selected as the grammatical output, the *optimal candidate*. The core of OT is then a set of violable constraints, CON, against which the candidates are judged. The constraints are ranked, so that there are some highly ranked constraints, the violation of which renders the output sub-optimal. A lower-ranked constraint can be violated in order to satisfy a higher-ranked one. Both GEN and CON are universal, so that language variation resides entirely in the ranking of the constraints within CON. To illustrate, we will consider two constraints: (i) states that an argument should occur in its canonical position, say next to its selecting verb—we will call this CANONICAL, and (ii) requires a *wh*-phrase to occur sentence initially, FRONT WH. If we imagine now an input containing

Tableau 2.1 OT Tableau for languages with fronted wh-word

eat (*dog*[DEFINITE], WH) [FUTURE]	FRONT *WH*	CANONICAL
The dog will eat what	*!	
☞ What will the dog eat		*
…		

Tableau 2.2 OT Tableau for languages with wh-word in canonical position

eat (*dog*[DEFINITE], WH) [FUTURE]	CANONICAL	FRONT *WH*
☞ The dog will eat what		*
What will the dog eat	*!	
…		

the verb *eat*, a subject *the dog*, a future feature, and the information that the object argument is questioned, we can express this informally as *eat* (*dog*[DEFINITE], WH) [FUTURE]—that is, a predicate "eat" takes two arguments; a definite "dog" and a questioned element, and this is to be expressed about a future time. GEN then takes this input and generates a large number of sentences. The exact words used will depend on the language, of course, but I will use English words here. In order to get a feel for how the constraints in CON work, it is sufficient here to focus on two of the output candidates—namely, the two which differ with respect to CANONICAL and FRONT WH, but which are identical in all other respects.[6] The ranking of the constraints is displayed in a table, referred to as a "TABLEAU" in OT, where the higher-ranked constraints occur further to the left. The different output candidates are listed in columns, with the actual input given above them. In the cells of the table, a star indicates a violation of that particular constraint, and an exclamation mark indicates that the violation is fatal, since there is a better candidate. TABLEAU 2.1 captures the constraint ranking for English; FRONT WH ranks above CANONICAL, and hence it is more important for the language to have *wh*-phrases at the front of the clause than in their canonical position. In TABLEAU 2.2, the opposite relation holds. As is customary in OT, a pointing hand is used to indicate the winning candidate.

The ranking in TABLEAU 2.1 gives a language like English, which sacrifices the desire to have an object immediately following its verb in order to satisfy the constraint requiring the fronting of a *wh*-word. TABLEAU 2.2, on the other hand, captures a language like Chinese, where *wh* words are left in their canonical position.[7]

Because OT in itself has nothing to say about the nature of GEN, this component receives different interpretations, particularly in syntactic applications of the theory. This can be said to make OT a meta-theory, rather than a theory, in that the shape of GEN and the formulation of the constraints depend on one's assumptions about syntactic theory.[8] In the context of the two other frameworks we have considered here, there are syntactic OT analyses that can be described as MP-OT or LFG-OT, depending on what assumptions underlie GEN and the constraints.

2.6 Conclusion

One thing that this chapter should have demonstrated is that the distinction between description and theory is by no means clear-cut. It is difficult to conceive of any interesting linguistic description which does not make some abstract assumptions. Similarly, within theories, analyses can be found which, even though they use the terminology of a theoretical framework, do little more than state the data the way a pre-theoretical description would.

The criteria which have been suggested in the literature as being crucial in distinguishing a theory from a description, or for judging the quality of theory, such as Chomsky's levels of adequacy or ontological parsimony, are difficult to apply. With respect to the latter, for instance, principles of economy as applied to linguistic theories tend to involve a tradeoff—simplicity in one part of the analysis is paid for by complexity in another part.

The fact that there are a number of different theories for different areas of linguistics seems no bad thing, given that it is still in parts a relatively speculative area of investigation. Terminology and mechanisms for explanation vary between theoretical frameworks; consequently, the questions naturally asked and the answers provided will vary between theories. Variation between theories then ensures breadth of coverage, and, as long as researchers are literate in each other's terminology, there should be ample room for cross-fertilization between the theories.

NOTES

1 For problems with the use of terms such as "introspection" and "acceptability," see Meyer and Nelson (Chapter 6, this volume).
2 I use "Chomskyan" here to refer to a particular influential tradition of linguistic theory, but I will return to the problems of using this term in the Section 2.5.2.
3 There is also some variation within theories in technical details.
4 Case in Chomskyan theory is not the same as morphological case marking, but is an abstract feature capturing grammatical relations. In order to indicate this distinction, it is always written with a capital "C."
5 This involves the concrete interpretation of case as a feature marked by linguistic material, contrasting with the abstract Case of MP (cf. fn. 3). The agreement marking on the verb also plays a role in the identification of the subject. Moreover, in some languages, this may be the only clue, in which case the mapping is from the agreement marking. We will, however, not illustrate this here.
6 In the example that follows, the issue of subject auxiliary inversion in English is ignored.
7 Of course, the losing candidate in Tableau 2.1 is grammatical in English, but not as an unmarked question.
8 Given what we said in Section 2.3, it might be more appropriate to use "architecture" or "framework" here, but OT is referred to as a theory by those who work within it.

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3 English Corpus Linguistics

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3.1 Introduction

To fix terminology at the outset, we define a corpus as "a collection of texts or parts of texts upon which some general linguistic analysis can be conducted" (Meyer 2002, p. xi). Corpus linguistics, then, is "a methodology that draws on collections of more or less naturalistic texts or speech for the sake of conducting some sort of linguistic analysis" (Szmrecsanyi 2017, p. 2). Our point of departure is that the first edition of this handbook had an excellent introduction to corpus linguistics from an English linguistics angle (McEnery and Gabrielatos 2006). But more than a decade later, old debates and dichotomies—for example, about corpus-based versus corpus-driven approaches (Tognini-Bonelli 2001)—are largely settled, and corpus linguistics has become so uncontroversial and mainstream (at least in English linguistics) that there is a need to rethink the status of corpus linguistics in English linguistics and, also, to rethink the remit of a chapter on corpus linguistics in a handbook of English linguistics. Why does a handbook of English Linguistics need a chapter on corpus linguistics at all? Notice that handbooks of the linguistics of other languages do not typically have chapters on corpus linguistics (see, e.g., Wetzels, Menuzzi, and Costa 2016; Tsujimura 1999; Hualde, Olarrea, and O'Rourke 2013; Brown and Yeon 2015). So it seems that corpus-linguistic methods have a special status in English linguistics. Against this backdrop, rather than explaining the corpus-linguistic methodology (for this, we refer the reader to the excellent chapters in Lüdeling and Kytö 2009; Biber and Reppen 2015), the objective of this chapter is to discuss the reasons for the special status of corpus methodologies in English linguistics (or vice versa).

To set the stage, we conducted an informal poll among a convenience sample of $N = 13$ colleagues of ours not specializing in English linguistics. The question that we asked them was the following: "Are there resources (and possibly methods) in English-language corpus linguistics that you wish you had at your disposal but currently do not? Are there ways in which English-language corpus linguistics sets a bad example or best practice in corpus linguistics at large?" The positive feedback that we received may be summarized as follows:

- Eight colleagues found it enviable that data sparseness is typically less of an issue in English-language corpus linguistics compared to other philologies, including in historical English corpus linguistics. Resources that were explicitly mentioned by these colleagues included the Helsinki Corpus, the Corpus of Early English Correspondence, the BYU corpora, MIMIC-III (clinical language), and syntactically annotated corpora such as the Penn Parsed Corpus Series.

The Handbook of English Linguistics, Second Edition. Edited by Bas Aarts, April McMahon, and Lars Hinrichs.

- Three colleagues responded that English-language corpus linguists have pioneered rigorous corpus building guidelines, as well as—especially in recent years—a number of innovative data analysis and modeling techniques.
- Two colleagues mentioned that there is a comparatively large number of specialized English-language corpora, covering a wide range of regional varieties, registers, communication types, etc.
- Two colleagues stated that good annotation is comparatively common in English-language corpora.
- One colleague found that English-language corpora come with particularly good user interfaces.

Negative feedback included the following:

- Six colleagues mentioned a lack of awareness in English corpus linguistics circles that many methods and findings generated in English corpus linguistics (e.g., phraseology, collocation research, *n*-grams) cannot be easily applied to, or are not true for, morphologically rich(er) languages.
- Two colleagues expressed the hope that English corpus linguistics would become more involved in comparative analyses with other languages or at least become more aware of the work that has been done in non-English corpus linguistics and highlight how their work on English contributes to those other language studies.
- One colleague discerned a tendency among some English-language corpus linguists to rest on laurels from the pioneering stages in corpus linguistics, neglecting innovation.
- One colleague noted a certain unhealthy skepticism among English corpus linguists toward theorizing.
- One colleague lamented a wide-spread focus in English-language corpus linguistics on words as basic linguistic unit.
- One colleague mentioned the focus often being too quantitative with limited attention for the possibilities of qualitative research.

Building on this feedback, the remainder of this chapter is organized as follows. In Section 3.2, we discuss—in line with responses in our mini-survey—the extent to which English-language corpus linguistics is comparatively well-endowed with resources. Section 3.3 then moves on to explore why English-language corpus linguistics is seen by many to have created a number of innovative data analysis and modeling techniques. Section 3.4 concludes the chapter.

3.2 English-Language Corpora are Numerous, Large, and Well Annotated

English-language corpora are simply too numerous to even begin to catalog them here in any detail. Still, there are a few trends that we should mention. For one thing, in the realm of synchronic English linguistics, the field seems to be moving away from the compilation and analysis of "representative" corpora—consider, for example, the 100-million-word British National Corpus (BNC) (Aston and Burnard 1998) (http://www.helsinki.fi/varieng/CoRD/corpora/BNC/)—and increasingly turns to specialized corpora such as, for example, the Switchboard Corpus of American English (Godfrey, Holliman, and McDaniel 1992), which is widely used to investigate spoken English; the International Corpus of English (ICE) (Greenbaum 1996) (http://www.ice-corpora.uzh.ch/en.html), which is designed to facilitate the investigation of regional varieties of English; dialect corpora such as the Freiburg Corpus of English Dialects (FRED) (Szmrecsanyi and Hernández 2007) (https://fred.ub.uni-freiburg.de/); the International Corpus

of Learner English (ICLE) (Granger, Dagneaux, and Meunier 2002) (https://uclouvain.be/en/research-institutes/ilc/cecl/icle.html), which samples essays written by learners of English; or the corpus of Global Web-Based English (GloWbE) (Davies and Fuchs 2015) (https://corpus.byu.edu/glowbe/), which covers a massive amount of web language.

In historical English linguistics, recent years have seen a steady increase in the number of available resources documenting Early and Late Modern English, from the Early English Books Online (EEBO) database (see, e.g., https://corpus.byu.edu/eebo/) to A Representative Corpus Of Historical English Registers (ARCHER) (Yáñez-Bouza 2011) (http://www.projects.alc.manchester.ac.uk/archer/) and the 400-million-word Corpus of Historical American English (see https://corpus.byu.edu/coha/).

Mair (2006, p. 355) draws a distinction between "small-and-tidy" corpus linguistics and "big-and-messy" corpus linguistics. Keeping in mind that not all small corpora are necessarily tidy while some big corpora are not messy, the situation in English corpus linguistics at the time of writing is such that the small-and-tidy tradition is still going strong: data sources such as, for example, the 1-million-word Brown Corpora (Francis and Kučera 1979; Hinrichs, Smith, and Waibel 2010) are still widely used. That being said, it is certainly true that corpora are becoming ever larger. This is a development not at all specific to English-language corpora, but it seems fair to say that the development is particularly pronounced here. Consider the corpora available at https://corpus.byu.edu/: these include, for example, the 6-billion-word News on the Web (NOW) corpus (https://corpus.byu.edu/now/), or the 1.9-billion-word corpus of GloWbE. Needless to say, corpora that are big permit the researcher to tackle research questions, for example, about lexis, which are impossible to deal with on the basis of smaller corpora. Huge corpora, such as NOW and GloWbE, typically contain written materials that can be fairly easily and automatically harvested from the worldwide web. By contrast, data scarcity is still by and large the name of the game when it comes to corpora covering face-to-face speech, but here too the situation is improving—consider, for example, the 11.5-million-word spoken component of the British National Corpus 2014 (http://corpora.lancs.ac.uk/bnc2014/), which covers conversations that were gathered from members of the UK public between 2012 and 2016.

Corpus annotation is nowadays fairly uncontroversial and, in fact, widespread in the realm of English corpus linguistics, as was also mentioned by some respondents in our mini-survey. Part-of-speech (POS) annotation is now relatively standard for English-language corpora. Syntax-parsed corpora are increasingly becoming available; consider, for example, the British component of the ICE (http://www.ucl.ac.uk/english-usage/projects/ice-gb/), the Penn Parsed Corpora of Historical English series (http://www.ling.upenn.edu/hist-corpora/), or the English corpora in the Universal Dependencies collection (https://universaldependencies.org/). Lemmatization and synset-annotation are, besides POS-tagging, features that for example the BYU corpora come with, in addition to a user interface that makes using these annotation layers fairly easy. Phonetic annotation—consider, for example, the Buckeye Speech Corpus (https://buckeyecorpus.osu.edu/)—is rather rare. The best annotated corpus in English-language corpus linguistics is probably the Switchboard Corpus, for which multiple annotation layers—for example, syntax, phonetics, discourse—are available.

3.3 Some Important Methodological Innovations Developed in English-Language Corpus Linguistics

In this section, we catalog seven methodologies pioneered in English-language corpus linguistics. We exclude applied corpus linguistics from the discussion, for example, for lexicography, pedagogy, or forensic linguistics, and refer the reader instead to the relevant chapters in standard textbooks (e.g., McEnery, Xiao, and Tono 2010, pp. 80–122) and handbooks (e.g., Biber and Reppen 2015, Part IV).

3.3.1 The British Tradition in Corpus Linguistics

The British tradition in corpus linguistics essentially approaches issues relating to meaning and grammar by studying co-occurrence patterns between words. Selected well-known concepts emanating from this research tradition include:

- **Collocation** ("collocations of a given word are statements of the habitual or customary places of that word"; Firth 1968, p. 181)—for example, in the Corpus of Contemporary American English, the top left-collocates of *food* are *fast* (as in *fast food*), *good* (as in *good food*), and *Chinese* (as in *Chinese food*).
- **Semantic prosody** (about the "consistent aura of meaning with which a form is imbued by its collocates"; Louw 1993, p. 157)—for example, Louw (1993, pp. 33–34) shows that in the Cobuild corpus, the right-collocates of *utterly* tend to be unpleasant (as in *utterly terrified*), hence *utterly* has negative semantic prosody.[1]
- **Colligation** (about "the grammatical company a word keeps"; Hoey 1997, p. 8)—for example, Sinclair (Sinclair 1998, p. 15; discussed in Lehecka 2015) notes that the phrase *naked eye* is often preceded by a preposition and determiner, as in *to the naked eye*.[2]

So it is evident that the British tradition in corpus linguistics takes a particular interest in the intersection of lexis and grammar. The basic idea behind work on "lexicogrammar" (parlance of Halliday 1991, 1992) or "lexical grammar" (parlance of Sinclair; see, e.g., Sinclair 2000) is that a strict separation between lexis and grammar is misguided: "the grammar of a language and its lexicon are not separate entities" (Hunston 2015, p. 201). Consider Sinclair's (1991, p. 109–110) distinction between the "slot and filler model" plus the "open choice principle," on the one hand, versus the "idiom principle" on the other hand: according to structuralist thinking, language users can fill slots offered by the grammar with lexical material of their choice. But this will not necessarily yield idiomatic language, hence the idiom principle: idiomatic language use is not a matter of filling at liberty slots afforded by the grammar but rather of respecting collocational preferences. This is another way of saying that being fluent involves using prefabs. This reasoning is why phraseology plays such an important role in the British tradition in corpus linguistics (Hunston 2015, p. 212).

This line of research has had great impact in English linguistics and beyond, and is often—particularly by linguists working on other languages than English—equated with English corpus linguistics per se. This, then, may also explain some of the less positive comments that shine through in our mini-survey. For one thing, corpus research in the British tradition is typically word-based: in actual practice, what is of key interest is how orthographically transcribed words co-occur with other items or patterns. The advantage of this approach, as noted by McEnery and Gabrielatos (2006, p. 45), is its practical appeal: it works just fine with raw corpora, and standard corpus analysis software suffices to carry out the analysis, as long as the corpora under analysis are reasonably large. However, outside English corpus linguistics, the notion of the orthographically transcribed word is not uncontroversial: Haspelmath and Michaelis (2017, p. 6), for example, argue that "the notion of "word" cannot be defined consistently across languages (other than orthographically, in languages with spaces between words)." The problem, then, is that if the notion of "word" is questionable cross-linguistically, then so are word-based techniques such as collocation analysis. Still, it is clear that collocation-based techniques work for English and similarly analytic languages (see Xiao 2015, pp. 120–123 for a case study of collocation and semantic prosody in Chinese). That said, it is less clear that word-based techniques developed in the British tradition in corpus linguistics work as well for synthetic and inflectional languages, such as, for example, Estonian, where one runs into all sorts of problems having to do with distinguishing between affixation and collocation. This, among other things, is the reason why some

respondents in our mini-survey worried that methods developed in English-language corpus linguistics cannot necessarily be applied to morphologically rich(er) languages.

3.3.2 Corpus-Based Discourse Studies

English-language corpus linguistics is characterized by a fairly recent, but increasingly well-established tradition of research which combines corpus-based methodology with analysis techniques from the field of discourse studies. Within this tradition, we count approaches such as corpus-assisted discourse studies (CADS, e.g., Partington, Duguid, and Taylor 2013) or certain work from the critical discourse analysis paradigm (CDA, e.g., Baker et al. 2008). These approaches gradually took off around the year 2000—with a number of precursors such as the work of Stenström (Partington 2004)—and have since gained increasing recognition both on the side of corpus linguistics as well as within the field of discourse studies.

Researchers working on the intersection of these fields are mainly interested in the study of various aspects of discourse (e.g., evaluation or discourse organization), but use quantitative methods from corpus linguistics, such as collocation analysis, to complement the typically qualitative tools traditionally used in discourse studies. In that sense, this branch of linguistics builds on the tradition of lexical grammar presented in Section 3.3.1.

While discourse studies typically work with smaller datasets, the tradition orienting toward corpus linguistics uses larger amounts of data for their analyses. These large corpora are often used in the first exploratory phase of a study using concepts such as collocations and semantic prosody to identify patterns, topics, and topoi in texts (Gabrielatos 2008). Such an exploratory analysis then serves as a starting point for a subsequent, more in-depth qualitative study of the texts. To illustrate this approach, let us take a look at Gabrielatos and Baker (2008), who used a 140-million-word corpus of British news articles focusing on migration to study the representation of refugees and asylum seekers in the British press. They retrieve the collocates of terms referring to people in these positions and use those as "a clear indication of the stance of the writer/newspaper toward these groups" (Gabrielatos and Baker 2008, p. 14).

Another way in which corpora are used in this branch of discourse studies is as a tool for tracking down and selecting texts of interest for a discursive analysis in a consistent and transparent way (e.g., Forchtner and Kølvraa 2012). Like in the example from Gabrielatos and Baker (2008) in the earlier text, this approach uses corpora as a first step toward a discursive study. Still another approach to combine corpora with traditional approaches within discourse studies is to use them as an additional validation of the results obtained in the initial analysis which is typically based on a smaller dataset. Corpora can provide additional data which allow to corroborate and generalize evidence from a discourse analytic study on a small sample. Combining quantitative corpus methods and qualitative discourse tools in a dialectic procedure, where the results of one analysis inspire the other and vice versa, allows discourse analysts to arrive at a more nuanced understanding of the phenomenon under study, but also to explore the pervasiveness of the discourse patterns under study in larger collections of data (Jaworska 2016).

3.3.3 Corpus-Based Approaches to Dialectology and Regional Varieties

Dialectology and research into geographical/regional variation are needless to say old and mature research fields in linguistics. Traditional dialectology is concerned with what most people think of when they hear the term dialect, spoken by (in Western societies at least)

fewer and fewer people in "remote and peripheral rural areas" (Trudgill 1990, p. 5). The traditional data source in dialectology, besides anecdotal evidence, are dialect atlases, such as, for example, the Survey of English Dialects (SED) (Orton and Dieth 1962). Starting in the late 1990s, however, dialectologists have begun to turn to dialect corpora, which tend to cover orthographically transcribed interviews with dialect speakers, similar to sociolinguistic interviews (see Szmrecsanyi and Anderwald 2017, p. 301 for discussion). The emergence of dialect corpora has put frequency and intraspeaker variation on the map in dialectology (as opposed to the more structural, categorical information available in dialect atlases), and the trend toward usage of dialect corpora has been particularly pronounced in English dialectology. Early studies include Anderwald (2003), who studies nonstandard negation patterns (as in *he don't have money*) based on the spoken material in the British National Corpus, which is (partly) annotated for the regional provenance of the speakers; Tagliamonte and Smith (2002), who investigate variation in NEG/AUX contraction (as in *it isn't true* versus *it's not true*) in corpora covering vernacular speech coming from eight communities in the United Kingdom; the papers in Kortmann et al. (2005), which investigate nonstandard grammar based on the FRED, which contains interviews with dialect speakers from all over England, Wales, and Scotland; and Beal and Corrigan (2006), who study negation in Tyneside English, drawing on the Newcastle Electronic Corpus of Tyneside English (NECTE). More recent methodological innovations include corpus-based dialectometry, which aggregates over frequencies of many features to calculate measures of dialect distance and similarity as a function of geographic distance (see, e.g., Wolk and Szmrecsanyi 2018), and usage of more unorthodox dialectology corpora, such as the corpus of letters to the editor from all over the USA analyzed in Grieve (2016).

Beyond dialectology with its focus on (more or less) traditional dialects, the English language of course offers exciting opportunities to study differences between a vast number of regional varieties of English around the world, thanks to colonial activities of the British Empire. A classic topic of the literature in this connection are differences between American and British English (see, e.g., the papers in Rohdenburg and Schlüter 2009). Earlier research on British–American differences has profited enormously from the compilation of the Brown family corpora, which match 1-million-word corpora of standard written–edited English and which facilitate not only the contrastive investigation of the two standard varieties in their written form, but also the study of language change in progress (see, e.g., Hundt and Mair 1999, for seminal work). This rich literature is unmatched in other philologies.

English corpus linguistics is leading when it comes to study of postcolonial varieties around the world, including not only what Kachru (1992) has called "Inner Circle" varieties such as American English, British English, New Zealand English, and so on, but also a large number of "Outer Circle" varieties such as, for example, Indian English, Singapore English, or Nigerian English. Not all of the research on postcolonial varieties is corpus-based; surveys such as the electronic World Atlas of Varieties of English (Kortmann and Lunkenheimer) play an important role. But the emergence of World Englishes corpora has clearly boosted the field. Consider the ICE series, whose goal it is to compile 1-million-word matching corpora to document Inner Circle or Outer Circle varieties of English around the world (Greenbaum 1996), or the GloWbE corpus, whose approximately 2 billion words of running text cover some 20 English-speaking countries around the world (Davies and Fuchs 2015). Recent representative studies using these corpora include Tamaredo (2018), who taps into ICE-India, ICE-Singapore, and ICE-GB to study pronoun omission (as in ___ *can't say I like it*), and Schmidtke and Kuperman (2017), who tap into the GloWbE corpus to study noun countability (as in *two luggages*) in World Englishes. Other languages with a similar postcolonial reach, such as French and Spanish, are not nearly as well documented with corpora.

3.3.4 Multidimensional Analysis

Multidimensional analysis is a quantitative corpus-based approach within the field of register studies. The approach focuses on linguistic variation that is determined by situational variables: the distribution of linguistic features in a text heavily depends on the register it belongs to (e.g., newspapers, academic lectures, sales pitches, application letters). Although the importance of register for linguistic variation has been recognized and studied for a long time, it was not until the 1980s with the work of Biber (especially Biber 1986; ibid. 1988) that register variation was studied quantitatively using large corpora. What sets the work of Biber and his collaborators apart from previous work on register is that it does not focus on the behavior of a single linguistic feature in various types of texts, but that it investigates the co-occurrence patterns of many different linguistic features in various registers. This is done through multidimensional analysis (MDA), a technique that identifies groupings of linguistic features by using factor analysis (Biber 1986; ibid. 1988). The dimensions (i.e., clusterings of features) resulting from that analysis are then interpreted according to their communicative function (Conrad 2015, pp. 316–317). The next step in the analysis is then to compare how various registers score on these dimensions or how much variability the registers show on each of the dimensions that were identified. Hence, MDA does not only allow to study how multiple features vary across register, but also allows to characterize registers based on the co-occurrence patters of linguistic features.

To make this more concrete, let us briefly consider a concrete example from Biber's seminal 1986 article which compares spoken and written language based on 41 linguistic features in over 500 text samples. One of the three dimensions that Biber found characteristic of the distinction between spoken and written texts showed a clustering of features such as word length (i.e., longer vs. shorter words) and type/token ratio (i.e., how much variation there is in word choice) (Biber 1986, p. 394). Interpreting the communicative functions of these features, the analysis shows that what these texts have in common is a high density of precise information, which is typical of written texts which are often (extensively) edited. Other features which appear on the same dimension are the use of *yes*/*no*-questions, *wh*-questions, and the pronouns *I* and *you*. These are interpreted as marking direct interaction which is typical of spoken language. As a result, Biber labels this dimension "interactive versus edited text" (Biber 1986, p. 395).

MDA has been used to study a wide range of registers, both from synchronic and diachronic perspectives (Conrad 2015). The large body of MDA research abundantly demonstrates and documents the importance of situational factors for linguistic variation. Yet, the accomplishments of MDA studies go beyond that, as they offer the potential for practical applications such as the description of registers and development of study materials for L2 learners, as well as a better informed selection of text genres in the compilation of corpora (Conrad 2015, p. 317).

From the very beginning, MDA approaches to register studies have focused predominantly on register variation in English. One of the reasons for this, as also pointed out in previous paragraphs, may well be the availability of various large English language corpora that encompass a wide variety of text types. A subfield of English studies that is particularly associated with MDA studies is English for specific purposes (Conrad 2015, pp. 318–319). An example of such work is Van Rooy and Terblanche (2006) who use MDA to compare native and learner writing regarding aspects of involvement. Building on Biber (1988), the study furthermore compares student writing to other registers such as academic writing and spoken language. The strong focus of MDA research on English and English for specific purposes does not mean, however, that this type of research has not developed in branches of linguistics focusing on languages other than English (e.g., Biber et al. 2008, on Spanish; Asención-Delaney and Collentine 2011, on L2 Spanish; Biber and Hared 1992, on Somali). Yet

the lion's share of MDA work is still concerned with English, and in that respect it is telling that in a chapter summarizing register studies, Conrad (2015) includes the application of MDA to languages other than English in her discussion of the extensions of MDA. This shows that work on English serves as a reference point in this line of research.

3.3.5 Corpus-Based Psycholinguistics

Psycholinguistics is the field of study that is concerned with how language users produce and process language. The use of corpora in this field takes two forms, both of which are characterized by a rather dominant position of English corpus linguistics. First, we briefly discuss the branch of psycholinguistic research that uses corpus linguistic methods to gain insight into mechanisms of language processing and aims to complement the experimental work typically conducted in psycholinguistics. Next, we touch upon the indirect use of corpora in psycholinguistics as a resource for materials to design, construct, and analyze experiments.

Although most work on the cognitive processes behind speech production and perception builds on a wide variety of experimental paradigms, some corpus studies have been carried out in this domain as well. These corpus studies have their roots in various disciplines ranging from traditional corpus linguistics to computational linguistics and cognitive science. Although experimental studies offer the advantage of carefully controlling for confounding factors in the psycholinguistic processes under study, corpus studies have the benefit of using naturalistic data and allow the possibility to take into account more factors than can be controlled for in experimental settings (Gries 2005).

One example of a topic in psycholinguistics that has received a fair amount of corpus-based attention is priming. Priming refers to the phenomenon that speakers have a tendency to repeat the same linguistic elements (Pickering and Ferreira 2008). In the case of syntactic priming, for instance, a syntactic structure has a higher chance of being used if it was previously used in discourse. A study that looked at priming using traditional corpus linguistic methods of regression modeling is Gries (2005). Focusing on two syntactic alternations in English, that is, the dative alternation and the particle placement alternation, the author presents corpus-based evidence for earlier accounts of syntactic priming based on experimental research. Dubey, Keller, and Sturt (2008) by contrast approach a similar topic from a computational perspective. They present a study that investigates the mechanism underlying the repetition of coordinate structures in discourse using corpora to train computational models. Building on these computer simulations, the authors compare the predictions of two competing accounts for the observed repetitions based on previous experimental research. Aside from priming research, another aspect of language processing that has been studied rather extensively from a corpus-based perspective is surprisal and informativity. This type of work is exemplified by studies on the role of predictability of phonological phenomena such as Jurafsky et al. (2001), Bell et al. (2003), Demberg et al. (2012) on reduction, or Cohen Priva (2017) on lenition processes. More recently, the role of predictability of syntactic variation (e.g., presence or deletion of complementizer *that*) has also received considerable scholarly attention for instance by Jaeger and colleagues (e.g., Jaeger 2010) who have used corpora to study the hypothesis that speakers tend to spread new information evenly across utterances.

In addition to corpus-based work that aims to directly contribute to the understanding of language processing by supplying complementary evidence to experimental studies, corpora are also used to other ends in psycholinguistics. More particularly, they can provide crucial information to build well-controlled experiments or are used to extract naturalistic experimental stimuli (but see Mandera, Keuleers, and Brysbaert 2015, for a discussion of limitations of corpus-based methods in this regard). One clear example here is the use of subtitle corpora to extract frequency information used in myriads of psycholinguistic studies

to approximate the frequency of words in interaction (New et al. 2007). Additionally, corpora are used to extract probabilities used in computational models of various aspects of language processing (see Roland and Hare 2012, for a discussion of such use of corpora in sentence comprehension research).

3.3.6 Variationist (Socio)linguistics

Variationist sociolinguistics is a vibrant research field whose primary mission is to understand the factors regulating the ways in which language users choose between "alternate ways of saying 'the same' thing" (Labov 1972, p. 188), with a particular interest in how social factors constrain choices. Consider, for example, Weiner and Labov (1983): the study investigates, on the basis of transcribed spontaneous material from interviews with working-class white speakers in Philadelphia, variation between agentless passives (as in *The liquor closet got broken into*) and "empty" actives (as in *They broke into the liquor closet*) (exemplification from Weiner and Labov 1983, p. 34). The study investigates a range of factors potentially constraining the choice, and concludes that the single most powerful factor to influence the choice of actives versus passives is repetition of previous structure. Now, variationist sociolinguistics is a powerful research paradigm that has pioneered a number of innovative analysis techniques—for example, since the 1970s variationist sociolinguistics have been using regression analysis to analyze variation data, in the form of the Varbrul program (see Cedergren and Sankoff 1974). The reason why we mention variationist sociolinguistics in this article is that much of the work carried out in this framework is concerned with English, although (Canadian) French and (North American) Spanish are also going strong. The big question is, however, whether orthodox variationist linguistics qualifies as "corpus-based." To the extent that work in variationist sociolinguistics is based on the analysis of fully transcribed sociolinguistic interviews (the preferred data type in the field), variationist sociolinguistics is arguably corpus-based (see Szmrecsanyi 2017, for discussion). But then again, variationist sociolinguists do not regularly self-identify as corpus linguistics, while some card-carrying corpus linguists feel uneasy about attaching the "corpus" label to transcribed sociolinguistic interviews. What is more, the transcribed interviews are often not publicly accessible.

Even so, work in variationist sociolinguistics has inspired—or is at the very least methodologically allied to—a good many variationist studies in the recent literature that are working on the basis of "proper" and publicly accessible corpora. This line of research may be labeled "corpus-based variationist linguistics" (CVL) (Szmrecsanyi 2017, p. 3), and includes corpus-based research that meets the following criteria:

1. CVL analysts properly define variables and variants to study different ways of saying the same thing (Labov 1972, p. 188).
2. Therefore, CVL analysts observe the principle of accountability (Labov 1969, p. 738) and focus on choice-making processes rather than on text frequencies (see Biber et al. 2016, for discussion).
3. CVL uses rigorous quantitative methodologies and statistical modeling techniques (see Tagliamonte and Baayen 2012, for an overview).

Some recent representative studies that come under the remit of CVL research include the following: Bresnan et al. (2007) investigate variation between interchangeable observations of the ditransitive dative construction (as in *Tom sent the president a letter*) and the prepositional dative construction (as in *Tom sent a letter to the president*) based on the Switchboard Corpus of American English (Godfrey, Holliman, and McDaniel 1992) and the Treebank Wall Street Journal collection of news and financial reportage (https://catalog.ldc.upenn.edu/LDC2015T13), and via regression modeling demonstrate, among other things, that dative variation is regulated by about ten language-internal/contextual probabilistic constraints;

Gries and Hilpert (2010) conduct a regression analysis of variation between third-person singular inflections (as in *he giveth* versus *he gives*) in the Parsed Corpus of Early English Correspondence (PCEEC) (http://www-users.york.ac.uk/~lang22/PCEEC-manual/), showing that the change from *-(e)th* to *-(e)s* consisted of five stages; and Hinrichs et al. (2015) model, again via regression analysis, variation between interchangeable restrictive relativizers (*the house which I bought* vs. *the house that I bought* vs. *the house ___ I bought*) in the Brown family of corpora (Hinrichs, Smith, and Waibel 2010). Analysis shows that the shift from restrictive *which* to restrictive *that* in late 20th century English is best characterized as a case of institutionally backed colloquialization.

Again, the point is that many if not most CVL studies investigate variation in English, although some other languages (e.g., Dutch—see, for example, Grondelaers and Speelman 2007; Levshina, Geeraerts, and Speelman 2013; Pijpops and Van de Velde 2014) are also going strong.

3.3.7 Learner Corpus Research

Learner corpus research (LCR) is a fairly young research endeavor that started in the late 1980s as a movement to "revolutionize" (Granger 1994) applied linguistics by marrying second language acquisition (SLA) research to corpus linguistics. In contrast to traditional SLA, LCR emphasizes performance rather than competence: what takes center stage is frequency, collocations, lexicogrammar, and message conveyance (see Gilquin and Granger 2015, pp. 418–420 for discussion). The corpora investigated in LCR have traditionally covered primarily written production in aggregated learner populations; consider, for example, the ICLE (Granger et al. 2009), which contains writing by higher intermediate to advanced learners of English from numerous mother tongue backgrounds. Increasingly, however, spoken LCR resources are coming online, such as the Louvain International Database of Spoken English Interlanguage (LINDSEI; Gilquin et al. 2010), which contains interviews in English with university students from several mother tongue backgrounds and whose English proficiency ranges from intermediate to advanced.

Some representative studies include the following. Gilquin and Paquot (2008) investigate how learners of English perform 12 rhetorical functions in academic English, in comparison to native academic English. The study checks the frequencies of these features in three (sub) corpora: native academic essays covered in the BNC, spoken materials covered in the BNC, and non-native academic writing as sampled in ICLE. Analysis shows that compared to native speakers learners overuse spoken-like features in their academic writing, indicating that they are not sufficiently aware of register differences. For example, as far as the expression of possibility is concerned, *perhaps* and *maybe* are lexical variants, but while in native academic writing *perhaps* is vastly more frequent than *maybe*, in non-native academic writing we find that *maybe* is used approximately as frequently as *perhaps*, which resembles the rates that we find in the spoken sections of the BNC (Gilquin and Paquot 2008, p. 46).

Gries and Deshors (2014) (see also Gries and Deshors 2015) is a paper that illustrates the recent trend in LCR toward using more advanced statistical methods. The authors use a methodology—Multifactorial Prediction and Deviation Analysis with Regressions (MuPDAR for short)—which is basically a two-step variationist regression analysis procedure. MuPDAR specifically compares native to non-native performance in scenarios where language users have the choice between different ways of saying the same thing. Faced with such a choice, MuPDAR provides a model of learners' choices given a range of contextual factors while asking what a native speaker would do under the same circumstances. As a case study, Gries and Deshors explore variation between *can* and *may* (as in *we can also let our imagination wander* vs. *we may also let our imagination wander*) in the French and Chinese subsections of ICLE, as well as in the Louvain Corpus of Native English Essays (LOCNESS) as a native benchmark.

Ehret and Szmrecsanyi (2019), on the other hand, is a study that demonstrates how LCR is also increasingly opening up to debates in general linguistics at large. SLA analysts have long been concerned with how to measure the complexity of interlanguages, but the point of departure of Ehret and Szmrecsanyi (2019) is the fact that since the early 2000s, cross-linguistic typologists and sociolinguists have increasingly experimented with new and innovative ways to measure language complexity. The paper "imports," as it were, one such complexity measure into LCR: drawing on information theory, the study defines the complexity of a text as proportional to the length of the shortest algorithm that can generate that text (Kolmogorov 1963, 1965). With this construct under its belt, the study assesses the complexity of learner essays sampled in ICLE. Analysis shows that, among other things, increased L2 instructional exposure predicts increased linguistic complexity of the essay material.

The reason why LCR deserves its own section in this article is that it is now a mature research field with its own journal (the *International Journal of Learner Corpus Research*), and its own association (https://www.learnercorpusassociation.org/). Most of the pioneering work in this tradition has been done by English linguists on learner English (Gilquin and Granger 2015, p. 428), thanks in no small part to the early availability of exquisite English-language resources such as ICLE.

3.4 Conclusion

Corpus-based research in English linguistics is by now so common that it would be an utterly hopeless task to even begin to summarize this literature comprehensively in a single article. Instead, we opted to reflect on the status of corpus-linguistic methodologies in English linguistics, and on the role of English linguistics in the development of corpus linguistics: What does English-language corpus linguistics look like from the outside? What is the extent to which English-language corpus linguistics is comparatively well-endowed with resources, in a way that other languages are not? And finally, what are key corpus-linguistic approaches and methodologies that were mainly or entirely developed in the context of English linguistics? In connection with that last question, we then sketched seven corpus-linguistic approaches and methodologies that have (or had initially) a strong English-linguistics bent: the British tradition in corpus linguistics, critical discourse analysis, corpus-based approaches to dialectology and regional varieties, multidimensional analysis, corpus-based psycholinguistics, variationist linguistics, and learner corpus research.

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NOTES

1 A related notion is that of semantic preference, which is about the "relation between a lemma or word-form and a set of semantically related words" (Stubbs, 2001, pp. 111–112).
2 A recent extension of colligational analysis is that of collostructional analysis (Stefanowitsch and Gries, 2003), which uses more advanced statistical machinery to investigate the

lexemes that are attracted by particular constructions, rather than the other way round. For example, Stefanowitsch and Gries (2003, pp. 227–230) show that those dative verbs ("collexemes" in their parlance) most strongly attracted to the ditransitive dative construction are *give* (as in *Tom gave me a present*), *tell* (as in *Tom told me a story*), and *send* (as in *Tom send me a letter*). See Gries and Stefanowitsch (2004) and Hilpert (2006) for follow-up work.

FURTHER READING

Corpus linguistics is a vast research field. An excellent starting point for further reading are the contributions in recent handbooks dedicated to the methodology, for example, The *Cambridge handbook of English corpus linguistics* (Biber and Reppen 2015), or *Corpus Linguistics: An international handbook* (Lüdeling and Kytö 2009).

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4 Experimental Approaches

LAUREN SQUIRES

4.1 Introduction

In recent years, experimental methodologies have become more central in linguistics. While psycholinguistics has always relied on laboratory experimentation, other subfields now also include it as a key generator of knowledge. Technological advancements have made experimental methodologies more accessible to a wider range of researchers, and theoretical questions have emerged that are especially suited to the benefits of experimentation.

In this chapter, I use the term "experiment" to refer to methods through which researchers expose participants to some stimuli, to which participants respond. Most often, experiments are designed to test a *hypothesis*, thus experimental research tends to be confirmatory rather than exploratory. The hypothesis is based in some prediction about the relationship between one or more *independent variables* (encoded in the stimuli, presentation, or properties of participants) and one or more *dependent variables* (some measurement of responses given by participants). Experimentation is fundamentally generative, in that the researcher creates both the conditions under which the data are collected, and the data itself, rather than documenting or analyzing preexisting or naturally occurring data. I will not discuss here "experiments" in the sense of manipulations or analyses done using only existing data or corpora (see Gilquin and Gries 2009). As I mean them, experiments are most commonly undertaken in a laboratory setting, but may be done in any setting in which a researcher has access to the participants and in which the operating technology (if any) is available.

The chapter is organized around the question, "What can we learn about English from experimental methodologies?" I will address experiments that shed light on patterns of *competence/production* and *perception/comprehension*. Each of these illuminate not just facts about the English language, but—and perhaps more accurately—facts about English language *speakers*. These findings cut across content of interest to different subfields including syntax, semantics, psycholinguistics, sociolinguistics, corpus linguistics, and pragmatics. Much of the information presented here will be, naturally, pertinent to the study of other languages as well, but I limit my presentation to experiments that have English structures and speakers as their targets.

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4.2 Experimentation Across Linguistics

There are important relationships between experimentation and other modes of collecting and analyzing linguistic data. One much-discussed area in which this is true is corpus linguistics. In a review paper, Gilquin and Gries (2009) note that experimental linguists make much more use of corpus linguistics than is true of the reverse. Indeed, several of the studies mentioned in this chapter use corpora as the starting or ending point of their stimuli creation, or as resources for data transformations (such as creating post hoc measures that control for word frequency or collocation probability). In their discussion, Gilquin and Gries note some of the important benefits of experimentation, which they argue can help counteract some limitations of corpora. These limitations include the facts that many linguistic phenomena (especially syntactic ones) are relatively infrequent, especially in the formal written contexts from which corpora often come (an example includes subject–verb agreement differences characteristic of many English dialects); that there are often conflicting results across different corpora; and, that the data in any given corpus are limited in generalizability by the specifics of its context. The latter limitation is equally true of experiments, since one subject population's results may not be generalizable to another. Nonetheless, as they are both grounded in rigorous empirical documentation, corpus and experimental approaches should be seen as highly complementary (see Chapter 2).

In this chapter, I present a mix of methods from the highly technical to the relatively low-tech. While conducting experiments does take some technical understanding, there are modes of experimentation that do not require heavy computing skills. A range of software products make experimentation available to those who need a graphical user interface in order to design experiments. Many of these are proprietary (e.g., E-Prime, SuperLab, and Paradigm), but others are free or open-source (e.g., MouseTracker, PsyToolkit, and PsyScope). While some methods require more sophisticated technical knowledge, such as eye-tracking and brain-scanning, methods such as forced choice, self-paced reading, rating tasks, mouse-tracking, and sentence completions do not. These are all widely recognized as producing valid results, given appropriate experimental design.

Before proceeding, I want to highlight some terms that will occur in my description of the studies below. I have already mentioned *hypothesis*, *independent variable*, and *dependent variable*. I will use *independent variable* and *predictor variable* to mean roughly the same thing, and likewise for *dependent variable* and *outcome variable*. Often the former term in each pair is used to describe experiment design, while the latter term is used when discussing analytical procedures and statistical results.

Conditions are the states created by the independent variables. For instance, in some of my own experiments, sentences occur in either a "standard" or "nonstandard" condition, referring to grammatical form. In a *within-subjects* design, all subjects are exposed to all conditions; in a *between-subjects* design, some participants experience one condition or set of conditions, while other participants experience another. An experiment *design* refers to the stimuli and programming choices made for one particular experiment; a *paradigm* refers to an established template for experimental procedure, specifically involving one task (for instance, researchers sometimes speak of self-paced reading as an experimental "paradigm"). Beyond these high-level basics, experiments also entail a range of detailed design objects.

The experimental *task* is what participants are required to do in order to complete the experiment. The task refers to both the physical requirements, such as pressing a button, and the cognitive demands, such as working memory or lexical access. For example, in a self-paced reading experiment, the task is for the participant to read silently and press a button when they are done reading that word, sentence, or section of text. Our interpretation of results (and our statistical procedures) must account for task-related factors: the time, effort,

concentration, and additional processing required of subjects to complete the task. The task must be feasible for participants to do, and minimally interfere in whatever linguistic behavior we seek to monitor.

Participants' responses are recorded at the level of an individual *trial*, which is one instance of a stimulus–response sequence, and hence also one instance of the execution of the task. Researchers often make a distinction between *training* or *practice* trials and *test* trials, with the latter being the only ones pertinent to the hypothesis, and the former serving to acquaint subjects with the task. Additionally, *filler* trials refer to trials that are not of analytical interest and are generally not incorporated into the hypotheses or conditions, though they occasionally serve as a comparison control condition. Fillers are included in order to keep participants from discovering the specific linguistic element that is being tested, or to refocus them after completing a test trial.

Each trial will include at least one experimental *item* of interest. *Item* can refer to an entire stimulus in a trial (such as a whole sentence), or a part of the stimulus that is being manipulated by the researcher (such as a word within a carrier sentence, or a single picture presented along with a sentence). Items are typically divided and organized into *blocks*, with an experiment having a number of blocks. All blocks may contain the same kind of material (i.e., a series of test trials), but possibly in different conditions or for different purposes, as when there are training blocks followed by test blocks. It is also common to have a *practice block* of practice trials, the data from which are not examined by the researcher, before beginning the experiment.

Trials and blocks are often presented in randomized order, and one purpose of "blocking" is to avoid having all participants see the same items in the same order, trying to mitigate what are known as "order effects." Alternatively, or in addition, different *lists* may be used that contain different presentation order of items or different assignment of items to conditions (such that item 28 is in condition A in list 1, but condition B in list 2, for instance). Participants are randomly assigned to a list, unless there is some hypothesis- or design-driven reason to group participants according to participant characteristics. Items, lists, and blocks are all sometimes incorporated as independent variables in statistical analyses of experimental data (sometimes as random effects in mixed-effects models), to account for the potential effects of specific items, item ordering, and so forth.

To conclude this section, I want to acknowledge that there are only some kinds of questions experiments are good to answer, and we should always be careful to use experiments when we think they are particularly well suited to our research questions—not just because we can, or because we have a case of "scientism." Occasionally, experimental methods garner critique simply because they are experiments, or because they are administered in the so-called "unnatural" setting of a research laboratory. Yet, as Gilquin and Gries (2009) note, whether experimental data can be said to be "naturalistic" is more about experiment task and design than experimentalism per se.

In a very useful typology of linguistic data, Gilquin and Gries note that some experiments have participants "do something with language they usually do anyway" and with "units they usually interact with," which can make them more "natural" for participants than non-experimental methodologies that engage participants in unfamiliar tasks with unfamiliar units (though some experiments use those as well) (p. 5). However, even in the cases in which experiments expose people to unfamiliar tasks and units, we may learn something valuable about linguistic knowledge or behavior that we could not learn via mere observation or elicitation (see also discussion in Kendrick 2017). Experimentation is a mode of conducting research in which one must think not only carefully, but also creatively, about precisely what the most productive research questions are, and precisely the kind of data that could speak to them. The combination of rigor and creativity required of experimentation is no doubt why many researchers are drawn to it as a research practice, beyond the scientific benefits.

Thus, the studies discussed below are not meant to provide a comprehensive review of the available literature, but rather to focus on the kinds of questions about English that experimentation has been used to answer, and the kinds of experimental methods available to study them. I have also tried to choose studies and findings that are likely to be of most interest to linguists working on English, and that I believe serve as good starting points for thinking about experimental design, while giving the reader a sense of the possibilities. For further detailed discussion of experimentation from various perspectives, see Drager (2018), Mackey and Gass (2011), Marinis (2003), or Traxler and Gernsbacher (2006).

4.3 Testing English Competence and Production

As noted above, experiments are sometimes characterized as an "unnatural" (or at least, not "naturalistic") means of collecting linguistic data. Perhaps because of this, speakers' production has not been a primary focus of experiments. Questions about production are typically framed as being about *what speakers do with language* (i.e., *What do they say? What do they not say?*). Admittedly, if one's questions can necessarily be answered only by observing what participants produce of their own volition with no researcher intervention, experiments will not be useful.

But experimental possibilities open up if we view competence, as the backbone of production, as the object of inquiry. If we reframe our questions to ask *what would or could speakers do with language* (i.e., *What would they say? What would they not say?*), then we are moving into the realm of questions frequently posed by multiple subfields of linguistics, first and foremost syntactic theory. Indeed, experiments allow us to control some external factors pertinent to competence and production, so that we can ask, *Given condition X, what will they (not) say?* This kind of question is central not only in understanding English syntax but also its semantics and its interactional sociolinguistics.

4.3.1 Syntax

The most pervasive kind of experiment to examine production in this sense is the collection of grammaticality or acceptability judgments, within what has been called "experimental syntax" (Cowart 1997). Schütze and Sprouse (2014) call an acceptability judgment a "reported perception of acceptability" (p. 28); judgments are essentially self-reports, and subject to the limitations thereof. They are (rather obviously) *not* direct production data. However, it is assumed that judgments give evidence about linguistic competence. Judgment data by now have a long history not only of use in the field but also of both critique and validation (Gilquin and Gries 2009; Schütze and Sprouse 2014; Schütze 2016). Acceptability judgments are also frequently used for norming stimuli in psycholinguistic experiments to ensure that they are valid (e.g., Luka and Barsalou 2005).

A grammaticality/acceptability judgment can be collected in a number of ways, from the anecdotal to the systematic. Often judgments are collected via rating scales, such as Likert scales or magnitude estimation, which recognize that grammatical acceptability lies on a continuum rather than a binary, though forced-choice binary options are also used (Schütze and Sprouse 2014). These judgment tasks fall under the class of *offline* methods, as opposed to *online*. Within psychology this distinction refers to the temporal relationship between stimuli presentation and measurement of participant responses. Offline responses are not collected contemporaneously with the participants' processing of the stimuli; rather, they require an explicit and non-automatic response. By contrast, *online* methods use time-sensitive measurement techniques that attempt to uncover automatic, implicit processes underlying participants' responses.

While judgment data have largely been used to answer questions within syntactic theory, they have also been used to shed light on specific English syntactic phenomena. Radford et al. (2012) examined "preposition copying" and "preposition pruning" (examples of each appear below). The former is an "extra" preposition in a relative clause in which the preposition has been "pied-piped" to the front of the clause, and the latter is a slot in a relative clause from which a preposition is "missing." Both patterns are well documented in English corpora, but Radford et al. ask whether they are to be considered "syntactic"—part of the grammar of English—or are essentially production errors. The authors hypothesized that if they are errors, sentences with them should be judged less acceptable by English speakers than their alternants (non-copied, non-pruned), whereas if they are part of underlying grammatical representations, speakers should rate all classes of sentences similarly.

To test this, Radford et al. conducted two experiments with British English speakers: an untimed 10-point scale rating task (on paper) and a timed, or "speeded," yes/no judgment task (via computer). Their stimuli were sentences containing restrictive relative clauses in one of four conditions: copying, pied-piping, stranding, and pruning. Example stimuli sentences are given in (1a)–(1d).

(1a) *Copying*: Climate change is a topic in which many people have a very strong interest in.
(1b) *Pied-piping*: Climate change is a topic in which many people have a very strong interest.
(1c) *Stranding*: Climate change is a topic which many people have a very strong interest in.
(1d) *Pruning*: Climate change is a topic which many people have a very strong interest.

(Radford et al. 2012, p. 425).

In the untimed pen-and-pencil ratings task, copying was not rated worse than pied-piping without copying; and, pruning was not rated worse than stranding without pruning. However, pied-piped sentences were judged overall more acceptable than stranded ones, whether or not pruning or copying were present. In the timed task, copying and pied-piping were again not judged significantly differently, but pruning was far less often judged to be acceptable than stranding. And, not only was pruning judged to be least acceptable, but participants took about twice as long to respond to the pruning sentences as to the others. Because response times are taken as a measure of processing difficulty and/or degree of automaticity of response, this result suggests two things: a) pruning was downgraded in acceptability during the timed task precisely because of the nature of the task and its concomitant processing effects, and b) judgments in the non-timed experiment were affected by the prescriptive norm that prefers pied-piping to stranding.

The data of Radford et al. challenge the idea that copying and pruning are simply "errors," and point to a need to account for them as part of the grammar of English. The pair of experiments demonstrates well the benefit of combining corpora data with experimental data for a fuller picture of speakers' production and usage patterns. They also show the benefit of examining temporal data about how participants arrived at the responses they made (discussed with several other experiments below). Lastly, this study sheds light on the relationship between prescriptive rules and a descriptively adequate documentation of English grammar (see Curzan 2014; van Ostade 2018; Peters this volume).

Another example of the use of acceptability experiments to explore English grammar, again with relative clauses (a central topic in syntactic theory), is Patterson and Caponigro (2015). This study examines free relative clauses, asking why clauses headed with *what* are more acceptable than those headed with *who*—an asymmetry that seems to be rare among the world's languages, yet present in English. The authors had English-speaking participants from Amazon's Mechanical Turk (see Sprouse 2011) rate sentences on a Likert scale

from 1 (completely unacceptable) to 7 (fully acceptable). The experiment manipulated whether the free relative was headed by *who* or *what*; the syntactic position of the free relative (subject, object, PP complement); and whether the position of the syntactic "gap" left by the relative pronoun was "parallel" to the syntactic position of the free relative in the matrix clause. Example stimuli are below in (2a)–(2c) (not all conditions are represented).

(2a) Object *who*, parallel: The music teacher married who he dated at college.
(2b) Subject *what*, parallel: What the shareholder heard at the meeting annoyed him.
(2c) PP comp *what*, non-parallel: The security guard looked at what had surprised him (Patterson and Caponigro 2015, pp. 351–352).

Acceptability of *what* versus *who* was sensitive to both the syntactic position of the free relative clause and parallelism of the "gap" position. This study highlights one of the key benefits of experimentation: it allows researchers to construct stimuli that will elicit data regarding very specific hypotheses, with carefully controlled linguistic elements thought to affect participants' responses.

Grammatical differences across English dialect regions have also been studied using acceptability judgments. For instance, Benson (2012) asked American English speakers about the *need*+prepositional adverb construction; Hasty (2011) investigated double modals; and Durham et al. (2012) compared responses to quotative *be like* across different English-speaking populations. Rating scales can be created that speak to the specific phenomena under investigation; for instance, Benson's (2012) study asked participants about when and with whom they would or would not use the sentences.

While I began this section noting that experiments seem more suited to attempting to measure competence rather than production, some experiments have measured production directly. Production tasks have been used for both syntactic and phonological questions. In the former, sentence completions or other kinds of elicitation tasks are used; in the latter, simple word production, reading, or shadowing tasks are typical.

Production tasks have frequently been used to study the influence of *priming* on syntactic production; that is, the tendency of speakers to reuse recently used syntactic structures. Priming is one of the most-studied topics in psycholinguistics, within both production and comprehension studies (see, e.g., Bock 1986; Branigan 2007; Pickering and Ferreira 2008). One English feature studied extensively is the dative alternation, whereby a ditransitive verb can occur with its indirect object as either a dative object (DO construction) (*I gave her the book)* or a prepositional object (PO construction, or sometimes called PP for "prepositional phrase") (*I gave the book to her*). Understanding the constraints on speakers' preferences for one structure over another is part of understanding the grammar of English, though typically priming studies have more cognitively oriented research questions.

Syntactic alternations like the dative have been studied using picture description tasks to elicit syntactic structures, where the target structure is one alternative among two (another English pattern examined this way is active/passive voice, e.g., Bock and Griffin 2000; Bock et al. 2007). For instance, Weatherholtz et al. (2014) investigated how participants described ditransitive-eliciting pictures after hearing a speaker make politically charged statements. The speaker stimuli contained either a DO or PO prime, and the researchers' hypothesis was that participants who aligned more politically with the speaker would be more likely to repeat the prime structure from the speaker. They did find basic syntactic priming of DO/PO structures, and they found that degree of alignment was mediated by social factors.

Another method of eliciting sentence structures, also in priming paradigms, is sentence completion. For instance, Corley and Scheepers (2002) presented participants with sentence fragments containing ditransitive verbs, which participants typed in a computerized sentence completion task (see also Branigan et al. 1999). The prime sentences contained a

subject, verb, and verb complement that was either animate or inanimate. The animate complement should bias participants to treat it as an indirect object (eliciting a DO construction), while the inanimate complement should bias them to treat it as a direct object (eliciting a PO construction). A prime sentence could be:

(4a) *Animate complement*: The bank manager handed the check…
(4b) *Inanimate complement*: The bank manager handed the customer…

The target sentences only contained a subject and ditransitive verb, with no complement at all, and participants completed the sentence after the verb. A possible target for the above-mentioned prime could be:

(4c) The junior surgeon handed… (Corley and Scheepers 2002, p. 127).

Because responses were collected using computer software that measured reaction times, the researchers were able to analyze timing differences in addition to categorical responses. They found a slight priming effect, but only when the verb itself was repeated between prime and target. They also found that sentences where completions demonstrated priming were produced faster than those without repetition.

Regarding other syntactic structures in English, there are relatively few experimental studies that target production directly. This is likely because it is sometimes difficult to elicit the targeted structure. Even with a carefully constructed elicitation task or picture description, participants may not produce the target utterances, as MacKenzie and Wynn (2016) found when they devised a task to elicit patterns of copula contraction in English (variation in contraction only happens after non-pronominal subjects, according to the corpus data). They had participants describe images they thought would garner copular sentences without pronominal subjects, such that a target sentence production would be either, for example, *The spoon is ~ 's on the left*. However, the copula was difficult to elicit; some participants used other discourse strategies and some simply never produced copular clauses. Though clearly a challenge, continuing to develop valid tasks for eliciting syntactic production could lead the way to more experiments that would shed light on questions of English grammar (for instance, one could imagine tasks designed to elicit preterit vs. participle variability, or the placement of *like*, or agreement or negation differences).

4.3.2 Phonetics/Phonology

In contrast to syntactic production, phonological/phonetic production can be simpler to elicit, since the properties of phonological structure are not as subject to semantic, discourse, or other contextual factors (though, they are certainly not immune; see, for instance, the classic "department store study" in Labov 1972). In its simplest form, a phonetic production experiment can involve having speakers read from carefully constructed word lists, often with the word in a carrier sentence. One example comes from a study of vowel tenseness in the American English low front vowel /æ/ by De Decker and Nycz (2012). They had four American English speakers produce tokens of a "minimal quadruple" of words which respectively condition lax variants (*pat*), tense variants (*pan*), or which demonstrate variation (*pass, pad*). From these tokens they produced ultrasound images and acoustic measurements of the vowel articulations, from which they found variable patterns across the four speakers, discovering that in some cases the acoustic properties are similar yet the articulatory process that produced them was different. In other words, what shows up as tense acoustically may not look like tense articulatorily, which has implications for understanding phonological variation and change in English (and other languages).

There has been a wave of recent experimental approaches from the perspective of sociophonetics (see Watson 2013; Drager 2018). I will give just a few examples to illustrate. Thomas and Hay (2005) investigated the production of the merger of prelateral /æ/ and /e/ in New Zealand English, using both production and perception tasks. The production task was word list reading, but the researchers used both real words and nonsense words. They manipulated syllable numbers in the words, to be able to examine the influence of syllable structure on vowel articulation; this was possible to control by using nonsense words. Thomas and Hay found that most speakers were merged in production but maintained a vowel distinction in perception environments. And, real and nonsense words were treated differently, suggesting that underlying their phonetic productions, speakers have knowledge about word-level categories. This study is nicely parallel to cases in syntactic experiments where surrounding syntactic/semantic properties are controlled for, accounting for the complexity of linguistic conditioning.

More complicated than a reading list is a shadowing task, as used in Babel (2010), who investigated phonetic accommodation by New Zealand English speakers. In a shadowing task, participants hear words spoken by others, and then are to "identify" the words by saying them out loud. This can test how accurately, how quickly, and with what phonetic articulations participants say the word, and which independent variables affect their production. Babel's goal was to test whether NZE speakers' vowel productions shifted to accommodate the productions of AusE speakers. She combined a shadowing task with an Implicit Association Task to measure New Zealanders' attitudes toward Australians. She found that participants did tend to converge to the speaker's vowels, but not equally for all vowels; and, participants who had stronger pro-Australia attitudinal bias showed more convergence. By pairing two different experimental methods, this study investigated some of the social factors at play in speech production. Other shadowing studies include Pardo et al. (2018), Nye and Fowler (2003), and Walker and Campbell-Kibler (2015).

4.4 Testing the Perception and Comprehension of English

On the flipside of production and competence are perception and comprehension. This area is where the vast majority of experimental linguistic work has been undertaken. Relevant questions here include how words are recognized, how meaning is interpreted, what factors interfere with comprehension, how listeners/readers resolve ambiguity, what kinds of meanings listeners construe from linguistic input, and how social evaluations and attitudes affect people's interpretations.

4.4.1 Phonetics/Phonology

I begin with the study of speech perception—probably the most robust area of experimental linguistic inquiry outside of psycholinguistics. Most of this work has a theoretical goal. Take for example Beddor et al. (2018), which tested the relationship between coarticulation in speech production and speech perception. Little work has heretofore tested directly the extent to which a speaker's patterns of perception "match" their productive repertoire. The study of Beddor et al. also sought to tie phonetic theory to theories of sound change, thus is of relevance to historical linguists as well. The focus is anticipatory nasalization in American English, where the velum is lowered during a vowel (V) prior to a nasal (N) consonant (I will represent non-nasal consonants as C). Vowel nasalization is not considered phonemic in English, yet coarticulation has been posited to have led to phonemic nasalization over time in other languages—raising the question of whether English might change slowly in this direction as well.

Beddor et al. used two paradigms. A production experiment measured nasal airflow of speakers' production of words with voiced and voiceless consonant-vowel-nasal-consonant (CVNC) sequences (e.g., *bend; bent*), and calculated each participant's temporal dynamics of nasalization. An eye-tracking perception experiment sought to examine whether participants' reliance on coarticulatory cues for speech perception mirrored the time-course of their productive coarticulation. Eye-tracking is an online measurement tool that produces extremely fine-grained temporal data. Often eye-tracking is conducted during a passive experimental task, where participants' only job is to listen, read, and/or look at images in what is called a "visual world" paradigm.

In the perception experiment of Beddor et al., participants heard auditory stimuli of either a CVC (*bed*) or CVNC (*bend*) word and were to look at which picture on the screen corresponded to the word they heard. Measurement of eye gaze was taken to index at what timepoint in the articulation of the word participants recognize it. If they are cued to nasal coarticulation, participants may recognize as early as the vowel whether the word will have a nasal in it or not. For instance, if a participant heard *bend*, and saw a picture of *a bed* and something *bending*, the question would be how quickly after the onset of nasalization their eyes moved to the picture representing *bend*.

Participants used nasal information as soon as it became available. Participants relied more on nasalization preceding a voiceless consonant than a voiced one, reflecting the fact that in American English, nasal consonants are more often deleted before voiceless consonants than voiced ones. Moreover, the perceptual time-course of individuals' word recognition also reflected the productive time-course of individuals' own coarticulatory patterns. Those who produced nasalization earlier also used the cue of nasalization earlier, shown by their earlier eye fixations on the nasal target words.

This study shows the benefit of experimental work for a wide-ranging set of theoretical questions involving phonetics, phonology, speech perception, and sound change, but it also illustrates one property of conducting experiments that is often exploited within English phonetics research: the ability to conduct and present momentarily ambiguous stimuli, whose interpretation reveals listeners' perceptual processes. This same ambiguity is not quite possible in syntactic work, though there are some variables that lend themselves to it (for discussion, see Squires 2014).

Other experimental work on speech perception has more sociolinguistic-oriented goals, such as understanding how cross-dialect perception works; or, exploring speech perception as it intersects with social perceptions, attitudes, and evaluations.

A study with the first goal—to understand how speech perception relates to sociolinguistic phonetic variation—is Shaw et al. (2018). This study takes as given that listeners extract some social indexical information about who is speaking from the linguistic signal. Two theoretical questions emerge from this fact: how does the social information in the signal affect how the linguistic information is perceived, and what are the cognitive underpinnings (in the "grammar") of listeners' ability and tendency to interpret linguistic and social information together? Experiments are well-suited to exploring the former question (for discussion of the latter, see Campbell-Kibler 2016).

Dialects of English maintain similar phonological categories—for instance, across words in a class—but with different phonetic variants expressing the categories. The work of Shaw et al. investigates *perceptual assimilation*, which describes listeners' ability to manage new phonetic variants by mapping them to their existing abstract phonological categories. Shaw et al. tested the effect of exposure to different English accents (dialect) on listeners' categorization of five vowels.

The experimental design consisted of a listening task, where participants heard a 10-minute story, followed by a vowel categorization task. The vowel stimuli were nonce words with vowels taken from five dialects: Australian English, the native dialect of the

study participants; Christchurch from New Zealand; and three UK dialects found in London, Yorkshire, and Newcastle. The stimulus story—essentially a phonetic prime—was also read in one of these five dialects. In a phonetic/phonemic categorization task like this, listeners hear a token of either an isolated speech segment or a word containing some segment of interest. Listeners then choose from a set of options which word (typically) represents what they heard. Since both vowels and consonants lend themselves to categorial ambiguity, this type of categorization task is well suited to use in speech perception. One fairly atypical property of the experiment design of Shaw et al. was the high number of alternatives participants were presented with: the same 19 possible target words in each trial. "Forced-choice" tasks like this usually present participants with only two to four options.

The experimental question for this study is: (how) do participants categorize the nonce words differently in the different accents, and after having heard different accents being spoken in the story? To the first issue, the study found that participants' categorization accuracy was, for the most part, not significantly different across accents. That is, overall, participants did no worse categorizing non-AusE vowels than their native AusE vowels. To the second issue, they found little effect of pretest accent exposure on categorization of nonce words in the non-AusE accent. This is contrary to the hypothesis, which was that pretest exposure would improve the performance on new talkers with new words. The upshot is that listeners' phonological categories are "tolerant" of within-language variance—but that tolerance is also mediated by social attitudes. The AusE listeners rated nearly all of the tokens preceded by a New Zealand speaker as "less good" than when participants had heard the story told by AusE speakers.

Similar influence of social attitudes on perception/comprehension of linguistic features has been shown to be robust (for overviews, see Campbell-Kibler 2010, and many of the studies referenced in Drager 2018). Consider D'Onofrio (2018), which investigated the backing of the TRAP vowel in California English. This feature is considered a sociolinguistic marker, as opposed to a stereotype (see Labov 1972; Johnstone and Kiesling 2008), in that speakers tend to show no metalinguistic awareness of the feature, even though the feature itself distinguishes between social groupings of people. Part of the California Vowel Shift, backed TRAP is associated stereotypically with two main social groups: a "valley girl" persona (negatively perceived) and an educated, professional speaker (positively perceived).

D'Onofrio tried to get at the difference between explicit and implicit processing by using two different experimental paradigms. The first, most explicit experiment used the matched guise technique (MGT), which is perhaps the most frequently employed experimental paradigm in sociolinguistics (going back to Lambert et al. 1960). In an MGT, listeners hear the same speaker in different "guises" that differ on some linguistic dimension(s). By eliminating the confounding variable of individual vocal properties, effects of the different guises are attributed to the specific linguistic features being manipulated. In D'Onofrio's MGT, listeners heard a list of word tokens with either backed or non-backed TRAP vowels, and then provided ratings of the speaker's demographic and social characteristics. Participants who heard the backed tokens were more likely to rate the speaker as a "valley girl."

The second experiment used eye-tracking to measure more implicit processing. D'Onofrio used a four-alternative forced-choice task where participants chose between words written on the screen; word choice indexed vowel perception. All audio stimuli now included backed TRAP. The critical manipulation was between subjects: some participants were not given any information about the speaker; some were told the speaker was from California; some were told the speaker was a valley girl; some were told the speaker was a business professional. Contrary to hypothesis, none of these conditions were significant predictors of word choice. However, the eye movements themselves told a different story. Fixations—eye gaze position settled on a point on the screen—were analyzed only for those trials in which participants

ultimately chose the TRAP word, from 200 ms after vowel onset in the stimulus to 200 ms following vowel offset. This window represents an early processing time that is assumed to represent automatic, implicit processing. These fixations went faster to the TRAP word in the California speaker condition than the other conditions.

While the explicit task found a clear association of the vowel with valley girl persona, with the eye movements, it was the social property of being Californian that showed a difference. Recall another study on syntactic structure, Radford et al., that found differing responses between more automatic and more explicit responses. Both studies show that one's immediate processing of linguistic stimuli may be modulated by more time processing, and affected by "external" social and cultural factors.

A final study investigating the interaction of phonological variant and speaker information, this time about dialect differences and racial identity, is King and Sumner (2014). Their paradigm used "cross modal form-priming," which means participants heard an auditory stimulus, then saw a word on the screen ("cross modal" here refers to the difference in spoken vs. written modality of the stimulus and response). Participants' task was to quickly make a lexical decision—a judgment as to whether the printed word was an English word or not. Lexical decision tasks are typically used when the only measurement of interest is speed or ease of processing, rather than distinguishing between different percepts. King and Sumner investigated how exposure to a General American (GA) versus African American Vernacular English (AAVE) speaker's voice affected participants' perception of two different phonological variants: TH-fronting, a feature of AAVE, and consonant cluster deletion, a general feature of English. They found a voice by variant interaction: while the GA voice garnered greater priming effects for the standard variants, the AAVE voice garnered greater priming for *both* standard and nonstandard variants. This is despite the fact that the consonant cluster deletion is not a feature dependent on dialect, and is indeed used by GA speakers. Similar results have been found by Seifeldin et al. (2015), with racial cues affecting processing of syntactic variability. Clearly, when English speakers process phonological input, they are not only using linguistic cues, but also categories about people.

4.4.2 Morphology

Morphology is rarely a point of focus in experimental studies, but recent experiments by Needle and Pierrehumbert (2018) have tested relationships between English morphology and social gender associations. They first identified words and suffixes in the British National Corpus which had a gender bias (i.e., were more likely to be produced by females or males; the study operationalized gender as a binary variable). They then used these as stimuli in a morphological decomposition task: participants saw a word written on a screen and were asked to divide the word into "two meaningful parts." Each word was also accompanied by two photographs—one male, one female—and participants were to choose who was more likely to be the author of the word. Stimuli came in three forms: simple real words, complex (multi-morphemic) real words, and complex pseudowords. The real words had gender bias either for the whole word or the second morpheme. The pseudowords contained a pseudostem and a real morpheme ending, so the suffix also had a real-world gender bias. For example, male-biased words were *censor**ship*** (real) and *klift**arian*** (pseudo); female-biased words were *great**ness*** (real) and *gream**tude*** (pseudo).

Participants were more likely to choose female authors for more female-biased simple and complex words, though the gender bias of individual morphemes was not significant. For the pseudowords only, morpheme gender bias led to gendered choices consistent with that bias. This study is important in trying to tease out the units of English that are relevant to discussions about social indexical knowledge: clearly, whole words have the potential to take on social meanings (Walker and Hay 2011), yet this study shows that given the right

circumstances (namely, in absence of real-world experience with the roots), derivational morphemes may themselves also take on such meanings. This finding fits well with studies showing that, for instance, certain morphosyntactic agreement patterns may carry social meanings (e.g., Squires 2013, 2014; Hilton 2018).

4.4.3 Syntax, Semantics, Pragmatics

Moving up to the level of morphosyntactic and syntactic processing, most experimental work has simply used English as a language on which to test theories of sentence comprehension (not unlike theories of speech perception tested out on English speakers). However, there is some work on processing syntactic dialect variation specific to English, for instance my own studies using syntactic priming (Squires 2013), mouse-tracking (Squires 2014), and self-paced reading (Squires 2016) to investigate agreement variation in invariant *don't* and existential *there's*. Using different paradigms, these studies have all shown that "nonstandard" syntactic structures are more difficult (take longer) to process than standard forms for standard speakers, and that social meaning is extracted during processing of morphosyntactic variants. Within the field of sentence processing proper, English dialect variation was first explored in several well-known experiments by Kaschak and Glenberg (2004) and Kaschak (2006), who tested how participants read sentences including the *needs*+past participle and *wants*+past participle constructions. These experiments used both sentence-by-sentence and word-by-word self-paced reading tasks. They found that participants experienced a processing slowdown for either whole sentences containing the dialect construction, or beginning at the word introducing the construction (the past participle). Yet they also found that the processing difficulty was quickly attenuated throughout the course of the experiment; their goals were to inform theories of adult grammatical acquisition and implicit learning.

A more recent study that uses syntactic perception to show something about the English language itself is Hilton (2018), which investigates variation in number in the nominal complements of existential *there's*. Hilton tested perception of three present-tense variants that can occur with a plural noun phrase complement: present-tense *there's*+NP_{pl}, *there is*+NP_{pl}, and *there are*+NP_{pl}. Using Mechanical Turk to recruit a large volume of participants (900), Hilton exposed each participant to a single sentence containing one of the variants, and participants then rated the speaker on 10-point scales for social dimensions of education, intelligence, and class background. Some participants heard the sentence, and some read it on a screen. The *there's* sentences were evaluated more favorably than *there is* and similarly to *there are*. The results suggest that the three variants are sociolinguistically distinct within the language, and moreover that *there's*+NP_{pl}—a "nonagreeing" variant historically considered to be nonstandard—is not evaluated as socially negative.

Moving even further up the levels of linguistic structure, enlightening experimental work has been done at the interface of English syntax and semantics. Politzer-Ahles et al. (2017) used event-related potentials (ERPs)—a method that measures brain activity—to study the interpretation of clauses headed with temporal subordinators *before* and *after*. Previous studies on these temporal markers found evidence of processing differences in N400 effects, which are associated with semantic difficulties. ERPs are measured using an EEG test, and ERP effects are discussed as "components" labeled by whether the brain activity consists of positive (P) or negative (N) voltage, distribution of the activity across areas of the brain, and/or the time-course of the activation in milliseconds (for an overview, see Steinhauer et al. 2008).

When occurring at the beginning of a sentence, clauses headed with *before* are more difficult to process than clauses headed by *after*. This difficulty has been attributed to two possible causes. First is "order-of-mention": the order of mention in the sentence does not map

to the order of occurrence in the sequence of events in the world in the case of *before*, contrary to with *after*. Second is "veridicality": while *after* clauses must be interpreted as describing an event that actually occurred, *before* clauses are ambiguous as to whether the event occurred or not. Compare (5a) to (5b):

(5a) *After I ate breakfast*, I read the newspaper.
(5b) *Before I ate breakfast*, I read the newspaper.

In (5b), the possibility that eating breakfast did not happen is raised; this is not possible in (5a). Politzer-Ahles et al. attempted to distinguish between the order-of-mention and veridicality accounts by testing how participants responded to sentences with the temporal clauses positioned sentence-finally instead of sentence-initially:

(5c) I read the newspaper *after I ate breakfast*.
(5d) I read the newspaper *before I ate breakfast*.

If the order-of-mention account is correct, people should have greater difficulty interpreting sentences with sentence-final *after* clauses than *before* clauses. Their design crossed the factors of marker (*before* vs. *after*) and structure (sentence-initial vs. sentence-final). Unlike self-paced reading tasks, in ERP reading tasks, the pace of stimuli presentation is typically controlled by the researcher. In this case, sentences were presented one word at a time on the screen, where each word was presented for between 300 and 800 ms. Participants were asked comprehension questions after a third of the sentences, by pressing a button on a response box. The results supported the order-of-mention account: in sentence-final position, clauses with *after* elicited more negative ERPs than clauses with *before*, whereas the pattern was reversed in sentence-initial position.

Another semantics study used mouse-tracking to investigate interpretation of English tense and aspect. Anderson et al. (2013) had participants listen to motion event descriptions while looking at scenes on a computer screen, and they moved a character on the screen to correspond to the description. Mouse-tracking is a low-cost, temporally sensitive measurement technique that can be seen as an alternative to eye-tracking; while there are programs developed specifically to capture mouse movements, such as MouseTracker (Freeman and Ambady 2010), other experimental presentation software also include mouse-tracking as a response option.

Anderson et al. presented participants with auditory stimuli of sentences in four variants that crossed the conditions of aspect (simple past vs. past progressive) and degree of pastness (recent vs. distant):

(6a) *Simple past, recent*: Yesterday David walked to the university.
(6b) *Past progressive, recent*: Yesterday David was walking to the university.
(6c) *Simple past, distant*: Last year David walked to the university.
(6d) *Past progressive, distant*: Last year David was walking to the university (Anderson et al. 2013).

At the same time as they heard the sentences, participants viewed scenes on the computer screen that corresponded to the description. The scene showed a path leading to a destination (such as a university building), and a silhouette figure located outside the picture. The participant's task was to move the figure to a position in the path that matched the sentence they heard. Researchers analyzed where along the path participants placed the character; the trajectory of mouse movements en route to the path; and, how long it took for participants to move the character.

The results showed that participants placed the character further from the destination when they heard past progressive rather than simple past sentences, with recent past sentences being placed furthest from the destination. That is, distant simple past sentences were conceptualized as more final and complete, hence participants placed the figure closer to the destination. The mouse trajectory results confirmed these interpretations: the recent past progressive sentences attracted movement to the path itself (ongoing action), whereas simple past sentences attracted movement to the destination (completed action). The amount of time it took participants from picking up the figure to dropping it in its location showed an interaction of aspect and distance: for distant time frames, durations were longer in the past progressive. For recent time frames, durations were longer in the simple past. This study informs understandings of how English aspect (progressive, specifically) influences speakers' perceptions of events relative to time and space (for a study that investigates the intersection of semantic factors with social meaning perceptions, see Beltrama and Staum Casasanto 2017, on intensifier usage).

Finally, at the level of pragmatics, de Marneffe and Tonhauser (2019) used a perception experiment to investigate the pragmatic meanings of intonational contours in English questions and answers, and how an intonational contour can signal or strengthen a negative. Each item was a single adjacency pair consisting of a polar (yes/no) question and an indirect answer, both of which contained a copula sentence and a scalar adjective:

(7a) (question) Is your sister beautiful?
(7b) (answer) She's attractive.

Intonational manipulation of the target—answer—sentences was done so that there were two contour conditions: a neutral contour, H* L-L%, and a rise–fall–rise contour, L*+H L-H%. Participants were asked to rate whether the respondent meant to confirm the adjective in the questioner's question or not; they rated on a seven-point Likert scale from "definitely no" to "definitely yes." Responses were more negative for the rise–fall–rise contour: when the indirect answer is given with the rise–fall–rise contour, listeners infer a negative answer to the question. For other experiments on the meanings and perception of intonation in American English, see Burdin and Tyler (2018).

4.5 Conclusion

In this chapter, I have presented experimental studies that speak to the breadth of what can be done through experimentation—what kinds of things we can learn about English and its speakers—and the methods available to us for doing so. I have focused on areas of linguistics that reflect both my own interest and where the bulk of the work has been done. At the level of what is being examined, this meant competence/production and perception/processing; at the level of field, this meant phonology, morphology, syntax, semantics, pragmatics, and sociolinguistics.

Nonetheless, there are many avenues of experimental research I have left out of this brief overview. In the area of first language acquisition, Odato (2010) used puppets in experiments to elicit children's knowledge of LIKE and commentary on its use; Wagner (2001, 2002) has used comprehension experiments to understand children's acquisition of tense and aspect. Marinis (2003) and Roberts (2012) offer reviews of second language acquisition research using experimental methodologies. In terms of bilingualism, many studies have used syntactic priming or related paradigms to investigate the representation of syntactic knowledge and the extent to which it is shared or separate between a speaker's languages, for example, Hartsuiker et al. (2004) and Kutasi et al. (2018). Experiments can be used to track patterns of

linguistic and social change, for instance, Ackerman (2018) investigated processing of singular *they*, reflecting an interest in language change related to gender identity. And, within interactional sociolinguistics, conversation analysis has also been studied using laboratory techniques (see Kendrick 2017).

I have shown that experiments are a fruitful way to examine certain kinds of linguistic research questions. As stated at the outset, experiments are not the appropriate methodological choice for every inquiry; for much of what we want to know about English, usage documentation, historical comparisons, corpora, and interview data are necessary. Experiments are not replacements for, but complements to, those other methods. But when our questions have to do with what is possible in the language, how speakers of the language behave given some set of constraints, what is going on in speakers' brains when trying to comprehend language, and so forth, we are on solid footing for exploring experimental approaches.

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5 English Grammar Writing

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5.1 Grammar Books

Grammar writing constitutes the oldest continuous tradition of explicit language study in the history of western linguistics. We all think we know what a grammar is, but *grammar* is a label that has been used and abused in more ways than any other in linguistics (see, e.g., Yañez-Bouza 2015, for eighteenth-century examples of such uses). In the specific sense of a written presentation of the structuring principles of a language, it has meant different things to different users at different times and in different places. The use of the name *grammar* for this type of text has come down to us from the Latin *ars grammatica*, a direct translation of the Greek *τέχνη γραμματική*, meaning "skill in the use of letters." The study of language has clearly come a long way since it amounted to little more than being able to read and write. Innumerable grammar books have passed through the hands of students and scholars alike in the course of the centuries, and grammar production has been as much of an industry for publishers and booksellers as it has for linguists.

Grammars, like dictionaries, form part of the familiar scenery of linguistics, and it is easy to forget that they carry enormous power. An individual grammar book can *be* the English language for millions of people, so it is essential to have a critical sense of why a grammar is as it is: what does it not say and what does it conceal? In the first half of the nineteenth century, Lindley Murray's *English Grammar* of 1795 captured the mood of the time. It entered at least 65 British editions as well as many editions and reprints in Europe, the British Empire, and the USA, where it had particular symbolic power as a key to social advancement (Schweiger 2010), not to mention offshoots and imitators (see the papers in Tieken-Boon van Ostade 1996). The authoritarian style and the 22 confident rules of syntax might not find favor with many linguists today, but its impact on the popular understanding of and attitudes toward English grammar is incalculable. The modern-day equivalents in terms of impact are the suites of grammars from the major publishing houses (Collins, Pearson, Oxford, Cambridge) dominating the English language teaching market (see Section 5.5), their teams of authors exhibiting many of the features of the eighteenth-century grammarians' discourse community described by Watts (2008).

How best to present the grammatical system of English is certainly not given, and a range of competing factors influence why a particular grammar book ends up taking its particular form. The factors involved in shaping an individual grammar book do not, however, form an undifferentiated bundle. Their relative importance will vary from one book to the next. Is it

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more important that the needs of the users be catered for or is it more important that a particular theoretical stance be taken? Is it more important to be exhaustive or to be simple? In the 1973 study of Stockwell, Schachter, and Partee, *The Major Syntactic Structures of English*, for example, the adoption of a particular theoretical framework (transformational-generative) was more important than other competing factors, which in their turn dominated other grammars from the same year, such as *A University Grammar of English* from the Quirk, Greenbaum, Leech, and Svartvik stable and *A Mathematical Grammar of English* by George Hemphill. The major publishing houses mentioned in the previous paragraph tend to adopt a differentiated approach to appeal to different markets, thus the Oxford University Press catalog embraces both Sidney Greenbaum's 650-page *Oxford English Grammar* from 1996, still in print in 2018, and the four-volume *Grammar* (Seidl 1992–1994)—"a gentle introduction to grammar for children." This is not the place to set out an entire theory for understanding grammar writing, but in the course of this overview our principal question will be why certain grammar books have been as they are and why particular approaches have, like Murray and the twenty-first-century grammar families, been successful in particular contexts, and this has to be understood in terms of the competing factors underlying grammar writing.

Individual grammar books may, then, be characteriszed by the interplay of differently prioritized variables in their construction, but we do nonetheless instinctively recognize a grammar book as opposed to some other sort of publication about language, so let us consider some of the features which make the genre recognizable. Around 1990, there was a flurry of interest in the nature of grammars, specifically *reference grammars*. Gottfried Graustein and Gerhard Leitner suggest that grammar books in general have three essential properties, and we will accept these as at least some of the key stylistic features of the genre:

1. Grammars of a language are more or less comprehensive and systematic accounts of the major categories, structures, and functions of linguistic expressions found in the language under description […]
2. Grammars of a language do not, and, perhaps, should not, aim to represent the totality of a language in its regional, social, stylistic, or temporal extensions. They select relevant sections according to linguistic and user-related criteria […]
3. Grammars of a language, like other types of reference materials, are not meant to be read from beginning to end but to be used wherever a need arises. They are to provide insights into the "making and working" of a language and to answer very concrete questions, regardless of theoretical or other issues. (Graustein and Leitner 1989, pp. 5–15)

It has become standard practice in what some (e.g., Leitner 1985) have called "grammaticology" (the study of grammar writing) to divide English grammar books into two discrete functional categories. Thus, the *school tradition* is distinguished from the *scholarly tradition*, and *teaching grammars* are distinguished from *reference grammars*, the two genres being referred to elsewhere as *Schulgrammatik* [school grammar] on the one hand and *Regulae* [rules] on the other (e.g., Law 1986). The "scholarly tradition" and "reference grammars" have received greatest attention from the grammaticologists, but in breadth of impact the other categories are more important, and we shall discuss grammars of all categories in what follows, treating "grammaticography" as a continuum, not as two poles. These distinctions are often unhelpful anyway, since many grammars have been written to serve one function and have come to serve another or have not differentiated, whether in how they were written or how they were used, between the different functions.

5.2 The First 300 Years

Grammars have been written in the West for over two millennia, and grammar writing in the modern age carries its past with it. There is a burden of tradition on anyone writing a grammar, a body of expectation that discourages innovation. One of the truly pioneering grammars was *The Structure of English* of 1952 by Charles Carpenter Fries, the first to use recordings of live data as its corpus. Fries draws attention to the "cultural lag" in grammar writing, and his reward for bringing English grammar writing into line with the usual practices of modern linguistics was a watery reception by the community of English language teachers. Gleason (1965) gives a fascinating account of what happened when English grammar writing and linguistics clashed in mid-twentieth-century America. Fries is an exception, and our history remains to a large extent one characterized by repetition and imitation.

The year 1586 is the annus mirabilis of English grammar writing, the year it all started. William Bullokar published his *Pamphlet for Grammar* that year with the express intention of showing that English grammar was rule-governed like Latin, something not generally assumed to be the case. To counteract the widely held view, Bullokar modeled his English grammar slavishly on the Latin grammar attributed to William Lily and prescribed for use in the schools by King Henry VIII (see Gwosdek 2013), and the subsequent history of English grammar writing was one of gradual and hard-won liberation from the shackles of Latin grammar.

Bullokar wrote in English, using his own reformed spelling system, but, moving into the seventeenth century, grammars of English still tended to be written in Latin, Christopher Cooper's grammar of 1685 being the last of the Latin ones (and the first prescriptive grammar). The burden of tradition means that the history of grammar writing for most languages is characterized by a move forward, then several shuffles back before the initial move forward is attempted again. Caution is the watchword, and the history of linguistics is littered with failed reform attempts, which have withered only to bud and flower years later. For example, where Bullokar had listed paradigms for noun declension, stating quite categorically that "A substantiue is declined with fiue cases in both numbers," the polymath John Wallis in his 1653 *Grammatica Linguæ Anglicanæ* [Grammar of the English Language], thinking about the nature of the English language on its own terms and not filtered through Latin, was able to state equally categorically that "substantives in English do not have different genders or cases." This was not the end of the matter, and nearly a century and a half later Lindley Murray is still having to cite grammatical authorities to defend the fact that English does not exhibit the same case system as Latin and Ancient Greek.

The seventeenth century, as well as witnessing the emergence of the "scholarly tradition" (if we continue to accept these different functional categories) in the work of Wallis, also saw the emergence of two closely related grammar-writing traditions, both inspired by the needs of the time, and both subsequently big business. First, English became increasingly significant for commercial and diplomatic reasons, and this called for grammars of English as a foreign language. Between 1646 and 1686, English grammars were printed in Denmark, Germany, Hungary, The Netherlands, and Sweden. Second, grammars were now being written for non-learned native-speaker audiences too. Cooper published an English translation of his grammar in 1687 for "gentlemen, ladies, merchants, tradesmen, schools, and strangers (that have so much knowledge of our English tongue as to understand the rules)." Moving from the seventeenth to the eighteenth century, education became more widespread and there was a hunger for popular scientific presentations. In line with the mood of the time, we find grammars such as John Brightland's *A Grammar of the English Tongue* of 1711 (now usually attributed to Charles Gildon et al.), intended for children, women, and others without a

Latin background, and James Greenwood's popular *An Essay Towards a Practical English Grammar* of the same year, also intended for children and the "fair sex" (see Vorlat 1975). Both these types of grammar show the role market forces have played in grammar production, and a characteristic of both traditions has consequently been opportunism: responding to new audiences and new circumstances of use.

By the end of the eighteenth century, over 270 grammatical works dealing with English had been published (Gneuss 1996, p. 28), and the figure for the next 50 years is getting on for 900 new grammars (Michael 1991, p. 12), the majority very much like the others. It was commonplace for a would-be grammarian to argue that local needs were subtly different to the needs of learners elsewhere or that the analysis of a particular grammatical point was erroneous in all competing grammar books, and so a new account was needed. Modern-language teaching in Europe until the very late nineteenth century was an ad hoc business, provided not as a matter of course but when there happened to be someone around offering to provide it (see the studies in Engler and Haas 2000; Haas and Engler 2008). Even in the venerable European universities, the modern languages tended to be taught by so-called *language masters*, who occupied a low status and were employed on a par with the teachers of other practical skills like fencing and dancing. Charles Julius Bertram was a good example of those entrepreneurs who flourished as English teachers and grammar writers. He worked as an English teacher in Copenhagen and in 1753 published a substantial *The Royal English-Danish Grammar*, in which he claimed to have "discovered many previously unknown and useful rules." In reality, he was simply responding to the publishing opportunities presented by a particular pedagogical circumstance (see Linn 1999). Local needs and opportunities have continued to fuel much English grammar writing. Staying in Denmark, although any country could probably be chosen, the prescribed grammars in the departments of English at the universities have tended to be those written by the presiding professor, being used for the duration of that professor's reign (Bent Preisler, *personal communication*). The fact that specific textbooks are written for specific situations is of course no surprise, but the point is that the teaching of English grammar and writing about it is more of a patchwork of local examples than a solid linear tradition.

English grammatical literature prior to 1800 has been charted quite fully. The key resource for scholars of eighteenth-century grammar writing is the free, searchable *Eighteenth-Century English Grammars* database (ECEG, Rodríguez-Gil and Yáñez-Bouza 2009).

Görlach's 1998 annotated bibliography is a great benefit to students of the nineteenth century, and a proper corpus is currently (2018) under development, testament to the growing interest in early grammars as a resource for the study of the history of English. Görlach lists 21 "topics worthy of detailed study," the majority of which are yet to be addressed, so there is plenty to do before we understand adequately how English grammar was approached, studied, and taught in that century, and Görlach's main bibliography contains 1936 items. In line with what we have already established about English grammar writing, the principal factor motivating the majority of these publications is local pedagogical conditions, and Edward Shelley's *The People's Grammar; or English Grammar Without Difficulties for 'the Million,'* published in 1848 in Huddersfield, Yorkshire, is but one example, in this case aimed at "the mechanic and hard-working youth, in their solitary struggles for the acquirement of knowledge."

Utilitarian grammars in nineteenth-century America were not much different from their European counterparts, although, apart from Lindley Murray, there was little importation from Britain into the American market: "English grammars suffered no sea change in their transatlantic migration" (Algeo 1986, p. 307). An important sea change in grammar writing, and one affecting European and American practice alike, was however the move from a *word-based* to a *clause-based* framework for description. The traditional word-and-paradigm model of grammar writing, inherited from the Latin tradition, aimed to show how words

related to other words, while the new clause-based grammars sought to show how words related to grammatical units, and the clause-based approach remains the dominant one in English grammars today, although Blevins et al. (2018) note that the word-and-paradigm approach has been "rehabilitated" in recent decades. The clause-based framework can be traced back to the German scholar, Karl Ferdinand Becker, whose analysis of syntactic relations rapidly gained influence outside Germany, thanks largely to an enthusiastic reception from language teachers. As with Murray (and indeed the Latin grammarian Donatus and others besides), it was the applicability of the system in the classroom that led to its success. Becker's *Schulgrammatik der deutschen Sprache* [School Grammar of the German Language] of 1831 appeared in England in English translation in 1855, and it was quickly adapted for the American teaching scene by Samuel Greene and others in the 1850s.

While Lindley Murray was popular in American schools, as the nineteenth century progressed that popularity diminished in direct proportion to the increase in popularity of the 1823 *The Institutes of English Grammar* by Goold Brown. Like Murray (and Becker), Brown was in no sense a professional linguist, and his primary concerns were moral rather than linguistic. He is contemptuous of other grammarians including Murray and contemptuous of innovation, whether in the language or in how it is taught and described: "the nature of the subject almost entirely precludes invention," he writes. The study of grammar for Brown is quite simply the inculcation of rules for the improvement of those who learn them. In both content and method, this is a stern product of the previous century, but editions continued to appear until 1923, carrying the principles and methods of the eighteenth century on into the twentieth century, aided and abetted by other popular schoolbooks. Brown did more than anyone, at least in America, to cement the popular association of grammar study with inviolable rules and by association with rules of propriety and morals, an association that lingers: *The Guardian* newspaper wrote in 2014 of "the trail of fear left behind by old-fashioned grammarians and their pedantic followers." The final baroque indulgences of the Goold Brown tradition are to be found in his 1851 *The Grammar of English Grammars*, over 1000 pages of lessons in correct usage and the avoidance of error. Exhaustiveness triumphed over usefulness, but Brown's approach to grammar writing should not be derided simply because it was archaic and confused description and prescription. It was what language users themselves wanted, and to this day it is parents, broadcasting agencies, and legislators and not linguists who have the greatest power and the loudest voices in dictating the direction of grammar teaching.

A major factor motivating the writing of English grammars in the nineteenth century is improved teaching methods. Becker's system grew out of his interest in the universal "logic" of grammar, but other reformed methods were more directly inspired by pedagogical needs. A direct result of the move to clause-based presentations was the introduction around 1880 of the highly popular Reed and Kellogg diagrams (see Figure 5.1), as found, for example, in *Higher lessons in English* of 1886 by Alonzo Reed and Brainerd Kellogg, horizontal branching trees showing the relationship between words in a sentence, and still used in American schoolbooks at the end of the twentieth century.

There has long been a close relationship between the study of grammar and the teaching of composition in America, much more so than in Europe, and this may go some way toward explaining the greater emphasis on the development of visual aids of this sort.

In the 1830s, Franz Ahn and Heinrich Gottfried Ollendorff presented their new "practical" means of learning foreign languages, using what came to be called the *grammar-translation* method, supposedly to enable those without formal language training to master the given language quickly. Grammars, based on repeated practice of grammatical structures (hence "practical"), using artificially constructed sentences, were immensely popular, and Ahn and Ollendorff spawned copious imitators, even for native speakers, as evidenced by R. B. Morgan's 1920 *Exercises in English Grammar for Junior Forms*. By 1920, however, the tide had

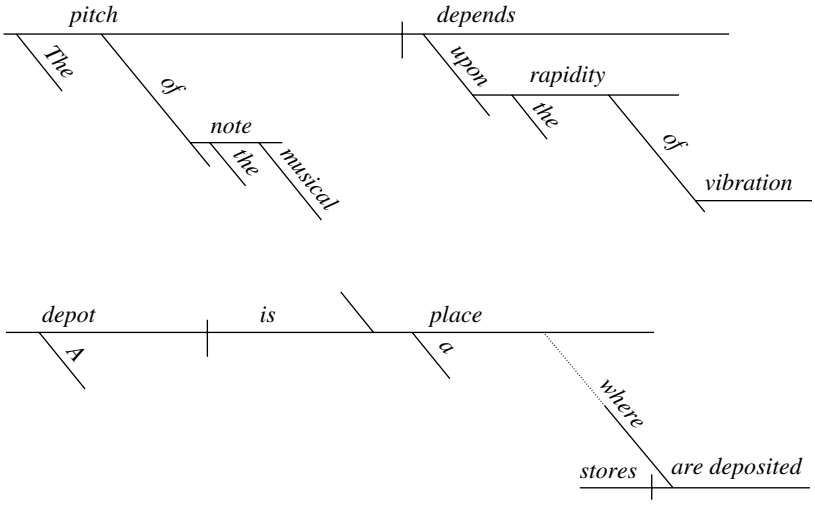

Figure 5.1 Examples of Reed and Kellogg diagrams (Reed and Kellogg 1886, p. 42, 108).

turned on this sort of grammar writing, and among those most vociferous in their attacks were Henry Sweet and Otto Jespersen, who we shall turn to next.

When we remember that the first half of the nineteenth century witnessed the appearance of nearly 900 new titles, summarizing grammar writing up to this point in so few pages can only be superficial. However, all that activity on the surface reflected a smaller number of currents underneath. These can be summarized as follows:

1. English grammatical practice to the mid-nineteenth century tended to be rather uniform, responding to local needs rather than reflecting real change in the understanding of English grammar or its teaching.
2. Advances in practice, such as the use of English as the metalanguage and an analysis of the language on its own terms, happened only gradually, and, as in the process of language change, conservative and radical practices have always existed side by side.
3. Method was not addressed to any significant extent until the nineteenth century when there was a radical shift to "practical" and clause-based presentations. (From here on method is the key focus in the development of English language teaching, leading Howatt and Smith (2014) to characterize the historiography of English language teaching as a "procession of methods.")
4. Grammar writers did not differentiate systematically between "scholarly" grammars and "teaching" grammars. Instead the form of individual grammar books tended to be dictated first and foremost by local needs.

5.3 The European Scholarly Tradition

The label *Great Tradition* was coined by the Dutch linguist, Flor Aarts, and it corresponds to what Gleason, surveying the scene from the other side of the Atlantic, called "the European scholarly tradition."

The study of modern languages was professionalized in the course of the nineteenth century. Modern languages entered both school and university curricula, and this called for proper studies of those languages, based on sound scientific principles, undertaken by

scholars with sound scientific credentials. English was studied by the early linguists of the historical-comparative school, but naturally this tended to be as part of a more general historical and comparative enterprise. The first of the "mighty monosyllables" of this school (the others being Grimm and Bopp), Rasmus Rask, wrote a grammar of English (the *Engelsk Formlære* of 1832), which had some pedagogical intent, but was really part of Rask's life's work to compare the structure of as many languages as possible. Jacob Grimm included Modern English in his *Deutsche Grammatik* [German Grammar] (1822–1837), which, despite the name, is a vast treasure trove of forms from the Germanic languages, ancient and modern. None of this, although indicating that English grammar was taken seriously by the first generation of full-time linguists, contributed much to English grammaticography.

As the century progressed, attention turned more systematically within linguistics to the spoken language, underpinned by the development of phonetic science and supported by the appearance of new specialist journals (see Linn 2018). By the final decades of the century there was an international community of English scholars, working together to advance an understanding of the language's structure very rapidly, and there were now large numbers of university students, the majority training to be teachers of English, calling on the fruits of their investigations. The institutional and intellectual framework was at last in place for the production of large-scale English grammars at the confluence of the well-established historical work from earlier in the century and the "new philology" of the final decades.

The first out was Henry Sweet with *A New English Grammar: Logical and Historical*, which appeared in two parts, the first of 1892 embracing "introduction, phonology, and accidence," and the second of 1898 covering syntax. The similarity between its title and that of the great contemporary dictionary, *A New English Dictionary on Historical Principles* (later known as the Oxford English Dictionary, or OED), is noteworthy. Sweet was for many years President of the Philological Society, whose brainchild the dictionary was.

Sweet opens the first volume by explaining his motivations:

> This work is intended to supply the want of a scientific English grammar, founded on an independent critical survey of the latest results of linguistic investigation as far as they bear, directly or indirectly, on the English language.

As with Fries, it is getting English grammar writing au courant with contemporary linguistic theory and practice that is Sweet's principal motivating factor. A secondary factor is weaknesses in existing grammar books, specifically Maetzner's *Englische Grammatik* of 1860–1865, which appeared in English translation as *An English Grammar: Methodical, Analytical, and Historical* in 1874, and motivated Sweet's title. There are those who regard Eduard Adolf Maetzner as the pioneer of the *Great Tradition*. His English grammar was certainly comprehensive, covering over 1700 pages, but it was concerned above all with the history of the language and comparison with related languages. It was archaic in other ways too, dealing with pronunciation in terms of letters rather than sounds and treating the syntax in notional rather than formal terms. Maetzner had an impact, however, and the fact that Sweet is using his work as a starting point three decades later does indicate that his work was not forgotten. The great strength of Sweet's grammar is that it presented the state of the art. The heart of the matter is contemporary spoken English, but sections on the history of language and on the history of English are to be found alongside articulatory phonetics.

Another successful British grammar of the period was Nesfield's *English Grammar, Past and Present*. Its success was due in large part to the range of students it aimed to appeal to. John Collinson Nesfield had worked for many years in India, and his grammar was written first for the Indian market. He notes that "for England no less than for India it is best to assume that the average student does not know very much to start with." He also takes into account the requirements of public exams in Britain and includes the questions on the

history of the language from the London Matriculation Papers. Furthermore, he hopes that "this book may be of some use at ladies' colleges and any other institutions where Historical as well as Modern English is made an object of study." If a distinction is maintained between "scholarly" and "teaching" grammars, Sweet is very much on the former side and Nesfield the latter, but in terms of approach they were both typical grammar writers, tempering received methods and analyses with cautious innovation. H. E. Palmer's *A Grammar of Spoken English* of 1924 was firmly in the phonetic tradition of Sweet but went a stage further than Sweet in being dedicated entirely to the spoken language and so includes, for example, a full account of intonation patterns in English, and it went further than Nesfield in being dedicated entirely to the teaching and study of English as a foreign language. It has been argued that Palmer's grammar (while relatively brief) forms part of the *Great Tradition*. I would not disagree, but the point does show how difficult it is to pigeonhole English grammar writing into neat, clearly quantifiable independent traditions.

The next two generations of authors of comprehensive English grammars were not native speakers. The Danish scholar Otto Jespersen visited Sweet in England and shared Sweet's commitment to the study and teaching of the spoken language. Both Sweet and Jespersen wrote a number of shorter grammars in addition to their major English grammars, and Jespersen's first foray into the field was while still an undergraduate. His major work was the seven-volume *A Modern English Grammar on Historical Principles*, whose title immediately reveals the lineage from Sweet, and in the preface to Volume 2 Jespersen states that his "debt to the great New English Dictionary is conspicuous on many pages." Like Sweet's grammar its organizing principles are nonstandard. From *Sounds and Spellings*, Jespersen, for personal reasons, moves on to syntax in Volumes 2 through 5. By the time the morphology volume came to be written, Jespersen was an elderly man and the volume was completed with the help of three research assistants. Volume 7 (back to syntax) was completed and published posthumously. In the preface to Volume 1, Jespersen explains his motivation in this grammar:

> It has been my endeavour in this work to represent English grammar not as a set of stiff dogmatic precepts, according to which some things are correct and others absolutely wrong, but as something living and developing under continual fluctuations and undulations, something that is founded on the past and prepares the way for the future, something that is not always consistent or perfect, but progressing and perfectible—in one word, human.

The "living language" was a key trope for Jespersen and European English scholars of his generation, building on the approach of Sweet. Randolph Quirk in 1989 described Jespersen's *Modern English Grammar* as "a continual source of inspiration and value" (Juul and Nielsen 1989, p. viii), and Chomsky talks very positively of the value of Jespersen's work, noting how he and his circle "rediscovered" Jespersen around 1960 after Jespersen had been out of fashion for a decade and a half (from Bas Aarts's interview with Chomsky at MIT, February 9, 1996). Jespersen is one of the few European grammarians to have been treated as authoritative in the United States as well as Europe. In 1933, the same year as Bloomfield's *Language*, Jespersen published a single-volume work, *Essentials of English Grammar*, in which he set out his principal ideas about grammar, the most innovative being the grammatical categories of *rank*, *junction*, and *nexus*. This way of analyzing the components of the sentence explicitly avoids reference to the word classes involved, instead seeing the relations in terms of (usually three) ranks which can combine to form nexuses (clauses).

The writing of comprehensive English grammars now passed to the Netherlands. Later Dutch scholars have been justifiably proud of this tradition, and the work of the three grammarians in question—Hendrik Poutsma, Etsko Kruisinga, and Reinard Zandvoort—has been well documented (see especially F. Aarts 1986; see also Stuurman 1993, for biographical treatments of Dutch scholars of English). English grammar has been an object of study in the

Netherlands since the annus mirabilis of 1586, when a work entitled *The Coniugations in Englische and Netherdutche* was published at Leiden, so there was a long tradition to build upon.

The first Dutch grammar in the *Great Tradition* was Poutsma's *A Grammar of Late Modern English* (1904–1929). Its subtitle reads "for the use of continental, especially Dutch, students," and this, as well as its object of study, sets it apart from Sweet and Jespersen. Poutsma's grammar does not have an explicitly historical dimension, and so looks forward to later twentieth-century grammar writing, but it is based on the language of literature and is in this way archaic vis-à-vis Sweet's emphasis on the "living language." *A Grammar of Late Modern English* is reminiscent of the *Englische Philologie* (2nd edition 1892/1896) by Johan Storm in thoroughly blurring the boundaries between *scholarly* and *teaching* grammars, and indeed Poutsma acknowledges his debt to Storm. In their size and detail, Poutsma and Storm are clearly *scholarly*, but they are written for the teaching of (advanced-level) students of English as a foreign language. This shows why English grammaticography is best treated as a continuum of practice, where motivating factors are simply combined and prioritized according to context.

Untraditionally, although following the lead of earlier Dutch grammarians of English, Poutsma begins with the sentence and its elements before proceeding to the parts of speech, and the two volumes on the sentence later appeared in revised editions, taking into account more recent scholarship. Reading these volumes, one senses that Poutsma suffered for his art. He complains often of the difficulty of the labor, the unsatisfactory nature of its fruits, and at the end of it all of the relief "now that it has been completed, and the strain of many a long year of strenuous work has been removed." He is not the only grammarian of English to complain of the punishing nature of the work. It is unusual now to find single-authored grammars of English, and modern readers cannot fail to be impressed by the years of patient work, of unceasing observation and analysis that went into these monumental English grammars. But all those years of labor meant that Poutsma's grammar was in the end too indigestible for student use.

Although still a formidable "scientific description of the structure of present [sic] English," Etsko Kruisinga's *Handbook of Present-Day English* was much more what its name suggested. We earlier characterized the tradition of grammar writing as advancing by steps forward and steps back. Kruisinga represents a step forward from Poutsma in his opening volume on *English sounds*, which (in the tradition of Storm, Sweet, and Jespersen) includes a full exposition of general phonetics, including anatomical and acoustic diagrams. It is also quite free of any historical dimension. As Kruisinga tells us in the 1914 preface to the 2nd edition:

> Bits of historical grammar interspersed in a book describing a particular stage, and especially the living stage, are not the proper introduction to a genuine historical study, nor do they help to understand the living language better.

The journey from historical to contemporary grammar writing is now complete, but, given the nature of progress in grammar writing, others were still making this journey (for example, an *English Historical Grammar* by M. K. Minkov was published in Sofia in 1955). However, with its traditional sounds → parts of speech → a final rather short section on sentence structure, Kruisinga's work looks more early-nineteenth century in its plan than Poutsma's. It should be said by way of mitigation that the 1941 abridgement, *An English Grammar*, written in conjunction with P. A. Erades, dealt with the elements of the sentence first.

The third in this Dutch triumvirate is R. W. Zandvoort. His *A Handbook of English Grammar* shows that it is not length or detail that qualifies grammars for nomination to the *Great Tradition*. This really is a handbook in a way that Kruisinga's just was not. Grammarians learn from their predecessors. Storm, Jespersen, and Poutsma had been treasure troves of information, unwieldy and hard to use. Zandvoort's *Handbook*, with the benefit of the long

view, is a single-volume compendium of the tradition and, as Zandvoort puts it himself, a "point of departure" into that tradition. It is not a strikingly original work, but none of the great landmark grammars of any language have been. They have been compendia. Zandvoort summarizes what had gone before in a clear and student-friendly way. It was last published in 1981 in its 15th edition, enjoying worldwide popularity in a crowded market, and by 1981 several new approaches to grammaticography had come along. F. Aarts (1986, p. 375) is right in his summary:

> If Sweet's *A New English Grammar* marks the transition from the nineteenth century school grammars to the scholarly grammars of the twentieth century, Zandvoort's *Handbook* may be said to represent the end-point of the scholarly grammatical tradition of the first half of the twentieth century.

5.4 The United States

Before moving on to English grammars of the most recent decades, we must stop to consider what had been going on in the United States. All the grammars we reviewed in the last section grew out of a specifically *European* way of doing language study, historical and then phonetic, data-oriented rather than theory-oriented, although some advanced-level American grammars did feel their influence (M. M. Bryant's 1945 *A Functional English Grammar*, for example, was heavily influenced by Jespersen). While Gleason calls the tradition the "European scholarly tradition," there was one American grammar, which was firmly in it, *A Grammar of the English Language: In Three Volumes* by George O. Curme. In the event there were only two volumes, *Syntax* (volume 3) in 1931 and *Parts of Speech and Accidence* (volume 2) in 1935. Volume 1, which was to cover *History of the English Language, Sounds and Spellings, Word-Formation* and to be written by Hans Kurath, did not appear. In the manner we have become used to, there is a mixture of the old-fashioned and the pioneering here. Curme's data are primarily literary, and like other linguists of the late-nineteenth and early-twentieth centuries he treats all post-sixteenth-century literature as part of the living tradition of the language. His indebtedness to the European grammarians and to the OED is explicit and evident throughout, not least in the rich mine of data. This is truly a *Great Tradition* grammar for America, embracing American as well as British literary language, and, in a way that is still quite novel in the early 1930s, "considerable attention has been given also to colloquial speech, which in its place is as good English as the literary language is in its place" (p. viii). Curme was aware that the scholarly market and the college market did not have the same demands, so he, like his European colleagues, and indeed like the major commercial grammar industries of the twenty-first century, produced a range of briefer presentations of English grammar along the same lines (e.g., *English Grammar*, 1947).

We have already mentioned C. C. Fries and his radical move to use a proper corpus. Algeo (1991, p. 126) describes Fries as "the greatest American English grammarian of the twentieth century," and, if we gauge greatness by indications of influence, so he was. Curme's grammar, although much more substantial than any of Fries's studies, belonged to a previous generation. Fries was firmly structuralist, born the same year as Bloomfield, and he was not the only English grammarian working within this framework. Major contributions to English grammaticography from the post-Bloomfieldian era include the 1951 *An Outline of English Structure* by George L. Trager and Henry Lee Smith, Jr. This is typical of the earlier post-Bloomfieldians in being predominantly dedicated to phonology with only a few tentative pages on syntax. It is also noteworthy that, while the Europeans heaped praise and gratitude on their predecessors, here a clean break with the past is intended: "no discussion is given of previous work or of differing analyses and conclusions" (p. 7). Toward the end of the 1950s,

other books appeared with the same aim of breaking with what their authors regarded as an unscientific past and of putting the study and teaching of English grammar on a new, sound (post-Bloomfieldian) footing, but now properly structuralist, showing the architecture of interrelated structures *from sound to sentence in English*, in the words of the subtitle of Archibald Hill's *Introduction to Linguistic Structures* from 1958. A particularly good example of American grammars of English from this period, destroying its past, explicitly borrowing the title of Robert Lowth's prescriptive grammar of 1762 (see Tieken-Boon van Ostade 2010) as it seeks to move on from the tradition of English grammar teaching spawned by Lowth, is James Sledd's 1959 *A Short Introduction to English Grammar*. Sledd's comprehensive litany of acknowledgments to other linguists is very striking: not one of them is based outside the United States and not one predates Bloomfield. Syntax did get a proper treatment in 1960 with Eugene A. Nida's *A Synopsis of English Syntax*, using immediate constituent analysis, but this was a reprint of Nida's 1943 University of Michigan doctoral dissertation (Nida 2013), and, while the focus within American linguistics was now turning from phonology to syntax, the dominant analytical framework had also moved on.

With the move in the 1960s from a descriptive, data-oriented bias in the study of English grammar to a theory-oriented bias, there was no longer an appetite for traditional grammar writing. There was too much of a whiff of mothballs about it. It is not altogether clear why a theory-driven linguistics should have been incompatible with grammar writing of the sort we have been discussing. However, grammar writing had been descriptive and pedagogically oriented for too long, and grammar writing is, as we know, a conservative craft, so maybe the fortress was just too solid for post-Chomskyan linguistics to storm. In any case, while the period up to the 1970s was dramatic for general linguistics, the *Great Tradition* of English grammar foundered until 1972 and the publication of *A Grammar of Contemporary English* (Quirk et al. 1972). The transformational-generative school and its offshoots have preferred to address specific aspects of English grammar, and indeed *grammar* has come to mean something else in this tradition. When Paul Roberts wrote in his grammar book of 1962 that "grammar is something that produces sentences of a language," he meant something very different to Curme only 15 years earlier. Even works with quite traditional-sounding titles, such as *English Transformational Grammar* (Jacobs and Rosenbaum 1968) or *Introductory Transformational Grammar of English* (Lester 1971), are very limited in their scope compared with Hill or Sledd, never mind Sweet or Jespersen. R. B. Long's 1961 *The Sentence and Its Parts: A Grammar of Contemporary English* is something of an isolated beacon. Norman C. Stageberg's 1965 *An Introductory English Grammar* is interesting in this respect. It is essentially a classic structuralist account of the shape of the English language and an overtly pedagogical one at that, including exercises. However, it has a very brief appendix by Ralph Goodman entitled *Transformational Grammar*, "presented primarily as a pedagogical not a theoretical work." It proved to be a step too far. There have of course been "scholarly" English grammars since then with other primary theoretical motivations (J. Muir's 1972 *A Modern Approach to English Grammar: An Introduction to Systemic Grammar*, and R. M. W. Dixon's 1991 *A New Approach to English Grammar, on Semantic Principles*, to name but two at random), and their scope has perforce been similarly limited. When the exercise of a theoretical model dominates all other factors in a would-be grammar book, a traditional English grammar is not, it seems, possible (see, however, the papers in Graustein and Leitner 1989, for an attempt at greater integration).

5.5 Into the New Millennium

Those mourning the passing of the *Great Tradition* felt it had risen again in 1972 with the publication of *A Grammar of Contemporary English* (GCE). In common with its predecessors in this tradition it is substantial, only one volume, but at 1120 pages this is not something for a

student to put in their pocket. As with its predecessors, the goal of comprehensiveness is the highest-ranked factor in its production, and it was certainly the most thorough account of the structuring principles of English to date, since, unlike its predecessors and for obvious historical reasons, it sought to account for the structure of English worldwide: "our field is no less than the grammar of educated English current in the second half of the twentieth century in the world's major English-speaking communities" (p. v). It is also unlike, for example, Sweet and Jespersen in that it is limited to the traditional heart of grammar: syntax and inflectional morphology. The margins of the language have been rubbed away with the passing of the twentieth century. Derivational morphology and suprasegmental phonology are relegated to appendices and, in this respect, GCE is less comprehensive than some of its predecessors.

Bearing in mind that it was published in 1972, it is remarkably theoretically eclectic and neutral. American theoretical linguistics of the day was temperamentally unsuited to the production of a full-scale grammar. What was needed was the heavily diluted theoretical mix of four Europeans, just one of them working in the United States. Gone are the days of the single-authored grand grammar book (much as Samuel Johnson's 1755 *A Dictionary of the English Language* was superseded by the multivolume collaborative *New English Dictionary* (the OED)), and gone is the possibility of one person reading himself or herself to an exhaustive knowledge of the English language or a variety of it. Most striking of all the superlative things about GCE is that it is the first European example of the genre to be produced by (mostly) native speakers since Sweet's *A New English Grammar* in the previous century.

GCE would prove to be a productive patriarch over the following decades. The first two offspring recognized the fact that different types of reader required different approaches. Sidney Greenbaum explained that GCE and its 1985 successor (see below) were:

> addressed not only to scholars in English linguistics and theoretical linguistics, but also to those from other disciplines who wish to refer to points in English grammar, for example literary critics or researchers in informational [sic] technology. We also wanted to make it accessible to nonspecialist readers. (Greenbaum 1986, p. 8)

Reviewers were more skeptical, wondering whether they might in fact only appeal to other grammarians of English (see Svartvik 1986). (The *Collins Cobuild English Grammar* (first edition 1990) is also rare in making the bold claim that it is "for anyone who is interested in the English language and how it works.") In 1975, Leech and Svartvik oversaw *A Communicative Grammar of English*, geared toward learners of English as a foreign language, which focused on function rather than form, and this entered a revised third edition in 2013. Two years earlier in 1973 Quirk and Greenbaum produced a version intended more for university-level students, which took the same form as the parent volume but in less detail. The intended readers in these two versions were higher ranked as factors in their production than was comprehensiveness. The parent volume entered a second edition in 1985, but to indicate the extent of its revision (now standing at 1779 pages) and the greater ambition of the project (F. Aarts (1986) explicitly viewed it as a continuation of the Great Tradition), it now bore a new title, *A Comprehensive Grammar of the English Language* (CGEL). This has also spawned little versions of itself, notably the 1990 *A Student's Grammar of the English Language* by Greenbaum and Quirk. Leech (with Margaret Deuchar and Robert Hoogenraad) has also addressed the needs of native speakers at a lower level in the educational system with the *English Grammar for Today* (1982; 2nd edition 2005), and this remains popular with native-speaker students of the English language.

CGEL is still widely accepted as a leading authority on English grammar. But grammar writing has not stood still in its wake. Two large-scale multi-authored grammars of English have appeared since then, namely the *Longman Grammar of Spoken and Written English* (1999) and the *Cambridge Grammar of the English Language* (2002).

The Cambridge grammar trumps even CGEL in exhaustiveness, standing at 1842 pages in the published version. Such exhaustiveness is seen as a potential practical disadvantage by one reviewer, who asks, as Svartvik had done, "I wonder who will benefit from this grammar" (de Haan 2005, p. 341). This potential crisis of audience has led, as in the case of the grammars discussed earlier, to a number of alternative versions, packaged for different markets, for example, Huddleston and Pullum's 2005 *A Student's Introduction to English Grammar*, "intended for students in colleges or universities who have little or no previous background in grammar, and presupposes no linguistics." The Longman grammar is not quite such a vast tome, but the authors point out at the outset that it has been a very substantial undertaking: "The research-based work required for this project has been on a scale probably unmatched in the writing of any previous grammar of the English language" (Biber et al. 1999, p. vii). This rhetoric resonates with the prefaces of English grammars down the ages, positioning the new work advantageously with respect to the shortcomings of previous such publications. What is new with these twenty-first-century grammars is the by now expected practice of basing the grammatical insights on data derived from a large corpus of what those nineteenth-century predecessors would have called "the living language." The 2006 *Cambridge Grammar of English* (Carter and McCarthy 2006), based on the Cambridge International Corpus, states on the cover that it is "the ultimate guide to English as it is really used," and the most recent edition of the Cobuild grammar (Cobuild 2017), based on the Collins corpus and now available digitally, describes itself as "the source of authentic English."

A glance along the shelves of a well-stocked library or a flick through the catalog of one of the major academic publishers reveals a mind-boggling amount of activity, largely because of the call worldwide for resources to teach and study English as a foreign language/as a second language/for special purposes. Many such grammars are written, as throughout our history, in response to local needs, or in response to the needs of particular English-language examinations, and the major international grammars are often reissued for local markets. The highly successful *English Grammar in Use* volumes by Raymond Murphy (Cambridge University Press) are available in a range of languages across the world, and under different titles for the North American market. They also come in a range of formats, as ebooks and online or via an app; in the previous version of this chapter it was cassettes and CD-ROMs which put this series in the technological vanguard! The move toward enhanced *flexibility* in grammar books for learners of English is also evidenced by the provision for different levels of student, for example, the Pearson *New Round Up* series for young learners. Oxford University Press series (such as *Grammar Sense*) have responded to this need particularly effectively, and their encyclopedia of problematic constructions and usages (*Practical English Usage* by Michael Swan) seems to have struck a particular chord with learners. Grammars for the teaching of English as a foreign language tend to take a *contextual* approach: grammar is taught and practiced via communicational contexts, as in, to take only one of countless examples, *Exploring Grammar in Context* by Carter et al. (2000). The 2011 edition of the Collins Cobuild grammar included new sections on the grammar of academic and business English.

Communication is now firmly at the heart of English grammars for non-native and native speakers alike at all levels, uniting the earlier "teaching" and "reference" grammar traditions. This way of dealing with grammar has filtered down from Leech and Svartvik (1975), and ultimately from the systemic-functional approach to grammar associated with Michael Halliday and his collaborators. Bent Preisler's *A Handbook of English Grammar on Functional Principles*, Talmy Givón's *English Grammar: A Function-Based Introduction*, *A University Course in English Grammar* by Angela Downing and Philip Locke, all from 1992, and Graham Lock's *Functional English Grammar* of 1996 are explicitly in this tradition. They are all of different national origins, but exemplify the fact that, insofar as any theory has penetrated English grammars, it is very definitely that of communicative functions derived from Halliday (although not all these grammarians would necessarily see themselves as Hallidayan in outlook).

Surveying the contemporary scene in a wide-ranging article like this is never going to be anything more than sketchy, and at worst it will just degenerate into a list. There are some clear tendencies in English grammar writing today, and, as we said of the nineteenth century, all that activity on the surface reflects a smaller number of currents underneath. We have left out a huge amount of surface activity, and by concentrating on Europe and North America, we have omitted, for example, the theoretically eclectic approach of grammarians working in Australia and writing for native-speaker students, notably Rodney Huddleston (in various grammars), succeeded by Peter Collins and Carmella Hollo in their 2000 *English Grammar: An Introduction*. Not to mention the brief 1968 *English Grammar* of F. S. Scott, C. C. Bowley, C. S. Brockett, J. G. Brown, and P. R. Goddard, written initially for use in New Zealand.

There is one generalization that we can make with absolute confidence. After half a millennium, and despite the decline in the formal study of English grammar in British and American schools, the writing of English grammars has never been more vigorous than it is now. English linguistics is barely 150 years old, and much of its theory and practice disappears overnight, touching very few. Grammar writing by contrast is an activity which touches countless numbers from professors to language learners the world over.[1]

NOTE

1 I am grateful for the practical insights offered by Dr. Gibson Ferguson and by English teachers at the Westminster International University in Tashkent.

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BIOGRAPHICAL DATES

Franz Ahn (1796–1865)
Karl Ferdinand Becker (1775–1849)
Charles Julius Bertram (1723–1765)
John Brightland (d. 1717)
Goold Brown (1791–1857)
Margaret M. Bryant (1900–1993)
William Bullokar (c. 1531–1609)
Christopher Cooper (c. 1646–1698)
George Oliver Curme (1860–1948)
Charles Carpenter Fries (1887–1967)
Ælius Donatus (C4 CE)
Pieter A. Erades (1898–1968)
Charles Gildon (1665–1724)
Henry Allen Gleason Jr (1917–2007)
Samuel Greene (1810–1883)
James Greenwood (1657–1737)
Jacob Grimm (1785–1863)
Archibald Anderson Hill (1902–1992)
Otto Jespersen (1860–1943)
Brainerd Kellogg (1834–1920)
Etsko Kruisinga (1875–1944)
Hans Kurath (1891–1992)
William Lily (1468?–1522)
Robert Lowth (1710–1787)
Eduard Adolf Maetzner (1805–1892)
Marko Konstantinov Minkov (1909–1987)
Robert Burns Morgan (fl. 1920)
Lindley Murray (1745–1826)
John Collinson Nesfield (1836–1919)
Eugene A. Nida (1914–2011)
Heinrich Gottfried Ollendorff (1803–1865)
Harold Edward Palmer (1877–1949)
Hendrik Poutsma (1856–1937)
Rasmus Rask (1787–1832)
Alonzo Reed (d. 1899)
Paul Roberts (1917–1967)
Edward Shelley (fl. 1848)
James Sledd (1914-c. 2003)
Henry Lee Smith, Jr. (1913–1972)
Johan Storm (1836–1920)
Henry Sweet (1845–1912)
George Leonard Trager (1906–1992)
John Wallis (1616–1703)
Reinard Willem Zandvoort (1894–1990)

6 Data Collection

CHARLES F. MEYER AND GERALD NELSON

6.1 Introduction

Data collection has been a neglected methodological concern within linguistics. This situation has arisen, Schütze (2016) argues, because many linguists have not taken data collection seriously. Generative linguists have relied almost exclusively on "introspection" for data—a process whereby the linguist uses his or her intuitions to invent examples and make grammaticality judgments.[1] This methodology has resulted in what Schütze (2016, p. xvii) characterizes as "grammars of intuition" that have little bearing on "everyday production or comprehension of language." Other linguists have turned to experimentation to obtain data, but these linguists, Schütze (2016, p. xvii) notes, often fail to employ "standard experimental controls," leading to questionable analyses because the data being used have been tainted by the "pseudoexperimental procedure" used to collect it.

If data collection is viewed as a methodological issue, it becomes incumbent upon the linguist to understand not just *how* data are collected but *why* certain ways of collecting data are better suited to some analyses than others. Chafe (1992, pp. 82–89) provides a useful overview of the types of data that exist and the ways that data can be collected. He observes that data can be "artificial" or "natural" and collected through processes that are either "behavioral" or "introspective" (1992, p. 84). Data collected by experimentation are artificial because any experimental situation (e.g., asking individuals to rate a series of sentences as acceptable or unacceptable) is divorced from the natural contexts in which language is used. By contrast, data obtained from an actual corpus of language (e.g., a transcribed collection of spontaneous conversations) are natural because a corpus contains instances of real language usage. Both types of data collection are behavioral because when conducting an experiment or examining a corpus, linguists are observing how language is used. But when linguists use their intuitions as a source of data, they are creating the data themselves and thus collecting it through a process that is introspective.

Each of these methods of data collection has individual strengths and weaknesses, making one method better for a particular analysis than another. For instance, in investigating the structure of newspaper editorials, it makes little sense to gather data through introspection, since one analyst's perceptions of the structure of editorials might be quite different from another analyst's perceptions, and there is really no way to prove which analyst is correct. In a case like this, it would be much more desirable to collect samples of actual newspaper editorials and analyze the types of linguistic structures that they contain. Such an

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analysis would be based on a real dataset of newspaper editorials and could be confirmed or disconfirmed by any other analyst examining the same dataset.

But while a corpus might be the most appropriate source of data for a study of newspaper editorials, for other kinds of analyses, a corpus will not produce the necessary linguistic information. As Chomsky (1962a) has observed, whatever one finds in a corpus is restricted to what is in the corpus and is not representative of the entire potential of a given language. A corpus contains a record of structures that speakers or writers actually use; it does not contain all the structures that they might potentially use. For instance, coordinate constructions containing "gapped" constituents have been the subject of much linguistic inquiry. A gapped construction contains missing constituents in the second clause, such as the verb *ordered* in example (1) below:

(1) I ordered fish and my son [ ] a hamburger.

Johnson (2000) notes that objects as well as verbs can be gapped (example 2), and, following McCawley (1993), observes that on some occasions not just the verb is gapped but the determiner preceding the subject noun phrase in the second clause (example 3):

(2) Some consider him honest and others ~~consider him~~ pleasant. (Johnson 2000, p. 95)
(3) Too many Irish setters are named Kelly and ~~too many~~ German shepherds ~~are named~~ Fritz. (Johnson 2000, p. 104)

However, in a 1-million-word corpus of speech and writing, Meyer and Tao (2004) found ten examples such as (2), but no examples such as (3). Instead, gapping in the corpus of Meyer and Tao was restricted most frequently to either an auxiliary verb (example 4) or copular *be* (example 5):

(4) I was mowing the lawn and my son [ ] trimming the hedges.
(5) The pianist was quite good and the oboe player [ ] somewhat average.

Had studies of gapping been restricted to examples occurring only in corpora, linguists would never have been able to uncover the entire range of constructions to which this process applies. Consequently, in a case such as this, introspection is crucial to isolating all potential constructions subject to the particular linguistic process being investigated.

The examples above provide a brief introduction to the types of data that can be used in linguistic analyses, and the methodological issues that the use of particular datasets raise. In the remainder of this chapter, we wish to explore these issues in greater detail, focusing our discussion on data obtained through introspection, experimentation, and the collection of spoken and written texts.

6.2 Introspection

Even though introspection has been the dominant way of collecting data within generative linguistics since the 1950s, within linguistics in general, it is a relatively new methodology. Most linguistic analyses prior to this period were based on naturally occurring data. For instance, Fillmore (1992, pp. 36–38) describes his experiences in 1957 deciding what kind of dissertation he would write. He could have taken the traditional route. This would have required him to spend over a year recording and transcribing a corpus of speech, and once this was done devoting additional time doing a detailed phonetic/phonemic analysis of the data, an endeavor that would have resulted in "some practical guidelines on how large a corpus

of spoken language needs to be for it to be considered an adequate reservoir of the phonological phenomena of the language" (Fillmore 1992, p. 36).

But Fillmore (1992) rejected this kind of analysis because during the period in question the "empiricism" of the American structuralist model of language was losing favor to the more "mentalist" views of the generative model. For Chomsky, language was a product of the mind. As a consequence, it was no longer necessary—indeed it was wrong-headed—to follow "a set of analytic procedures for the discovery of linguistic elements such as phonemes or morphemes" that ultimately produce little more than "the inventory of these elements" (Chomsky 1962b, pp. 537–538). Such a "discovery procedure," Chomsky argued, resulted in only a "performance grammar," a listing of what speakers of a language actually produce. And this list would have included utterances containing mistakes, hesitations, and stammers: "performance errors" that reveal little about the native speaker's knowledge of his or her language. Of greater importance, Chomsky claimed, is the creation of a "competence grammar," a grammar reflecting "the fluent native speaker's knowledge of the language" (Radford 1988, p. 3). And obtaining data for writing a competence grammar required the linguist to rely only on his or her intuitions about language.[2]

Within generative grammar, introspection produced two types of data. Many linguistic analyses consisted of sentences created by the analyst to support the particular linguistic argument being advanced. For instance, Lobeck (1999, pp. 100–105) uses introspective data to discuss similarities and differences between VP-ellipsis, gapping, and pseudo-gapping. She notes that each of these types of ellipsis involves the deletion of some kind of constituent: a lexical verb and (if present) its complements. Thus, in (6a), an instance of VP-ellipsis, the entire predication in the second clause (*wants to buy a skateboard*) is ellipted; in (6b), a verb (*wants*) and its complement (*to buy*) are gapped in the second clause; and in (6c), even though it would be possible to gap both the auxiliary and lexical verbs (*will buy*), only the lexical verb (*buy*) is ellipted, producing an instance of pseudo-gapping:

(6) a. Mary wants to buy a skateboard and Sam does [*e*] too.
b. Mary wants to buy a skateboard and Sam [*e*] a bicycle.
c. Mary will buy a skateboard and Sam will [*e*] a bicycle.
(Lobeck 1999, p. 101)

In addition to inventing sentences to develop her argument, Lobeck also uses her intuitions to make grammaticality judgments so as to develop a linguistic argument by introducing data that are grammatical and ungrammatical. She notes, for instance, that while all three types of ellipsis can occur in coordinated clauses, only verb-phrase (VP) ellipsis can be found in subordinate clauses. To support this generalization, she includes each ellipsis-type in a subordinate clause following the verb *think*. According to Lobeck's (1999) intuitions, the example containing VP-ellipsis (7a) is clearly grammatical, while the examples illustrating gapping (7b) and pseudo-gapping (7c) are quite ungrammatical:

(7) a. Mary bought a skateboard and she thinks that Sam should [*e*] too.
b. *Mary bought a skateboard and she thinks that Sam [*e*] a bicycle.
c. *Mary will buy a skateboard and she thinks that Sam should [*e*] a bicycle.
(Lobeck 1999, p. 101)

Thus, we see that Lobeck (1999, p. 99) uses introspective data not just to describe the differences between the three types of construction but to make a larger theoretical point: that while gapping and pseudo-gapping are true instances of ellipsis (termed "PF deletion" in Minimalist Theory, i.e. phonological form deletion, a type of deletion based on sound as well

as form), VP-ellipsis is more like pronominalization. The missing verb and complement in a sentence such as (7a) are better analyzed as a single empty pronominal.

The reliance in generative grammar on introspective data reflects not just an anti-empiricist bias but the greater emphasis in this theory on "explanatory adequacy" rather than "observational" or "descriptive" adequacy. Many linguists would be content to simply observe that a sentence such as (7b) is ungrammatical or describe the constraints that make (7a) grammatical and (7b) and (7c) ungrammatical. But Chomsky has always argued that "the goals of linguistic theory can be set much higher than this" (Chomsky 1966, p. 20); that is, that a linguistic description should do more than simply describe a language such as English. Thus, in her analysis, Lobeck (1999) uses the introspective data from English that she cites to demonstrate how it shed light on well-established linguistic categories in Minimalist Theory (e.g., PF deletion or empty pronominals). These categories go beyond English and describe processes common in all languages.

The priority attached in generative grammar to explanatory adequacy has minimized the need for developing a more rigorous methodology for collecting data. As Chomsky (1965, p. 20) has noted, "…sharpening of the data by more objective tests is a matter of small importance for the problems at hand." If linguists are engaged in the development of competence grammars, they need only use their intuitions to gain access to linguistic competence and reach judgments about the grammaticality of the data they use to develop their theories. Many, however, have questioned this assumption. Schütze (2016, pp. 19–36) surveys the work of many linguists who claim that it is impossible to gain access to the native speaker's linguistic competence, and he ultimately concludes:

> …in principle, there might someday be an operational criterion for grammaticality, but it would have to be based on direct study of the brain, not on human behavior, if it turns out to be possible to discern properties of the mind (e.g., the precise features of the grammar) from physical properties of the brain. (Schütze 2016, p. 26).

Thus, when linguists use their intuitions to produce data, they are in essence making acceptability judgments about the data, not grammaticality judgments.[3] And because acceptability is within the realm of performance, linguists who rely only their own intuitions for data often produce theories of language that are reflective of their own idiolects—their own personal views of what is acceptable or unacceptable.

Because acceptability judgments can be idiosyncratic, it is not uncommon to find linguists who will reject a linguistic analysis simply because they disagree about the acceptability of the data upon which the analysis is based. In a methodological discussion of the use of grammaticality judgments in generative analyses, Wasow (2002, p. 158) comments that he coined the terms "strong" and "weak" crossover (cf. Wasow 1972) to reflect differences he had with Postal (1971) concerning the acceptability of sentences (8b) and (9b).

(8) a. Which teachers$_i$ did Pat say thought the students disliked them$_i$?
    b. *Which teachers$_i$ did Pat say they$_i$ thought the students disliked?

(9) a. Which teachers$_i$ criticized the students who disliked them$_i$?
    b. ?Which teachers$_i$ did the students who disliked them$_i$ criticize?

"Crossover" constraints predict which NPs in *Wh*-questions can be coreferential. For Postal (1971), (8b) and (9b) are equally unacceptable and as a result are subject to a single crossover constraint. However, for Wasow (2002), (9b) is less unacceptable than (8b), a difference in acceptability that leads him to posit two types of crossover constraints. And to further

support this distinction, Wasow (2002, p. 158) notes that in his 1972 study he included "examples of weak crossover sentences taken from novels by respected writers."

Manning (2003) finds similar problems in a study of verb subcategorization that he conducted. He comments that many treatments of verb subcategorization make erroneous claims because the data introduced reflect the intuitions of the analysts, which differ significantly from the facts of language usage. For instance, Manning (2003, p. 299) notes that Pollard and Sag (1994) claim that the verb *consider* can be followed by predicative complements (example 9) but not *as*-complements (example 10):

(9) We consider Kim to be an acceptable candidate.
(10) *We consider Kim as an acceptable candidate.

However, in an analysis of texts in the *New York Times*, Manning (2003, p. 299) found many examples (such as (11)) where *consider* could take an *as*-complement.

(11) The boys consider her as family and she participates in everything we do.

Manning (2003, p. 299) comments that if counterexamples such as (11) were anomalous, then "…Pollard and Sag got that one particular fact wrong." But his analysis found many additional instances where the data of Pollard and Sag (1994) were simply wrong, casting serious doubts on the legitimacy of the theoretical points they were making.

The problems in data collection that Wasow (2002) and Manning (2003) document point to two key limitations of introspection. First, data collected introspectively are decontextualized: data exist in the linguist's mind, not in any real communicative context. However, "with richer content and context," as Manning (2003, p. 300) notes, what might sound awkward and ungrammatical out of context can become quite grammatical in context. Thus, it is not surprising that many linguistic analyses can be brought into question when the constraints that are proposed are tested in a broader linguistic context. This consideration points to a more fundamental flaw of introspection: even though, as Chomsky has argued, introspection allows the analyst to work with data that might not easily be found in corpus, at the same time, by not consulting a corpus, the analyst might never discover data that are key to the analysis being conducted. In other words, introspection blinds the analyst to the realities of language usage.

Chomskyan linguists might counter this criticism by acknowledging that this is indeed true: that the "probabilistic information drawn from corpora is of the utmost value for many aspects of linguistic inquiry" (Newmeyer 2003, p. 698). But because the study of usage patterns in corpora is more within the realm of performance than competence, information on these patterns "is all but useless for providing insights into the grammar of any individual speaker" (Newmeyer, op. cit.). However, as was noted earlier, competence is really impossible to gain direct access to: our only gateway to it is through performance. And even though Chomskyan linguists make a clear distinction between competence and performance, many linguists have argued that performance is more closely related to competence than some have claimed. Leech (1992, p. 108), for instance, argues that "the putative gulf between competence and performance has been overemphasized … since the latter is a product of the former." Others have advocated the creation of "usage-based grammars" (cf. Langacker 2000): theoretical models of languages based on actual language usage.

Introspection will always be a useful tool for linguists, but to rely solely on it for data creates, as we have noted in this section, a limited and potentially misleading dataset upon which to conduct linguistic analyses. For this reason, many linguists have turned their attention to other means of collecting and assessing data—experimentation and the creation and analysis of linguistic corpora—topics we will discuss in the next two sections.

6.3 Experimentation

To ensure that the data used in a linguistic analysis reflect more than a single analyst's intuitions about language, some linguists have designed various kinds of experiments intended to elicit grammaticality judgments from groups of speakers of English. Cowart (1997, p. 64) describes a number of different experimental designs for eliciting judgments from subjects. Experiments can be written or spoken. For instance, subjects can be given printed questionnaires in which they are asked to either judge the acceptability of sentences or perform various operations. Alternatively, experiments can be presented in spoken form. For instance, the experimenter can meet with subjects individually or in groups and present material to them orally. Such experiments can also be recorded and presented without the experimenter present.[4]

As Cowart (1997) notes, each type of experiment has advantages and disadvantages. If experimenters conduct the experiments in person, their physical presence during the experiment might prejudice the responses obtained. If the experiment is presented in written form, subjects may apply standards of formal written English in arriving at judgments, not the standards they would apply in casual spoken English. But despite the problems that written questionnaires have, because they are relatively "easy to prepare and administer" (Cowart 1997, p. 64), they have become a common way to present experimental data to subjects.

Greenbaum and Quirk (1970, p. 3) describe a number of elicitation tests that can be administered using questionnaires. Their tests fall into two main categories: "performance" tests and "judgment" tests. Performance tests require individuals to manipulate the structure of a particular sentence. For instance, if the experimenter wished to test the claim that speakers of American English prefer singular verbs with collective noun phrases, he/she could give a group of subjects the sentence "*The committee met on a regular basis*" and ask them to rewrite it, making *met* a present tense verb. This type of "selection" test, as Greenbaum and Quirk (1970, p. 4) note, requires subjects to choose "between two o(r more variant forms." In rewriting the sentence, subjects will need to select either a singular or plural verb form, since the past tense form is unmarked for number. And whichever form they choose will provide evidence of whether they prefer a singular or plural verb with collective nouns.

Judgment tests, in contrast, require subjects to express opinions about the acceptability or unacceptability of a sentence. For instance, in Figure 6.1, subjects are given the two sentences together and are asked to rate their relative acceptability by placing a checkmark in one of the boxes below each sentence.

This type of "preference" test (Greenbaum and Quirk 1970, p. 5) can provide evidence as to whether subjects prefer singular versus plural verbs with collective noun phrases, or whether they find both constructions of equal acceptability.

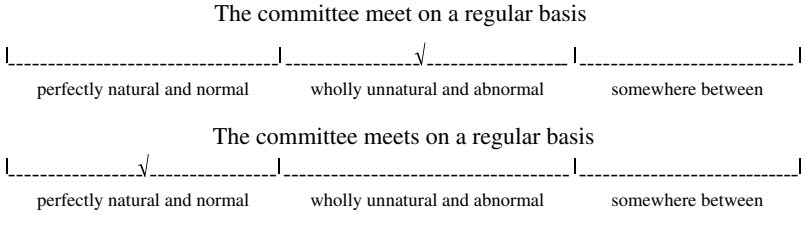

Figure 6.1 Judgment test for subject–verb agreement with collective nouns.

Each of these tests has advantages and disadvantages. By directly asking individuals whether they prefer singular or plural verbs, the linguistic issue at hand will be immediately apparent. As a consequence, many individuals might not give a natural response, but try to determine what they might have been taught in school about subject–verb agreement. In cases such as this, one can never be entirely sure whether the responses are genuine or not. On the other hand, if the individuals are asked to rewrite the sentences, the issue of using a singular or plural verb will not be directly presented to them. However, because of the open-ended nature of this type of experiment, some individuals may not give a relevant response. For instance, subjects might not follow instructions and provide additional revisions to a sentence not specified in the instructions. They could completely revise the original sentence and produce a new version (e.g., *The members of the committee meet on a regular basis*) that contains a plural verb but that, at best, provides only indirect evidence of their preference for singular verbs with plural nouns.

Schütze and Sprouse (2013, pp. 31–36) provide additional examples of different ways for structuring judgment tests. For instance, in a *yes–no task* experiment, subjects are given a sentence and asked to indicate whether it is acceptable or unacceptable (Schütze and Sprouse 2013, p. 32):

What do you wonder whether John bought? ○ Yes ○ No

By contrast, in a *Likert scale task*, subjects are asked to rank a sentence on a scale (Schütze and Sprouse 2013, p. 33):

What do you wonder whether John bought? ○ ○ ○ ○ ○ ○ ○

1 2 3 4 5 6 7

Obviously, the two types of experiments will elicit different kinds of judgments. The *yes–no task* forces subjects to make absolute judgments of the acceptability of a sentence, while the *Likert scale task* allows subjects to provide a more nuanced view of acceptability.

As experiments are constructed, there are a host of additional concerns that need to be considered, ranging from deciding exactly what population of English speakers should be tested to determining how sentences being presented in an experiment are best ordered. We describe considerations such as these below.

6.3.1 Subjects

Selecting participants for an experiment involves determining which population of speakers should participate in the experiment and from this population how many speakers are necessary to yield valid results.

In determining who the target population for an experiment should be, it is first of all important to understand that research has shown that more linguistically informed individuals have markedly different intuitions about language than less linguistically informed individuals. For instance, Snow and Meijer (1977, pp. 172–173) conducted an experiment in which they asked two groups of native speakers of Dutch to evaluate a series of sentences exhibiting variations of word order in Dutch. One group had considerable experience in linguistics; the other group did not. The biggest difference between the groups was that the linguists were not only more consistent in their judgments but "showed greater agreement with one another as well…" (Snow and Meijer 1977, p. 172). This finding led Snow and Meijer (1977, p. 176) to conjecture that in making grammaticality judgments, linguists might be failing to notice small semantic differences between sentences, or they might be producing

biased judgments by allowing "their linguistic theory [to] determine their judgments of unclear cases." Whatever the reason, Snow and Meijer (1977) argue that it is necessary to incorporate the judgments of non-linguists in any data being used for linguistic analysis (cf. Schütze 2016, pp. 114–115 for a survey of other viewpoints on this topic).

Dąbrowska (2010, p. 21) reached similar conclusions after administering a series of experiments in which she had professional linguists and linguistically naïve speakers rate the acceptability of a series of sentences. She found statistically significant differences in the acceptability judgments of the two groups, demonstrating "that linguists' judgments of the same sentences differ in systematic ways from those of native informants, even when they are asked to behave like ordinary language users."

In selecting subjects for an experiment, it is useful to draw upon research done in sociology that uses mathematical formulas to determine how many individuals from a given "sampling frame" are needed to produce a "representative" and therefore "valid" sample. The most reliable and valid way to select participants is to use a "random sample": from a given population, mathematical formulae are used to randomly select a subset of that population. However, since random samples often require very large numbers of participants, linguists have typically used less rigorous sampling procedures, such as "haphazard, convenience, or accidental sampling" (i.e., using whatever population is available for participating in an experiment) (Kalton 1983, p. 90), or "judgment, purposive, or expert choice sampling" (i.e., deciding before an experiment is given who would be the best population to participate in the experiment) (Kalton 1983, p. 91).

Although convenience and judgment sampling are less desirable than random sampling (cf. Kretzschmar and Schneider 1996, p. 33), they are often the only sampling types available, since logistical constraints will limit many individuals to administering experiments in academic contexts. However, Cowart (1997) provides evidence that it is possible to obtain valid and useful experimental results from testing students attending classes in university settings. One experiment involved testing the *that*-trace effect (Chomsky and Lasnik 1977) with differing verbs in the main clause:

(11) a. Who do you suppose invited Ann to the circus?
b. Who do you suppose Ann invited to the circus?
c. Who do you suppose that invited Ann to the circus?
d. Who do you suppose that Ann invited to the circus?
(Cowart 1997, p. 25)

As Cowart (1997, p. 18) notes, "there is a certain subject–object asymmetry" in constructions such as (11) when *that* is either present or absent. Without *that*, subject (11a) and object (11b) extraction is possible; with *that*, only object extraction (11d) is possible: subject extraction (11c) is not possible. Cowart wished to determine whether the type of verb used in the main clause affected the acceptability of sentences such as those in (11). He used four verbs: *suppose* (as in 11), *hear*, *wish*, and *feel*.

A total of 332 undergraduates at three different universities in the United States were given sets of sentences containing the four verbs listed above in the four different contexts illustrated in (11), and were asked to rate the acceptability of each sentence on a five-point scale from "fully normal, and understandable…" to "very odd, awkward, or difficult…to understand" (Cowart 1997, p. 71). The results from the three universities were very systematic, with each group of students rating the sentences with subjects extracted without *that* (11c) much lower in acceptability than the other three sentences (Cowart 1997, p. 27).

Even though Cowart (1997) found very similar responses across different groups of speakers, as Schütze (2016, p. 77–81) notes, there will always be intersubject and

intrasubject variations in the responses that people give to very similar sentences. Groups of individuals will rate the same sentences differently, and a given individual may respond slightly differently to sentences with identical syntactic structures but different lexical items. A certain amount of "variance," as Cowart (1997, pp. 40–41) terms it, is not necessarily bad, "provided that some of this variability is under the experimenter's control." If an experimenter finds, for instance, that males and females respond differently to a given linguistic construction, before interpreting the results, the experimenter will want to be sure that this difference is truly a difference in how males and females feel about the construction, not a difference that is attributable to a faulty experimental design. Thus, Cowart (1997, p. 44) is quite correct that "…the art of experiment[al] design consists in controlling variance," since the better the design of an experiment, the more confidence one can have in the results that are obtained.

6.3.2 Experimental Design

Even though experimentation is a fairly new trend in linguistic research (see Squires' chapter in this volume), considerable research has been devoted to discussing how to design experiments that are valid and that will yield reliable results (cf. Quirk and Svartvik 1966; Greenbaum and Quirk 1970; Schütze 2016; and Cowart 1997). This research has isolated a number of areas that are keys to an effective experiment: the wording of instructions given to subjects, the manner in which the sentences to be judged are presented, and the types of acceptability judgments that subjects are asked to make.

6.3.2.1 Instructions

When eliciting linguistic judgments from linguistically naïve subjects, it is impossible to avoid the "observer's paradox" (Labov 1972, p. 209): the methodological quandary that as soon as subjects realize that their linguistic behavior is being "observed," many will change the way that they speak, no longer producing natural speech but speech that conforms, for instance, to perceived prescriptive norms. Even though it is impossible to avoid the fact that an experiment is an unnatural context in which to study language behavior, it is possible to minimize the effects of the observer's paradox by giving subjects explicit instructions outlining precisely which kinds of judgments the experimenter wishes them to give. In a sense, as Meyer (2002, p. 57) notes, subjects need to be told what is stressed over and over again in any introductory linguistics class: that no linguistic form is more "correct" than any other linguistic form, and that when linguists study language, they are interested not in what individuals may have been taught about correct or incorrect usage in school, but in how they naturally feel about a given linguistic construction.

The best way to convey this information is by giving subjects very explicit information about the purpose of the experiment they are taking part in and the kinds of judgments about the data that the experimenter wishes them to make. Schütze (2016, p. 185) comments that many experiments have failed because the tasks that subjects have been instructed to perform were explained "too briefly and vaguely." He argues that instructions should:

- be "specific," explaining how sentences should be judged, and listing the considerations (e.g., prescriptive norms) that should not be used in making judgments.
- allow for subjects to "say sentences out loud" in addition to reading them "to overcome some prescriptive compunctions associated with written norms."
- contain examples of good and bad sentences (not illustrating the point being tested) with discussion of why the sentences are good and bad.
- be of a "reasonable length" so that subjects are not burdened with excessive detail.

Even though the experimenter can go to great lengths to ensure that instructions provide specific guidance for subjects, ultimately it can never be truly known whether subjects are giving genuine responses to sentences. Cowart (1997, p. 56–59) conducted an experiment in which he gave two groups of subjects the same set of sentences but different instructions for evaluating them: a set of "intuitive" instructions asking for neutral assessments of the sentences, and a set of "prescriptive" instructions eliciting more prescriptively based judgments of the sentences. Both groups evaluated the sentences very similarly, leading Cowart (1997, p. 58) to conclude "that subjects have very little ability to deliberately adjust the criteria they apply in giving judgments." Because of the small size and scale of this experiment, its results must be interpreted carefully. But the results do indicate how little is actually known about the nature of judgments that individuals give sentences, and the methodological complexities involved in attempting to get test subjects to provide the kinds of judgments that the experimenter is seeking.

6.3.2.2 The Presentation of Sentences

In addition to deciding which sentences to include in an experiment, the experimenter needs to be concerned with the order in which sentences are presented.

Any linguistic experiment will contain a series of sentences intended to test various hypotheses. Greenbaum (1977) describes a series of experiments that he conducted to test such hypotheses as whether subjects thought sentences in the active voice were more frequent and acceptable than sentences in the passive voice and whether subjects (all speakers of American English) judged *might not* (to express possibility) as more frequent and acceptable than *may not*. To test claims such as these, Greenbaum (1977, pp. 84–85) constructed test booklets containing contrasting pairs of sentences. Figure 6.2 contains an example of what a page eliciting frequency judgments looked like.

A second page was created for each distinction being tested using different lexical content to test the same syntactic distinction (e.g., *Bruce called Jane* was compared with *Jane was called by Bruce*).

Subjects were given test booklets in which the data were presented in various different orders. Pages were randomized for each test booklet, and half the subjects received the sentence pairs in one order (e.g., active sentence first, then the passive sentence), the other half in the reverse order (e.g., passive, then active). Random ordering like this is important because if all subjects received test pages in the same order, for instance, there is a chance that sentences on adjoining pages might influence the judgments that subjects give (cf. Schütze 2016, pp. 132–133, and Cowart 1997, pp. 98–102 for more details on order effects in experiments). Cowart (1997, pp. 51–52) also advises that test booklets contain "filler sentences": sentences containing linguistic constructions unrelated to the hypotheses being tested. Filler sentences help prevent subjects from being habituated to the same linguistic constructions. Greenbaum's (1977) experiment did not contain any filler sentences probably because he

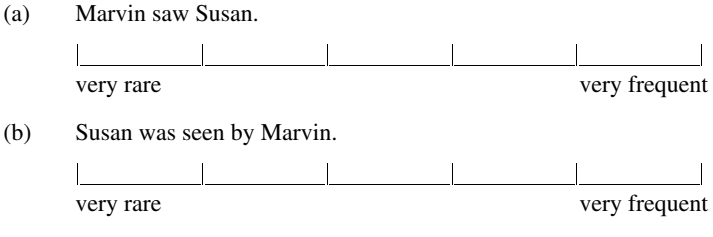

Figure 6.2 Sample booklet page testing perceived frequency of actives and passives.

was testing so many different linguistic points that subjects would not become habituated to any one type of linguistic construction.

In his experiment, Greenbaum had subjects rate the frequency and acceptability of sentence pairs on a five-point scale, from "very rare" to "very frequent." Greenbaum (1997) could have just as easily had subjects directly evaluate each pair, asking them to state whether each (a) sentence was more frequent or acceptable than each (b) sentence, whether each (b) sentence was more frequent and acceptable than each (a) sentence, or whether the two sentences were equally frequent or acceptable. There is some evidence to suggest that the scalar method of evaluation that Greenbaum (1977) employed is preferable. Schütze (2016, pp. 62–70) provides a comprehensive survey of the many studies that have argued for the view that grammaticality judgments are not either/or choices but are on a continuum.

6.3.3 Online Surveys

All of the experiments discussed thus far in this section have been conducted using individuals in a traditional testing context. However, with the rise of Internet-based resources, it is now possible to conduct experiments completely online. Sprouse (2011) describes how research on acceptability judgments can be conducted using Amazon's Mechanical Turk (AMT), an application that allows for the administration of online surveys. Sprouse (2011, p. 156) argues that this application is superior to other web-based applications for surveying acceptability judgments, such as WebExp (http://groups.inf.ed.ac.uk/webexp/), because it is able to "completely automate the recruitment of participants, the administration of surveys, and the disbursement of compensation."

To test the viability of AMT, Sprouse (2011, p. 156) had two groups of 176 students each judge the acceptability of a group of 24 sentence types. One group did the experiment in a traditional laboratory, while the second group did the same test using AMT. One of the major differences that Sprouse (2011, p. 159) detected between the two tests was that while it took 88 experimenter hours (and 3 months) to process the surveys given in the traditional laboratory setting, AMT required only 2 hours. However, with a fee of 10%, AMT is more expensive than a laboratory experiment. More importantly, as Sprouse (2011, p. 165) comments, both tests had identical outcomes: statistical analyses of the results of the two tests revealed "no evidence of meaningful differences in the shapes or locations of the judgment distributions."

6.4 Corpus Building

Despite Chomsky's objections to the corpus-based approach, the compilation and analysis of corpora have developed exponentially over the last two decades. McEnery and Wilson (2002, p. 10) make an important distinction between "early" corpus linguistics and the form that it now takes. In using the term "early" corpus linguistics, they refer to various corpus-based enterprises which were undertaken from the 1950s to the 1970s, that is, before large-scale computerization. Among these enterprises was Fries's work, based on a corpus of around 250 000 words of recorded telephone conversations. The corpus was not computerized, and had to be transcribed and analyzed entirely by hand, which was obviously very labor-intensive, time-consuming, and expensive. The corpus formed the basis of Fries's influential work, *The Structure of English* (1952). The sheer amount of human effort (and potential human error) involved in enterprises such as this simply provided further ammunition for those who were fundamentally opposed to the methodology.

The major breakthrough came in the early 1980s with the availability of relatively inexpensive computer hardware and software. The computer has made available to linguists data-processing capabilities which have hitherto been unknown, and has revolutionized both data collection and data analysis. The key factors in the computer revolution have been speed of processing and the sheer amount of data that can be analyzed. Since the 1980s, corpus linguists have been compiling ever-larger databases of machine-readable data. Corpora of 1 million words were considered large in the early 1980s, but corpus linguists now regularly use corpora of 100 million words, such as the British National Corpus (Burnard and Aston 1998), and even 500 million words, such as the COBUILD Bank of English (Sinclair 1987). It is likely that even larger corpora than these will become the norm in the near future (see Section 6.4.1).

The computer revolution has brought about a revival in corpus linguistics, but the availability of ever-increasing processing power and ever-larger corpora has not in itself answered the objections raised by critics such as Chomsky. The basis of Chomsky's criticism was that we could never generalize from the findings in a (necessarily finite) corpus to the language as a whole. Since the set of all possible sentences in a language is unbounded, any sample of that language, no matter how large, will always be skewed or unrepresentative.[5] The point is a valid one, though it could be said to apply to all probabilistic sampling techniques, and indeed the sampling techniques adopted by modern corpus linguists are widely used in many disciplines, notably in the social and natural sciences. Kretzschmar et al. (1997) explore the use of sampling procedures in corpus linguistics, and show the parallels between this methodology and those used in conducting political opinion polls. Opinion polls use probability sampling in an effort to predict how an entire voting population will vote. By adopting a principled sampling procedure to ensure maximal representativeness, they are able to generalize their findings beyond their necessarily finite sample to the population as a whole, always building into their calculations a tolerable margin of error. In the same way, the corpus builder must adopt a rigorous sampling technique during the data collection phase, to ensure that the corpus is maximally representative of the language used by the population under review. In the broadest terms, the role of the corpus builder is to construct a "scale model" of the language (or a well-defined subset of the language) according to rigorous sampling principles. If the corpus is truly to scale, the linguist can be confident that his findings based on that corpus can be "scaled up" or generalized to the language as a whole, always bearing in mind that a statistical margin of error operates in all sampling procedures.

This is the general principle underlying the design of a representative corpus, though as Kretzschmar et al. (1997, pp. 168–169) show, the application of this principle in practice is fraught with logistical difficulties. They consider what kind of corpus would be required to be truly representative of American English in the 1990s. As they point out, many important decisions would have to be made, given the size of the population (about 250 million), and its ethnic and regional diversity. Should all ethnic groups be included, and if so, in what proportions? Should all regions be sampled? Should the corpus include non-native speakers as well as native speakers? These are just some of the many questions which every corpus builder must address at the very beginning of a corpus project. Even if they can be answered satisfactorily, it still remains for the corpus builder to contact and record an enormous number of speakers over a vast geographical area. Logistical problems such as these are not confined to spoken corpora. Using one of Kalton's (1983, p. 82) formulas for calculating necessary sample size, Kretzschmar et al. (1997, p. 173) estimate that in order to provide a representative sample of the 49 276 books printed in the United States in 1992, samples from around 2200 books would have to be included. Taking 2000-word extracts from each of these, a corpus of around 4.4 million words would be required.

We should not conclude from this that a representative corpus of American English is impossible to build, but it does provide a salutary reminder that building a statistically

representative corpus is logistically very difficult and (in many cases) prohibitively expensive. It also strongly suggests that corpora such as the 1-million-word Brown corpus are far too small to be statistically reliable. Such a corpus is "reflective" rather than "representative" of American English (Kretzschmar et al. 1997, p. 168).

In recent years, a great deal of attention has been paid to the problem of representativeness, and to corpus design as a whole (Atkins et al. 1992; Biber 1993; Quirk 1992). Biber (1993) provides the most comprehensive discussion. Central to Biber's argument is that corpus building should be a cyclical process. The corpus builder should begin by identifying the population and the range of text types to be included. A provisional corpus design can then be put in place, and a small "pilot corpus" can be built. The pilot corpus should then be empirically tested, to check, for example, whether it contains adequate coverage in terms of linguistic variability. The results of this testing will indicate how the provisional design needs to be modified. In this way, the design can be repeatedly modified in an "almost continuous" cycle (Biber 1993, p. 256).

According to Biber, the corpus builder must initially produce a very clear, principled definition of the target population that the corpus is intended to sample. This includes two aspects, (1) a definition of the boundaries of the population—what texts will be included or excluded, and (2) a definition of the hierarchical organization of the population to be included, that is, what text categories are included in the population (Biber 1993, p. 243). Central to the sampling procedure is the use of a sampling frame. A sampling frame may be defined as a complete, comprehensive inventory of the population of texts from which the samples will be selected. In practice, sampling frames for written data are usually reference books such as *Books in Print* or the *British National Bibliography*, or library catalogs. For example, in compiling the London-Oslo-Bergen Corpus (commonly referred to as LOB), a one million word corpus containing various kinds of written British English, periodicals and newspapers were selected from those listed in *Willing's Press Guide* (1961) (Johansson et al. 1978). Provided that the sampling frame is genuinely comprehensive, its use ensures that all texts have an equal chance of being selected for inclusion in the corpus. The selection of texts from within the sampling frame can be carried out either by random sampling, or by what Biber (1993, p. 244) calls "stratified sampling," that is, by first identifying subgenres or "strata" within the population of texts as a whole, and then by sampling within each subgenre.

Sampling frames are used extensively in designing written corpora, but cannot be applied to most kinds of spoken data. Instead, demographic sampling is used. Crowdy (1993) describes how demographic sampling was used in the process of collecting spoken data for the British National Corpus. This is essentially different from using a sampling frame, in that it selects informants (speakers) rather than texts. The selection is made on the basis of social variables such as age, sex, education, and regional background. As pointed out earlier, demographic sampling in corpus building has parallels in other disciplines, such as the social sciences, where researchers attempt to define a representative cross-section of the entire population. In sampling language use, however, there is a crucial difference, namely, that not all people have equal opportunity to produce all types of discourse. While all speakers can provide conversational data for the linguist, only elected members of parliament can provide parliamentary debates, and only members of the legal profession can provide legal discourse, and so on. Furthermore, strict demographic sampling according to sex, for example, may not always reflect the realities of language use. In building the International Corpus of English (ICE)-GB corpus (Greenbaum 1996), Nelson (1996) observed that if a corpus is accurately to reflect the population from which it is drawn, it must inevitably reflect at least some of the social inequalities which exist in that society. For example, while as a general principle, the ICE-GB corpus attempted to sample both male and female speakers equally, it was quickly discovered that in many areas of British society males and females are

not in any sense equally represented. In both politics and the legal profession, to cite just two areas, females are still very significantly underrepresented. In these two domains—politics and law—a direct application of demographic sampling would be inappropriate, since it fails to reflect language use. To take account of realities such as these, strict demographic sampling must be supplemented with a context-based approach (Crowdy 1993). In the context-based approach, specific types of discourse, such as parliamentary debates, are specifically targeted for inclusion in the corpus.

McEnery and Wilson (2001, p. 66) summarize the use of statistical sampling methods as follows: "…the constant application of strict statistical procedures should ensure that the corpus is as representative as possible of the larger population, within the limits imposed by practicality." The use of statistical procedures at the corpus building stage is crucially important, and it is equally important at the stage of corpus analysis. A great deal of attention has been paid to this issue in recent years. Oakes (1998) provides the first full-length study of statistical techniques which can be applied by the corpus linguist, including clustering, multivariate analysis, and measures of collocation strength. Kilgarriff (1996) considers the use of the standard chi-square test for statistical significance, and explores the limitations of the test when applied to language data. The issue is taken up by Rayson and Garside (2000), who propose the use of log-likelihood statistics as a more appropriate method of measuring distributional variation across corpora or subcorpora. The use of statistics in corpus analysis is also examined in detail by Dunning (1993); Biber et al. (1998); Gries (2013, 2017); Kilgarriff and Rose (1998); and Wallis (in press).

The advantages of the "modern" corpus-based approach—as distinct from that of "early" corpus linguistics—have long been recognized (Chafe 1992; Fillmore 1992; Leech 1992). A corpus contains authentic examples of naturally occurring patterns of language use, which frequently contradict even the intuitions of native speaker. Furthermore, these examples always occur in a wider context, since corpora, especially those used for syntactic research, always consist of running text. In many areas of linguistic research, this context is crucially important to the interpretation of the data, and it is typically not available in data derived from either introspection or elicitation. A corpus also offers the advantage of scale: the ability to examine very large amounts of data with speed and accuracy. Related to the concept of scale is the concept of variety. Aarts (1999) reflects on what has been called the Great Tradition of English grammars—Kruisinga, Poutsma, Jespersen, Quirk et al.—and observes that what they describe "is in reality the description of only one variety of the language: one dialect, one sociolect, one medium" (Aarts 1999, pp. 3–4). Specifically, traditional grammars were restricted for the most part to "standard," "educated," written, British English. See also Linn (this volume). According to Aarts, what the mega-corpora have brought about is a much greater awareness of the immense variety of language in use. The availability of large electronic corpora forces us to devise new descriptive models for language in general and for specific languages in particular.

The various methods of collecting linguistic data that we have discussed in this chapter have their supporters and their critics. In general, however, these methods—ideally at least—are seen as complementary (Chafe 1992; Svartvik 1992). Chafe (1992, p. 96), in particular, looks forward to the day when linguists of all types—introspective linguists, experimental linguists, and corpus linguists—will be more versatile in their approaches, and will freely use a variety of methodologies and techniques.

6.4.1 The Internet Age and "Mega Corpora"

The expansion of the Internet in recent decades has had very significant effects in the field of language data collection. The Internet itself has increased in size from an estimated 172 million websites in 2008 to over 1.6 billion today (Internet Live Stats 2019). The easy availability of vast amounts of text, already in electronic form, has proved very attractive to some corpus

linguists (Nesselhauf et al. 2007), and some have even developed systems which treat the Internet as a corpus in its own right (Renouf and Kehoe 2013). The technology for searching the Internet has also improved significantly in terms of speed and sophistication. Search engines, notably Google, have made access to the Internet faster and more reliable than ever before. Increases in bandwidth and storage capacity have meant that very large "mega-corpora" can now be stored on most servers, and can be accessed rapidly from any part of the world.

Compilers and distributors of language corpora have taken advantage of increased broadband width to allow access to online databases via the Internet. In corpus linguistics, online access is quickly becoming the norm, in contrast with earlier methods of distribution, which relied on CD-ROMS or other portable devices. In the following sections, we look at two of the recently developed online "portals" that are quickly becoming standard as sources for language data.

6.4.2 CQPweb: The Corpus Query Processor (CQP)

The CQP at Lancaster University, United Kingdom (https://cqpweb.lancs.ac.uk) is a large and varied collection of language and other databases which can be searched online via the system's own query interface (Hardie 2012). The collection includes 18 databases of present-day English, including the Spoken BNC2014, which contains 11 million words of spoken British English recorded between 2012 and 2015 (Love et al. 2017). The collection also includes several corpora of American English, including the Longman Spoken American Corpus (5 million words from over 1000 speakers), and the New York Times Annotated Corpus (over 1.8 million articles published between 1987 and 2007). CQPweb also allows access to large collections of historical data, including Early English Books Online, the ARCHER Corpus (a historical corpus containing various kinds of written British English published between 1600 and 1999), and very large collections of newspaper data, including the *Times* from the 1780s to the present, as well as several British regional newspapers. Registration is required in order to obtain access to some parts of the collection. For details, see https://cqpweb.lancs.ac.uk.

Online collections such as these offer unprecedented access to corpus data from anywhere in the world. They are particularly useful for teaching purposes, since they offer students free access to data that would have been very expensive just a few years ago. Students and teachers do not even need to have dedicated retrieval software on their own computers, since CQPweb provides an online query interface. In the Spoken BNC2014, for example, users can carry out searches and show results as concordance lines, together with information about the word's frequency, distribution, and collocation. Concordance lines and other results can be downloaded to the user's own computer for further exploration. The Spoken BNC2014 is especially valuable in that it includes part-of-speech tagging and semantic tagging, which can be incorporated into searches.

The query interface is easy to use, and retrieval times are impressive. For many researchers, however, the lack of direct access to the full corpus texts is a limitation. In many instances, researchers may wish to download the actual texts themselves, and format and annotate them to suit their own individual research interests. The query interfaces, too, may be restrictive for some types of research, including discourse or pragmatic analysis. The restriction on downloading, however, is unavoidable, since it is imposed by the current state of copyright law in relation to corpus data. An exception to this is the Global Web-Based English (GloWbE) corpus, which we discuss below. That corpus is freely available to download in its entirety, since it consists only of webpages, which are considered to be in the public domain.

6.4.3 *The Brigham Young University (BYU) Collection of Corpora*

Developments in corpus collection and distribution at Lancaster University have been paralleled, to some extent, at Brigham Young University in the United States. Researchers there have developed the BYU collection of online corpora (https://corpus.byu.edu/corpora.asp). The BYU collection overlaps with that at Lancaster to some degree, but it offers some important corpora not readily available elsewhere, including the Wikipedia Corpus (1.9 billion words of Wikipedia entries up to 2014), the Corpus of American Soap Operas (100 million words of transcripts from the early 2000s), and the Strathy Corpus of Canadian English (50 million words, spoken and written, 1970s–2000s). A new web-based corpus of English from the United States, Canada, the United Kingdom, Ireland, Australia, and New Zealand, totaling 14 billion words, is now available.

Among the largest corpora currently available from BYU is the 1.9-billion-word corpus of GloWbE (pronounced *globe*, Davies 2013; Davies and Fuchs 2015). The corpus was developed at Brigham Young University and is freely available as part of their online collection of corpora. The release of the GloWbE corpus in 2015 was generally welcomed by researchers in the field of World Englishes (Mair 2015; Mukherjee 2015; Nelson 2015; Peters 2015), although some issues relating to the corpus design have been raised. We discuss some of those issues below.

Like the ICE project, GloWbE was developed to facilitate comparative studies of varieties of English around the world, but it was designed to do so on a much larger scale, in terms of numbers of words. In ICE, each of the varieties is represented by 1 million words (60% spoken, 40% written), but in GloWbE, the figures are significantly larger, as shown in Figure 6.3.

Web domain	**No. of words**
Australia	148 208 169
Bangladesh	39 658 255
Canada	134 765 381
Ghana	38 768 231
Great Britain	387 615 074
Hong Kong	40 450 291
India	96 430 888
Ireland	101 029 231
Jamaica	39 663 666
Kenya	41 069 085
Malaysia	42 420 168
New Zealand	81 390 476
Nigeria	42 646 098
Pakistan	51 367 152
Philippines	43 250 093
Singapore	42 974 705
South Africa	45 364 498
Sri Lanka	46 583 115
Tanzania	35 169 042
United States	386 809 355
TOTAL	**1 885 632 973**

Figure 6.3 Composition of the GloWbE corpus. Source: Adapted from https://corpus.byu.edu/glowbe/.

The GloWbE corpus consists entirely of webpages (a total of 1.8 million), which were downloaded automatically using the webcrawler software HTTrack, from each of the 20 domains listed. The corpus contains no spoken data, though the compilers claim that they followed the 60–40% proportions in ICE:

> In the creation of GloWbe, we followed roughly the same approach. About 60 percent of the words from each country come from informal blogs, whereas the other 40 percent come from a wide variety of (often) more formal genres and text types. (Davies and Fuchs 2015, p. 4)

This, of course, raises many important questions. First, to what extent is it valid to equate spoken English with informal blogs? (Mair 2015) Clearly, blogs are written, and they lack all the phonological features of speech, no matter how "informal" we take them to be. They also lack the spontaneity of conversation: how can we know how much editing and reediting a blog has undergone before it is published online? Most importantly, the idea that speech is "informal" while writing is "formal" has been shown to be quite simplistic, not least by Biber's (1988) multidimensional analysis of the two modes. Both speech and writing contain formal and informal genres, and indeed many genres contain a mixture of both. It is for this reason that in the ICE project, spoken texts are classified into dialogues and monologues, scripted and unscripted, as well as a "mixed" category for broadcast news reports, which contain scripted material as well as spontaneous speech (Nelson 1996).

Second, in order to identify each variety, the compilers of GloWbE used the top-level domain (TLD) which is assigned to each country, for example, .uk = United Kingdom, .sg = Singapore, etc. The TLD is part of the "address" of a website and can usually be assumed to correspond to the locale where the website is hosted. It does not, however, provide any guarantee that the text itself originated in the corresponding country, or that the author necessarily has any connection with that country. The compilers of GloWbE admit that this was "the most challenging part of the corpus creation," but were satisfied that while "this approach may not be perfect ... it is very good" (Davis and Fuchs 2015, pp. 4–5).

In an earlier attempt to compile a web-based corpus, ICELite, Nelson (2009) found that using the domain name to identify a country was very problematic. In many instances, it was clear from reading the websites themselves that they did not, in fact, originate in the corresponding country. Many of them were "mirror sites," that is, replicas of sites from another domain that are used to reduce traffic on the original server. Others were found to be translations of texts originally published in other languages. Those sites could be excluded quite easily, but in most cases, there was no indication, apart from the TLD, of the origin of the text.

An added complication in this is that much of the Internet is anonymous, or at least pseudonymous. For many writers, that is one of its attractions, but for the corpus compiler, it makes it difficult to determine precisely who the author is. In more traditional corpus building, writers and speakers could be positively identified, and in many cases were contacted personally for details of their age, regional and educational background, and education. For a linguist, the "metadata" are as important as the corpus data. It allows sociolinguistic variables to be factored into the analysis of the language, giving a much more detailed picture of how it varies across multiple variables. If the metadata are absent, then the corpus becomes much less valuable as a tool for linguistic research.

The ICELite project also showed that although the Internet is vast, it is actually very limited in terms of the range of texts available. Some spoken genres, such as radio broadcasts and YouTube videos, can be downloaded and transcribed, but the Internet is still very much a written medium. Despite recent advances in technology, we still communicate online overwhelmingly through the medium of writing, not through speech. But even in the written mode, the range of text types is quite limited. Some of the genres represented in ICE are not

available online, including students' writing and examination scripts. Newspapers are readily available in most domains, but here too the corpus compiler needs to be careful. In ICELite, it was found that large national newspapers, usually published in the nation's capital, are readily available, while smaller regional and local papers were much scarcer. For that reason, the range of newspaper texts in ICELite is much narrower than in ICE. It was found too, that in some countries, feature articles in newspapers were virtually the only source for text types such as "skills and hobbies" and "popular (non-academic) writing" in the humanities, social science, and technology. Clearly, there is a danger in relying too heavily on newspapers for these types of texts, since that would bias the corpus heavily toward the language of journalists.

Like GloWbE, the ICELite corpus was compiled entirely from Internet sources. It was on a much smaller scale, however, sampling just five domains (Uganda, Sudan, Sierra Leone, Papua New Guinea, and Oceania), giving a total of 1 000 214 words in 1518 samples. The corpus was never released for research by linguists, for the reasons discussed here. It was concluded that while web-based corpus compilation is inexpensive and fast, the collection procedures raised too many questions about the provenance and representativeness of the data. In particular, the almost total absence of metadata meant that it could not be used as a basis for detailed comparative studies of English varieties.

With the availability of "mega-corpora," we have now entered the area of "big data," a term which is also applied in other fields to denote datasets that are so large that they defy traditional methods of analysis. Instead, various statistical and machine learning procedures, including predictive analytics, are used to detect patterns and hitherto unseen correlations in data. Big data analysis currently has a wide range of applications, from predicting business trends to analyzing how people vote in elections (Marr 2015).

Data analysis is strictly beyond the scope of the current chapter, but clearly the development of mega-corpora in the order of billions of words will have a significant impact on how we analyze such data in the future. Before doing so, however, we need to consider a fundamental question: just how much data do we need in order to carry out reliable research into linguistic features and their distributions? In theory at least (and certainly for lexical studies), the more data we have, the better, since we would expect a larger corpus to contain more instances of the linguistic feature under examination. This should allow us (again in theory) to observe more internal variation in the feature.

To facilitate rigorous and detailed linguistic research, web-based corpora need, perhaps, to pay less attention to corpus size and more to corpus metadata and representativeness. By the same token, those who use corpora to study world Englishes may need to reconsider what is meant by the term "language variety." Traditionally, linguists have equated a language variety with a geographical region (usually a specific country), such that "language variety" effectively means "national variety." However, it may be time to reassess what "language variety" actually means today, in light of ongoing globalization, which itself is driven in large part by the Internet.

NOTES

1 The term "introspection" is problematic when used to describe the kinds of judgments that individuals make when they use their intuitions to rate the grammaticality of sentences. As Schütze (2016, pp. 48–52) notes, "introspection" has its origins in psychology, where it was used to describe experiments in which "the idea was to describe internal experience in terms of elementary sensation. That is, rather than saying that one sees a

book, one should relate the colors, shapes, etc., that are perceived." However, "introspection" is such a commonly used term in linguistics that we will continue to use it in this chapter, even though it does not accurately describe what individuals do when they make linguistic judgments.

2 The exception, of course, are cases where linguists are working with languages that they themselves do not speak. In these situations, it is common to consult native speakers of these languages to elicit judgments of grammaticality.

3 Schütze (2016, pp. 19–27) documents how inconsistently the terms "grammaticality judgment" and "acceptability judgment" have been used in the literature. He ultimately rejects any distinction between the terms, deciding to regard "*grammaticality judgment* and *acceptability judgment* as synonyms, with the understanding that the former is unquestionably a misnomer, and only the latter is a sensible notion" (Schütze 2016, p. 26, emphasis in original).

4 Sociolinguists have developed other ways of collecting data, including dialect surveys, interviews, and what Starks and McRobbie-Utasi (2001) label "polling techniques": questionnaires sent out by mail or email or administered over the telephone. However, these techniques are more useful for studying lexical or phonological variation, not the kinds of syntactic/semantic/pragmatic preferences described in this section.

5 Even this objection, however, may be mitigated to some extent with the development of "open-ended" corpora or "monitor" corpora. Sinclair (1991) has pioneered the use of monitor corpora, that is, machine-readable collections of texts which are continually being increased in size by the addition of new data. As such, they are not a "synchronic snapshot" (McEnery and Wilson 2002, 22) of the language, in the way a finite corpus is, but a constantly changing data collection. The use of a monitor corpus now means that we no longer have to rely entirely on "core" corpora, however large. We can now supplement them with much larger monitor corpora, against which "core" corpora can be continually compared and validated.

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Section 2: Syntax

7 English Word Classes and Phrases

BAS AARTS AND LILIANE HAEGEMAN

7.1 Introduction: Aims and Scope

In this chapter, we introduce two concepts which are essential for the description of the grammar of a language: *word classes* and *phrases*. In the first part of the chapter (Section 7.2), we examine the classification of words into categories and we highlight some of the many problems that may arise. Among other things, we will outline some of the solutions proposed for dealing with words that seem to have properties of different categories. In the second part of the chapter, we turn to the grouping of words into phrases, and we examine in particular the constituency of what is referred to as the "verb phrase" (VP) (Sections 7.3 and 7.4). We will integrate our conclusions into a representation of the structure of clauses (Section 7.5). Section 7.6 is a brief summary of the chapter.

7.2 Word Classes

7.2.1 Definitions

Word classes (also known as *parts of speech*) are essential for any grammatical description, even though we can never really be entirely sure what their nature is. The reason for this uncertainty is that word classes are not tangible three-dimensional entities, but mental concepts, that is, they "exist" only in our minds. Word classes can be viewed as abstractions over sets of words displaying some common property or properties. In this section, we will be looking at a number of approaches to word classes, asking in particular how we can define them, and whether they have sharp boundaries.

For English, most linguists agree on the need to recognize at least the following word classes: *noun*, *verb*, *adjective*, *preposition*, *adverb*, *determinative*, and *conjunction*. Each of these word classes is illustrated in the sentence below:

(1) [$_{\text{determinative}}$ The] [$_{\text{noun}}$ chairman] [$_{\text{preposition}}$ of] [$_{\text{determinative}}$ the] [$_{\text{noun}}$ committee] [$_{\text{conjunction}}$ and] [$_{\text{determinative}}$ the] [$_{\text{adjective}}$ loquacious] [$_{\text{noun}}$ politician] [$_{\text{verb}}$ clashed] [$_{\text{adverb}}$ loudly] [$_{\text{conjunction}}$ when] [$_{\text{determinative}}$ the] [$_{\text{noun}}$ meeting] [$_{\text{verb}}$ started].

The Handbook of English Linguistics, Second Edition. Edited by Bas Aarts, April McMahon, and Lars Hinrichs.

Each member of the word classes can be the head of an associated *phrasal projection*, for example, a noun can be the head of a *noun phrase* (NP), an adjective can be the head of an *adjective phrase* (AP), verbs head *verb phrases*, prepositions head *prepositional phrases* (PP), etc.[1] Phrases will be discussed in greater detail in Sections 7.2 and 7.3. Sections 7.4 and 7.5 consider the way phrases are combined to form clauses.

The question arises how to define word classes. The oldest way to go about this is by appealing to so-called *notional definitions*, an approach familiar from school grammars. In this tradition, a noun, for instance, is defined as "a word that denotes a person, place, or thing," and a verb is an "action word." We think that notional definitions can be useful, for example, in certain pedagogical settings, but in general they are not adequate. For nouns, the definition clearly fails, for example, in the case of abstract words such as *freedom*, *intelligence*, and *rudeness*. As far as verbs are concerned, there are many words that do not refer to actions, but which we would nevertheless want to call verbs, for example, *sleep*, *think*, *concentrate*, *seem*, *please*, etc. Moreover, in spite of their denotation, the words *action* and *activity* are nouns and not verbs.

A variant of this semantic approach to defining word classes is to argue that word classes should be defined in terms of more abstract semantic criteria. Thus, for Langacker (1987, p. 189), word classes are "symbolic units" whose semantics determines the category the elements belong to. For example, a noun is a symbolic unit that semantically instantiates a schema referred to as [THING]. Verbs designate processes, while adjectives and adverbs designate atemporal relations (Langacker 1987: *ibid*.; see also Taylor 2002, p. 341ff.). For a recent account of this approach, see Hollmann (2020). Other linguists stress that the definitions of word classes should make reference to the *discourse roles* of words. For Hopper and Thompson, "the basic categories N and V are to be viewed as universal lexicalizations of the prototypical discourse functions of 'discourse-manipulable participant' and 'reported event'" (1984, p. 703).

To supplement these meaning-based definitions (or even to replace them), we can try to define word classes in terms of their morphosyntactic properties, that is, by using inflectional and distributional properties. Under this view, nouns are words that can typically be associated with plural and genitive morphology,[2] and which can occur in the position of X in the frame "determinative-adjective-X." Following this line of thinking, the word *cat* is a noun because it has a plural form *cats* and a genitive form *cat's*, and because it occurs in a sequence such as *a beautiful cat*. The word *cheerfully* is not a noun because it lacks a genitive or a plural, and because the string **the beautiful cheerfully* is illicit. Verbs are words that can take tense inflections and that can occur to the immediate right of a modal auxiliary; thus, *arrive* is a verb because it has a past tense form *arrived* and because it can occur in a string such as *he will arrive tonight*.[3] In English, many words can be assigned to different categories depending on their different syntactic environments. An often-cited example is *round*, which can be a noun (*this is your round, John*), an adjective (*a round surface*), a verb (*they rounded the corner*), or a preposition (*round the clock*) (see also Note 9).

In the vast majority of cases, we can assign words to word classes without much difficulty, but there are words about which linguists disagree as to what might be the best way to classify them. We will discuss a few such problematic cases in the next section. In Section 7.2.3, we deal with the issue of words whose properties would justify simultaneously assigning them to distinct classes.

7.2.2 Some Problematic Cases: Determinatives

Consider first the noun phrases in (2):

(2) A politician/the politician.

The question arises to which word class we should assign words such as *a* and *the*. At first sight, there are at least three possibilities:

- *a* and *the* are adjectives.
- *a* and *the* are articles.
- *a* and *the* are determinatives.

The representation in (1) reveals which analysis we prefer, but we may ask ourselves whether there is any supporting evidence for this preference. Consider first the alternative possibility that *the* is an adjective, as has been suggested in the work of the American linguist George Curme (1935 | 1947). If this were indeed the case, it would be difficult to explain the contrasts shown in (3) and (4).

(3) a. Loquacious, boring politicians.
    b. Politicians are loquacious.
    c. Very loquacious politicians.
(4) a. *The a politician.
    b. *Politician is a/the.
    c. *Very a/the politician.

The data in (3) and (4) show that words such as *a* and *the* are more restricted in their distribution than adjectives: While we can combine adjectives to the left of the noun, as in (3)a, we cannot combine *a* and *the*, as (4)a shows. Also, while adjectives can be positioned to the right of a verb such as *be* (cf. (3)b), this is not possible for *a* and *the* (cf. (4)b). Finally, while adjectives can be preceded by intensifying words such as *very* (cf. (3)c), words such as *a* and *the* cannot (cf. (4)c).[4] Notice also that while words such as *loquacious* and *boring* have clear descriptive (or "lexical") meaning, words such as *a* and *the* do not have such lexical meaning. All they contribute, meaning wise, to the phrases in which they occur is "indefiniteness" or "definiteness." Clearly, then, we have some arguments to assign *a* and *the* to a word-class distinct from that of adjectives because their distributional and semantic properties are sufficiently different from those of adjectives.

One way to separate *a* and *the* from adjectives would be to classify them as "articles," more specifically as *indefinite article* and *definite article*.[5] The traditional class of articles is usually taken to comprise just these two words, and no others. This is problematic, however, because there are a number of other words which behave very much like *a* and *the*. For instance, *this*, *that*, *these*, and *those* (traditionally called *demonstrative pronouns*) are distributionally similar to the articles in that they can also immediately precede nouns. Like *the*, the demonstratives encode that the noun phrases they introduce are definite.

(5) a. This/that politician.
    b. These/those politicians.
    c. This/that is surprising.
    d. Those are more convincing than these.

Demonstratives differ from the definite article in that they also signal that the referent of the associated noun phrase is *proximal* ('nearby') or *distal* ('far away'),[6] and, unlike the definite article, the demonstratives have number inflection: *this/that* are singular in number, while *these/those* are plural. A further difference is of course that demonstratives can also be used independently as pronouns, without an accompanying head noun ((5)c/(5)d). What is of interest to us, though, is the parallel distribution of *a/the* and the prenominal demonstratives.

Given the considerations above, it seems that to accommodate all these words we need a class that is wider than the two-member class of articles. In recent discussions, this more comprehensive class has been labeled the class of *determinatives* (Huddleston 1984; Huddleston and Pullum 2002, see also Note 7).

The case of words such as *a* and *the* is relatively straightforward, and most present-day grammarians would agree that calling such elements adjectives is misguided. However, there are a number of other words, some with quite distinct properties, which have more controversially been claimed to belong to this class of determinatives. Quirk et al. (1985, p. 253f.) in fact distinguish three sub-classes of determinatives: *predeterminatives*, *central determinatives*, and *postdeterminatives*.[7] Here are some examples from each of these classes:

Predeterminatives: *all*, *both*, *half*, *double*, *such*, etc.
Central determinatives: *a*, *the*, *this*, *that*, *these*, *those*, *my*, *his*, etc.
Postdeterminatives: *two*, *three*, *second*, *third*, *last*, *next*, *few*, *many*, etc.

The three labels aim to reflect the distributional properties of the words belonging to the class. Quirk et al. claim that if there is more than one determinative, only the order *predeterminative–central determinative–postdeterminative* is allowed. What is more, in any one noun phrase there can only be one item from the class of central determinatives and one item from the class of predeterminatives. Multiple postdeterminatives are possible. Thus, for example, *all the many questions*, with one item from each of the determinative classes shown above, is fine, but **all both books* with two predeterminatives is not permitted, and neither is **my this book*. On the other hand, *the last two days*, which contains a central determinative and two postdeterminatives, is licit.

While the classification above offers a neat descriptive taxonomy of the determinatives and captures some of their distributional (linear precedence) properties, it also raises questions. For example, why is it that we cannot select more than one element from the predeterminative and central determinative classes, while there is no such restriction in the case of postdeterminatives? And what about examples such as the following:

(6) a. Many a good book.
    b. These many good books.

In (6)a, the word *many* seems to be a predeterminative as it precedes a central determinative, while in (6)b *many* follows a central determinative, and hence is arguably best classified as a postdeterminative. How do we solve this problem? Let us consider some more data. Consider (7) and (8) below:

(7) Very many books.
(8) Many books, more books, most books.

The fact that an intensifying element can precede *many* and that *many* itself has comparative and superlative forms suggests that perhaps *many* ought to be regarded as an adjective, not as a determinative, because adjectives generally allow intensification and the occurrence of comparative and superlative forms. But then, what about (6)a? Surely this example shows that *many* cannot possibly be an adjective? This objection to classifying *many* as an adjective would be valid *only* if adjectives could never occupy the position occupied by *many* in (6)a, but this is not the case, as the following example shows:

(9) Seldom have I seen *so magnificent a palace*!

On the other hand, the word *many* is not quite like other adjectives either: in (10)a *many* is followed by a PP *of the books*; a similar pattern is not possible with the adjective *nice* (10)b:

(10) a. Many of the books.
b. *Nice of the students.

Given its contradictory properties, *many* has received different analyses in the literature. Taking (10) as core evidence, Huddleston and Pullum (2002, p. 539f.) analyze *many* as a determinative, but obviously, this leaves questions as to how to account for its adjectival properties. In a generative framework,[8] Kayne (2002) takes the view that *many* is adjectival and accounts for its determinative properties by assuming that it moves to a determinative position.

Consider next the behavior of *such*, a similarly contentious word that is regarded by some grammarians as a determinative (cf. Quirk et al. 1985, p. 257), while others regard it as an adjective, cf. Huddleston and Pullum (2002, p. 435) and Spinillo (2003).

(11) Such a nice day.
(12) No such thing.
(13) The next such event.

In the approach of Quirk et al., a word like *such* would again have to be regarded as anomalous because it can occur in the position occupied by predeterminatives (11), as well as in the position occupied by postdeterminatives, as in (12) and (13). If we regard *such* as an adjective this problem does not arise: in (12) and in (13) the word would have the position typical of adjectives, in (11) it could have been fronted to a position to the left of the determinative. A third alternative is proposed in Biber et al. (1999, p. 280f.), who analyze *such* as a *semi-determiner* to reflect its intermediate status between determiners and adjectives. For a transformational analysis of *such*, which appeals to movement to account for its distribution, see Wood (2002).

The discussion above does not pretend to be exhaustive and many other similar problems could be raised for the classification above. The discussion only serves to show that it is not always obvious how to classify specific words.

7.2.3 Word Class Boundaries and Gradience

The problematic cases discussed in the previous section raise the more general question whether the boundaries between the word classes can really be sharply delimited. Readers will have noticed that in assigning our problematic words to word classes we systematically made an *either–or* choice. That is to say, we assumed that words such as *many* and *such* belonged *either* to the class of determinatives *or* to the class of adjectives. Although we did conceive of the possibility that in one use, a word may belong to one category, and in another use, it may belong to another category, crucially, we did not envisage a situation in which in a particular use one word would simultaneously belong to more than one category. We also did not envisage that a word could partially belong to one category and partially to the other. Such a procedure is very much in keeping with a very dominant line of thinking in linguistic categorization that goes back to Aristotle. Aristotle held that as far as membership of categories is concerned, a particular element A either belongs to a category α or to a category β, but not to both categories at the same time. In addition, he held that all members of a category are equal members, so that it is not possible to be a member of a category to a certain degree. The main attraction of the Aristotelian approach to categorization is that a grammar that has neatly delimited categories is less "messy" than a grammar that does not, and

arguably it is necessary to impose such an abstraction (an "idealization") onto the facts of language in order to be able to even begin to make sense of the often complex and intricate facts of natural languages.

Formal approaches to linguistics (e.g., Noam Chomsky's theory of language) have adopted a fairly strictly Aristotelian approach to categorization.[9] This view was countered by other schools of linguistics whose thinking was influenced by the philosopher Ludwig Wittgenstein. In thinking about the notion "game," Wittgenstein had noticed that the concept is difficult to define: there are many activities which we would call games, but which are nevertheless quite different. For instance, skipping is a game and it is something you can do by yourself, while football is a game played by two teams. Wittgenstein's solution to this classificatory problem was to say that all games bear a *family resemblance* to each other, in the same way that members of a family do.

Wittgenstein influenced work in psychology by Eleanor Rosch and her collaborators who did experiments which involved showing subjects a large number of pictures of animals and objects, for example, birds and chairs (cf. Rosch 1978). The subjects were then asked if a particular picture showed a good or bad example of the animal or object in question. The results revealed that subjects perceived specific instances of animals or objects as more prototypical than others. For example, a sparrow was perceived as a more typical example of a bird than a penguin. This type of work in *prototype theory* influenced cognitive linguists who refused to accept what we might call the categorial straitjacket, and strove to build the concept of prototypes into their theories. In such frameworks, there have been proposals to conceptualize grammatical categories in terms of prototypes. How would this work? One way to do this is to examine the syntactic behavior of a particular word, say a verb, in a given context, to compare it to the behavior of another such word, and to decide on the basis of that comparison which is the more typical verb. For example, if we compare the distributional potential of the word *must* with that of *eat*, we find that the former cannot occur on its own, and always has to precede a verb (e.g., *I must go to London*, but not **I must to London*).[10] Furthermore, *must* lacks a third-person singular ending (**musts*) and a past tense form (**musted*). The word *eat* is not constrained in the same way: it can occur without an accompanying verb (e.g., *I eat bagels every day*), it can take a third-person singular inflection (e.g., *He eats bagels every day*), and it has a past tense form (e.g., *He ate bagels every day*). To explain such data linguists have proposed the concept of *gradience*: we could say that both *must* and *eat* are verbs, but that *eat* is a more prototypical verb than *must* (see also Notes 26 and 31). We can then be more specific and postulate what is called *subsective gradience*: this involves grammatical categories having a *core* (the prototypes), as well as a *periphery*, which consists of a number of less prototypical members (for more discussion, see Aarts 2007). Note that if a grammatical framework does not permit gradience, there are two options. One option is to say that modals such as *must* are auxiliary verbs which are obligatorily tensed (and hence have a restricted distribution), or, alternatively, one could say that given their particular morphological and distributional properties, modals are not verbs at all.

Another dimension of gradience, which we will call *intersective gradience* (IG), involves categories resembling each other to varying degrees (see Aarts 2007). The so-called gerund in English is a good example. Consider the examples below:

(14) I'm so tired of [this builder incompetently *plastering* the walls].
(15) [The builder's incompetent *plastering* of the walls] was a frustratingly slow process.

Both examples contain the word *plastering*, and in both cases this word has verb-like properties, as well as noun-like properties. In (14), the verbal properties are that *plastering* ends in *-ing*, a typical verbal inflection. In addition, this word appears to take a noun phrase as its subject (*this builder*) and as its complement (*the walls*), and is modified by a manner adverb

(*incompetently*). In (15), *plastering* is preceded by a genitival noun phrase (i.e., *the builder's*, cf. *the builder's van*) and by an adjective phrase (*incompetent*), and is followed by a prepositional phrase (i.e., *of the walls*, cf. *the color of the walls*). These are all properties of nouns. Conversely, in (15), *plastering* cannot be preceded by an adverb (**incompetently plastering of the walls*). In conclusion, *plastering* in (14) is more verb-like than *plastering* in (15).

We can now approach these examples in at least three ways. First, we could say that verbs and nouns are on a *cline* or *gradient*, such that these word classes shade into each other gradually.[11] Another possibility is to say that *plastering* in these two examples is a hybrid element that belongs to the classes of verb and noun at the same time. This strategy is adopted in cognitive approaches to grammar. It is also proposed in Hudson (2003). Notice that both these strategies would mean abandoning the strict Aristotelian separation of the categories. A third possible strategy would be to retain the sharp boundaries between the verb and noun classes, and say that although *plastering* in (14) has verbal as well as nominal properties, the verbal ones (for instance taking an NP object and having an adverbial modifier) outweigh the nominal ones, and for that reason *plastering* is a verb. In (15), the converse situation obtains: here the nominal features (e.g., being modified by a genitival NP and by an adjective phrase) are more numerous than the verbal features, and we therefore conclude that *plastering* is a noun. We will say that the classes of verbs and nouns *converge* upon each other, and that this is manifested by the possibility of elements displaying verbal and nominal features at the same time in different proportions.[12]

7.3 From Word to Phrase

7.3.1 Grouping Words

Having discussed words as units of grammar, we now turn to phrases, which we regard as "expansions" or "projections" of words. Consider sentence (16)a, which consists of eight words. It is uncontroversial that these words are grouped into strings that form units, both in terms of form and in terms of meaning. For instance, in (16)a it is generally agreed that the determinative *the* and the noun *students* form a unit. It is also agreed that the core of this constituent is the noun *students*, hence the string *the students* is referred to as a noun phrase.[13] In the same vein, the string *just recently* is labeled an adverb phrase (AdvP).

(16) a. $[_{Det}$ The$]$ $[_{N}$ students$]$ $[_{V}$ have$]$ $[_{V}$ completed$]$ $[_{Det}$ the$]$ $[_{N}$ assignments$]$ $[_{Adv}$ just$]$ $[_{Adv}$ recently$]$.

b. $[_{NP}$ $[_{Det}$ The$]$ $[_{N}$ students$]]$ $[_{V}$ have$]$ $[_{V}$ completed$]$ $[_{NP}$ $[_{Det}$ the$]$ $[_{N}$ assignments$]]$ $[_{AdvP}$ $[_{Adv}$ just$]$ $[_{Adv}$ recently$]]$.[14]

The structural grouping of the words in a sentence is represented either by a so-called labeled bracketing or by means of tree diagrams, a format that has been popular since the emergence of generative grammar in the 1960s which we will turn to presently.

Informally, one might define a noun phrase as a unit or a constituent whose most important element is a noun. This definition implies that NPs in fact need not contain more than just a noun:

(17) $[_{NP}$ $[_{N}$ Children$]]$ bring $[_{NP}$ $[_{N}$ happiness$]]$.

The definition will obviously have to be adapted to include NPs without an overt nominal head. To mention a few examples, consider the phrases *the rich* and *the poor* in (18)a and the bracketed constituents in (18)b which contain a determinative element, but lack a head noun.[15]

(18) a. [$_{NP}$ The rich] do not understand [$_{NP}$ the miseries of [$_{NP}$ the poor]].
b. The students have chosen their texts. [$_{NP}$ These three] have been selected by [$_{NP}$ many].[16]

Typically, noun phrases can be replaced by pronouns. For example, in (19) the pronoun *he* replaces *the minister*.

(19) The minister was sacked because he misled the press.

An NP functioning as a predicate may be replaced by *so*:

(20) Mary is [$_{NP}$ an excellent teacher] and *so* is her sister.

There is also agreement that the italicized strings in the following sentences are NPs: in each case the string can be replaced by a pronoun (*it, this*).

(21) a. *The discovery of the wreck* caused consternation.
b. What we need is *a careful examination of all the details*.
c. We need *a quick reappraisal of the situation*.

By analogy with the definition of NPs above, we can say that an AP is a constituent whose core element is an adjective. The italicized strings in (22) are APs.

(22) a. John is *very envious of his sister*.
b. Mary is *afraid of the consequences of this decision*.

It is possible to substitute the AP by means of *so:*

(23) a. John is [$_{AP}$ very envious of his sister] and *so* is Bill.
b. Mary is [$_{AP}$ worried about the consequences of this decision] and *so* am I.

Prepositional phrases are constituents with a preposition as their core, as illustrated by the bracketed strings in (24):

(24) a. Mary is [$_{PP}$ *in London*].
b. Mary arrived [$_{PP}$ *on Tuesday*].

And once again, these strings can be replaced, this time by pro-forms such as *there* or *then*:

(25) a. John is *there* too.
b. John arrived *then* too.

In (24)a, the PP can also be replaced by *so*:

(26) Mary is [$_{PP}$ in London] and *so* is John.

7.3.2 The Verb Phrase

Identifying noun phrases, adjective phrases, prepositional phrases, and adverb phrases is usually fairly straightforward. We turn now to verb phrases, which require more extensive discussion. Analyzing the grouping of words around verbs has led to many sharply different

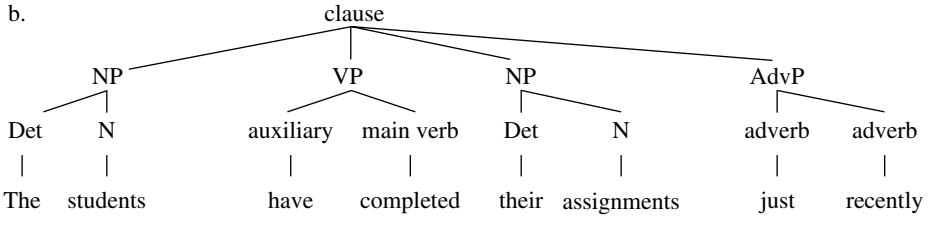
analyses, two of which we will compare in this section. We will provide arguments for one of these analyses and against the other.[17]

7.3.2.1 Two Approaches to the Verb Phrase

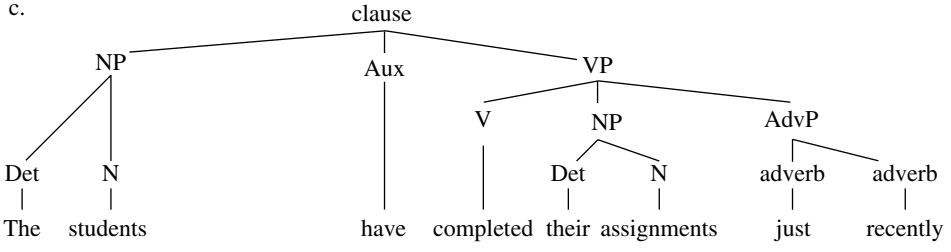
In the representation in (16)b, repeated here for the reader's convenience as (27)a, the affiliation of the verbal elements *have* and *completed* is left open. In fact, in the literature there is an interesting split in how such units are handled in terms of the overall structure of clauses. In one line of thinking *have* and *completed* are taken to form a constituent (labeled verb group or VP); in another, the string *completed their assignments just recently* would be a larger VP constituent of the clause, with the auxiliary represented as a separate constituent of the clause. The first approach is represented by (27)b based on Quirk et al. (1985, p. 39); the second is represented by (27)c. In (27)b, the label "auxiliary" is used to signal that the node dominates an element belonging to the class of auxiliaries. In (27)c, the label "Aux" is provisionally introduced to signal a specific structural position in the clause which is occupied in our example by the finite auxiliary.[18]

(27) a. $[_{NP}\ [_{Det}$ The$]\ [_{N}$ students$]]\ [_{V}$ have$]\ [_{V}$ completed$]\ [_{NP}\ [_{Det}$ their$]][_{N}$ assignments$]]\ [_{AdvP}\ [_{Adv}$ just$]\ [_{Adv}$ recently$]]$.

b.



c.



These two analyses of the verb phrase have consequences for the overall structural relations in clauses. In (27)b, the subject NP, *the students*; the direct object NP, *their assignments*; and the adjunct, the AdvP *just recently*, are on the same hierarchical level: they are all immediate constituents of the clause. In (27)c, the subject NP, *the students*, is a privileged constituent of the clause: it is hierarchically more "prominent" in that it is an immediate constituent of the clause, while the direct object, the NP *their assignments*, is an immediate constituent of VP, itself an immediate constituent of the clause.[19]

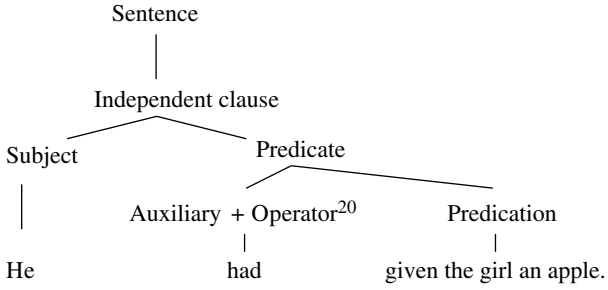
In the following sections, we show that structure (27)c is preferable to structure (27)b. A closer look at the data reveals that postulating a VP along the lines of (27)b is in conflict with the assumptions about structure elaborated in Section 7.3.1.

Representation (27)b is similar to those adopted in earlier transformational approaches (Chomsky 1957, 1955/1975), while representations along the lines of (27)c have been adopted in more recent versions of generative syntax. Interestingly, the two major comprehensive grammars of English also differ to some extent in terms of the structure they adopt, with

Quirk et al. endorsing an approach along the lines of (27)b, and Huddleston and Pullum et al. adopting a variant of (27)c. For a more general discussion of the different status of the two representations, see also Leech (2004).

In fact, in addition to (27)b, Quirk et al. (1985, p. 79) seem to also assume something like the structure in (27)c, when they introduce the category of "predicate," and provide a structure as in (28):

(28)



Quirk et al. (1985, p. 90) discuss the coexistence of the two representations. They say:

> There are occasions, however, when such alternative analyses seem to be needed, on the grounds that some of the generalizations that have to be made require one analysis, and some require another. It is for this reason that we have presented, in this chapter, two ways of analyzing a clause: one analysis in terms of the elements S, V, O, C, and A,[21] and the other in terms of subject and predicate, the predicate being subdivided into operator and predication.

Given that their grammar remains relatively informal, these authors do not spell out in detail how the two analyses are formally related, or which of the two is more basic. But see also Leech (2004). In Section 7.5, we will recast representation (27)c into a representation that is closer to that in (28).

7.3.2.2 The Relation of the Complement to the Verb

Consider again the examples of the uncontroversial phrases discussed in Section 7.3.1. The italicized strings in (29)a–c illustrate NPs, those in (29)d,e APs, and those in (29)f,g PPs:

(29) a. *The discovery of the wreck* caused consternation.
b. What we need is *a careful examination of all the details*.
c. We need *a quick reappraisal of the situation*.
d. John is *very envious of his sister*.
e. Mary is *afraid of the consequences of this decision*.
f. This chapter is *about categories and structure*.
g. Mary arrived *on Tuesday*.

In each of these examples, the complement of the head of the construction is taken to be part of the phrase. Thus, for instance, the complement of the N *discovery* is the string *of the wreck*, which is standardly taken to be part of the NP. This is corroborated by the fact that the string *the discovery of the wreck* can be replaced by the pronoun *it*. Similarly, *of her sister*, the complement of the adjective *envious* in (29)d, is standardly taken to be part of the AP, etc. Observe that with respect to NP and AP, the discussion in Quirk et al. (1985, p. 62ff.) is fully compatible with such an analysis.

When we turn to VPs, however, things are viewed differently by those supporting the representation in (27)b: for them the complement of the verb, whether it is a predicate, a direct object NP, or a subcategorized PP, is taken not to be part of the VP. Rather, the verb and the auxiliaries form a constituent separate from the verb's complement and from its adjunct. Quirk et al. (1985, pp. 39), and many others, use the label "VP" for this sequence of one or more auxiliaries and the lexical verb taken together; others use a different label, but the implications for the structure are similar.[22]

7.3.2.3 Medial Adjuncts

One consequence of the approach in (27)b, that is, the hypothesis that the verb phrase consists of just auxiliaries and the main verb, is that very often this VP will have to be regarded as being discontinuous. In the attested examples in (30), for instance, non-verbal material intervenes between the auxiliaries and the verb.

(30) a. This has *very much repeatedly* been the story of *staphylococcus aureus*. (*The Guardian*, 12/07/02, p. 6, col. 7)
b. The result is a hobbled place, where working for public services can *only with difficulty* make you proud. (*The Guardian*, 01/29/03, p. 8, col. 6)
c. The former Treasury minister, Geoffrey Robinson, was *last night publicly* upbraided for "self-indulgence" and playing "personality politics"… (*The Guardian*, 10/16/00, p. 2, col. 1)

To make such examples compatible with the approach in (27)b, we either have to say that the VP in such examples contains the verbal elements, as well as any intervening (non-verbal) adverb phrase(s), PP(s), and NP(s); or else we have to say that the VP is discontinuous and that the italicized segments are somehow "outside" the VP. Observe that the assumption implicit in the traditional literature is that constituents such as NP, PP, etc., are not routinely discontinuous. Discontinuous NPs, for instance, are usually accounted for in terms of extraposition.

Suppose we did assume that VPs conceived of as in (27)b are not discontinuous and that therefore the italicized adjuncts in (30)a–c must be part of the VP. If this is true then, according to (27)b, the manner adjunct *very carefully* will be analyzed as being part of the VP in (31)b but not in (31)a, which is surprising, to say the least.

(31) a. Jack will examine the evidence *very carefully*.
b. Jack will *very carefully* examine the evidence.

7.3.2.4 Substitution

In the literature, there is a consensus that proforms typically replace constituents, even though this assumption is not always made fully explicit. Thus, for instance, NPs can be replaced by pronouns (see Quirk et al. 1985, p. 76), while predicative NPs, APs, and PPs can be replaced by *so*, as we have seen. Let us explicitly adopt the assumption that a proform replaces a constituent, which may be a word or a phrase. This assumption will lead us to the conclusion that the verb and its complement[23] must be a constituent. This is shown by the examples in (32):

(32) a. John has left the office, and *so* has Mary.
b. The evenings have turned very cold, and *so* have the mornings.
c. John has left for another job, and *so* has Mary.
d. John has passed the new information to the police, and *so* has Bill.

In each of the examples above, *so* substitutes for the verb and its complement. If substitution is structure-dependent, then the substitution data above are clearly much more readily compatible with the structure in (27)c than with that in (27)b. These data also suggest that the inflected auxiliary is *not* included in the VP.[24]

The following attested examples illustrate how a verb + its complements (italicized here) can be replaced by *do* (see Miller 2002; Haddican 2007).

(33) a. [Linley] said: Why do you *keep the cellar door locked*? Have you always done? (Elizabeth George, *Missing Joseph*, Bantam Books, 1993, p. 272)
b. If I had wanted to *hurt someone*, believe me, I would have done. (Elizabeth George, *Missing Joseph*, Bantam Books, 1993, p. 172)
c. If Sir Alex wants to *sign somebody* he can do. (*The Guardian*, 12/31/02, p. 14, col. 1)
d. There was page upon page of tribute to "The Man who saved the mirror," some of it from people who should have *known better*, and indeed had done a few years earlier. (*The Guardian*, G2, 11/05/01, p. 2, col. 3)

Again, if substitution is structure-dependent, then these data conflict with representation (27)b, which treats the VP as a string of auxiliaries + a lexical verb. Once again, the tensed auxiliary is not affected by the substitution process.

7.3.2.5 Movement

It is generally assumed that constituents have a canonical position in the clause, and that they may be moved from that position for particular communicative effects. For instance, in (34)a–c an NP is fronted, in (34)d an AP is fronted:

(34) a. *Everything that doesn't sell* we give to Goodwill. (*The Guardian*, 01/03/03, p. 5, col. 1)
b. *The news*, when it comes, he seems to take well enough. (*The Guardian*, G2, 07/26/02, p. 2, col. 1)
c. *A lot of the elements that surround you in the job*, you sometimes think are just a vast conspiracy to divorce you from ordinary life. (*The Guardian* 04/26/02, G2 p. 6 col. 4)
d. Our dustmen arrive too early for me to check, but our fishmonger and his staff in Petersfield all wear ties (Letters, October 22) and *very smart* they look too. (Letters to the Editor, *The Guardian* 10/23/02, p. 9, col. 5)

We assume that fronting a constituent is structure-dependent. (35) shows that the verb is fronted *with* its complement, whereas simply fronting a verb without its complement is not possible. Again this is unexpected under (27)b, but it follows naturally from (27)c.

(35) a. "But I couldn't rewind time, I just had to get over it." And *get over it*, she did. (*The Guardian*, 09/06/01, p. 15, col. 8)
b. *And *get*, she did over it.

Consider also the following sentences from which we can draw the same conclusion:

(36) a. Pete says he will call his bank manager, and *call his bank manager* he will —.
b. *Pete says he will call, and *will call his bank manager* he — his bank manager.
c. *Pete says he will call his bank manager, and *will call his bank manager* he —.

(37) a. *Clear their debts* though they must —, this isn't going to be easy for them.
b. **Must clear* though they — *their debts*, this isn't going to be easy for them.
c. **Must clear their debts* though they —, this isn't going to be easy for them.

In (35), (36), and (37), verb + complement combinations are fronted, while the dummy auxiliary *do* in (35) and the modal auxiliaries *will* and *must* in (36) and (37) must stay behind. See Aarts (2018) for discussion.

Patterns referred to as "predicate inversion," illustrated by the attested example in (38), also offer support for (27)c. Here again, the lexical verb is fronted with its complement, leading to inversion of *be* around the subject. It is not clear how such patterns could be derived by movement on the basis of the structure in (27)b.

(38) *Competing with him* are Jack Nicholson, who would set a record of four Oscars if he won for his portrayal of a retired widower in *About Schmidt*, Daniel Day-Lewis, who plays a ferocious, knife-wielding butcher in *Gangs of New York*; Nicolas Cage in *Adaptation*, and Adrien Brody, of *The Pianist*, the only one of the five not nominated previously (*The Guardian*, 02/12/03. p.5, col. 2).

7.3.2.6 Coordination

Once constituents are formed they may be coordinated. We reproduce the following extract from Quirk et al. (1985, p. 46):

> [T]wo or more units of the same status on the grammatical hierarchy may constitute a single unit of the same kind. This type of construction is termed COORDINATION, and, like subordination, is typically signaled by a link-word termed a conjunction: in this case a COORDINATING conjunction. The most common coordinating conjunctions are *and*, *or*, and *but*:
>
> COORDINATION OF CLAUSES
> a. [[$_S$ It was Christmas Day] and [$_S$ the snow lay thick on the ground]].
>
> COORDINATION OF PREPOSITIONAL PHRASES
> b. You can go [[$_{PP}$ by air] or [$_{PP}$ by rail]].
>
> COORDINATION OF NOUNS
> c. His [[$_N$ son] and [$_N$ daughter]] live in Buenos Aires.

When we turn to coordinations involving verbs, it becomes clear that the coordinated segments containing a verb correspond more to the VP as represented in structure (27)c than to the VP as represented in (27)b. Quirk et al. (1985, p. 949) give (39)a, while (39)b is attested. Observe that in both these examples the complements of the verbs (and some adjuncts in (39) b) participate in the coordination.

(39) a. You must *take the course* and *pass the examination*.
b. Word spreads rapidly through a telephone tree, she said, which has *galvanized activists in the West Yorkshire valley* and *already filled six Calderdale buses for next Saturday's London demonstration*. (*The Guardian*, 02/08/03, p. 4, col. 4)

If coordination implies the linking of two constituents, then the data in (39) again tend to favour the representation in (27)c.[25]

From the discussion above, we tentatively conclude that a structure like that in (27)b, in which a VP does not include the complement(s) of the verb, is not easily compatible with a conception in which constituents are units of structure and units of sense. We therefore adopt the structure in (27)c. In the next section, we elaborate the structure of clauses in terms of such a view of the VP.

7.4 Clause Structure

Before we can integrate the type of VP we postulate here (cf. (27)c) into the representation of the complete clause, we need to address two points. What happens when there is more than one auxiliary in a clause? What happens when there is no auxiliary at all?

7.4.1 Stacked Auxiliaries

Consider the following example:[26]

(40) This student might have been writing a letter.

On the basis of *so*-substitution in (41) and coordination in (42), we conclude that the string *writing a letter* is a constituent, a VP, as shown in (43):

(41) Mary thinks this student might have been [writing a letter], and so he might have been.
(42) This student might have been [writing a letter] or [watching TV].
(43) This student might have been [$_{VP}$ writing a letter].

The question arises how to deal with the sequence of auxiliaries *might have been*. Morphologically and distributionally, the aspectual auxiliaries *have* and *be* share properties of verbs: they can be finite or nonfinite, and when finite they may show agreement morphology:

(44) a. He has/had been writing a letter.
b. Having been writing letters all day…
(45) a. He is/was writing a letter.
b. To be writing letters all day would be terrible.

If *have* and *be* are verbs, then they should be able to head verb phrases. We will say that unlike lexical verbs the aspectual auxiliaries necessarily select a VP as their complement.

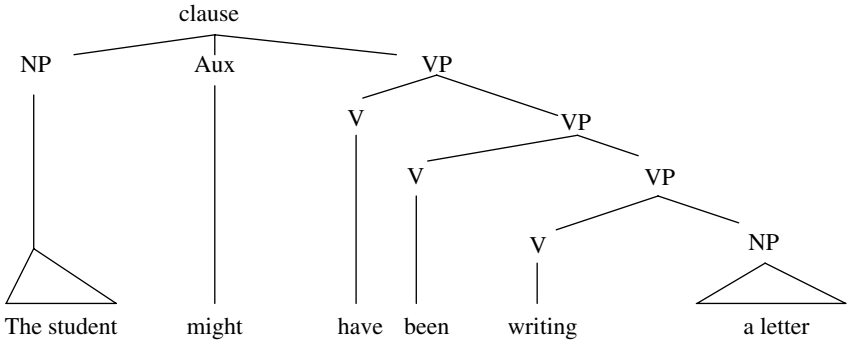
The examples in (46) provide evidence that the string *been writing a letter* in (40) is a constituent: in (46)a, *so* substitutes for *been writing a letter*, and in (46)b the string *been writing a letter* is coordinated with the string *been watching TV*.[27] In the attested (46)c and d, the second of the coordinated VPs includes a non-finite auxiliary. In (47), *so* substitution and coordination show that the string *have been writing a letter* is also a constituent.

(46) a. Mary thinks the student might have *been writing a letter*, and *so* he might have.
b. The student might have *been writing a letter* or *been watching TV*.
c. He had *claimed asylum in 1998* and *been refused in 2001*. (*The Guardian*, 01/16/03, p. 1, col. 4)
d. Determining precisely how much money has *made it to New York* and *actually been distributed* is difficult. (*The New York Times*, 12/30/02, p. B4, col. 1)
(47) a. Mary thinks the student might *have been writing a letter* and *so* he might.
b. The student might *have been writing a letter* or *have been watching TV*.

Data such as those in (46)–(47) show that while the verb, its complement(s), and adjuncts form a constituent, the finite auxiliary can remain outside the VP (but see also Section 7.5).

Observe that modals remain *in situ* when verb + complement combinations are displaced. The modal auxiliaries are inflected for tense; they are formally always either present or past. Based on these observations, we propose the provisional structure in (48):

(48)

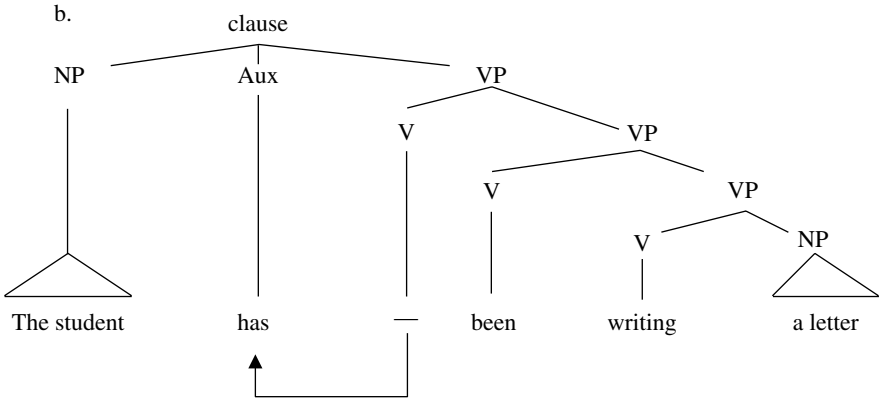


The core VP is *writing a letter*, which expresses the kind of event denoted by the clause. The merger of the core VP with the auxiliary *been* creates another VP and adds progressive aspect to the event; the merger of *have* with the resulting VP adds perfectivity. The stacked structure in (48) manages both to express constituency relations and to encode the scopal relations of the auxiliaries.

For clauses with one or more aspectual auxiliaries, but without a modal auxiliary, such as (49)a, we maintain the structure in (48) as a starting point, and in particular we assume that the aspectual auxiliary is the head of a VP. In addition, we assume that in such cases the finite aspectual auxiliary, which originates as the head of a VP, moves into the auxiliary slot (see Emonds 1970, 1976, 1978; Pollock 1989, 1997; Haegeman and Guéron 1999; and Aarts 2018), as in (49)b. We will account for this movement in Section 7.4.2.[28]

(49) a. The student has been writing a letter.

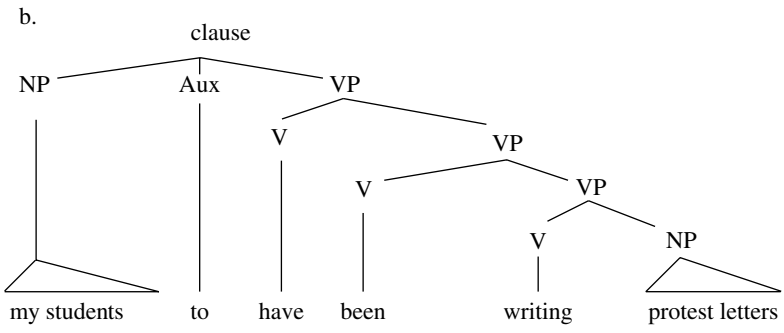
b.



Infinitival clauses such as the bracketed constituent in (50)a can be analyzed with *to* occupying the position "Aux," as in (50)b:[29]

(50) a. I expect [my students to have been writing protest letters].

b.



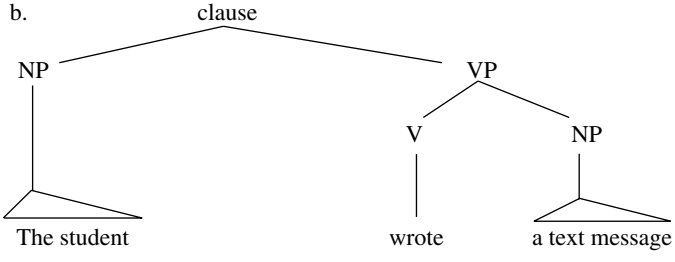
In the representations above, clauses systematically contain three basic constituents: a subject, an Aux position (containing an auxiliary or the infinitive marker *to*), and a VP. This constituency has an intuitive semantic appeal to it: a clause can be seen as the application of a particular event/state of affairs to a referent, and the element occupying the Aux position serves to qualify the linking in terms of time, probability, etc.[30] The representation singles out the subject as the most prominent NP in the clause because it is an immediate constituent of the clause. This is a positive result since we know that all finite clauses have subjects, even when the subject lacks semantic content,[31] in which case impersonal *it* or *there* is inserted. In addition, the structural prominence of the subject can be related to a number of properties which single it out, for instance the fact that the subject is the most accessible to syntactic processes such as relativization (cf. Keenan and Comrie 1977), and the observation that subjects are often privileged antecedents for reflexives and anaphoric pronouns (Halmari 1994).

7.4.2 Clauses without Auxiliaries

The question arises what happens if a clause does not contain any auxiliaries. One might propose that in the absence of auxiliaries a clause such as (51)a consists simply of a subject NP and a VP, as represented in (51)b.

(51) a. The student wrote a text message.

b.



With respect to the informal semantics outlined above, this representation is unattractive. In structure (48), there are three major components: (i) a predicate (the VP) as applied to (ii) the subject (NP), and (iii) the linking element in the position labeled "Aux." The element in the Aux position qualifies the subject–VP link in terms of modality or time. In (51)b, there is no longer a linking position available, suggesting that the interpretation of clauses without auxiliaries is profoundly different from that of clauses with auxiliaries.

Note that in (51)a, the past tense inflection is associated with the verb and thus is part of the VP. When we consider how (51)a behaves with respect to the various diagnostics for

structure implemented in the preceding sections, it is, however, not clear that the tense morpheme of the verb should be an integral part of the VP. Observe, for instance, that if we replace the VP by *so*, then the tense morpheme is stranded and realized on the auxiliary *do*:

(52) The student wrote a text message and so *did* the professor.

Similarly, if we front the VP, then we do not actually move the tense morpheme of the verb along, as shown by example (35)a repeated here as (53):

(53) "But I couldn't rewind time, I just had to get over it." And get over it, she did. (*The Guardian*, 09/06/01, p. 15, col. 8)

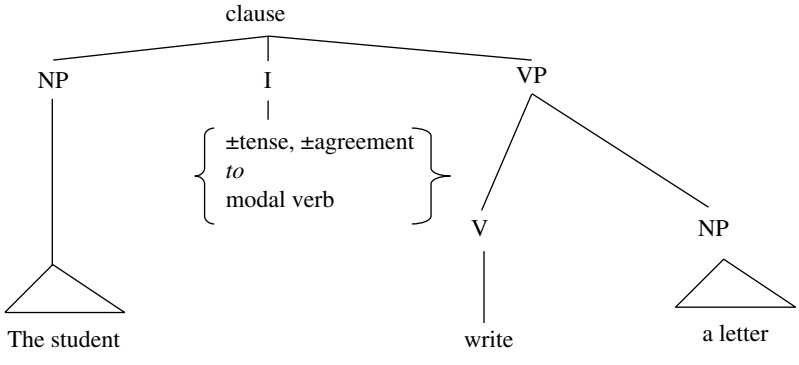
Furthermore, in negative clauses without aspectual or modal auxiliaries the tense of a lexical verb is not realized on the verb itself but it is realized separately on *do*:

(54) The students *did* not write any letters.

These data suggest that the tense morpheme should retain some independence with respect to the VP. When there is no aspectual or modal auxiliary in the clause, tense serves as a link for the subject and the predicate, and locates the proposition expressed in time. In clauses without auxiliaries, we will separate the tense structurally from the VP and locate it in the position previously labeled "Aux." By adopting this analysis, we can generalize the ternary structure elaborated above and assume that all clauses consist of a predicate as applied to a subject, and that the link between the two is encoded in a specific position, and that it can be qualified by a separate unit, realized by an auxiliary, by *to* or by the tense morpheme.

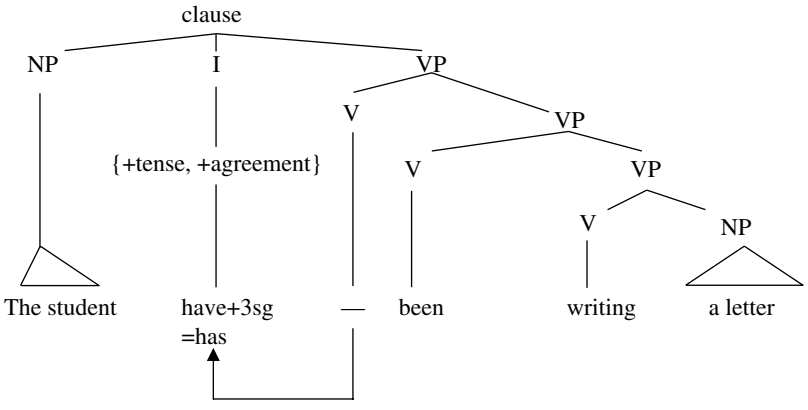
The auxiliaries that were shown to occupy the linking position (originally labeled "Aux") are inflected for tense. We can postulate that the crucial feature of this linking position is its inflectional nature, and hence we will relabel the position "Aux" as "I" for "inflection." "I" is an abstract *functional head*, which carries inflectional and agreement features, and hosts (modal) auxiliaries in finite clauses, as well as the element *to* in non-finite clauses.[32] We represent (51) a as in (55):

(55)



As discussed in Section 7.4.1, a finite aspectual auxiliary is inserted as the head of a VP and moves up to the position "I," previously labeled "Aux" (see (49)b). We can make sense of this movement now: the aspectual auxiliary moves up to "I" in order to pick up its finite inflection in "I." In (56), a more accurate representation of (49)a, *have* moves to "I," and picks up the third person singular inflection, resulting in *has*:

(56)



When there is only a tense morpheme in the clause, this is either affixed to the verb,[33] or it is spelt out by means of the auxiliary *do*. The latter arises in negative or interrogative clauses.[34]

One context in which the tense morpheme in the "I"-node in (55) is not affixed to V concerns clauses with so called emphatic *do*, when the actual validation of the link between subject and predicate is focused on: (56) contains some such examples:

(57) a. The student did write the text message.
b. I'm probably more benevolent towards Mr. Livingstone than a lot of people and I actually do think he's very brave in trying congestion charging. (*The Guardian*, 01/03/03, p. 3, col. 4)
c. People close to Senate leader Tom Daschle say he should be considered a possible candidate, but many Democrats say they would be surprised if he does run. (*Atlanta Journal Constitution*, 12/01/02, p. A6, col. 5)

7.5 Rethinking the Structure of the Clause

Structure (27)c displays ternary branching. We have consistently used such ternary branching structures in this chapter. However, there is also a long-standing intuition that sentences are essentially organized on a binary scheme because a subject combines with a predicate. This intuition was, for instance, already reflected in representation (28), which we reproduced from Quirk et al. (1985, p. 79). Below, we explore how the two proposals can be combined into one fully binary branching structure.

A potential counterexample to the ternary branching structure in (27)c, and evidence for a binary branching structure along the lines of (28), is the following kind of example:[35]

(58) The Smiths will have arrived and should have read their mail.

We could address this point in two ways. One option would be to posit an ellipted subject before *should*: it could then be proposed that ellipsis targets a constituent which is coreferential with *the Smiths*:

(59) [$_{\text{coordination}}$ [$_{\text{clause}}$ The Smiths will have arrived] and [$_{\text{clause}}$ ∅ should have read their mail]].

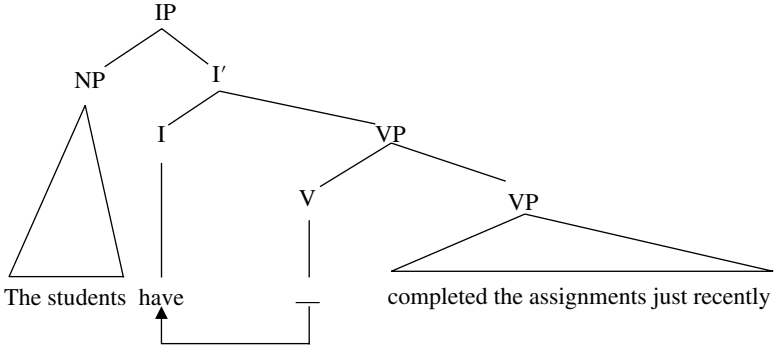
This move is not entirely satisfactory, however. For one thing, it sheds doubt on the use of coordination as a diagnostic for constituency developed in Section 7.3.2.6, because we might then also posit ellipsis in cases such as (39).

Moreover, the ellipsis analysis becomes harder to maintain in view of data such as (60). The ellipted constituent in representation (60) could not be said to be "coreferential" with *no one*, since *no one* does not refer to a particular entity.

(60) a. No one could understand it or would take the trouble to read it.
b. [$_{\text{coordination}}$ [$_{\text{clause}}$ No one could understand it] or [$_{\text{clause}}$ ∅ would take the trouble to read it.]].[36]

Alternatively, to accommodate (58) and pursuing developments in generative grammar (see Haegeman 1997), we could adapt our structure (27)c in the spirit of the binary branching format of (28), using a particular formalism in generative grammar.

(61)



According to (61), a clause is a projection of "I", or an "inflection phrase" (IP).[37] I′ ("I-bar") is a constituent consisting of the inflection node "I" and "VP". I′ corresponds to the "predicate" of Quirk et al. in (28). The subject NP combines with I′ to form IP.

Under this hypothesis, (58) is derived by coordinating two constituents of the type I′, each consisting of the modal in I and the VP:

(62) [$_{\text{IP}}$ The Smiths [$_{\text{coordination}}$ [$_{\text{I′}}$ will have arrived] and [$_{\text{I′}}$ should have read their mail]].

For more details on the implementation of this type of structure, the interested reader is referred to the literature, for example, Kayne (1984) and Haegeman and Guéron (1999), for an application to English.

7.6 Conclusion

In this chapter, we discussed the issue of how to classify words into categories ("word classes"), and how words are combined into larger units ("phrases" and "clauses").

We discussed a number of problems that arise with respect to classifying words into categories. In particular, we raised the role of gradience in categorizing words.

In the discussion of phrases, one phrase type, the VP, was singled out. We argued for a conception of the VP as containing a verb together with any complement(s) and adjunct(s). This account is shown to be preferable to one in which the VP contains merely auxiliaries (if present) and the main verb.

We also proposed that each clause contains a position labeled "I," which hosts inflectional properties. In the final section of the chapter, we showed how the proposed structure can accommodate the traditional conception of sentences in terms of a combination of a subject and a predicate.

ACKNOWLEDGMENTS

The authors thank Peter Collins and Rodney Huddleston for reading an earlier draft of this chapter.

NOTES

1 Following the generative tradition, a phrase headed by a subordinating conjunction could be argued to be a clause (see Haegeman and Guéron 1999, chapter 10).
2 Obviously plural endings are restricted to countable nouns.
3 In general terms, morphosyntactic definitions are valid cross-linguistically, but the specific inflectional or distributional properties will be determined by the language in question.
4 Observe that not all adjectives have all the properties listed here: some cannot precede nouns (**an afraid cat*), others cannot function as predicates (**the point is main*; cf. *the main point*). Non-gradable adjectives cannot be modified by degree words (**a very nuclear war*), but while adjectives will have at least a subset of the properties, the articles do not have any of them.
5 For some discussion of the semantics of the articles, see, among others, Hawkins (1978) and Lyons (1999).
6 See also Cornish (2001) and the references in Note 5.
7 In fact, Quirk et al. (1985) use the labels *predeterminer*, *central determiner*, and *postdeterminer*. They use the label *determiner* as a grammatical form label and *determinative* as a grammatical function label. In this chapter, we follow Huddleston and Pullum (2002) in using *determinative* as a form label, and *determiner* as a function label. The labels of Quirk et al. have been adjusted in accordance with this practice.
8 See Lohndal and Haegeman (2020) for an introduction.
9 It should be noted that various attempts have been made to elaborate a more refined conception of categorization. One approach tries to deal with what seem to be intermediate or hybrid categories. See for instance Biber et al. (1999), Corver and Van Riemsdijk (2001), Aarts (2003, 2004, 2007), and Aarts et al. (2004) for discussion.

   The approach referred to as *distributed morphology* proposes that categories such as nouns or verbs are not specified in the lexicon. Rather, categorially underspecified roots such as *round* are inserted in different positions in the structure and these positions will determine a particular nominal or verbal behavior. For a first discussion of distributed morphology, see Halle and Marantz (1993). The approach referred to as *nano syntax* decomposes words into smaller meaningful constituents which are assembled by "syntactic rules." This approach in effect abandons the clear separation between lexicon and morphology on the one hand and clausal syntax on the other. For an introduction to nano syntax, see Baunaz et al. (2018). For a comparison of the two frameworks, see Caha (2018).
10 This is not strictly speaking true since *must* may of course be sentence final in a context where the constituent following it has been fronted (i) or deleted (ii): but in both examples, we can restore the appropriate verbal constituent to the right of *must* (see Section 7.3.2.5).
   (i) Talk about this, we must.
   (ii) You may not want to talk about it, but you must.
11 On clines and gradients, see Bolinger (1961), Halliday (1961), and Quirk et al. (1985).
12 Further details of this approach can be found in Aarts (2003, 2004, 2007). On linguistic indeterminacy more generally, see Aarts et al. (2004). For further discussion of the

"gerund," see Aarts (2019) and Aarts et al. (2018). Observe that the issues raised for the gerund also arise with nominalization. Consider for instance (i), from Fu et al. (2001, p. 549, their (1a)) in which the deverbal noun *explanation* is modified by an adverbial *thoroughly*, suggesting that the noun somehow inherits the verbal character associated with the verb *explain*:

(i) Kim's explanation of the problem to the tenants thoroughly (did not prevent a riot).

For a generative approach to nominalization, see Fu et al. (2001) and the literature cited there. See also Note 16.

13 Since Abney (1987), it has been assumed in some generative approaches that the head of the noun phrase is in fact the determinative (the determiner phrase (DP)-hypothesis).

(i) $[_{DP}\ [\ _{Det}$ The$]\ [_{NP}$ youngest children$]]$ bought $[_{DP}\ [_{Det}$ a$]\ [_{NP}$ book of fairy tales$]]$.

We refer to the literature for that discussion. For an introduction, see Haegeman and Guéron (1999).

14 The bracketing in ((18)b) is incomplete as we have not indicated any VP. We return to this point in Section 7.3.2.

15 See, for example, Günther (2013).

16 As Peter Collins (personal communication) points out, the examples in (18) are subtly different, in that in (18)a *the rich* and *the poor* are not referentially dependent on a discourse antecedent: their interpretation is restricted in that they are generic noun phrases and they are associated with the feature [±human].

A question arises whether the NPs in (17) have a zero determinative:

(i) $[_{NP}\ [\ _{Det}\ \emptyset]\ [_{N}$ Children$]]$ bring $[_{NP}\ [_{Det}\ \emptyset]\ [_{N}$ happiness$]]$.

Similarly, one might think of postulating a zero noun in (18): in (iia) the zero noun would be associated with the feature [+human] and would be interpreted generically; in (iib) the features of the zero noun will be recovered by virtue of the anaphoric relation with the discourse antecedent.

(ii) a. $[_{NP}$ The rich $\emptyset]$ do not understand $[_{NP}$ the miseries of $[_{NP}$ the poor $\emptyset]]$.
b. $[_{NP}$ These three $\emptyset]$ have been selected by $[_{NP}$ many $\emptyset]$.

We will not pursue these issues here, as such a discussion would lead us too far astray.

17 In Section 7.2.3 (examples (14) and (15)), we raised the problem of determining the word class of gerunds, which seem to have nominal and verbal properties. The uncertainty with the classification of gerunds reappears at the level of phrasal labeling. To accommodate the nominal and verbal properties of phrases whose head is a gerund, it has been proposed that in such cases the head of a phrase may, as a marked option, be of a different category from that of the phrase itself. Pullum (1991), for instance, argues (against Abney 1987) that the lexical head of a gerund in English may be of the category V, while the containing phrase may be nominal. This "hybrid" status of the projection would account for the fact that the internal structure of the gerund in (i) is clausal, with a verb taking a nominal complement (*pieces of paper*) and being associated with adverbial modifiers such as *often*, while its external distribution is like that of an NP.

(i) [John often throwing pieces of paper during class] bothered the teacher.

A similar analysis can be envisaged for the derivation of deverbal nouns, as discussed in Note 12; see also Fu et al. (2001, p. 549). For recent work on the "gerund," see Aarts (2020) and Aarts et al. (2018).

18 As will become clearer later, the position labeled "Aux" hosts finite auxiliaries, the finite form of the copula *be*, the infinitive marker *to*, and the finite inflection of the verb. See Section 7.4.2.

19 Observe that an alternative representation could be one in which auxiliary and verb form a constituent which is the head of the predicate, which also contains complement(s) and adjunct(s).

(i) $[_{S}$ The students $[_{predicate}$ [have completed] their exams just recently$]]$.

As will become clear in the following text, the arguments in favor of (27)c suggest that the finite auxiliary should be separated from VP. This is not compatible with (i).

20 The class of "operators" includes all the auxiliary verbs, but in e.g. *Is John here?* and *Have you any idea how old he is?* both *is* and *have* are also operators.

21 This would correspond to (27b).

22 Bache and Davidsen-Nielsen (1997, p. 38) use the term "predicator," for instance.

23 And indeed at least some adjuncts. A stacked structure internal to the VP will allow the distinction between complements and adjuncts to be made. For reasons of space we cannot go into this here.

24 The same conclusion also seems to follow from the following observation in Quirk et al. (1985, p. 76): "But *so* has a more important function in modern usage, namely to substitute—along with the "pro-verb" DO—for a main verb *and whatever follows it in the clause*" (our italics). For reasons of space, we do not illustrate *do so* substitution in our chapter. The text examples in (33) illustrate *do* substitution.

25 Rodney Huddleston notes (personal communication) that data such as (i) could be argued to favor the analysis in (27)b:

(i) I [have read] and [may recommend] Kim's new textbook.

However, this example can be taken to involve a process that is called *right node raising*, such that the verb *read* shares its (right-raised) direct object with *recommend*: the idea is that the direct object *Kim's new textbook* is the object of both *read* and *recommended*, and that it is placed in a final position for reasons of focusing.

(ii) I [have read — $_i$] and [may recommend — $_i$] [Kim's new textbook]$_i$.

See Huddleston and Pullum (2002, p. 1343f.) who call this phenomenon *delayed right constituent coordination*.

26 The data are based on Radford (1988, pp. 162–164).

27 Quirk et al. (1985, p. 949) provide the examples in (i) and (ii):

(i) Most people will have read the book or have seen the film.

(ii) Most people will have read the book or seen the film.

They seem to suggest that these coordinations result from some kind of left-peripheral ellipsis in the clause. They do not make the structural basis for this claim explicit, but note that by simply assuming coordination of VPs we can generate the patterns in (i) and (ii) without an additional appeal to ellipsis. See also Section 7.5 on ellipsis and coordination.

28 It is not clear whether we should propose that, like aspectual auxiliaries, English modals are inserted under a node V and move to Aux. See Aarts (2018). The rationale for the analysis of aspectual auxiliaries in (49) is that these auxiliaries may also appear in nonfinite forms, in which case they follow a modal or another auxiliary. But modals themselves are always tensed, and they lack nonfinite forms. See also Note 34.

29 See, for example, Pullum (1982).

30 In line with representation (28), Quirk et al. (1985, p. 121) also provide an analysis of sentences containing sequences of auxiliaries which is very similar to (50), one in which each auxiliary selects a predication consisting of the next auxiliary combined with another predication. Thus, the sentence *He might have been being questioned by the police* is analyzed as in (i):

(i) [$_S$ [$_{Subject}$ He] [$_{Predicate}$ might [$_{Pred.1}$ have [$_{Pred.2}$ been [$_{Pred.3}$ being [$_{Pred.4}$ questioned by the police]]]]].

Using the binary branching format discussed in Section 7.5, (i) can straightforwardly be made compatible with the hypothesis concerning VP structure that we endorse.

31 "A subject is obligatory in finite clauses except in imperative clauses, where it is normally absent but implied" (Quirk et al. 1985, p. 725).

32 For reasons of space we cannot elaborate the proposed structure in more detail. See Haegeman and Guéron (1999) and Aarts (2018) for further discussion. For more technical discussion in terms of the generative framework, see Pollock (1989) and (1997).

In some of the generative literature, it has been proposed that the ternary structure be reinterpreted in terms of binary branching (Kayne 1984). For an introduction, see Haegeman and Guéron (1999) and Section 7.5.

33 In the earlier generative literature, this process was referred to as "affix hopping." See Haegeman and Guéron (1999) and Aarts (2018) for further discussion of why the inflection moves onto lexical verbs.

34 With respect to the status of the modals, discussed in Note 28, we might say that they are verbs/auxiliaries, and that they differ from aspectual auxiliaries in that they are necessarily finite.

35 As pointed out by Peter Collins (personal communication).

36 Thanks to Rodney Huddleston (p.c.) for the example.

37 Recently, in what has become known as the minimalist approach (see Chomsky 1993), the label "I" has been replaced by "T" for "tense." Thus, a clause is a projection of tense, "TP". In such a view, the agreement features of the subject are then also encoded on T.

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8 Clause Types

PETER COLLINS

8.1 Introduction

Clause type is the technical term referring to the syntactic categories of declarative, interrogative, imperative, and exclamative, each of which is associated with a characteristic use, as illustrated below:

CLAUSE TYPE	EXAMPLE	CHARACTERISTIC MEANING/USE
Declarative	*She is sensible*	Statement
Interrogative	*Is she sensible?*	Question
Imperative	*Be sensible!*	Directive
Exclamative	*How sensible she is!*	Exclamatory statement

Declarative is the "unmarked" or "default" type, lacking the distinctive properties of the other types (such as subject–auxiliary inversion in the case of interrogatives). *Directive* is a general term covering orders, requests, instructions, and the like (the term *command*, as commonly used in traditional grammars, being too specific to capture the range of uses associated with imperative clauses). Following Huddleston (1984, p. 352), *exclamatory statement* is preferred over the more familiar term *exclamation*, which fails to distinguish the characteristic use of exclamative clauses from the exclamatory realization of other use categories (e.g., *Who the hell are you?* as an exclamatory question representing the interrogative clause type).

Some grammars (e.g., Quirk et al. 1985) use the term *sentence type*, but the grammatical system in question strictly belongs to the clause rather than the sentence. One piece of evidence for this claim is that the clause type categories may be applied, except for imperatives, to subordinate clauses as well as to main clauses (the underlined clauses in *I suppose that she is sensible*, *I doubt whether she is sensible*, and *I realize how sensible she is* are respectively declarative, interrogative, and exclamative). Another piece of evidence is the impossibility of applying a type category to a whole sentence in which there is a coordination of clauses of different types (as in *Have another glass of champagne, or would you prefer wine?* [imperative + interrogative]; *What an excellent meal we had, and it only cost $30!* [exclamative + declarative]).

The syntactic categories of clause type represent the mutually exclusive terms of a grammatical system. This claim is not undermined by the possibility of sentences ambiguous between an exclamative and interrogative structure (e.g., *What excellent products are sold there*), insofar as such sentences can only be interpreted as one or the other in a particular context. It is the criterion of mutual exclusiveness that obliges us to exclude echo questions from the clause type system. Echo questions are formed by questioning some element of

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what the previous speaker has said (which McCawley 1988, p. 720 calls the *stimulus*), they may be overlaid on any of the clause types and are not mutually exclusive with them. For instance, the echo question uttered by Speaker B in the following exchange *A: It's very annoying. B: It's very what?* belongs to the declarative clause type, that in *A: Go to Kakadu. B: Go where?* to the imperative clause type.

The four-term system of clause type presented above is that found standardly in descriptive grammars of English (e.g., Quirk et al. 1985; Biber et al. 1999). However, Huddleston (1994) argues for a five-term system in which *closed interrogatives* (e.g., *Is she sensible?*) are distinguished from *open interrogatives* (e.g., *How sensible is she?*) on the grounds that, despite their being similarly used to ask questions, they have distinct syntactic properties. Whereas closed interrogatives always exhibit subject–auxiliary inversion, this is merely a secondary feature of open interrogatives, triggered by the fronting of a non-subject interrogative phrase. The most distinctive syntactic property of open interrogatives is thus not subject–auxiliary inversion, as in closed interrogatives, but rather the invariable presence of an interrogative phrase involving a *wh*-word. The presence of inversion would not in any case be sufficient grounds to treat closed and open interrogatives as subclasses of a single larger class, because inversion is found in various other constructions as well (such as declaratives with a fronted negative, e.g., *Never had I seen such a spectacle!* and some exclamatives, e.g., *How hard have I tried to please them!*). It follows that the interrogatives *Is Tom the treasurer?* and *Who is the treasurer?* do not share any syntactic property which differentiates them from the declarative *Tom is the treasurer*.

The formal approach to the definition of clause type adopted in this chapter contrasts with the semantically/pragmatically based approach adopted in functional accounts such as that of Halliday (q.v. Halliday and Mathiessen 2014). Halliday's four-term mood system is based on two intersecting parameters, one involving two basic types of speech act ("demanding" and "giving"), and the other involving two types of "commodities" ("information" and "goods-and-services"). Unfortunately, as observed by Collins (2005), correlations between this system and structurally based accounts of the present type are partial. Note that in Halliday's system offers of goods-and-services are realized by the same clause type as information demands, and there is no place in the system for exclamatives (which involve a giving of information, but one which is secondary to the expression of the speaker's emotional state or attitude).

8.2 Syntax versus Semantics versus Pragmatics

The clause type system raises vexing issues concerning the interrelationship between syntax and semantics/pragmatics. Consider the relationship between the declarative clause *Tina is sensible* and the interrogative *Is Tina sensible?* Semantically, they are partly alike and partly different. What they share is a common propositional meaning: both express the proposition "Tina is sensible." Where they differ most is in their non-propositional meaning, more specifically in their illocutionary force: a typical utterance of the declarative would be a statement, used to assert the proposition, but a typical utterance of the interrogative would be a question, used to question the proposition. Statements, questions, and directives are in essence pragmatic categories. Each represents a very general class of speech acts which embraces a range of more specific categories; for example, assertions and predictions as types of statement; orders, requests, and invitations as types of directive (see Huddleston and Pullum 2002, p. 858; Quirk et al. 1985, p. 804). Beyond these there are a vast number of illocutionary categories that are not subsumed under any of the general categories, such as promises, congratulations, bets, wishes, and the like.

While clause type is an important determinant of illocutionary force, it is not the only one. For instance, if a declarative such as *Maria is Spanish* is uttered with rising intonation, this will typically have the effect of making what would otherwise be a statement into a question. One special device of relevance here is the *performative* use of verbs that denote illocutionary acts (e.g., *admit*, *swear*, *urge*, *apologize*, *warn*, *suggest*); that is, their use to effect the performance of the very acts they denote. Performative utterances are characterized by a precise specification of illocutionary force, which is identified in their propositional content (thus, the warning force of *I warn you to leave* is identifiable in the proposition it expresses, but the statement force of *I warned you to leave* is not similarly identified in its propositional content).

Unlike the syntactic categories of clause type, illocutionary categories are not mutually exclusive. In cases where an utterance has more than one illocutionary force, as Huddleston and Pullum (2002, p. 859) observe, one will be primary or salient and the other secondary. For example, in a typical utterance of *I advise you to make an appointment*, the advice force is primary and the statement force secondary (the statement simply being the means by which the advice is issued), as reflected in the greater likelihood that the utterance would be reported as *You advised me to make an appointment* rather than *You said you advised me to make an appointment*.

When the illocutionary force of an utterance is different from that normally conveyed by the clause type concerned, we have what is generally referred to as an *indirect speech act* (e.g., a typical utterance of the imperative clause *Have a nice holiday!* will have the (indirect) force of a wish rather than a directive, insofar as having a nice holiday is not normally considered to be within the addressee's control; similarly, the closed interrogative *Do you have a cigarette?* is often used as an indirect request for a cigarette, and in this case the question about the addressee's possession of a cigarette is of secondary importance to the indirect request). Indirect speech acts have varying degrees of indirectness. Compare for instance the following: a teacher's *This classroom is a complete mess!*, uttered with the intention of directing her students to tidy up the mess (where there is a considerable discrepancy between the indirect directive meaning "Tidy up this mess" and the proposition directly expressed by the declarative "This classroom is a complete mess"); and a bank customer's *I'd like to request a list of your term deposit rates* (where the customer will be readily understood to have performed the illocutionary act of requesting the list in question, rather than merely wishing to do so, insofar as the wish is satisfied simply by the utterance of the words *I'd like*).

Indirect illocutionary force may be signaled in various ways. For instance, the exclamatory statement force of the interrogative *Gee, is he strong!* is reinforced by the non-propositional marker *gee* and by the likely selection of a falling intonation terminal, rather than the rising terminal typically associated with closed questions. Often used as an indicator of indirect illocutionary force is the conventional use of certain expressions, for example, the use of the modal *can* and the adverb *please* in a request such as *Can you pass the salt, please?*, where by contrast *Are you able to pass the salt?* is unlikely (unless there is actual doubt as to the addressee's ability to perform the desired activity).

8.3 A Semantic Level

In some grammatical accounts of clause type, it is suggested that a distinction between the three levels of syntax, semantics, and pragmatics can be consistently maintained. For instance, Quirk et al. (1985, p. 804) describe the four general illocutionary categories presented above (statements, questions, directives, and exclamative statements) as "semantic" classes, distinguishing them from the more specific "pragmatic" categories associated with each. Their justification is the possibility of mismatches occurring both between the semantic and pragmatic categories (what Quirk et al. define as indirect speech acts) and between the

syntactic and semantic categories. An example of the former is said to be *I think you'd better leave at once*—a (pragmatic) request made by a (semantic) statement rather than by a (semantic) directive; an example of the latter is *I'd love a cup of tea*—a (semantic) directive in the form of a (syntactic) declarative rather than in the form of a (syntactic) imperative. The problem with this, as pointed out by Huddleston (1988), is that both types of mismatch are standardly treated in the pragmatics literature as types of indirect speech act, and if there is no principled basis for distinguishing the two types of mismatch then neither is there for distinguishing the semantic and pragmatic levels. There is however one important qualification to be made here: as demonstrated by Huddleston (1994) it is necessary, in the case of interrogative clauses, to distinguish between these levels (which he does by invoking a distinction between the semantic concept of *question* and the pragmatic concept of *inquiry*: see Section 8.5 below).

8.4 Declaratives and Statements

Declarative is, as noted above, the unmarked clause type, with respect to which the other three syntactic classes can be defined in terms of their special properties. A declarative is typically used to make a statement, an utterance which expresses a proposition assessable as true or false. However, there are (as Huddleston 1984, p. 358 observes) at least three types of linguistic factor that may disrupt this correlation between declarative clause type and the illocutionary force of statement. First, when illocutionary verbs such as *forgive*, *promise*, *testify*, *offer*, and *congratulate* are used performatively, the statement force is relegated to secondary status. Thus, when the declarative clause *I congratulate you* is used by the speaker to congratulate the addressee, it has the primary illocutionary force of a congratulation rather than a statement (as reflected in the likelihood of its being reported as *You congratulated me* rather than *You said you congratulated me*). Second, rising intonation (or a question mark in writing) can be used to signal that a declarative is being used as a question rather than a statement (albeit a conducive question: *You've seen the Grand Canyon?* predisposes the speaker to accept a positive answer, whereas *Have you seen the Grand Canyon?* is neutral). That *You've seen the Grand Canyon?* is in fact syntactically declarative rather than interrogative is suggested by its resistance to non-affirmative items such as *ever* (**You've ever seen the Grand Canyon?*; compare *Have you ever seen the Grand Canyon?*). Third, a declarative can be endowed with indirect directive force by various additional means, such as the selection of a modal used deontically (e.g., *You will/must be here by five*), or an expression of the speaker's wishes (e.g., *I want you to accompany me*).

8.5 Interrogatives, Questions, and Inquiries

The distinguishing property of questions, as a semantic category, is their capacity to define a set of answers. For example, for the question *Did you enjoy it?* there are just two possible answers, one positive and one negative (each expressible in a variety of ways, but each of these understood to constitute the same answer: *I enjoyed it*; *I did*; *Yes*; *Yes I did*, etc.; versus *I did not enjoy it*; *I didn't*; *No*; *No I didn't*, etc.). Notice that it is possible to make a response to a question (where *response* is a pragmatic category) without providing an answer to it. For instance, if upon being asked *Did you enjoy it?* I reply *Maybe* or *It's none of your business*, then my response is one that fails to answer the question. Even a response such as *You know that I did* fails to qualify technically as an answer, because despite the fact that it entails *Yes* it is not logically equivalent to *Yes*.

Pragmatically, questions are prototypically associated with the illocutionary category of inquiry (as in the question *What's your name?* asked by a speaker who does not know the addressee's name and wants to know what it is). However, not all questions are used to make inquiries. For example, a teacher who asks her students *What was the name of Australia's first Prime Minister?* will presumably know the answer to the question and be seeking to test the students' knowledge. Or a question such as *Did they?*, prompted by the observation *They really enjoyed the concert*, is not used to make an inquiry (insofar as the answer has already been provided), but rather merely to provide an attentive response.

Questions may be cross-classified on a number of dimensions. The most widely known is that based on the different types of possible answers: between what are commonly called *yes/no-questions*, *alternative questions*, and *wh-questions*. The first two are normally expressed by closed interrogatives, the third by open interrogatives.

(i) Yes/no-questions (sometimes also referred to as *polar* questions) have two possible answers: positive and negative. The question itself provides the propositional content for one of the answers, while the other answer has the reverse polarity (e.g., Q: *Has he left?* A: *He has left* or *He hasn't left*; Q: *Hasn't he left?* A: *He hasn't left* or *He has left*).

(ii) Alternative questions have a set of alternatives as answers which can be derived directly from the question, the propositional content being logically equivalent to a disjunction of propositions. For example, the answers to the alternative question *Is his light on or off?*, namely *His light is on* and *His light is off*, correspond to each of the disjoined propositions in "His light is on or his light is off." More than two alternatives may be expressed: *Would you like tea, coffee, or neither?*
Syntactically, alternative questions are distinguished by the obligatory presence of *or* (which cannot be paired with *either*). Whereas yes/no-questions usually have the form of a (single) closed interrogative clause, alternative questions may have the form of one or more than one interrogative clause (e.g., *Is his light on or off?* versus *Is his light on or is it off?*).

Yes/no-questions are sometimes analyzed (e.g., by Karttunen 1977, p. 5) as being derived from alternative questions. However, while an alternative question such as *Is he coming or not?* may be logically equivalent to the yes/no-question *Is he coming?*, they differ in that the propositional content of both the positive and negative answers is expressed in the former, but not the latter. Furthermore, as noted by Huddleston (1994, p. 417), there are distributional differences involving embedding constructions (compare *I doubt whether he is coming* versus **I doubt whether he is coming or not*; **I'm going, whether he is coming* versus *I'm going, whether he is coming or not*). Pragmatically, too, alternative questions differ from yes/no-questions in foregrounding the exhaustiveness of the alternatives, in a way that may give rise to an emotive overlay of aggressiveness or impatience.

(iii) Wh-questions (sometimes also referred to as *special*, *open*, and *variable* questions) express a proposition containing a variable, the answer being arrived at by the substitution of a value for the variable. Thus, the propositional content of *What did she buy?* can be represented as "She bought x" and the answers are arrived at by supplying different values for the variable x: *She bought a dress*; *She bought a coat*; *She bought a hat*; etc. Wh-questions may be multivariable, as in *Who wants what?* and *Who gave what to whom?* (for a detailed account, see Comorovski 1996, who labels these *multiple constituent questions*).

Wh-questions have the form of an open interrogative clause in which a non-subject interrogative phrase is usually fronted, triggering subject–auxiliary inversion. There has been extensive discussion of this process in the generative literature, where it is generally referred

to as *wh-movement*. Among other things, it has been noted that there are restrictions on the application of *wh*-movement where the interrogative word originates from a position within an embedded clause: the embedded clause cannot, for instance, be a relative clause (compare *He noticed a woman who was painting something* and **What did he notice a woman who was painting?*). It is possible for an open interrogative clause to be reduced to the interrogative phrase alone (e.g., *A: We're going on a holiday. B: When?*), or the interrogative phrase plus a stranded preposition (e.g., *A: Loosen the nuts first. B: What with?*). Wh-questions may also be expressed in the form of infinitival open interrogatives, as in *When to prune your roses*.

Limitations of space here preclude detailed discussion of the range of additional question types in English which any comprehensive account must address (see, e.g., Quirk et al. 1985, pp. 810–816, 825–826; Ginzburg and Sag 2000; Huddleston and Pullum 2002, pp. 876–897). These include: *deliberative* questions (also known as *direction* questions), which differ from typical information-oriented questions in that answers to them have the force of directives rather than statements (e.g., *Shall we follow Rodney?*; *Where will I put it?*, the answers to which are *Follow Rodney*, and *Put it here*, etc.); *conducive* questions, which are biased toward one particular answer (e.g., *Doesn't he look handsome?* is biased toward the positive answer *He looks handsome*, unlike its neutral counterpart *Does he look handsome?*); *tag* questions, which are formed via reduction of a closed interrogative clause, and typically change both the polarity and illocutionary force of the utterance (e.g., *She's very tall, isn't she?*; *She isn't very tall, is she?*).

Let us, finally, revisit the issue of distinguishing three levels in the analysis of questions. It is immediately apparent that there cannot be an exact correspondence between the syntactic and semantic levels, insofar as we have identified two clause types—closed and open interrogatives—at the syntactic level, but three question types at the semantic level. One category involving a syntactic–semantic mismatch to which reference has already been made, is that of so-called *declarative questions* (i.e., yes/no-questions or alternative questions with declarative syntax where the question meaning is signaled via prosody or punctuation, as in *He has left?* and *You're physically unable to help, or you're simply feeling off color?*). Declarative questions are conducive (see above) in the sense that they are biased toward a positive answer when positive in form (e.g., *She has left?*), a negative answer when negative in form (e.g., *She hasn't left?*). Another, noted by Morgan (1978) and Huddleston (1994), is that of conventionalized expressions whose original question meaning has been lost in the process of developing a new force. For example, a salutation such as *How do you do* and a rebuke such as *How dare you interrupt me* no longer serve to define a set of answers in English: witness the unnaturalness of *I do well*; *I dare bravely*. Yet another category is the echo-question, a special type of construction—usually yes/no or wh—whose members are echoic in the sense that they are used to question whether the utterance is a representation of the stimulus. Normally they echo the actual wording of the stimulus, but as argued by Blakemore (1994)—contra Banfield (1982)—they may also echo the thoughts communicated, as in the following example from Blakemore (p. 203): *A: Echo questions aren't interrogatives. B: Echo questions aren't interrogatives? A: Not from a syntactic point of view*. Here B's echo question elicits a rejoinder from A which consists of a qualification of the thought communicated by A's original utterance. As we have already noted, echo-questions may be associated with any clause type. Consider the range of yes/no-echoes and wh-echoes in the following exchanges: *A: He invited Sally. B: He invited Sally/who?* [declarative]; *A: Did he invite Sally? B: Did he invite Sally/who?* [closed interrogative]; *A: Who invited Sally? B: Who invited Sally/who?* [open interrogative]; *A: Invite Sally! B: Invite Sally/who?* [imperative]; *A: How lucky Sally is! B: How lucky Sally/who is?* [exclamative]. In fact, the stimulus may (as noted by McCawley 1988, p. 722) be nonclausal, which is confirmation that this type of question is not related to clause type (e.g., *A: Good morning, Dear! B: Good morning who?*).

Non-isomorphism is also in evidence between the semantic and pragmatic levels. While questions are prototypically used with the illocutionary force of inquiries, as we have already noted exceptions are commonplace. A question may be used to indirectly convey, inter alia, a suggestion (e.g., *Why don't you take out a loan?*), a request (e.g., *Could I please borrow your car?*), an exclamatory statement (e.g., *Boy, is he clumsy!*), or an order (e.g., *Will you be quiet?*). Conversely, an inquiry may be conveyed indirectly by a statement (e.g., *I would like to know when the movie starts*), rather than directly by a question (e.g., *When does the movie start?*).

8.6 Imperatives and Directives

Whereas a statement—the illocutionary act characteristically performed by the utterance of a declarative clause—can be assessed as either true or false, a directive—the illocutionary act characteristically performed by the utterance of an imperative clause—cannot (for discussion of the problems associated with truth-conditional semantic accounts of imperatives, see Aarts 1989). Rather, the proposition expressed by an imperative clause represents a potential situation, one which may or may not be complied with (Davies 1986, p. 48). In much of the literature, especially the philosophical literature, the term *imperative* is used ambivalently to refer to both clause type and speech act (e.g., Hamblin 1987; Merin 1991). Contemporary reference grammarians (e.g., Quirk et al. 1985; Biber et al. 1999; Huddleston and Pullum 2002) are generally more careful to restrict *imperative* to clause type, and most use *directive* as a technical term covering a broad range of speech acts. These embrace a continuum extending from, at one end, acts for which there is a strong expectation of addressee-compliance (e.g., orders and commands, such as *Get your feet off the coffee table!* and *Surrender your weapons!*, which typically invoke institutionalized authority and may involve penalties for non-compliance) to, at the other end, those where the expectation is weaker (e.g., suggestions and recommendations, such as *Prune your roses in August* and *Have faith in your own abilities*, where compliance is understood to be in the addressee's interests). The set includes requests such as *Please give me a hand with the dishes* (which are like orders in deriving from the speaker's will, but unlike them in offering the addressee the option of not complying), instructions such as *Rotate the filter anti-clockwise* (where compliance will enable a certain goal to be achieved), invitations such as *Call me whenever you like* (where the future action is something that the addressee will not necessarily benefit from, but rather find pleasing), and permission-granting as in *Feel free to take photographs* (which involves the removal by the speaker of potential impediments to the action).

Directives may be conveyed indirectly. For example, interrogatives are commonly used to make requests, where an imperative might otherwise appear too blunt or impolite, especially between non-intimates. Typically the speaker will question the addressee's ability to perform the desired action (e.g., *Can you help me?*; *Would it be possible for you to arrive by 7pm?*), or the addressee's willingness to do so (e.g., *Would you mind helping me with the dishes?*). Declaratives can also have indirect directive force, the indirectness in many such cases not serving the interests of politeness (e.g., *You will/must stop that now*; *Trespassing is forbidden*).

Imperative clauses can be subclassified syntactically into two types: the central kind which Huddleston and Pullum (2002, p. 924) call *ordinary imperatives*; and those containing *let* (the special grammaticalized *let*, that is, which can only occur in imperatives of this type), which Huddleston and Pullum call *let-imperatives*, Davies (1986) the *let-construction*. We shall begin by discussing the properties of the major type which, for convenience, will be referred to simply as *imperatives*. These properties are generally considered to demarcate imperatives sharply from the other clause types (Culicover 1976, p. 152 describes the imperative as "an idiosyncratic construction in most languages," while for Schmerling 1982, p. 203, imperative clauses are "formally primitive relative to indicative clauses"). However, the case has been

made by some that imperatives have largely unexceptional syntax; for example, by Beukema and Coopmans (1989), working within a government-binding framework, and by Potsdam (1998) within the principles and parameters framework.

Although imperatives typically occur without a subject, they can normally be interpreted as if they had *you* as subject (as evidenced by the use of second-person reflexive pronouns, as in *Behave yourself/*you*, and the appearance of *you* in tags, as in *Behave, will you?*. If a subject is present it will be either *you* (as in *You behave yourself*) or a third-person subject representing the addressee(s) or a subset of the addressees (e.g., *Somebody answer that phone*; *Everyone whose surname begins with 'A' stand up*). In negative imperatives, the subject will follow *don't*, as in *Don't you be cheeky!*; *Don't anyone stop!*. When *you* is retained as subject in imperatives, the motivation is sometimes to signal a contrast, as in *You go this way and I'll go that way*, sometimes to provide an emotive reinforcement of the speaker's authority (e.g., *You watch your manners*; *You just rest your weary legs here*). The distinction between subject and vocative in imperatives, where both functions are optional and addressee-referential, is less pronounced than it is with declaratives. This is especially so in final position (e.g., *Clap your hands everyone*), where the prosodic separation normally associated with a clause-initial vocative may be less determinate.

A distinctive structural property of imperatives is the categorical requirement of the dummy auxiliary *do* in negatives (specifically, those where it is the verb that is negated; e.g., *Don't admit anything* rather than *Admit nothing*). *Do* is not, as it is in other clause types, mutually exclusive here with other auxiliaries (e.g., *Don't be browbeaten*; *Don't be eating when they arrive*). Similarly, in emphatic positive imperatives, *do* is required invariably, and not just in the absence of another auxiliary (e.g., *Do come along*).

Imperatives display a strong preference for dynamic verb phrases (VPs) (not surprisingly, in that directives prototypically seek some type of action from the addressee). However, it is certainly not the case, as some have claimed (e.g., Stockwell et al. 1973) that stative VPs are excluded altogether. As Davies (1986, p. 13) notes, while *Understand the answer* and *Hope it rains* sound odd, *Just understand this—I never meant to hurt you* and *Stop moaning and hope for the best* are fine. Davies suggests that the differences relate to the possibility of the state or event being within the addressee's control, noting that this criterion serves to explain the unacceptability of an imperative such as *Inherit a million*. A property of the imperative construction is its capacity to assign an agentive role to the subject where it would not have such a role in the corresponding declarative (e.g., *Sue is polite* describes a state, but *Be polite* enjoins the addressee to engage in a certain type of activity, the exercising of good manners). This property also appears in passive imperatives, where again the construction can assign to the (understood) subject an agentive role that it would not have in a comparable declarative, particularly in negatives (compare *Don't be caught* with *You weren't caught*).

There are some cases where the agentive interpretation normally associated with imperatives is blocked—or at least strongly diminished—by their conventional use as indirect speech acts. For example, *Have a nice holiday* and *Enjoy your meal* convey wishes rather than directives, insofar as having a nice holiday and enjoying a meal are situations that would not usually be considered as being under someone's control. Imperatives with a non-agentive interpretation are also found in coordinations such as *Annoy us again and you'll be in trouble*, where the imperative appearing as the first clause has a conditional implication ("If you annoy us again you'll be in trouble"). In fact, such clauses display a number of properties not conventionally associated with imperatives: ready tolerance of stative predicates (e.g., *Know the answer and you'll get an A*); compatibility with negative polarity items such as *any* and *ever* (e.g., *Say anything else and there'll be trouble*); the possibility of a non-second-person subject interpretation (e.g., *Call myself Lord Bowen-James and everyone thinks I'm putting on airs*); and the possibility of a past interpretation (e.g., *Take a holiday in those days and you would be roundly criticized*). Differences such as these have prompted some (e.g., Bolinger 1977) to propose that

such clauses be derived from conditional clauses. However, there are a number of problems with this suggestion, including the availability of conditional clauses for which there is no corresponding imperative (e.g., *If you are the owner of this dog you are in trouble*; compare **Be the owner of this dog*), and the use of *do* in the formation of verbal negatives (e.g., *Don't be on her doorstep with flowers every week and she gets moody*; compare *If you *don't be/aren't* ...).

A further distinctive grammatical feature of imperatives is their reliance on a quite different set of grammatical principles in the formation of interrogative tags than those that apply in the case of declarative (and exclamative) clauses. Sadock (1970) suggests that they should be treated as being derived by ellipsis from those interrogatives which convey an indirect directive force matching the direct force of the imperative, what he terms "whimperatives." For example, the most likely tags for the request *Give me a hand* would be the positive *will you?* and the negative *won't you?* (but further possibilities exist, including *could you?*, *would you?*, *can you?*, and *can't you?*). *Will you?* is construable as an elliptical version of *Will you give me a hand?* and *won't you?* of *Won't you give me a hand?* (both of which may have indirect request force). By contrast, a negative imperative such as *Don't spend too much money* will take only a positive tag (*will you?*), as we might predict from the availability of *Will you not spend too much money?* as a negative directive, but not of *Won't you spend too much money?*. The normal tag for *let's*-imperatives is *shall we?*, as in *Let's have a swim, shall we?*. Undoubtedly there is some truth in Schmerling's (1982, p. 214) claim that imperative tags are "frozen expressions," but the conventionalization is not absolute. As the discussion above suggests, the tag must at least be pragmatically compatible with the imperative clause: *must you?* and *should you?* are never possible (as noted by Bouton 1990).

Imperative clauses are further distinguishable from the other clause types by the unavailability of subordinate counterparts. The subordinate subjunctive clause in mandative constructions of the type *It is essential that you be there* has certain semantic affinities with main clause imperatives. However, as Huddleston (1984, p. 359) argues, apart from the occurrence of a base form as their first verb, these are grammatically quite different from (main clause) imperatives in that many have no imperative analog (as can readily be seen if we change the subjunctive clause in the last example into *that he be there* or *that there be consensus*: witness the unacceptability of **He be there* and **There be consensus*). A similar argument could be used to reject infinitival clauses as in *She told him to be there* as subordinate imperatives.

Our final topic in this section is *let*-imperatives, the term we are using for imperatives containing a grammatically and semantically specialized use of *let* that is distinguishable from its normal use with the meaning "allow." The latter may be used in ordinary second-person imperatives such us (*Somebody*) *please let us* (*come*) *in, won't you?* There are two types of *let*-imperative. In the first type exemplified by *Let's have a party*, *let* is always followed by *us*, which is usually contracted to *'s* and whose reference normally includes the addressee(s) as well as the speaker. These are called *let's constructions* by Clark (1993), and *first-person inclusive let-imperatives* by Huddleston and Pullum (2002). The second type normally has third-person reference, as in *Let there be light* and *Let that be a lesson to them*, but also allows first- and second-person reference, as in *Let me/us/you be punished for this terrible oversight*. These are called *let-constructions* by Clark (1993), and *open let-imperatives* by Huddleston and Pullum (2002). Collins (2004, p. 300) presents a constructed example, *Let us finish this race!,* that is three-ways ambiguous, each reading involving a different use of *let*. The interpretation "Allow us to finish this race, will you?" has *let* as a lexical verb (whose distribution is not limited to imperative clauses; compare *He always lets us finish*) used in an ordinary second-person imperative. The interpretation "Let's finish this race, shall we?" features the special, grammaticalized use of *let* found only in first person inclusive *let*-imperatives where it is followed by addressee-inclusive *us*. On the interpretation "I wish/hope that we may finish the race" we again have the special grammaticalized *let*, this time used with optative force in an open *let*-imperative, though more commonly followed by a noun phrase (NP) with third-person reference.

The contractibility of *us* in the first-person inclusive construction is grammatically distinctive: in no other English construction is *us* contractible. Opinions are divided as to whether *us/'s* should be analyzed as object (Huddleston and Pullum 2002, p. 934; Davies 1986, p. 242)—note for example that nominative *we* cannot replace *us* (**Let's we have a party*); or as subject (Quirk et al. 1985, p. 829; Potsdam 1998, p. 297)—note for example the appearance of *we* in the interrogative tags that may occur with this construction (*Let's have a party, shall we?*). The reference of *us/'s* may, particularly in informal contexts, not be first-person inclusive but rather second–person inclusive, as in Biber et al.'s (1999, p. 1117) example of a teacher saying to her class *Let's do it please*, or first-person exclusive, as in the example of Biber et al. of a medical specialist saying to his patient *Let's have a look at your tongue*. Manifestations of the first-person inclusive construction are subject to a good deal of dialectal variation, associated with the differing degrees of grammaticalization that *let* has undergone in the usage of various speakers. For example, many speakers allow sentences such as the following (the examples are from Potsdam 1998, p. 267): *Let's you and me be roommates next year*; *Let's US go instead*; *Let's us and them challenge the winners*; *Let's all of us go*; *Let's everyone try and behave*; *Let's no one forget to turn off the lights*. In these perhaps marginally standard examples, the contraction is obligatory and the NP following *let's* unambiguously the subject, suggesting that *let's* is a single word functioning simply as an imperative marker. A similar analysis for *let's* is suggested by the negative construction with *don't* following *let's*, as in *Let's don't forget* (which is fairly uncommon, and described as "esp. AmE" by Quirk et al. 1985, p. 830).

Let-imperatives of the second type are syntactically similar to ordinary imperatives, except that they do not allow an interrogative tag or the insertion of *you* as subject (*You don't let there be light, will you*). The main differences are pragmatic, the construction typically having an optative and/or hortatory force, calling for some future activity to occur but not necessarily seeking the compliance of any specific addressee(s) in effecting it (as exemplified by the possibility of having existential *there or* dummy *it* as the NP following *let*; e.g., *Let there be a re-trial*; *Let it be known that I will seek revenge*). Nevertheless, even pragmatically it is often difficult to draw the line between imperatives with causative *let* and those with hortatory/optative *let*, especially with conventionalized forms of expression which resist the kinds of syntactic manipulation (adding a tag, inserting *you*, etc.), which might facilitate classification. Consider for example *Let the games begin* and *Let "x" represent the first variable*. Here, even though *you* or a *will you* tag are not permitted, *let* conveys the sense "allow," serving as more than merely an illocutionary marker. And, even though there is no specific addressee, it is understood that the involvement of the addressee(s) is required.

8.7 Exclamatives and Exclamatory Statements

Exclamative clauses feature the fronting of a *wh*-phrase (more specifically, a *wh*-phrase with *how* or *what*, these being the only *wh*-items that can express degree), except when the *wh*-phrase is subject and therefore already in initial position (see further Siemund 2015). In this respect, exclamative clauses are structurally similar to open interrogatives, giving rise to the possibility of ambiguity in abstraction from relevant intonational or punctuational indicators (e.g., *What fun lies in store for us* meaning either "An exceptional amount of fun lies in store for us!" or "What is the amount of fun that lies in store for us?"). As in interrogatives, the *wh*-phrase in exclamatives can derive from a subordinate clause (e.g., *How stupid we thought he looked!*) and it can be a prepositional phrase (PP) (e.g., *For how long did she put up with his drunken behavior!*, though more commonly the preposition is stranded as in *How long did she put up with his drunken behavior for!*). A further similarity is the possibility of reduction to just the wh-phrase, as in *What a day!* and *How odd!*.

Like exclamative *how*, interrogative *how* can be used as a degree modifier. However its semantic role within open interrogative clauses is different from that of its exclamative counterpart: in the exclamative *How clever he is!* we understand that the degree of his cleverness is extraordinary; in the interrogative *How clever is he?* we understand that his cleverness is simply to be located at some point on a scale of cleverness (precisely where, the speaker anticipates, will be indicated in the answer). Exclamative *how* is distinctive in two further respects: unlike interrogative *how* it can modify another degree modifier (compare *How very clever he is!* with **How very clever is he?*). And as an adjunct expressing degree (e.g., *How they pursued him!*) it contrasts with interrogative *how*, which usually expresses manner (e.g., *How did they pursue him?*). Exclamative *what* and interrogative *what* are similar in their grammatical functions, as either head of an NP (e.g., *What he has achieved!*; *What has he achieved?*) or determiner (e.g., *What parties they throw!*; *What parties do they throw?*), but differ in that exclamative *what* is always concerned with degree, interrogative *what* with identity.

A significant grammatical difference between main clause exclamatives and open interrogatives is that subject–auxiliary inversion occurs obligatorily with the fronting of the wh-phrase in interrogatives, but typically not with that in exclamatives. When it does occur in exclamatives subject–auxiliary inversion tends to have a rhetorical or literary flavor, as in *How bitterly did he regret his decision!*, and structural ambiguity is possible ("How bitterly he regretted his decision!" versus "To what degree did he bitterly regret his decision? "). Ambiguity is perhaps even more likely in subordinate clauses, with the subject normally preceding the predicator in both open interrogatives and exclamatives, and the prosodic/punctuational differences that generally block one or the other reading in the case of main clauses here tending to be less salient or even absent. Thus, *He knows how slow the ferry is* is ambiguous, interpretable as either "He knows that the ferry is extraordinarily slow" or "He knows the answer to the question 'How slow is the ferry?'." There may even be, in some contexts, a pragmatic similarity between the two possible interpretations, making it difficult to determine which is the intended or most appropriate one. For instance, the indirect complaint force of *How many times have I had to save your skin!* relates on one reading to its question force as an interrogative at the direct level (albeit a rhetorical question, to which only an uncooperative addressee would be tempted to supply an answer), and on another to its exclamatory force as an exclamative at the direct level (the speaker's disapproval stemming from the assessment that the number of times the addressee has had to be assisted is extraordinary).

There is good deal of disagreement in the literature over the delimitation of the exclamative class. While there is consensus that sentences introduced by *what* and *how* such as *How handsome he is!* and *What a handsome man he is!* are exclamative clauses, some writers also accept sentences such as *Is syntax easy!* (e.g., McCawley 1973; Jacobson 1987), *It is such a nice day!* (e.g., Elliott 1974; Michaelis and Lambrecht 1996), and NPs such as *The things he eats!* (Zanuttini and Portner 2003). However, we shall argue that while these represent constructions which can convey similar illocutionary force to exclamative clauses, they can do so only indirectly, for it is only in "true" exclamatives that the exclamatory statement force has been grammaticalized.

Despite the exclamative force of *Is syntax easy!* (which McCawley 1973, labels an *exclamatory-inversion sentence*), syntactically it is a closed interrogative, and semantically a question (insofar as it has a set of possible answers, even though it differs from an inquiry in not inviting the addressee to supply any answer). According to McCawley, exclamatory-inversion sentences are distinguishable from ordinary yes/no-questions on a number of grounds, including their compatibility with interjections such as *boy* and *wow*, and their requirement of a definite subject (**Is something easy!*). However, as Huddleston (1993) observes, this merely suggests that not all yes/no-questions can be used to make exclamatory assertions (just as not all yes/no-questions can be used as directives; e.g., *Would you please sit down?* but not *Did they sit down?*).

As for declarative sentences with *such* and *so*, it is undeniable that there are grammatical parallels between these items and *what* and *how* (*What/Such a great holiday it was!*; *How/So much is not understood!*). However, *such* and *so* cannot be regarded as markers of the exclamative clause type insofar as they are not obligatorily clause-initial, and they can occur also in interrogatives (e.g., *Why is he such a bore?*) and imperatives (e.g., *Don't be so defensive!*). Furthermore, *It is such a nice day!* differs from a "true" exclamative in its ability to serve as complement to a non-factive verb such as *think* (*I think it's such a shame*; compare **I think what a shame it is*).

The things he eats! and *The money he spends on clothes!* are examples of what Huddleston and Pullum (2002, p. 923) refer to as *extraposable NPs*: they can appear in extraposed subject position after predicates such as *amazing*, as in *It's amazing the things he eats!*. As mere NPs they cannot, of course, represent a clause type. Furthermore, the extraposed-subject sentences with which they may be associated, which are treated by some (e.g., Michaelis and Lambrecht 1996) as exclamatives, differ from direct exclamatory statements in asserting rather than merely implicating the speaker's judgment (see further below for discussion of this implicature).

Consider finally the semantic and pragmatic properties of exclamatives. Exclamative clauses normally have the force of what Huddleston (1984, p. 374) calls an *exclamatory statement*, a statement overlaid by an emotive element (often reinforced by an interjection, as in: *Wow, what a loud band!*; *Gee, how fussy grandma is!*: see Collins 2005, p. 4). Compare for instance the exclamative *What a strong performance she gave!* with its declarative counterpart *She gave a strong performance*: the former is provided with an attitudinal component by the implicature that the performance is to be located at an extreme point on a scale. Semantically, there is a close semantic parallel with *She gave such a strong performance!*. But there is also a difference: the declarative sentence with *such* asserts, rather than presupposes, that "She gave a strong performance." Consequently, it could more readily serve as a response to a question such as *How was the concert?* (whereas *What a strong performance she gave!* would sound decidedly odd because of the presupposed status of the proposition that supplies the answer).

Exclamatives typically do not serve to advance a discourse informationally, but rather to express the speaker's affective stance or attitude toward some event or state of affairs. The event or state in question is expressed in the form of a presupposed open proposition, and thus is backgrounded as uncontroversial information by the speaker. That this is so is suggested, as Huddleston and Pullum (2002, p. 922) observe, by the use of interrogative tags with exclamatives. It is possible to have a reversed polarity acknowledgment-seeking tag (with falling intonation), as in *What a strong performance she gave, didn't she!*, where the acknowledgment relates not just to the proposition that she gave a strong performance but also to the attitudinal stance (that the strength of the performance was remarkable). However, a constant polarity tag would sound odd, as in *What a strong performance she gave, did she!*, because it would seek acknowledgment of the proposition, and incongruously so in view of its presupposed status.

The claim that the propositional component of exclamative clauses is backgrounded is supported by further evidence. For one thing, they are incompatible with "non-factive" verbs (compare *I recall what a strong performance she gave*; **I believe what a strong performance she gave*), a restriction referred to as *factivity* by Zanuttini and Portner (2003), who ascribe it to the presupposed open proposition expressed by exclamatives. For another, exclamative clauses are unable to serve as answers to questions, because the information which provides the answer to a question will normally be asserted rather than presupposed: *What a strong performance she gave!* is not an answer to the question *Did she give a strong performance?*

We have already mentioned the scalar implicature associated with exclamatives, the implicature that "the degree of the scalar property in question is unusually high," as

Michaelis and Lambert (1996, p. 384) put it. The value of the variable expressed by the exclamative phrase is not specified, but simply interpretable as extraordinary. Thus, *How smart he is!* implicates that the property of smartness denoted by the exclamative phrase lies at the extreme end of some contextually given scale, that it is greater than any alternatives that one might consider. In some cases, it may not be clear which end of the scale is relevant, as in *What a performance he gave!* It is from this scalar implicature that the affective stance associated with exclamative utterances derives. Some writers are uncautiously specific in describing this stance as, for example, one of "surprise" or "unexpectedness." As Zanuttini and Portner (2003, p. 54) observe, however, in exclaiming *What a delicious dinner you've made!* a speaker "doesn't mean to imply that he or she didn't expect a good dinner (…). Rather, the speaker implies that the tastiness of the dinner exceeds the range of possibilities previously under consideration, presumably something like the range of tastiness the speaker has experienced at other people's houses. It doesn't need to imply that the speaker expected anything less at this house."

8.8 Conclusion

We have seen that clause type in English is standardly treated as a four-term system, with each term associated with a characteristic illocutionary force. However, this correspondence may be overridden—in indirect speech acts—by a variety of factors, including prosody and the performative use of speech act verbs. The system of clause type raises challenging questions as to the relationship between syntax, semantics, and pragmatics. The syntactic category of interrogatives is argued to be distinguishable both from the semantic category of questions (classifiable on one important dimension into wh-questions, yes/no-questions, and alternative questions) and the pragmatic category of inquiries (embracing queries, suggestions, requests, and the like). Imperative clauses typically have directive force, but directives are also commonly conveyed by the other clause types (e.g., by an interrogative such as *Would you mind helping me?* or a declarative such as *You must not touch it*). A distinction is posited between ordinary imperatives and *let*-imperatives. One important consideration in the analysis of the latter is the varying degrees of grammaticalization that *let* has undergone with different English speakers. The delimitation of the exclamative clause type has been the subject of some disagreement. In this chapter, it is maintained that the class is limited to clauses introduced by an exclamative phrase with *what* or *how*, and excludes structures such as *Isn't syntax easy!* and *Syntax is so easy!*: only in the former is the illocutionary force of exclamatory statement grammaticalized.

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9 Complements and Adjuncts

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9.1 Introduction

The terms "complement" and "adjunct" appear to be fairly widespread in linguistics and language pedagogy. At first sight, the key difference between the two terms appears to revolve quite simply around the issue of obligatoriness. And yet, the actual difference between the two seems to be anything but clear. When we look at two major grammars of English, we see that Quirk et al. (1985) already mention that "adjuncts [...] closely resemble other sentence elements such as S[ubject], C[complement], and O[bject]" (Quirk et al. 1985, p. 504). More recently, Huddleston (2002 p. 219) points out that "[c]ore complements are generally more sharply differentiated from adjuncts than are non-core complements, and there is some uncertainty, and disagreement among grammarians, as to how much should be subsumed under the function of complement." What makes matters even more complicated is the fact that these two major grammars of English show different uses of the two terms.

While for Huddleston, (core) complements are more closely associated with the verb (Huddleston 2002, p. 219), Quirk et al. (1985, pp. 505–510) also include a number of obligatory structures associated, for example, with copular verbs as adjuncts. This terminological and conceptual mess relating to what appear to be key concepts warrants some detailed discussion.

The following two sections will therefore present the terminology and line of argumentation in chronological order, beginning with Quirk et al. (1985), followed by Huddleston (2002). On this basis, a third section will look at the complement–adjunct distinction from the perspective of linguistic gradience and fuzziness (Aarts 2007; Keizer 2004). This in turn is followed by a fourth and final section on the perspective of usage-based Construction Grammar, and an attempt to integrate the findings of linguistic gradience into a cognitively plausible, usage-based framework.

9.2 Quirk et al. (1985) on Complements and Adjuncts

9.2.1 Adjuncts

In their *A Comprehensive Grammar of the English Language*, Quirk et al. (1985) reserve the term adjunct primarily for particular adverbials (pp. 51–52), which, prima facie, might appear to be facultative. They argue, however, that some adverbials are indeed obligatory and complement the verb (which is why some grammars, but not Quirk et al., subsume them under the label of complements). The class of adverbials as a whole therefore "represent[s] a

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spectrum of types, the most central of which, because of their obligatoriness and relative immobility, resemble complements" (Quirk et al. 1985, p. 52). Sentence adverbials, at the opposite end of the spectrum of adverbials (since these are mostly non-obligatory), modify a whole sentence and are separated from the rest by an intonation boundary or comma. They can usually be classified as either conjuncts (with a connecting function), or disjuncts (i.e., comments on either form or function). Real adjuncts (and subjuncts), by contrast, are more closely integrated into the clause structure, tend to be obligatory, and give information such as time, place, manner, degree, etc. (Quirk et al. 1985, p. 52). These distinctions are illustrated by examples (1) to (4) below.

(1) And they would forget that they were **in the real world**. (COCA 2017, Spoken, NPR: Fresh Air)
(2) But**, nevertheless,** her point's well taken. (COCA 2017, Spoken, ABC: 20/20)
(3) **To the best of my knowledge,** the French have more than we do. (COCA, 2015, Spoken, CNN: State of the Union)
(4) Yeah. I expect he, you know they're **fairly** busy but (pause) you they may well. (BNC, spoken, D97, S_meeting)

Example (1) illustrates what Quirk et al. call a (core) adjunct. It serves as an adverbial indicator of place, it is fixed in its position (**And they would forget that in the real world they were*.), and it is obligatory in the sense that it is required by the verb for a complete, meaningful sentence (**And they would forget that they were*.). Example (2), in contrast, is classified as a conjunct as it links or conjoins the message in question to something previously mentioned (and establishes the contrast between the two). This element appears to be more flexible (*But her point's well taken, nevertheless*) and is non-obligatory (*But her point's well taken*.). Example (3) shows a disjunct, which is used to comment on the message as a whole. Again, this is non-obligatory and has a variable position in the sentence. Finally, example (4) illustrates the use of a subjunct. It does not show any of the grammatical features of adjuncts (see below), and adds a particular pragmatic viewpoint ("it is not an exaggeration to say" rather than "in a just and impartial way"; the latter illustrates an adjunct reading (Quirk et al. 1985, p. 567)). Note that both the conjunct and the disjunct are sentence adverbials in the sense that they both modify the whole clause or sentence. The adjunct and subjunct in (1) and (4) are more restricted and modify only subparts. Moreover, the conjunct and disjunct are obviously less tightly integrated, more flexible in terms of their position, and set off from the rest of the sentence by commas (or pauses). Only the core adjunct appears to be obligatory.

Adjuncts, in contrast to other adverbial functions, but not unlike other functions such as subject, complement, or object, may be the focus of an it-cleft, such as in (5), or may occur as contrasting elements as in (6) and (7).

(5) It was in **spite of himself**, and without realizing it, that he became a thought thief […] (COCA 1990, written, Marcel Marien, *Four Stories*)
(6) Did Hilda help Tony **because of his injury** or (did she help him) to please her mother? (Quirk et al. 1985, p. 504)
(7) Hilda didn't help Tony **because of his injury**, but (she helped him) to please her mother. (Quirk et al. 1985, p. 504)

These adjuncts, according to Quirk et al., come in three different categories. There are sentence adjuncts and predication adjuncts. The latter may be either obligatory or optional. The obligatory predication adjunct is the one that most closely resembles other syntactic functions such as object or complement, while the optional predication adjunct and the sentence adjunct are somewhat more loosely connected to the rest of the sentence. Examples (8) and (9) illustrate the difference between regular objects and obligatory adjuncts.

(8) Then he ate **the yolks**, but not the whites. (COCA, 2017, written, Practical Navigator)
(9) His father, Billy, lived **in Hawaii** until his family moved to Alaska in 1990. (COCA, 2017, written, LA Times)

It is fairly obvious that both (8) and (9) need the post-verbal element (*the yolks, in Hawaii*) for completion (unless, of course, one allows for a very general or elliptical reading: *Then he ate. His father lived*. This, however, appears to be a different reading of the verb and the utterance altogether). And yet, the relationship between the verb and the adjunct in (9) seems to be less tight than between verb and object in (8). For example, one can easily insert a prepositional phrase ("at that time") between verb and adjunct, but not between verb and object. Such an insertion appears to be more acceptable with (8) than with (9).

Quirk et al. also note that the obligatoriness of the adjunct seems to depend on the verb itself. Copular verbs such as *be* absolutely require either a complement (10) or an obligatory predication adjunct (11) for a felicitous utterance:

(10) John is a **committed vegan and a pretty good home cook**. (COCA, 2017, spoken, NPR: How I built this)
(11) John is **in his mid-40s**. (COCA, 1998, spoken, Ind: Geraldo)

Verbs such as *disappear* or *vanish*, on the other hand, do not always need complementation, as in example (12):

(12) He disappeared. He vanished. (COCA 2017, written, Detroit Free Press)

When the latter verb type combines with an adverbial, we find an example of what Quirk et al. (1985, p. 510) call an optional predication adjunct, as in (13):

(13) I kissed him **on the chin**. (COCA 2017, written, Reckoning Ruin)

It is clear in (13) that the adverbial as optional predication adjunct is optional and does not contribute essential information. It adds further details (here on the actual area of kissing), but it is not vital for a felicitous, context-independent utterance. Example (13) can also be used to contrast predication adjuncts from sentence adjuncts. Contrast (13) and (14).

(14) I kissed him **in PIRATES**! (COCA, 2004, written, Cosmopolitan—this is Keira Knightley talking about her role in *Pirates of the Caribbean*)

The semantic relationship between the verb and the adjunct in (13) is much closer than it is (14). *On the chin* in (13) describes the area that was kissed, while *in PIRATES* in (14) merely describes the occasion, but not the place that was kissed (without further contextual clues we may suspect it was the lips, the default place for kissing).

9.2.2 Complements

Quirk et al. (1985, p. 54) recognize two different types of complements, in contrast to objects: subject and object complements. While objects, both direct and indirect, are independent of the particular subject or object they occur with, complements are essentially bound to the subject or object they co-occur with. Consider (15) and (16).

(15) Unfortunately, Mary is **the only female of the group**. (COCA, 2017, written, Big Sheep).
(16) Now Hwa just considered him **a good listener**. (COCA, 2017, written, Company Town)

In both cases, the boldfaced complement is a necessary complement to another syntactic constituent. In (15) it qualifies the subject *Mary*, and in (16) it qualifies the indirect object *him*. In both sentences, complements and the part they qualify can be said to be co-referential. This is obviously not the case with regular objects, which are different from their subjects.

There is a very thin dividing line (if any) between certain adjuncts and similar complements. Compare (17) and (18), taken from Quirk et al. (1985, p. 55).

(17) He stayed **very quiet**.
(18) He stayed **in bed**.

Quirk et al. (1985, p. 55) say that *very quiet* in (17) is a subject complement, while *in bed* in (18) is an adjunct, occurring in an subject–verb-adjunct (SVA) pattern. The difference appears to be a subtle, semantic one. Adjuncts, prototypically realized as prepositional phrases, function as adverbials and give information on the action, regarding time, space, reason, manner, and the like, while complements add information on the quality of subject (or object, in the case of object complements). Needless to say, this line of distinction is very thin. Only compare (19) and (20):

(19) He stayed **very quiet**.
(20) He cried **very loudly**.

Example (19) illustrates a complement (*He is quiet*), while (20) illustrated an adjunct (*He was crying in a loud way, the act of crying was loud*). This, obviously, may lead to some confusion and actual fuzziness (see below). The gist should be clear, though. Nevertheless, even Quirk et al. (1985, p. 56) admit that the actual distinction can be very difficult, as (21) and (22) show.

(21) She is **without a job**. (Quirk et al. 1985, p. 56)
(22) She is **unemployed**.

We might say that *without a job* and *unemployed* are perfectly synonymous phrases. And yet, Quirk et al. claim there is a difference in terms of form. They classify the prepositional phrase *without a job* in (21) as an adjunct, while the adjective in (22) serves as a subject complement. The difference is not so much one of semantics, but rather of syntax, where the prepositional phrase in (21) exemplifies an adjunct, and the adjective phrase in (22) a complement. Ultimately, for Quirk et al. (1985), the distinction seems to rest on a complex combination of semantic and syntactic factors.

9.3 Huddleston (2002) on Complements and Adjuncts

In Huddleston (2002), we also find a detailed treatment of adjuncts and complements, albeit from a slightly different perspective. Like Quirk et al., he claims that complements "are more closely related [in their morphosyntactic behavior, AB] to the verb than adjuncts" (2002, p. 219). This is more clearly visible in what he terms "core complements" versus adjuncts than in "non-core complements." Especially for the latter group, we find some dispute as to what counts as a complement and what does not. In order to clarify and offer practical advice, Huddleston (2002) lists five syntactic and three semantic criteria that need to be considered. Note that Huddleston only implicitly says something regarding the specific value, importance, or ranking of these criteria. The first criterion, licensing, is regarded as "the most important property of complements in clause structure" (2002, p. 219), obligatoriness is seen

as "a second important property" (2002, p. 221). If and to what extent these ideas can be couched in some ranking in the spirit of Optimality Theory would be interesting to explore but goes beyond the scope of this paper.

9.3.1 Licensing

Complements need to be licensed by their respective verbs. Verbs come in different subcategories according to their transitivity (intransitive, monotransitive, ditransitive, complex transitive), which in turn license (or allow for) different numbers and kinds of elements. The verb *sleep*, for example, does not need any kind of object for a felicitous utterance, while the verb *resemble* usually does. Note that verbs often come in two or more subcategorization frames, such as *bake* in (23) and (24).

(23) We **baked a cake**. (COCA, 1999, written, Inner Harbor)
(24) I even **baked her a cake**. (COCA, 2016, written, Survivors)

In (23), the verb *bake* is obviously monotransitive, since it only takes one (direct) object, while in (24) it occurs in a ditransitive frame with a direct object (*a cake*) and an indirect object (*her*). Also note that complementation may involve noun phrase (NP) complements (25), prepositional phrase complements (26), and even clausal complements (27).

(25) It's hard to **think thoughts**. (COCA, 2016, spoken, NPR_ Fresh Air)
(26) **Think of Renaissance paintings of the Annunciation** … (COCA, 2017, written, Ethics and the Environment)
(27) I am optimistic enough to **think that everything can be smoothed out**. (COCA, 2017, written, Journal of American Folklore)

The essential point is that with complements verbs license the exact type of preposition or clause, making these irreplaceable by others. Compare (28) and (29):

(28) He **gave it to Pat**. (Huddleston 2002, p. 220)
(29) He **threw it to/towards/past Pat**. (Huddleston 2002, p. 220)

In (28), there is only one possible preposition, and the prepositional phrase is licensed by the verb, whereas in (29) there are a couple of options, making the prepositional phrase in (29) more adjunct like.

9.3.2 Obligatoriness

According to Huddleston, complements are "sometimes obligatory, whereas adjuncts are always optional" (2002, p. 221). Licensing is about allowing certain kinds of complementation. Obligatoriness is about requiring them. Note that this is one of the points where we seem to find crucial differences between the analyses of Quirk et al. (1985) and Huddleston (2002). For Huddleston, even prepositional phrases signifying location or time are complements when they follow a form of *be* as in (30) or (31):

(30) Jill is **in her study**. (Huddleston 2002, p. 222)
(31) The meeting was **on Monday**. (Huddleston 2002, p. 222)

As the prepositional phrases in (30) and (31) are obligatory, Huddleston treats them as complements, in contrast to optional prepositional phrases as in (32) and (33).

(32) Jill signed it **in her study**. (Huddleston 2002, p. 222)
(33) We signed it **on Monday**. (Huddleston 2002, p. 222)

For Quirk et al. (1985), all of these prepositional phrases, both the one in (30) and (31) as well as those in (32) and (33), would be adjuncts since they signify adverbial qualities of time, space, manner, etc. Also remember that Quirk et al. explicitly allow for obligatory adjuncts. For them, the notion of complements in this case would only cover co-referential noun phrase subject complements, as in (15) above.

9.3.3 Anaphora

One of the litmus tests for complements is their co-occurrence with anaphora. Compare (34) and (35).

(34) Soon after BMG began **restructuring its businesses**, some of its rivals did so too. (COCA 2003, written, Fortune)

Here, the anaphor *did so too* can only be taken to mean "began restructuring their businesses", that is, as referring to both the verb and all its complements.

(35) Jill washes her car **in the garage**, but Pam does so **in the road**. (Huddleston 2002, p. 223)

Here, the anaphor is co-referential with only parts of the preceding verb phrase, namely *washes her car*. The prepositional phrase *in the garage* is not a core part of the verb phrase; it is an adjunct and not a complement, which is why it can be replaced in the anaphor with another prepositional phrase. This is not possible with complements, as (36) shows.

(36) *Jill keeps her car **in the garage**, but Pam does so **in the road**. (Huddleston 2002, p. 223)

Here, *in the garage* is an obligatory core part of the verb phrase; it is a complement, and therefore cannot be replaced in the anaphor. Note again that Quirk et al. come to a different conclusion since the prepositional phrase *in the garage* functions as an adverbial of place and is therefore an (obligatory) adjunct for them.

9.3.4 Category

Huddleston (2002, p. 223) acknowledges that in the ideal, prototypical cases complements materialize as noun phrases, and adjuncts as adverbs or adverb phrases. However, they also claim and show that in their analysis this need not always be the case. Just as noun phrases can have the function of optional time adverbials, which makes them adjuncts, as in (37), adverbial and prepositional phrases may also be obligatory, despite their semantic function, and thus must be classified as complements, as in (38) and (39).

(37) Kelly Preston. I went and saw her **this morning**. (COCA 2008, spoken, NBC_today)
(38) I don't want to say they treated us **badly**, because they didn't … (COCA 2017, written A.V. Club)
(39) 1. Get a bikini. 2. Put it **on your body**. (COCA 2017, written USA TODAY)

9.3.5 Position

Just as Quirk et al., Huddleston (2002, p. 225) also notes that the "fixedness" or position of the element in question plays a role. Complements appear to be more fixed in their position than adjuncts and may only be moved under very specific (pragmatic) conditions.

Consider again example (9), repeated here for ease of exposition as (40a), and the fronted counterpart in (40b)

(40a) His father, Billy, lived **in Hawaii** until his family moved to Alaska in 1990. (COCA, 2017, written, LA Times)
(40b) **In Hawaii** lived his father, Billy, until his family moved to Alaska in 1990.

The "basic position" (Huddleston 2002, p. 225) for the complement *in Hawaii* is following the verb *live* as in (40a). It can only be fronted as in (40b) in particular pragmatic or discourse conditions. (40a), but not (40b), is the natural answer to the question "Where did his father live?" (40b) is the natural answer to a question such as "Who lived in Hawaii? His father or his uncle?" Also, it appears that no other complement may be inserted between the verb and the complement. Thus, complements tend to show more restrictions and constraints regarding their position in the sentence than adjuncts. An adjunct such as *fortunately* is most flexible with regard to its position, and prepositional phrases as adjuncts seem to have a basic position (e.g., *We played tennis in the afternoon*), but the non-basic position is less marked and more common than with complements (*In the afternoon we played tennis*).

Having discussed the five syntactic criteria—licensing, obligatoriness, anaphora, category, and position—we will now turn to three semantic criteria outlined by Huddleston (2002): argumenthood, selection, and role.

9.3.6 Argumenthood

Prototypically, complements are arguments of the verb in the sense that they express entities crucially involved in whatever is expressed by the predicate. In (41), we have the predicate *eat* with two arguments, that is, two entities crucially involved in the act of eating, the subject/agent *he* and the object/theme *lunch*. These are the complements. The prepositional phrase *at his desk* is not a necessary, crucial argument, but only adds extra, circumstantial information. Syntactically speaking, it can thus be characterized as an adjunct.

(41) He eats lunch **at his desk**. (COCA, 2003, written, Fortune)

Huddleston (2002, p. 226) adds that this criterion is complicated by the fact that some complements in English syntax, dummies, do not correspond to semantic arguments. One example is given in (42).

(42) Only one of them made **it** to Quinn's jail. (COCA, 2017, written, House Blazes)

The *it* in (42) is a complement by the criteria mentioned so far (it is a licensed, obligatory, fixed noun phrase), yet, it is not a semantic argument of the verb *make*, in contrast to (43).

(43) In the meantime, she had to make a phone call. Probably should have made **it** last night. (COCA, 2009, written, Alpha Wolf)

The *it* in (42) is a semantic dummy, the *it* in (43), however, is co-referential with the preceding noun phrase *a phone call*. Note that it is also a complement by the criteria listed above plus it is also a regular argument of *make*.

A similar problem arises in so-called raised complements, that is, when an argument is raised out of its original position in the clause to a higher-level matrix clause, as in (44).

(44) President Nixon himself seems to have suffered from that confusion. (COCA 2917, written, Stanford Law Review)

President Nixon is actually an argument of its original embedded clause (*President Nixon suffered from that confusion*), but was raised out of this position into the matrix clause. It is now a complement of the verb *seems*, but not its semantic argument. It can, for example, be easily replaced by a dummy pronoun (*It seems that President Nixon himself suffered from that confusion*)—and dummy pronouns cannot be arguments.

9.3.7 Selection

Semantic predicates, usually verbs, typically also impose certain restrictions on the kinds of arguments (and hence complements) they occur with. Certain predicates require animate (volitional) subject-agents, while others require inanimate object-patients, and the like. This is obviously not the case with optional adjuncts that "only" give circumstantial information.

9.3.8 Role

Verbs not only select the kind of arguments they go with, but they also assign certain semantic roles to these arguments. The verb *kill* needs an agent (the killer) and a patient (the killed). These are, typically, the complements. Anything beyond that is additional, circumstantial information (where, how, when?) and can usually be considered as an optional adjunct. Again, we see that the verb ultimately decides what is a complement in a given sentence and what is an adjunct.

We may now broadly summarize the two approaches by Quirk et al. (1985) and Huddleston (2002) in Table 9.1.

Table 9.1 clearly shows that the approaches of the two major grammars of English show indeed some overlap, but that they are also incompatible and contradictory in other places. Concepts such as "obligatory predication adjunct" cause a lot of confusion here. For this reason, the following section will offer a basically compatible and yet different viewpoint, namely that of linguistic gradience or fuzziness. The analysis of linguistic fuzziness and gradience often begins with the criteria outlined in traditional grammars, but rather than treating these as binary black or white factors, fuzziness also allows for some grey middle ground between the two extremes or prototypes.

Table 9.1 Complements and adjuncts in Quirk et al. (1985) and Huddleston (2002).

	Adjuncts	*Complements*
Quirk et al. (1985)	Adverbials only (obligatory and optional)	Only obligatory subject and object complements (noun phrases and adjective phrases) in "copular" structures
Huddleston (2002)	Always optional More flexible	Need to be licensed by the verb Sometimes optional Irrespective of phrase type category "Do so too" test Syntactically more fixed Prototypically arguments

9.4 Linguistic Fuzziness and a Constructional Perspective

The aforementioned analyses and tests are obviously not without problems, and sometimes even contradictory. It is not without reason that the complement–adjunct distinction has provoked so much controversy in contemporary linguistics. In the following sections, I will first present an analysis that brings linguistic fuzziness or gradience into the picture. This will provide a starting point for the discussion of complements and adjuncts from the perspective of Construction Grammar.

9.4.1 Complements, Adjuncts, and Linguistic Gradience

Syntactic gradience (Aarts 2007) or "fuzzy grammar" (Aarts et al. 2004) acknowledges that in syntax and syntactic categories we may encounter phenomena which resist traditional clear-cut differentiations and binary oppositions. Rather, problems such as the infamous nouniness squish (Ross 2004) suggest that there is something like systematic grammatical indeterminacy, vagueness, or "fuzziness."

Aarts (2007) generally distinguishes between intersective and subsective gradience. While the former refers to gradience between distinct categories (e.g., nouns and verbs), the latter refers to gradience within a particular category (e.g., better or worse examples of adjectives). Obviously, the question of adjuncts and complements would fall into the domain of intersectional gradience, that is, gradience (or fuzziness) between categories. Aarts (2007, pp. 186–187) explicitly talks about complements and adjuncts as an example of "intersective constructional gradience" (roughly: strings of words with two or more different roles in grammar) and points out that even in apparently simple sentences such as (45), we find some disconcerting phenomena.

(45) She lives **in London**. (Aarts 2007, p. 186)

From what has been discussed so far, it appears that *in London* would clearly qualify as a complement in Huddleston's (2002) sense. It is obligatory, licensed by the verb, and more or less fixed in terms of position. And yet, contrary to prototypical complements, it allows for the insertion of a cognate object, as in (46).

(46) She lives her life **in London**. (Aarts 2007, p. 186)

Usually, complements would not allow that sort of intrusion (see above). Even worse, the insertion of the cognate object NP makes the prepositional phrase even more facultative and circumstantial, and thus adjunct-like. In a nutshell, Aarts (2007) suggests that instead of a clear-cut dichotomy, we should treat adjuncts and complements rather as being on a gradient scale, with clear-cut boundaries (prototypes) at the edges and undetermined and debatable fuzziness for the middle ground.

Table 9.2 below illustrates what such a gradient might look like. It shows a prototypical complement construction (*Mary is a firefighter*) on the left, and a prototypical adjunct construction (*We ate pizza last night*) on the right. In between you see some examples that can be found on the gradient between the two prototypes, since they do not fulfill all necessary criteria for the prototype categories, or because their status is (semantically, pragmatically) debatable. This is also shown in Table 9.3, where all the example sentences are checked with regard to Huddleston's five syntactic and three semantic criteria (outlined above). A checkmark means that the construction meets the criterion and makes the example more complement-like. A checkmark in brackets means that the criterion is debatable in this case.

Table 9.2 Complement–adjunct gradient illustrated.

Complement							*Adjunct*
Mary is **a firefighter**. (A)	She read **the report**. (B)	They made **it** home. (C)	It's hard to think **thoughts**. (D)	John talked **to Bill**. (E)	Jill washes her car **in the garage**. (F)	He threw it **towards/past/to Pat**. (G)	We ate pizza **last night**. (H)

Table 9.3 The complement–adjunct gradient scale arranged by syntactic and semantic criteria.

	Lic.	*Oblig.*	*Anaph.*	*Cat.*	*Pos.*	*Argum.*	*Select*	*Role*	*Score*
A	X	X	X	X	X	X	X	X	7
B	X	X	X	X	X	X	X	(X)	6
C	X	X	X	X	X			(X)	5
D	(X)	(X)	(X)	X	X	X	X	X	5
E	X		(X)		X	X		X	4
F	(X)				X				1
G		(X)	(X)		X			(X)	1
H									0

The more criteria are clearly met, the higher the score, the more complement like a given construction. Needless to say, the arrangement presented here is only a first approximation to the problem and merely serves as illustration. Nevertheless, it shows that concrete utterances can actually be arranged according to certain criteria in a specific order. This helps to elegantly and empirically capture the apparent fuzziness between the two prototypes. What we end up with, however, is the sorites paradox that lies at the heart of all fuzziness: when does a pile of individual sand grains form a heap? Where is the ultimate cut-off point for complements and/or for adjuncts on such a list? And do we need such a cut-off point? This is a question that cannot be discussed at this point (but see, e.g., Aarts 2007, for a comprehensive treatment).

In a similar vein, Keizer (2004) argues that because the distinction between complements and adjuncts (modifiers) is due to the cognitive activation status of the concepts invoked. It follows that the distinction between the syntactic categories cannot be binary, but must be gradient. Consequently, she argues for a cognitive approach that implies schema-theory prototypes and activation networks (cf. Iran-Nejad and Winsler 2000).

9.4.2 Adjuncts and Complements in Construction Grammar

In this paper, I would like to take this idea one step further and suggest that such an approach might be usage-based Construction Grammar (see Hoffmann and Trousdale 2013; Goldberg 2006). It seems clear that traditional approaches to grammar are having a hard time with their attempts to come up with a clear-cut and straightforward distinction between complements and adjuncts, and that fuzziness or gradience is hard if not impossible to capture in most traditional frameworks (see Aarts 2007). Construction Grammar (henceforth CxG) might offer some interesting alternatives.

9.4.3 Key Ideas of Construction Grammar

Instead of describing language as a system with "words and rules" (e.g., Pinker 1999; Boeckx 2010), CxG assumes that language, and knowledge of language, consists of a structured inventory of constructions, described as form–meaning pairings at various levels of granularity and abstractness. So, constructions can range from concrete to abstract. The word *house* is a simple, concrete construction, while the word class 'noun' is a simple, abstract construction. Similarly, constructions can either be simple (such as 'noun') or complex, for example, idioms

such as *will cross that bridge when we come it* or abstract complex constructions such as the ditransitive. Complex constructions may have one or more variable slots that need to be filled with appropriate material (e.g., the subject slot in *cross that bridge when we come to it* > ***We*** *will cross that bridge when we come to it*). Constructions are prototypically characterized by their non-compositionality, that is, their meaning cannot be seen just by looking at their parts. *We will cross that bridge when we come to it*, for example, has nothing to do with bridges! Alternatively, as Goldberg and Jackendoff (2004) suggest, forms may also be stored as constructions if they occur with "sufficient frequency" (Goldberg 2006, p. 5) even when they are fully compositional. The structured inventory of constructions is sometimes referred to as the "constructicon" (see Lyngfelt 2018). This can be imagined not unlike the traditional mental lexicon. However, in contrast to the mental lexicon, the constructicon not only contains words, but all the constructions a given speaker/hearer is familiar with, both simple and complex as well as concrete and abstract. These are connected to each other ("un système oú tout se tient" [a system in which everything holds together/is connected], see Koerner 1997) through various types of links (cf. Boas 2013). These links may connect them horizontally to related (sister, cousin…) constructions, but also vertically to mother and daughter nodes. Links between constructions may be based on the form side, meaning side, or both (cf. Bergs 2010). Traugott (2007, 2008) termed these relations microconstructions, mesoconstructions, and macroconstructions. The bottom level of this hierarchy is formed by types of constructions, so-called microconstructions. These cluster together on the basis of form, meaning/function, or both, into higher-level, more abstract units, so-called mesoconstructions. These in turn can also cluster together, mostly on the basis of function, into macroconstructions, the highest and most abstract level of this hierarchy. In the following sections, the complement–adjunct distinction will be couched in these Construction Grammar terms.

9.4.4 Complements and Adjuncts in CxG

Hoffmann (2005, 2007) was probably among the first to suggest that the strict, binary dichotomy and the problems related to this might be solved with a constructional analysis.

In his study, he shows that we can distinguish between two basic types of constructions: obligatory prepositional phrases and optional prepositional phrases. Both constructions again are realized by three different subtypes, which are characterized by different degrees of schematicity.

Let us begin with obligatory prepositional phrases. Hoffmann demonstrates that there seem to be three different subtypes of this general construction. First, there are the traditional obligatory complements associated with "copular verbs," as in (11), repeated here as (47):

(47) John is **in his mid-40s**. (COCA, 1998, spoken, Ind: Geraldo)

Note that Quirk et al. (1985) classify this as an obligatory predication adjunct, while Huddleston (2002) would call it a (subject) complement. In any case, it seems obvious that "copular verbs" such as *be*, *seem*, or *live* require an obligatory element ("complement") for a felicitous sentence. Second, we also see obligatory elements where the verb subcategorizes for one particular kind of prepositional complement, for example, as in *rely on* NP. Third, there is a group where the verb requires complementation, but does not necessarily specify the exact type, for example, as in *put something in/over/on/under* NP.

The same kind of analysis can be carried out for apparently optional prepositional phrases. Note that this is the category that seems to cause some confusion in traditional approaches: while adjuncts are usually seen as optional, complements may be either optional or obligatory. Hence, it is sometimes hard to distinguish optional complements and adjuncts. Like with obligatory prepositional phrases, Hoffmann (2007) suggests that we find three subtypes in this

category. First, there is a group of verbs plus prepositions in which the prepositional phrase may be optional, yet the verb clearly requires a particular preposition for certain readings. There is, for example, a huge difference between *talk to John* and *talk about John*, or between *work at the store* and *work for Mary*. First, we need to see that none of these prepositional phrases are, strictly speaking, necessary. (48) is just one example of the verb *talk* without any additional elements.

(48) Jessica held his hand while he talked. (COCA, 2017, written, Conjoined)

But the majority of occurrences of *talk* is with some kind of modification. The kind of preposition matters just as the verb itself does: "[t]he choice of the preposition is not arbitrary, nor is its content sufficient to identify the role [the thematic role of the complement] by itself" (Huddleston 2002, p. 228). If you *talk at somebody* the subject is the active agent, while the object is a passive recipient of what the subject agent is saying. If you *talk to somebody*, both subject and object are somehow active in the communication. If you *talk about somebody*, then there is a third party involved, the one you talk to (not specified here) and the one you talk about (as a theme). This kind of information needs to be explicitly stored in the construction itself, together with the individual forms. These modifiers are also the most complement-like.

On the other end of the scale, we find what Quirk et al. (1985) termed sentence adjuncts. They show the weakest connection to the verb itself, but rather modify the whole sentence or action. (49) is one example.

(49) **In Austin**, most people are familiar with Fredericksburg peaches. (COCA, 2015, written Austin)

It is easy to see that *in Austin* is optional, flexible in terms of position, and only gives additional locative information not required by the verb in any sense. Note that this is not inherent in the preposition or prepositional phrase. In *She lived in Austin*, the prepositional phrase also gives locative information but is required for a meaningful reading.

The third group Hoffmann terms "mixed," since it comprises elements with very complex syntactic behavior and features. On the one hand, and in contrast to the first group, their prepositions alone seem to determine the thematic role of their construction. In (50), the prepositional phrase *with his friend* is optional and the preposition in no way dependent on the verb itself. On the other hand, the prepositional phrase has a more fixed position than the one in (51). *With his friend Peter committed a crime* appears to be less natural than *On Saturday Peter committed a crime*.

(50) Peter committed a crime **with his friend**.
(51) Peter committed a crime **on Saturday**.

Moreover, Hoffmann (2007) also suggests the "And this happened…" and "does so too" tests in order to check whether the prepositional phrase is tightly integrated into the structure or not. Compare (52) and (53) as well as (54) and (55), adapted from Hoffmann (2007):

(52) *?Peter committed a crime. This happened with his friend.
(53) Peter committed a crime. This happened on Saturday.
(54) Jill washes her car in the garage, but Mary does so in the road.
(55) *Paul ran to the church, but Peter did so to the store.

It becomes clear that *with his friend* in (52) cannot be easily moved out of the construction, while *on Saturday* can. This in turn means that the prepositional phrase in (50) does not

modify the event as a whole. Rather, the whole prepositional phrase is modified by (and in turn modifies) the event. The event itself is somehow affected by the circumstances described in the prepositional phrase (cf. examples (13) and (14) above, where *on the chin* is the directly affected area and therefore cannot be taken out of the construction in a "this happened" test, while *in PIRATES* is not affected and can be put into a separate "this happened" structure). Similarly, in (54) the prepositional phrase does not seem to be integrated into the verb phrase, but rather modifies the action or event as a whole, whereas in (55) the prepositional phrase is more closely integrated and expresses the goal/source of the action. This means that, as a proform, it cannot successfully substitute parts of the construction.

According to Hoffmann (2007), passivization is often seen as another problem in discussing the status of verb–preposition constructions. While some structures can easily be passivized (e.g., *This bed has been slept in*), others cannot (**This church was run to*). Even the same prepositional phrase sometimes can be passivized, sometimes not (*This house has been lived in* versus **New York has been lived in*). This is partly due to the element being affected by the action or not, as in (50)–(54) above. He suggests that the simplest and most plausible solution to this complex problem is to assume an abstract prepositional passive construction, which has certain selectional restrictions as part of its specifications and thus allows certain structures to unify, but not others.

On the basis of Hoffmann (2007), we ultimately arrive at the following constructional analysis (see Figure 9.1 below). At the microlevel, we find at least six different groups of

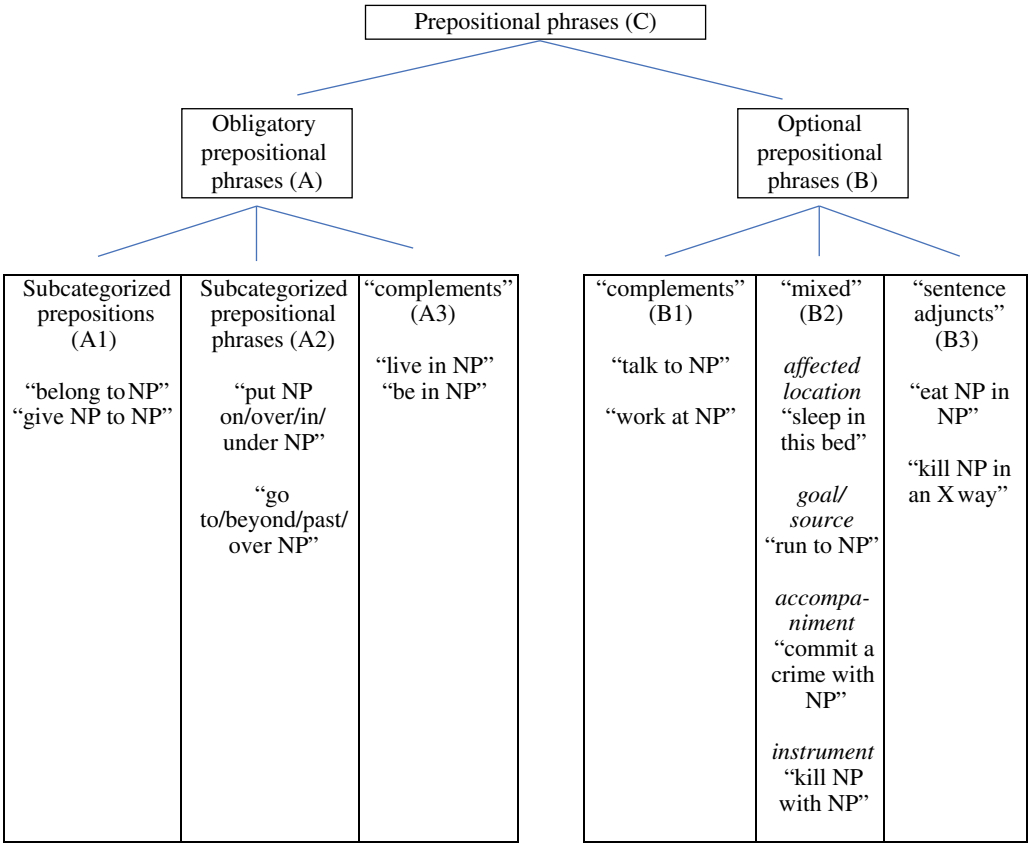

Figure 9.1 A network of adjunct/complement constructions, based on Hoffmann (2007).

microconstructions. These include obligatory prepositional phrases with particular subcategorized prepositions (A1), subcategorized prepositional phrase types (A2), and complements (A3). These together form the mesoconstruction "obligatory prepositional phrases" (A). Then we also find three optional prepositional phrase types at the microlevel: "complements" with tightly integrated required prepositions (B1), "mixed" constructions with affected locations, or closely integrated goal/source themes, instruments, etc. (B2), and finally "sentence adjuncts" with no integration into the verb phrase (VP) and only a very lose semantic relation to the predicate itself (B3). These three microconstruction types also form a mesoconstruction, "optional prepositional phrases" (B). In a third and final step, one might speculate now if and in how far these two mesoconstructions (A) and (B) again can be lumped together on the basis of form into a macroconstruction "prepositional phrase" (C). The obvious problem is that this would be a highly abstract construction with hardly any unified meaning/function or features. On the other hand, the structural similarities of all these constructions might warrant such a category. This paper, however, is not the right place to make that this decision, so we will leave this to future research.

Instead of drawing a universal binary dividing line between complements and adjuncts (which proved to be problematic), this approach suggests that every microconstruction specifies in its own entry the kind of modification pattern it needs and allows. This ranges from very specific, concrete cases (A1, B1) to more flexible, more schematic patterns (A2) to completely underspecified constructions (B3). Furthermore, we can also treat other constructions, such as traditional noun phrase subject complements (*John is a carpenter*) and noun phrase object complements (*I considered John a friend*), as related to the network discussed in Figure 9.1 (qua links) and yet distinct from the prepositional phrase constructions presented here.

This approach is capable of capturing both the sometimes very subtle and complex differences and similarities between particular constructions while at the same time allowing for broader generalizations across specific types of constructions. These generalizations are developed in an empirical, bottom-up way, so as not to dub over particular idiosyncrasies of single constructions. Furthermore, since a usage-based constructional model also aims at psychological or cognitive plausibility, the ideas advanced by Keizer (2004), namely that the complement–adjunct distinction needs to be couched in a framework that encapsulates schema-theory, prototypes, and activation networks, are perfectly compatible with what has been described so far.

At least in usage-based CxG it is assumed that constructions arise and develop in and through actual language use, that is, they are influenced by type and token frequency or prototype effects (Goldberg 2006; Bybee 2013). If we assume that there are prepositional constructions as sketched above, these should also be subject to these effects. In other words, we would expect to find high-frequency individual tokens of particular constructions (e.g., *put* sth. *onto* sth., *live in* NP or *talk to*) which serve as prototypes for particular constructional groups (e.g., A2, A3, or B1). In future research, an empirical corpus study on collocational patterns would have to test this. Keizer (2004) explicitly mentions schema-theory (Anderson 1977; Iran-Nejed and Winsler 2000) as relevant for the processing of the structures in question. Schemata go beyond single words and are seen as "data structures for representing generic concepts in memory" (Keizer 2004, p. 342). Keizer also calls these schemata general knowledge structures. These "are structured in that they contain a hierarchical network of interrelations among their various constituents, which may themselves be knowledge structures" (Keizer 2004, p. 342). To use Keizer's example: the word *church* evokes all the knowledge about churches, including their architecture and their cultural relevance and background. Similarly, the mentioning of one part of a church, for example, *spire*, will also evoke the whole concept (schema) of *church* and its subparts (albeit with a different conceptual perspective; for some exemplary analysis, see FrameNet and its analysis of Buildings:

https://framenet2.icsi.berkeley.edu/fnReports/data/frameIndex.xml?frame=Buildings). To the best of my knowledge, schemata of this kind and general knowledge structures have not been discussed extensively in CxG, if at all. But from what can be said at this point it seems like schemata or general knowledge structures are at least compatible with what construction grammarians know as semantic frames (in terms of Frame Semantics, see Boas 2017). Semantic frames are schematic representations of particular situation and specify (as frame elements) the participants, props, and other circumstances relevant for that particular situation. The frame for "commerce_buy" (i.e., the situation of buying something), for example, involves a few core frame elements, such as the buyer and the goods that are bought (*Phyllis bought a car*), as well as some optional, non-core frame elements, such as the recipient, seller, money, purpose, etc. (*Phyllis bought a car for Gladys from Pete for $2000 just to drive to the beach!*). Frames activate their relevant frame elements, as well as related frames. They are used to conceptualize and perspectivize a particular situation and let the speaker/hearer decode the message on the basis of relevant contextual background knowledge. As such the notion of semantic frames is probably more restrictive than schemata, but there seems to be quite some overlap. Since the relevance of Frame semantics for Construction Grammar has often been discussed (see Fillmore 1988; Boas 2017, and elsewhere; Ziem 2009, and elsewhere), we can assume that schemata can also be incorporated in a systematic and cognitively plausible way into the analysis presented above (e.g., in the discussion of "affect" or directionality).

9.5 Summary and Conclusion

This chapter described and discussed "complements" and "adjuncts" in several grammatical frameworks. In first section, it presented a detailed account of the treatment of this distinction in two major grammars of English (Quirk et al. 1985; Huddleston 2002). In direct comparison it became clear that the two grammars differ significantly in their analyses of complements and adjuncts. For example, Quirk et al. (1985) seem to put greater weight on syntactic criteria for complements (and only allow noun phrases and adjective phrases as subject and object complements). On the other hand, they show a fairly liberal or even controversial use of the term "adjunct." For example, they classify the preposition phrase *in his forties* in *John is in his forties* as obligatory predication adjunct, primarily because it is a prepositional phrase. A noun phrase, such as "John is a car dealer" would be regarded as a subject complement. For Huddleston (2002), adjuncts can never be obligatory, but complements may sometimes be optional, as in *She read the report*, where the noun phrase is not strictly necessary, but adds important information to the core meaning of the sentence. Huddleston (2002) would also see the obligatory prepositional phrase *in his forties* as a complement, qua its obligatoriness. It thus became evident that a consensus between these two analyses would be hard to reach, and that even the individual treatments still leave some questions open.

For that reason, this paper looked at the problem of complements versus adjuncts from the viewpoint of linguistic gradience and fuzziness (Aarts et al. 2004; Aarts 2007; Keizer 2004). It was shown that the complement–adjunct distinction actually can be elegantly modeled in such a framework. Using a list of nine features derived from Huddleston (2002), sentences can be evaluated on a gradient scale from most prototypical complement to most typical adjunct, with a "fuzzy" midfield in between. However, such an analysis still suffers from the general problems of gradience analyses generally, such as the sorites paradox. In other words: how many features does a given construction need to have in order to qualify as either or? And is it really helpful to "count" features in such a way? Do we expect a clear cut-off somewhere in the middle between the two prototypes, or do certain constructions really not qualify as either or? Despite all these general questions, a usage-based, bottom-up

approach that takes the idea of schema-theory, prototypes, and frequency effects into account seems worth pursuing.

This led to a final section which investigated the issue from the perspective of usage-based Construction Grammar (Hoffmann and Trousdale 2013; Bybee 2013). On the basis of an exemplary analysis of verb–preposition combinations (Hoffmann 2007), it was shown that a constructional network of verb–preposition constructions can be developed. The central claim is that we basically can distinguish between two mesoconstructions, that is, obligatory and non-obligatory prepositional phrase constructions. Both these mesoconstructions can in turn be subdivided into three microconstruction groups. These are typically characterized by different degrees of schematicity, in the sense that they require more or less specific types of prepositions or prepositional phrases. Since usage-based Construction Grammar explicitly includes the idea of prototypes and frequency effects in the development and processing of constructions, this approach appears to be perfectly compatible with key ideas of gradience and linguistic fuzziness, while at the same time staying clear of some of the problems involved in such an approach. Moreover, a constructional treatment might actually also do away with the general divide between adjuncts and complements, and the related controversies, and may treat individual constructions and collocations in their own right and based on actual language use.

FURTHER READING

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10 Tense in English

LAURA A. MICHAELIS

10.1 Introduction

Humans conceive of time in terms of space, as shown by the language that we use to talk about temporal relations: we habitually speak of *stretching out* or *compressing* an activity, *heading toward* the future, *returning to* the past, and so on (Whorf 1956; Lakoff and Johnson 1980; Binnick 1991; Chapter 1, Casasanto and Boroditsky 2008). When describing the meanings of the tenses, linguists have relied on a specific instantiation of the space–time analogy: the TIMELINE. The timeline is a line (or, equivalently, an ordered set of points) that is unbounded at either end and segmented into three parts: the past, the present, and the future. While we can describe various ordering relations among points on the timeline (as when we describe two events as simultaneous), only one type of relation counts as a tense relation: that which includes the time at which the linguistic act is occurring. As Lyons states (1977, p. 682), "the crucial fact about tense […] is that it is a deictic category. A tensed proposition, therefore, will not merely be time-bound, […] it will contain a reference to some point or period of time which cannot be identified except in terms of the zero-point of the utterance."

Like other linguistic reference points that are anchored in the "here and now," the temporal zero-point can, under the appropriate conditions, be identified with times other than the time of speaking or writing. One such case is that in which a writer uses the time of message interpretation, rather than the time of message construction, as the zero-point (Declerck 1991, p. 15). For example, a note writer may choose the formulation *I'm across the hall* rather than *I will be across the hall*. The shifting of the temporal zero-point also occurs in subordinate clauses, both temporal and conditional, as in, for example, *When/if you have finished your test, [raise your hand]*. Here, a present-perfect predication is used despite the fact that its reference point is located in a (hypothetical) future rather than at the time of speaking (McCawley 1981).

When we talk about the "location" of the temporal zero-point, we are of course making use of the space–time analogy. But if the zero-point is a temporal landmark, what is being located relative to it? Comrie (1985, p. 14) tells us that "tenses locate situations either at the same time as the present moment […], or prior to the present moment, or subsequent to the present moment." This definition appears transparent, in that it partakes of the logic of the space–time analogy, but in fact there is reason to question whether tense "locates situations." If the situation in question is an event, then it is certainly true, for example, that a past-tense sentence like (1a) locates the cab ride prior to the time of speech, but do past-tense STATE predications, as in (1b), localize the situations that they denote in a similar way?

The Handbook of English Linguistics, Second Edition. Edited by Bas Aarts, April McMahon, and Lars Hinrichs.

(1) a. I took a cab back to the hotel.
b. The cab driver was Latvian.

If a speaker makes the assertion in (1b) following that in (1a), no sensible hearer will respond by asking whether the cab driver is still Latvian now. This is presumably because the cab driver's Latvian identity is highly unlikely to desist following the cab ride. Why then has the speaker of (1b) chosen to "locate" the cab driver's Latvian identity in the past? The answer, which the German logician Hans Reichenbach provided over 50 years ago, is that tenses do not express the relationship between the temporal zero-point and the time of the state of affairs described. Rather, tenses express the relationship between speech time and another interval of interest, which Reichenbach (1947) referred to as REFERENCE TIME (R). Reference time is in principle distinct from either the time of the utterance (which Reichenbach refers to as SPEECH TIME, or S) or the time of the situation that the speaker is describing (which Reichenbach refers to as EVENT TIME, or E). Reference time, according to Klein (1992, p. 535), is "the time for which, on some occasion, a claim is made." In (1a), for example, R is a specific past time that both the speaker and hearer can identify, while in (1b) R is the time established by (1a): the time of the cab ride. What (1b) shows us is that when a speaker makes a past-tense stative assertion, she or he may vouch only for that portion of the state's tenure that coincides with the mutually relevant interval. In the following section, we will further explore the concept of reference time, its role in relative tenses like the past perfect, and the use of reference time to describe the fundamental conceptual division between events and states.

The foregoing discussion has touched upon yet another questionable assumption about tense—that one can analyze it without reference to aspect. Certainly, as Comrie (1985, p. 6–7) observes, the two notions are conceptually separable: aspect involves the internal temporal structure of a situation (e.g., whether or not it includes transitions) rather than its placement on the timeline relative to speech time. The view that tense and aspect are semantically distinct is a basic premise of compositional models of English verb morphology, like that of Klein (1992). Such accounts assume that each component of semantic interpretation is associated with a distinct component of morphology or syntax. For example, periphrastic forms like the present progressive are analyzed as having a tense component (expressed by the finite auxiliary verb) and an aspect component (expressed by the present participial complement). The separability of tense and aspect is assumed as well in logical approaches to temporal relations like that of Herweg (1991), in which tenses are represented as operators that have scope over aspectual operators like the progressive, and aspectual operators in turn have scope over predicate–argument complexes or, equivalently, tenseless propositions, for example, *I take a cab back to the hotel* in (1). However, as we have seen, states and events relate in distinct ways to the reference times for which they are asserted, and this fact alone suggests that tense and aspect "are […] intimately related, and interact quite extensively" (Hornstein 1991, p. 9).

One such interaction is observed by Comrie (1985, p. 7): "many languages have forms that include specification both of location in time and of internal temporal contour; thus Spanish *hablé* is both perfective aspect and past tense." Here Comrie is illustrating the phenomenon of ASPECTUAL SENSITIVITY, as described by De Swart (1998): tenses may select for specific aspectual classes, as the Spanish perfective past invokes the class of events and processes. While aspectual sensitivity is generally illustrated by reference to the imperfective and perfective past tenses of the Romance languages, aspectually sensitive tenses can be found in English as well. In particular, we will see that the English present tense is an aspectual-class selector, and that many of its uses can be ascribed to this property. As observed by Langacker (1991, p. 259–260), Smith (1997, p. 110–112) and others, the present (or—in Langacker's formulation—the event of speaking), is construed as a single moment. Events have heterogeneous internal structure (i.e., distinct subphases), and for this reason they take time. Accordingly, one cannot

confirm that an event of a given type has occurred if one has access only to a single moment in the time course of that event. By contrast, states are effectively atemporal (Bach 1986): they can be verified on the basis of a single momentaneous sample. This entails that the present tense is semantically compatible only with state predications. This account, however, appears to leave us with no explanation of the fact that event verbs do indeed appear with present inflection, as in (2) and (3):

(2) The flight arrives at noon.
(3) My sister walks to work.

Certainly, neither the flight's arrival nor an episode of my sister walking to work must overlap the time of speech in order for (2) or (3) to be truthful assertions. Therefore, these examples suggest that the present tense has functions beyond that of reporting situations ongoing at speech time; the majority of scholars of English tense indeed assume this to be the case (see Kučera 1978; Binnick 1991, p. 247–251; and Dahl 1995, for discussion). However, as we will see in Section 10.3, there is a way to analyze the functions exemplified in (2) and (3) that is highly compatible with the assumption that the present tense selects for the class of states. According to this view, both "scheduled future" presenting predications like (2) and generic presenting predications like (3) are the products of COERCION, or, equivalently, implicit type-shifting (De Swart 1998; Jackendoff 1999). Coercion can be illustrated in its application to the grammar of English nominal expressions. English determiners like the indefinite article select for nouns that denote countable entities, as in *an apple*. However, when the indefinite article is combined with a nominal that denotes a mass rather than a bounded entity, it forces an interpretation of that entity as a bounded quantity, as in, for example, *a wine*, which denotes a portion or variety of wine. Here, as in the case at hand, the semantic requirements of the grammatical marker cause it to override intrinsic semantic features of the word with which it combines, resulting in a shift in what the word designates. Similarly, the present tense, as a state selector, can impose stative readings on any dynamic verb with which it combines, thereby resolving semantic conflict between the verb and the inflection that is attached to it. We will see that future and generic readings of present-tense predications can be analyzed as the products of this coercion mechanism.

In addition to interacting semantically, within a given grammatical construction, exponents of tense and aspect also interact within the system of time reference in English: aspectual constructions can express the same basic temporal relations that tense inflections do. These overlaps will be discussed in Section 10.4. The English present perfect construction, for example, *We've lost our lease*, is a notorious case of such a functional overlap. Theorists are not in agreement concerning the appropriate treatment of the English perfect construction; it has been analyzed as both a tense and an aspect (see Fenn 1987; Declerck 1991, p. 10–13; Klein 1992; and Binnick this volume, Section 11.3.1, for discussion). However, as we will see, there are good reasons to regard the perfect as an aspectual construction, and in particular as a stativizing construction (Herweg 1991). This function reflects its history: it emerged in Old English as a resultative construction containing a passive participle in agreement with the direct object. Through subsequent reanalysis, the participle came to be construed as predicating an action of the individual to whom the subject refers (Bybee et al. 1994; Hopper and Traugott 1993, pp. 57–58). It is at this point that the present perfect and simple past tenses come to be synonyms: as McCawley (1981) points out, it makes sense to refer to the past perfect as a "past in past" form, but it makes much less sense to refer to the present perfect as a "past in present," since this is exactly what the simple past is. By the same token, we cannot appropriately refer to the perfect as a relative tense, because the present perfect encodes the same temporal relation that the simple past does: anteriority of the denoted event to speech time. Thus, the simple past

and the present perfect do not appear to be distinguishable at the level of semantics. Instead, as both Slobin (1994) and Michaelis (1998, Chapter 5) argue, the two forms of past-time reference are distinguished by their use conditions. The development of this discourse–pragmatic division of labor served to differentiate the two converging constructions.

Additional evidence that an aspectual construction may function as a tense without losing its aspectual properties is provided by the so-called future tense of English, a periphrastic construction whose head is the modal verb *will*. A number of scholars, including Binnick (1991, pp. 251–252) and Hornstein (1991, pp. 19–20), have argued that the modal future of English does not have future reference but rather present-time reference, as indicated by patterns of adverbial co-occurrence. This will lead us to conclude that modal-future sentences are in fact present-tense stative predications. As we will see in Section 10.4, this analysis of the English modal future, combined with the analysis of the present tense developed in Section 10.3, has a significant implication for our description of the tense system of English: this system, rather than being based upon a past–non-past division, as many scholars (e.g., Comrie 1985; Van Valin and LaPolla 1997) have assumed, is in fact based on the opposition between past and present.

10.2 Reference Time

The primary insight behind Reichenbach's (1947) model of tense is that the meaning of every tense can be represented as a sequence of the three time points mentioned above: E, R, and S. In Reichenbach representations, these points are separated either by a line, which is used to indicate that the left-hand point precedes the right-hand point, or by a comma, which is used to indicate that the two points are identical (i.e., not ordered with respect to one another). In the case of the simple tenses—past, present, and future—R and E are identical: the time referred to is also the time of the state of affairs denoted by the sentence. By contrast, in the case of the relative tenses, for example, the past perfect, E and R are distinct: the time that the speaker is referring to is a time that either precedes or follows the time of the state of affairs denoted by the sentence. Reichenbach's representations of the simple tenses and the three perfect "tenses" are given in (4a–f). For each tense representation, an example sentence is given, along with specification of the R point (which may or may not be overtly referred to by a subordinate clause or adverbial expression):

(4) a. **Present**: E,R,S (e.g., *She's at home right now*; R = right now).
b. **Past**: E,R_S (e.g., *She was at home yesterday*; R = yesterday).
c. **Future**: S_E,R (e.g., *She will be home this evening*; R = this evening).
d. **Present perfect**: E_S,R (e.g., *The crowd has now moved to plaza*; R = now).
e. **Past perfect**: E_S_R (e.g., *The crowd had moved to the plaza when the police showed up*; R = the time at which the police arrived).
f. **Future perfect**: S_E_R (e.g., *The crowd will have moved to the plaza by the time you call the polic*e; R = the time at which the police are called) or S_R_E (e.g., *That's Harry at the door; he will have bought wine*; R = a time prior to Harry's arrival).

Hornstein (1991) extends the Reichenbach framework in order to account for constraints on DERIVED TENSE STRUCTURES, which result either from adverbial modification or clause combining. According to Hornstein (1991, p. 15), derived tense structure (DTS) must preserve the tense structure of the input sentence, which he refers to as the basic tense structure (BTS). He states two conditions under which BTS may be preserved:

(5) a. No points are associated in DTS that are not associated in BTS.
b. The linear order of points in DTS is the same as that in BTS.
(Hornstein 1991, p. 15, (13))

Hornstein proposes (1991, p. 17) that adverbial modification is a function that maps a BTS into a DTS that is identical to the BTS of the particular adverbial expression. For example, the BTS of the adverb *yesterday* is E,R_S, while that of *tomorrow* is S_E,R. Accordingly, the DTS of (6)a obeys (5) while that of (6)b violates (5):

(6) a. Harry arrived yesterday.
b. *Harry left tomorrow.

In (6′)a and (6′)b, we see the BTS–DTS mappings that produce (6)a and (6)b, respectively:

(6′)

a. E,R_S → yesterday
E,R_S
|
yesterday

b. E,R_S → tomorrow
S_E,R
|
tomorrow

Sentence (6)a is well-formed because the adverb *yesterday* does not create associations that are not already present in the BTS of the base sentence (*Harry arrived*), nor does it alter the linear association of points within this BTS. By contrast, (6′)b violates (5)b: the adverb *tomorrow* alters the linear association of points within the BTS of *Harry left*: while this BTS places S after E and R, modification by *tomorrow* requires that S precede these two points.

Crucially, as Hornstein demonstrates (1991, Chapter 2), the constraints on temporal modification given in (5) scale up to more complex constructions, in particular those that contain finite subordinate clauses headed by temporal connectives like *when*, *while*, *after*, and *before*. In describing such constructions, Hornstein capitalizes on the basic insight, mentioned above, that "S may be anchored to times other than the moment of utterance" (Hornstein 1991, p. 126). The particular constraint on temporal embedding that he proposes is as follows: "a sentence that modifies another sentence [must] share its S point and its R point" (Hornstein 1991, p. 44). The linking of the respective S and R points must preserve the BTS of both the subordinate and main clauses. In (7)a and (7)b, we see two examples of complex clauses, the first of which obeys (5) and the second of which violates it:

(7) a. Harry will leave when Sam has arrived.
b. *Harry will leave when Sam arrived.

The grammaticality contrast in (7)a and (7)b is explained according to the representations of these sentences in (7′)a and (7′)b, respectively. In these representations, the respective S and R points of the main and subordinate clauses have been associated.

(7′) a. $S_1\_R_1,E_1$ (Main clause: *Harry will leave*)
$E_2\_S_2\_R_2$ (Subordinate clause: *Sam has arrived*)

b. $S_1\_R_1,E_1$ (Main clause: *Harry will leave*)
$R_2,E_2\_S_2$ (Subordinate clause: *Sam arrived*)

Hornstein assumes that the linking of S_2 to S_1 occurs first, followed by the linking of R_2 to R_1 (1991, p. 43). He thus states the constraint on clause combination as follows (ibid): "The movement of R_2 to a position associated with R_1 must obey [the constraints stated in (5)]." Thus, once S_1 and S_2 are associated in (7′)a, R_1 and R_2 can be associated without requiring reorderings in either of the two input representations. (Notice that while the association of R_1 and R_2 requires breaking of the association between R_2 and S_2, neither clause of (5) prevents this.) By contrast, once S_1 and S_2 are associated in (7′)a, the association of R_1 and R_2 can occur only if the order of R_1 relative to R_2 is altered as shown. Since this reordering would violate (5) b, Hornstein correctly predicts that (7)b is semantically anomalous.

It is not clear, however, that the constraints on derived tense structures also apply to MODAL uses of absolute and relative tenses, in which tenses are used to express speakers' judgments, either about the degree of likelihood or the factuality status of an event denoted by the subordinate clause of a conditional sentence (Fleischman 1989). These examples include those in which the present tense, the past tense, and the past perfect appear in the subordinate clauses of future, hypothetical, and counterfactual sentences, respectively:

(8) a. If she **arrives** before midnight, she will catch the shuttle.
b. If she **arrived** before midnight, she would catch the shuttle.
c. If she **had arrived** before midnight, she would have caught the shuttle.

In (8)a, present tense is used in the subordinate clause to denote a future event; in (8)b, past tense is used to denote a future event that is presumed by the speaker to be relatively unlikely; and in (8)c, the past perfect is used to denote an event that is presumed by the speaker not to have occurred. Clearly, these subordinate tenses do not denote the relationship between E and S, or E and R, that is shown in the representations in (4). Hornstein argues (1991, pp. 73–79) that while the constraints on derived tense structures do not predict the particular tense uses in (8), they do not rule them out either. All such sentences meet the conditions on derived tense structures "on the assumption that simple modals are in the present tense, whereas *modal + have* are past-tense forms" (p. 77). We will return to the question of why the modal or *will* future is generally barred from the subordinate clauses of futurate conditionals like (8)a in Section 10.4 below.

Another problem of clause embedding that is widely discussed in the literature on tense is that of SEQUENCE OF TENSE (Comrie 1986; Enç 1987; Declerck 1991, pp. 157–191; Hornstein 1991, Chapter 4; Altshuler et al. 2015). Sequence of tense phenomena involve the BACKSHIFTING of the tense of a present, past-tense, or future predication when that predication is the complement of a past-tense verb of speaking or thinking. Examples involving indirect speech are given in (9); the sentences in parentheses beside each example show the direct-speech counterparts of each embedded clause:

(9) a. Debra said she **liked** the wine. ("I like the wine")
b. Debra said she **had brought** a bottle of wine. ("I brought a bottle of wine")
c. Debra said she **would bring** some wine. ("I will bring some wine")

The tenses in the embedded clauses of such sentences are relative tenses, because they do not relate the situation denoted (e.g., Debra's liking the wine or buying a bottle of wine) directly to speech time; instead the S point of the embedded clause is identified with the event time of the matrix clause—the time of the event of speaking. To model sequence of tense, Hornstein proposes a sequence-of-tense (SOT) rule, which shifts the S of the embedded clause and associates it with E of the matrix clause (Hornstein 1991, p. 137). The position of the E and R points of the embedded representation relative to S of the matrix clause in the derived tense structure predicts the form of the backshifted tense in the embedded clause. An example of the application of the SOT rule, as applied to (9)b, is given in (10):

(10)
$$\begin{array}{lcl} E_1,R\_S_1 & \text{SOT} & E_1,R\_S_1 \\ & \rightarrow & | \\ E_2,R\_S_2 & & E_2,R\_S_2 \end{array}$$

In the derived tense structure that is output by the SOT rule, shown on the right side of the arrow, the association of the embedded clause's S point with the matrix clause's E point has caused the embedded clause's E point to precede both the matrix R point and the matrix S point. Since, as shown in (4)e, the schema E_R_S corresponds to the past perfect, the SOT rule correctly predicts that the backshifted form of the past tense will be the past perfect. At the same time, however, not all theorists of tense presume the existence of a backshifting rule for sequence of tense. Declerck (1991, 1995) and Declerck and Depraetere (1995) argue that sentences like (9)a simply illustrate two distinct uses of the past tense: the verb *said* illustrates the absolute use, in which the past tense indicates anteriority of R to S, while the verb *liked* illustrates a relative use, in which the past tense indicates simultaneity of the situation to a reference time that is in the past relative to S. This analysis is based on the observation that the use of the past tense to indicate simultaneity is attested independently of SOT contexts—for example, in coordinate sentences like *I danced and my sister played the recorder*. Here, the first sentence establishes a past reference time and the second an activity that overlaps this past reference time (see Binnick, this volume, Section 11.6, for discussion of rhetorical relations in temporal discourse).

Backshifting sometimes fails to occur, and these cases illustrate that backshifting is not a "rule" but rather a strategy for describing quoted content. The attested sentence in (11) illustrates one case in which a present-tense predication (*the Earth revolves*…) is embedded under a past verb of speaking:

(11) On a recent survey, just 74 percent of Americans said that the Earth **revolves** around the sun.

In (11), use of the past tense *revolved*, although predicted by the SOT rule, would be inappropriate—presumably because it would invite the unwelcome (quantity-based) inference that the Earth no longer revolves around the sun. Altshuler et al., 2015, make clear that the case of gnomic statements, as in (11), is but one instance of a more general phenomenon, the DOUBLE ACCESS interpretation, which arises when a present-tensed verb is embedded under a past attitude, as in, for example, *John said that Mary is pregnant*. Their account explores the interpretive factors that distinguish licit double-access instances from those that are inarguably odd, for example, #*John believed that Mary is pregnant*. They argue that double-access sentences are appropriate insofar as (a) the matrix attitude verb is interpreted as a parenthetical (a marker of evidence source) and (b) the embedded situation as ongoing at speech time. This work succeeds in highlighting the variegated pragmatic considerations that influence the manner in which we attribute statements, thoughts, and beliefs to others.

Thus far we have seen some of the properties of Reichenbach's framework that are responsible for its enduring appeal: it not only provides an elegant way of representing the meanings of the tenses, but can also be used to capture constraints on the embedding of one tensed clause in another. Several failings of the Reichenbach framework, including its inability to distinguish between events and states and its overly restrictive view of temporal-adverb reference, are discussed by Declerck (1991, pp. 224–232). An additional problem, recognized by a number of discourse theorists starting in the 1980s, is that Reichenbach's conception of R is static; he argues, for example, that assertions in a narrative must share a reference point (Reichenbach 1947, p. 293). This view is difficult to square with the fact that narratives depict a time course. We now turn to attempts by discourse theorists to expand the Reichenbach conception of reference time in order to describe the temporal sequencing of events in narrative.

In the prototypical case, a narrative is a sequence of past-tense assertions. For this reason, we will focus here on the semantic representation of such assertions. Logical accounts of the meaning of the English past tense can be divided into two general types. In both types of accounts, the past-tense marker is viewed as an operator, for example, *Past*, that has scope over a tenseless proposition. The truth of the resulting proposition is evaluated at speech time. The first type of account, associated with Prior (1967), is that in which a proposition of the form *Past* (*A*) is judged to be true if and only if the tenseless proposition *A* is true at a time *t-1* earlier than speech time, *t*. In the second type of account, advocated by Reichenbach (1947), a past-tense sentence is interpretable as true or false only relative to a specific past interval, reference time. Partee (1984) observes that under Prior's view, the truth of an assertion in the simple past depends on the truth of the base sentence at SOME point in the past, whereas under Reichenbach's view, the truth of a past-tense assertion depends on the truth of the base sentence at THAT time in the past. Most modern accounts of past-time reference follow Reichenbach's view rather than that of Prior. One reason for this is that there is evidence to suggest that reference-time specification must be part of the truth conditions of past-tense sentences. For example, a speaker who makes the assertion *I took out the garbage* will be viewed as lying if he completed the denoted action merely at *some* point in the past (say, a month ago) rather than at the time that he knows the hearer has in mind, say, this morning.

The idea that R is an interval that is mutually identifiable to speaker and hearer underlies Partee's (1984) claim that past-tense sentences "refer back" to an already established reference time, as in the narrative passage in (12):

(12) Police have arrested a suspect in last week's string of convenience store robberies. They apprehended the suspect as he left a downtown Denver nightclub. He was taken into custody without incident.

In (12), the present-perfect "lead sentence" establishes a past reference time (the time of the arrest), while the two following past-tense sentences evoke that same past interval as they elaborate the circumstances of the arrest. It is in this sense that we may say that the two past-tense sentences in (11) are anaphoric: like pronouns, they rely on the interpreter's ability to recover the identity of a discourse-active entity, in this case, a past interval. However, as Partee (1984) and Hinrichs (1986) point out, past-tense sentences need not receive the anaphoric interpretation that they have in (12). As described by Binnick (this volume, Section 11.6), there is another narrative mode, which Dowty (1986) refers to as TEMPORAL DISCOURSE, in which the sequence of sentences in the narrative matches the real-time structure of the world that is being described. The passage in (13) provides an example of temporal discourse:

(13) Sue began to walk out. She paused for a moment and then turned around to face her accusers once again. The room was silent except for the ticking of the wall clock. She began to speak, shook her head and hurriedly exited.

In (13), for example, the time at which Sue paused is not the same interval as that during which she began to walk out of the room; the latter interval follows the former. Thus, the past-tense sentence *She paused for a moment* does not "refer back" to the reference time of the prior past-tense sentence (*Sue began to walk out*); rather, it refers to a time *R+1*. This means that in a temporal discourse like (13) there must be some procedure for updating R during the course of the narrative (Partee 1984, Hinrichs 1986, Dowty 1986). Approaches to this problem within formal semantics have typically relied on some version of discourse representation theory (Kamp and Reyle 1993). Whether formal or informal, however, models of tense use in texts must acknowledge the central role played by sentence aspect in the identification of reference time. To see this, let us return to the passage in (13). Here, we can notice that while the event assertion *[Sue] turned around to face her accusers* induces us to advance R, the state assertion *The room was silent* does not. Rather, we interpret the state of silence as holding at the same point that Sue turned around to face her accusers.

There is, however, another reading of the predication *The room was silent* in which silence was a consequence of Sue's action. This reading clearly does require updating of R: the room's silence began at a reference time following that of the sentence *[Sue] turned around*. On this latter reading, in fact, the assertion *The room was silent* denotes not a state but an event—the event of the room's becoming silent. Partee (1984) captures these two distinct interpretations by means of the following generalization: if the situation denoted is an event, R includes the event, and elapses with its cessation; if the situation denoted is a state, R is included within that state, and does not elapse (i.e., it remains the reference time for the next assertion). Dowty's (1986) temporal discourse interpretation principle is a similar generalization, although Dowty assumes, contra Partee (1984), that state predications, like event predications, move reference time forward in temporal discourse. Dowty (1986) proposes that pragmatic inferences concerning possible overlap relations determine whether the situation denoted is interpreted as holding at both the new reference time and prior reference times. He argues (1986, p. 48) that

> the inferences we draw in a narrative about which events or states overlap with others in the narrative [are] not really a consequence of the times sentences are *asserted* to be true, but rather also in part a consequence of the times at which we *assume* that states or events actually obtain or transpire in the real world, intervals of time which may in some cases be greater than the intervals of time for which they are simply asserted.

Dowty goes on to point out that since a state assertion may be true for an interval that includes the interval for which the actual assertion is made, state predications can always be understood to extend "backward" in the time line of the text to include previously invoked reference times. In making this observation, however, Dowty has implicitly acknowledged that direction of inclusion is not a contextual implication but a semantic property of state predications. It is in fact the same property that leads Comrie (1976), Langacker (1986), and Smith (1997), among others, to the observation that perfective aspect, as in (13), encodes an "external viewpoint" while imperfective aspect, as in (14)b, encodes an "internal viewpoint" (see Binnick, this volume, Section 11.3):

(14) a. Sue went home at noon.
b. Sue was home at noon.

In (14)a, noon is interpreted as an interval during which the act of Sue's going home occurred. In (14)b, by contrast, noon is interpreted as a point within the span of time that Sue was at home. By assuming that state predications include their references times, we can also account for the fact that the situations denoted by stative predications are always temporally extensible: a stative assertion that is true at a given reference time may also be true at a superinterval that includes that reference time (Herweg 1991). This means that one can always follow an assertion like (14)b with a "proviso" that suspends the inference that (14)b invites:

(15) In fact, she is still home now.

Sentence (14)b triggers the inference that Sue was not home during any intervals that include noon; had she been, the reasoning goes, the speaker would have made a stronger assertion, involving that larger interval. The fact that this inference, which is based upon Grice's first maxim of quantity ("Say as much as you can"), can be preempted indicates that states are unconfined by the reference times for which they are asserted; they are, as Bach (1986) says, temporally ill-founded. Direction of inclusion can also be used to account for ambiguities that arise in adverbially modified predications containing state verbs, as in (16):

(16) Sue was in Cleveland yesterday.

Sentence (16) has both a stative interpretation and an episodic (event) interpretation. In the former case, the reference time named by *yesterday* is included within the time that Sue was in Cleveland. In the latter case, the daylong interval exhausts Sue's stay in Cleveland. What this shows is that aspectual construal does not depend on the inherent aspectual semantics of the verb, but rather on the direction of inclusion selected by the interpreter.

The mere fact that past-tense predications like (16) are ambiguous between state and event readings provides evidence against the traditional model of the English past tense, in which it "express[es] an explicit temporal relation, that the narrated events occurred before the moment of speech" (Bybee et al. 1994, p. 152). Such definitions are sufficient for past-tense *event* predications, but it is only by examining past-tense *state* predications as well that we can arrive at a sufficiently general definition of the past tense. As we have seen, the past tense merely locates R before S; it is the aspect of a predication that determines whether it denotes a situation that ended prior to speech time. In the next section, we will examine another tense-aspect interaction, which occurs when reference time and speech time coincide.

10.3 The Present Tense as State Selector

The present tense, according to Bybee et al. (1994, p. 152), "carries no explicit meaning at all; it refers to the default situation from which other tenses represent deviations." Because of its neutral semantics, they argue, the present tense can "absorb the meaning inherent to normal social and physical phenomena, and this meaning if described and broken down explicitly, consists of habitual occurrence and behavior as well as ongoing states" (ibid). The analysis raises more questions than it answers. First, why should ongoing states be more "normal" than ongoing events? Second, why should a meaningless construction require a disjunctive definition, involving both ongoing states and habituals? But even leaving these concerns aside, it is apparent that one could not describe the aspectual constraints that the present tense exhibits, or the coercion effects that it triggers, if one did not view it as meaning something. As discussed in the Introduction, the present tense can be viewed as an aspectually sensitive tense operator that selects for the class of states. As we saw, this selection

behavior comes from the logical relationship between time depth and the conditions of verification upon event reports. It is this selection behavior that yields habitual and gnomic construals of sentences that combine present-tense inflection with an intrinsically dynamic verb like *read* or *float*, as in (17) and (18), respectively:

(17) I read in bed.
(18) Oil floats on water.

Many aspectual theorists, including Krifka et al. (1995), conflate habitual and gnomic sentences (statements of general principles) under the general rubric of GENERIC sentences. In accordance with Krifka et al. (1995) and Bybee et al. (1994, p. 152), we will assume that the differences between habitual sentences (which Krifka et al. refer to as CHARACTERIZING SENTENCES) and gnomic sentences (which Krifka et al. refer to as REFERENCE TO TYPES) can be traced to characteristic properties of nominal reference. Nominal expressions in gnomic sentences have attributive reference, leading to contingency readings. For example, one can paraphrase (18) by means of a conditional sentence: if there is something that counts as oil, it will float on whatever substance qualifies as water. Habitual sentences like (17) do not have contingency readings, since they attribute properties to specific individuals. However, habitual and generic sentences both differ from episodic sentences in that they entail iteration of the denoted event and express nonincidental facts about the world.

In a typological survey of the generic–episodic distinction, Dahl (1995) suggests that although all languages use grammatical markers to distinguish between generic and episodic sentences, no language dedicates grammatical resources exclusively to this function (p. 425). One can reach an even stronger conclusion when considering English data, because in English there does not appear to be *any* grammatical marking of the generic–episodic distinction. Dahl has assumed that there is a single marker of genericity in each of the languages in his study, taking the present tense to be the "generic marker" for English. This appears to be a mistake, however, as generic statements can be expressed by a number of other tense–aspect combinations. These include the simple past and past progressive, as exemplified in (19) and (20), respectively:

(19) Dogs chased cars in those days,
(20) During that summer parents were keeping their children indoors.

These examples show, as Langacker observes (1996, p. 292), that generic predications can denote situations which hold "for either a bounded or an unbounded span of time, that is, their validity has a temporal *scope*" [emphasis in original]. Therefore, we cannot define generic sentences as either a class of state sentences or a class of present-tense sentences: as shown in (19) and (20), past-tense sentences and progressive sentences can also be used to make generic assertions. However, we can say that generic sentences are highly likely to be expressed by the present tense, and that speakers are highly likely to use the present tense when called upon to produce a generic sentence. This correlation suggests that genericity is not only a contextual inference but also one that is based upon a semantic prototype. The generic–episodic distinction is a contextual one because it hinges on inferences about the size of the relevant time scales. If the intervals separating instances of the iterated event are judged to be small, as in (21), the predication will be judged as episodic; if the iterated events are judged to be widely dispersed through time, as in (22), the predication will be judged generic:

(21) The light flashed.
(22) The Catholic mass was recited in Latin.

But there is still a sense in which (22) is not a "true" generic sentence, because the situation reported is not ongoing at speech time. It is this intuition that leads us to conclude that genericity is a prototype-based concept. The best examples of generic sentences not only invoke large time scales but also denote situations that hold at speech time. Why should this be? When a situation is reported as including the reference time, as states are, nothing preempts the inference that this situation also holds at times prior to and subsequent to the reference time. An interpreter who is placed "inside" a situation in this way is therefore free to conclude that the situation is a fact about the world rather than merely incidental. Now, certainly (22) could be construed as a state sentence, since the situation that it denotes could be understood to include an already evoked reference time (e.g., the sixteenth century). However, (22) also has a "closed," episodic interpretation in which, for example, the Catholic mass was recited in Latin only prior to the Second Vatican Council. This is because the past tense is aspectually neutral: as seen in the previous section, past-tense sentences may be ambiguous between event and state readings. Sentence (16), repeated here as (23), is a past-tense sentence that is ambiguous in exactly this way:

(23) Sue was in Cleveland yesterday.

The present tense, however, is not aspectually neutral. Present-tense sentences are intrinsically state sentences, and for this reason the present tense is more strongly correlated with the generic construal than is the past tense. Observe, for example, that (24) has only a generic construal:

(24) The Catholic mass is recited in Latin.

As mentioned, generic sentences describe multiple instances of a given event, for example, recitation of the Catholic mass. But how can a present-tense sentence denote an event, repeated or otherwise, when, as we saw above, present-tense sentences denote states? Certainly, a repeated event does not necessarily qualify as a state: iterated-event sentences like (21) are event sentences rather than state sentences. The problem can be framed as follows: if the present tense is a state selector, it must find a state within the semantic representation of the tenseless proposition with which it combines. In the case of (24), for example, this tenseless proposition is *The Catholic mass be recited in Latin*. The semantic representation of this proposition does in fact contain selectable states: an event sequence must, by definition, contain periods of stasis, or, equivalently, RESTS, which hold between adjacent subevents (Michaelis 2004, 2011). This is equivalent to saying that every transition has both an anterior, onset, phase and a posterior, offset, phase (Bickel 1997). The present tense, as a state selector, can select that rest which includes the reference time (i.e., speech time).

Of course, every event, whether iterated or not, has both an anterior state (the state that holds before the event occurs) and posterior state (the state that holds after the event has occurred). This observation leads naturally to a coercion-based account of the so-called futurate present in English. This construction is exemplified in (3), repeated here as (25):

(25) The flight arrives at noon.

Since arrival has an extended temporal profile that cannot fit inside the present moment, that event must be "flipped" onto either one side or the other of the present partition in order for the semantic conflict between the tense inflection and the verb to be resolved. Thus, (25) denotes the state that lasted until the event of arrival. While in many languages the equivalent of (25) can be interpreted as a perfect predication (via selection of the state phase *following* the

denoted event), in English, as a matter of linguistic convention, coercion selects the state phase that *precedes* the denoted event. These observations point to the conclusion that the specific coercion effects triggered by a given aspectually sensitive form, for example, the present tense, may vary from language to language, while the aspectual-selection properties of that form do not.

By viewing the present tense as a state selector, we can address a long-standing puzzle concerning temporal reference in English: why is not the English present tense used for event reporting? Notice, for example, that (26) and (27) are ungrammatical if construed as reports of events ongoing at speech time:

(26) *Look! Harry runs by the house!
(27) *They finally fix the sidewalk!

As evidence that the ungrammaticality of (26) and (27) is due to the impossibility of overlap with the moment of speech, consider that similar effects occur in reported speech, in which, as described in Section 10.2 above, a matrix verb of cognition or speech provides a surrogate speech time for the subordinate-clause predication. If the subordinate clause contains a stative verb, the sentence is ambiguous: we do not know whether the speech act reported upon was originally in the present tense or past tense (Declerck 1991, pp. 26–27, 1995). Sentence (28) exemplifies this ambiguity:

(28) Sue said that she preferred white wine.

If Sue's speech act is to be reconstructed as a stative predication, that is, *I prefer white wine*, it includes the time at which she uttered it. If, alternatively, Sue's speech act is to be reconstructed as an event predication, that is, *I preferred white wine*, the situation described by Sue must precede the time of her speech act. Notice, however, that if we were to replace the subordinate-clause verb *preferred* with an event verb, for example, *drank*, Sue's original speech act could only be reconstructed as a past-tense predication. In other words, an event cannot be construed as overlapping speech time, whether speech time is the time at which the speaker is speaking or a surrogate speech time—the time at which someone is depicted as speaking.

Cooper (1986) argues that the English Present is "exotic" in requiring a higher degree of coincidence between speech time and situation time than does present-tense inflection in other languages: "the semantic location of the present in other languages requires the discourse [time] to temporally overlap the event [time] rather than be identical with it" (p. 29). However, it appears that what makes the English present tense idiosyncratic in comparison to the present tenses of other languages (e.g., the Romance languages) is that it is not a general-purpose stativizer. The type-shifts which the English present tense fails to perform are those which are performed by periphrastic stativizing constructions—specifically, the perfect and progressive constructions. The emergence of these two constructions, via possessive and a locative periphrases, respectively, increased the overall transparency of the type-shifting system in English, but contrary to what we might expect, these newly developed stativizers did not merely narrow the functional range of the present tense. When the perfect obtained a continuative meaning in Early Middle English, as exemplified in (28), it in fact took over a function previously performed by the PAST tense, exemplified in (29) and (30):

(29) Ant ye mine leove sustren **habbeth** moni dei **icravet** on me after riwle.
"And you my beloved sisters have for many days desired a rule from me." (*Ancrene Wisse* c. 1220)

(30) A Ic wite **wonn** minra wraecsitha.
"Always I [have] suffered the torment of my exiles." (*The Wife's Lament*, c. 970)
(31) For that sothe **stod** a than writen hu hit is iwurthen.
"For that truth [has] remained always in writing, about how it happened."
(Layamon's *Brut*, c. 1200)

Unlike the perfect, whose current use conditions were largely in place by the thirteenth century (Carey 1994), the progressive is a relatively recent innovation (Joos 1964). As of Shakespeare's time, the alternation between the present tense and the present progressive was apparently conditioned only by metrical considerations (Dorodnikh 1989, p. 107), as when the present tense is used to convey progressive meaning in Romeo's question *What light through yonder window breaks?*. According to Joos (1964, p. 146), the progressive attained its current usage only in the nineteenth century, when it came to be used in passive predications, for example, *The lamps were being lighted*, as against the earlier middle form, *The lamps were lighting*. Again, however, it would be shortsighted to analyze this development as having occurred at the expense of the present tense alone, as when Bybee et al. (1994, p. 144) state that "the Progressive appears to have been taking over some of the functions of the Present for several centuries." Indeed, as we saw in (26) and (27), simple present-tense predications in English, unlike those in, for example, French, lack progressive readings, but so do simple PAST-TENSE sentences, as shown by (32):

(32) When I entered the church, they recited the mass in Latin.

Sentence (32) does not have a reading in which the recitation of the mass was ongoing prior to my entering the church. In order to achieve this "overlap" interpretation, the past progressive (i.e., *They were reciting the mass in Latin*) would be required. Thus, we can hypothesize that the introduction of the progressive construction in English narrowed the functional range of BOTH the present and past tenses, and not merely the present tense. The progressive replaced tense-based coercion as the means of denoting overlap between an event and the currently active reference time.

10.4 Functional Overlaps between Aspect and Tense

While the preceding section concerned implicit type-shifting, or coercion, an interpretive process through which the meaning of a verb is shifted in order to resolve semantic conflict between a verb and its grammatical context, the present section will concern EXPLICIT type-shifting, in which verbal aspect is shifted through grammatical means, in particular through the use of periphrastic, auxiliary-headed constructions (Herweg 1991). Several of these constructions have meanings that are indistinguishable from those of specific tenses, and this is why they are of interest to us here. In type-shifting constructions, the auxiliary verb denotes the output type (a state) while the nonfinite complement denotes the input type (an event). In English, these constructions include the perfect, the progressive, and the modal (or "will") future. These constructions are not uniformly viewed as stativizers in the literature, and so it is worthwhile to look at the evidence that they are. One line of evidence comes from stativity tests like Vlach's (1981) *when*-test: if the situation denoted by the main clause can be construed as overlapping an event denoted by a temporal clause introduced by *when*, it is a state. If, alternatively, the main-clause situation cannot be construed as overlapping the *when*-clause event, but must instead be construed as following that event, it is an event. Using this

test, we can show that progressive sentences are state sentences. In (33)–(35), the verbs whose aspectual properties are being diagnosed are shown in boldface:

(33) **State**: When Harry met Sue, she **preferred** white wine.
(34) **Event**: When Harry met Sue, she **drank** a glass of white wine.
(35) **Progressive state**: When Harry met Sue, she was **drinking** a glass of white wine.

In (33), just as in (35), we see that the main-clause situations (Sue's preferring white wine; Sue's drinking a glass of white wine) overlap the event of Harry's meeting Sue. That is, the progressive predication in (35) has the same overlap interpretation as the stative predication in (33), indicating that progressive predications are appropriately viewed as state predications. Together, (33) and (35) contrast with (34), in which the main-clause situation (Sue's drinking a glass of white wine) cannot be construed as overlapping the event of meeting. What type of state is the progressive state? According to Michaelis (2004, 2011), it is a state derived via selection of an intermediate state or "rest" between two transition points in the temporal representation of an activity. In the case of the progressive predication in (35), this intermediate state might be the period of stasis between two swallows of wine. By viewing the progressive as an intermediate-state selector, we can account for the fact that progressive predications report upon events that are ongoing at R. Analogous observations can be made about the perfect aspect:

(36) **State**: When Harry met Sue, she **preferred** white wine.
(37) **Event**: When Harry met Sue, she **drank** a glass of white wine.
(38) **Perfect state**: When Harry met Sue, she had **drunk** a glass of white wine.

The application of the *when*-test in (38) is somewhat less straightforward than that in (345), so some further explanation is required. In (38), we construe the event of Sue's drinking a glass of white wine as having preceded the event in which Harry met her. What does precedence have to do with overlap? The two notions amount to the same thing in the case of the perfect construction, since perfect predications can be said to denote a state of aftermath following the occurrence of that event denoted by the participial complement (Herweg 1991). It is this state of aftermath which overlaps the event denoted by the subordinate clause in (39). Thus, while perfect predications, for example, *The Eagle has landed*, are state predications, they also count as event reports, since they assert a past event by means of asserting its resultant state (see Binnick, this volume, Section 11.3.3 for discussion of the various uses of the perfect aspect). It is therefore no surprise that a periphrastic present-perfect construction may take over the functions formerly served by a morphological past-tense construction, as in modern spoken French. In English, however, the opposite development appears to have occurred: the present perfect currently has more restrictive use conditions than the past tense. These conditions, described by Fenn (1987) and Michaelis (1998), among others, include the prohibition against specification of event time (39), and against use of the present perfect in information questions that presuppose the occurrence of a unique past event, as in (40):

(39) *I have woken up at dawn this morning.
(40) *When have you woken up?

As Comrie (1976) observes, there is no reason in principle that (39) could not be used as a response to a question like "Why do you look so tired?." Certainly, in such a context the present-perfect predication would describe a state of aftermath, as required by its semantic analysis. Nor is there any logical reason that (40) could not be used as an inquiry into the time

of rising of someone who is currently awake. The constraints illustrated in (39) and (40) instead appear to be consequences of the development of a discourse–pragmatic opposition between two nearly synonymous forms of past-time reference, one a tense construction, the past tense, and the other an aspectual (stativizing) construction, the present perfect (Slobin 1996). According to Michaelis (1998, Chapter 5), this opposition involves temporal anaphora: while the present perfect establishes a reference time, the past tense, as described in Section 10.2, either establishes or evokes a previously established reference time.

The degree of functional overlap between exponents of tense and aspect becomes particularly clear when one considers the English modal future. Unlike other languages, English has no morphological future tense, but only a periphrastic construction containing the auxiliary *will*, a form derived via semantic bleaching from a stative verb meaning "want." While this construction is a stativizer, that function is somewhat more difficult to establish by means of the *when*-test than were the stativizing functions of the progressive and perfect constructions. The reason is that *will* has no unambiguous past tense: the past-tense forms of modals, for example, *would*, have subjunctive functions rather than unambiguous past-time reference (Fleischman 1989; Langacker 1991, Chapter 6). There are, however, other ways of establishing that a clause denotes a state, one of which involves temporal reference. Present-time adverbials, including *now* and *at this moment*, are compatible only with stative predications, for the reasons outlined in Section 10.3: the present is conceived as a moment, and only states are verifiable on the basis of a single momentaneous "sample." Given the fact that present-time adverbials are compatible with modal-future predications, as exemplified in (41) and (42), we have reason to conclude that modal-future predications are in fact state predications:

(41) My daughter will now play the clarinet for you.
(42) I will fill out the form right now.

The state denoted by modal-future predications is an anterior state, that is, the "preparatory phase" preceding an event. The behavior of morphological future tenses, in those languages which have them, is very much different. As pointed out by Hornstein (1991, pp. 19–20), for example, French future-tense predications are not compatible with present-time adverbial reference:

(43)	*Je	donnera	une	conference	maintenant.
	I	give:1SG:FUT	a	lecture	now
	"I will now give a lecture."				

If the English modal future in fact has present-time reference—that is, if its temporal representation is not S_E,R, as shown in (4)c, but S,R_E, the mirror image of the present-perfect representation given in (4)d—we have a potential explanation for the tendency for subordinate futurate clauses, as in (44), to lack the modal:

(44) a. *When the Prime Minister will arrive, they will play the national anthem.
b. When the Prime Minister arrives, they will play the national anthem.

Nieuwint (1986) proposes that the modal future in English expresses a predication, and therefore that sentences like *They will play the national anthem* predicate a state of the present time (e.g., that the appropriate preparatory conditions for the event in question exist). On this understanding, sentences like (44)a are semantically anomalous: they appear to reverse the order of events intended by the speaker. If the playing of the national anthem occurs during

the time when the Prime Minister is about to arrive, then the playing precedes his arrival rather than following it. On Nieuwint's account, therefore, the preemption of the modal future in subordinate-clause contexts like that in (44)b follows from the fact that the English modal future associates S and R. See Declerck and Depraetere (1995) for an alternative proposal.

While many scholars, including Hornstein, have observed that English lacks a true future tense like that of French, there is disagreement about the implications of this fact for the tense system of English. Many, including Comrie (1985), view English as having a past–non-past tense distinction. The rationale for this analysis comes from the supposition that the English present tense does not denote present time, since it is also used to express future events and temporally unbounded situations, in particular generic ones. However, as we saw in Section 10.3, both futurate present and generic predications can be seen as the products of stative coercion triggered by the aspectual selection properties of the present tense. It is therefore reasonable to conclude that the English tense system is based instead upon a past–present distinction: English lacks a future tense but has both a past tense and a present tense. Each of these tenses can combine with the auxiliary head of a periphrastic aspectual construction, including the progressive, the perfect, and the modal future. In specific contexts of use, as we have seen, each of these auxiliary-headed constructions may be used in place of a simple tense in a predication: the progressive replaces the present tense when an event is being reported as ongoing at speech time, the past tense replaces the perfect when the speaker is referring to a specific past interval, and the present tense replaces the modal future in the subordinate clause of a futurate conditional sentence. These interactions need not, however, be taken to imply that the perfect, progressive, and modal-future constructions are tenses. As we have seen, tenses fix the location of R with respect to S, while the periphrastic constructions that we have looked at in this section do not: their auxiliary verbs, when finite, can be inflected either for present tense or past tense.

10.5 Conclusion

In this survey of English tenses and tense uses, we have discussed a number of misconceptions about tense. One of these is that tense locates situations. In fact, as we have seen, tense merely locates reference time, while aspect determines the manner in which the denoted situation relates to reference time. Another misconception about tense is that the present tense is meaningless or, at the very least, identifies a far broader interval than the present interval. This view is based on the observation that the present tense combines with both state verbs and event verbs. As we have seen, however, the ability of the present tense to combine with event verbs should not be viewed as evidence that it lacks semantic restrictions. This combinatory freedom is instead evidence of the aspectual sensitivity of the English present tense and its consequent ability to shift the aspectual type of verbs with which it combines. As a state selector, the present tense is capable of selecting state phases within the temporal representations of events. The importance of aspect to an understanding of the English tense system is underscored by the fact that, as we have seen, certain auxiliary-verb constructions with tense-like functions, for example, the perfect construction, also function as stativizers. In such constructions, the state denoted by the tensed auxiliary verb is ordered relative to the event denoted by its complement in a way that resembles the ordering relations encoded by tense, and for this reason type-shifting constructions like the perfect aspect are often functionally indistinguishable from tense constructions like the past tense.

Throughout this survey, we have gained insight into the semantics of tense by examining the interaction of tense and aspect, both within a given grammatical construction and within

the system of temporal reference in English. The depth of these interactions should not, however, be taken as evidence that tense and aspect are inextricable at the level of semantics. Rather, it is only by carefully distinguishing the functions of tense markers from those of aspectual markers that we can say anything rigorous about the interplay between the two systems.

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11 Aspect and Aspectuality

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11.1 Introduction

English has three constructions that combine tensed auxiliary verbs with nonfinite forms of content verbs and are generally considered grammatical markers of aspect. The *progressive* combines forms of *be* with the present participle (e.g., *was going*); the *perfect*, *have* with the perfect participle (*had gone*); and the *habitual*, *will* with the infinitive (*would go*). The tensed verb itself may also mark aspect.

There has been much debate regarding the analysis of aspect, the relationship of grammatical aspectual categories to semantic ones, and even the meanings of the term itself and of related terms such as *aspectuality* (Dahl 2006; Dahl and Velupillai 2013; see Binnick 1991, chapter 5, for a history). Little consensus has yet been achieved, and a great deal remains debatable.

Like tense, aspect is concerned with time, but differs from tense in two ways. Aspects "are different ways of viewing the internal temporal constituency of a situation" or "situation-internal" time (Comrie 1976, p. 3, 5, following Holt 1943), while tenses serve (roughly) to locate situations or *eventualities* (Bach, 1986) in "situation-external time." Second, while tenses represent objective differences, sentences differing only in aspect ((1) and (2)) can truthfully be used at one and the same time to report the same eventuality.

(1) We studied all night.
(2) We were studying all night.

This kind of "aspect," explicitly marked and part of the grammar, is called *grammatical* or *verbal aspect*. *Aspect* is also used, however, for a language-independent, merely implicit, classification called *lexical aspect*, though more than the properties of solitary verbs is in question (Verkuyl 1972): (3) reports an activity taking place over time but (4), an event.

(3) John caught fish (all day).
(4) John caught a fish (right away).

Insofar as grammatical aspect represents a view of an eventuality, it is called *viewpoint aspect*, in opposition to "lexical" or *situation aspect*, which concerns the aspectual nature of the eventuality itself (Smith 1983, 1986, 1991). Johnson (1977, 1981) and Dowty (1986) term the aspect markers *aspect(ual) forms* and the members of the aspectual classification *aspect(ual) classes*. In syntactic studies, these are respectively *outer aspects* and *inner aspects* (Travis 1992), since the former have greater syntactic scope than the latter. Grammatical aspect is

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sometimes referred to as *aspect proper* in contrast with *Aktionsart* "kind of action" or *actionality*, that is, "lexical" aspect.

Before Mourelatos (1978) lexical aspect was thought to involve a classification of linguistic expressions (specifically the verb, in Vendler 1957), but since then has mainly been understood to concern real-world eventualities: *read* and *read books* are *activities* because reading (books) is an activity but *move* and *move the table* are *eventive* because a change in location is an event (though Borik, 2006, p. 20, argues to the contrary).

An event (4), or an episode of a process (1) or of a *state* (5), is a delimited occurrence at a determinable time and place (Maienborn 2016), as opposed to an undelimited process (6) or state (7).

(5) On the camping trip John was always hungry.
(6) Prince Rainier collected stamps.
(7) 2 is a prime number.

Though the concept of grammatical aspect entered Western grammar from Slavic linguistics only in the mid-nineteenth century (the term *aspect*, a calque of Russian *vid* "view," dates from 1853), the observation of differing aspectual classes of verbs goes back to Plato and Aristotle, although its modern study is rooted in the work of the philosophers Ryle (1949), Vendler (1957), and Kenny (1963).

This chapter reports on the present state of the study of English aspect and the effort to answer questions such as these: In Section 11.2, what are the classes of English expressions relevant to aspect and what are the properties that define them? In Section 11.3, what grammatical aspects are marked in English and by what formal (morphosyntactic) devices, what are their meanings, and how are they used and interpreted? In Section 11.4, how does grammatical aspect interact with the various aspectual classes? How do the semantic properties of the verb, its arguments, and modifiers combine to produce the semantic and pragmatic aspectual properties of a verb phrase or larger unit? And in Section 11.5, what are the functions of aspect in English speech and writing, and how do the various aspectual classes and grammatical aspects fulfill them?

11.2 Situation Aspect

11.2.1 Types of Eventuality Expressions and Their Semantic Properties

Vendler (1957) distinguishes *states* (e.g., *exist*); *activities* (*read*); *accomplishments*, which take place over time (*cool*); and instantaneous *achievements* (*notice*). Mourelatos (following Kenny 1963) treats accomplishments and achievements as sub-types of events (Kenny's *performances*) and renames activities *processes* to encompass non-agentive ones, which lack a "doer" (*drip*). States are properties *of* times, whereas events occur *at* times (Davidson 1967; Parsons 1990).

The semantic properties of expressions follow from the temporal properties of the types of eventualities they represent. Because states are homogeneous and lack development, stative expressions have the *subinterval property* (Bennett and Partee 1978): what can truthfully be said of an interval of time can truthfully be said of every subinterval within it; (8) entails (9). Processes, too, are homogeneous, but, unlike states, allow trivial gaps ("continuum failure" in Abusch 1985); (10) does not entail (11). Eventive expressions, however, lack the subinterval property, since events exhibit change over time and consist of different *phases* (Section 11.2.3).

(8) Mary was on the team from June to August of last year.
(9) Mary was on the team in July of last year.
(10) John works nine to five.
(11) John works during his lunch hour.[1]

Because states are homogeneous, stative sentences can express propositions true at an instant. Processes and events, however, generally hold true of intervals of time and the corresponding expressions require intervals for their interpretation (Vendler 1957; Bennett and Partee 1978; Dowty 1979; de Swart 2012). However, achievements like spotting a coin on the pavement are *instantaneous* or *punctual* events, as opposed to accomplishments like climbing a mountain, which are *durative* and have *temporal extent* (Filip 2012). A *point* (Miller and Johnson-Laird 1976), or *semelfactive* (Smith 1991), *process* such as blinking (once) is similarly non-durative, while weathering and reading are durative.

Because of the varying temporal properties of the eventualities they represent, the types of predicate expressions differ in the types of adverbials they co-occur with (Dowty 1979). A *frame adverbial*, such as *(with)in a minute*, normally combines with an eventive expression, and triggers an *ingressive* or *inchoative* interpretation of a non-event (in (12), *understood* = "came to understand, realized"). An *adverbial of duration*, such as *for a minute*, normally combines with a non-eventive expression, and triggers a processual interpretation of an eventive one, such as *paint the fence* in (13).

(12) At that moment, Susan finally understood what she had to do.
(13) He painted the fence for at least fourteen minutes.

11.2.2 Telicity and Boundedness

Garey (1957) contrasts events as *telic*, "tending toward a goal," and hence *bounded*, with states and processes, *atelic* eventualities that "are realized as soon as they begin," so (14) entails (15), while (16) does not entail (17) (unless (17) receives a processual interpretation), because there is no guarantee John actually reached the other side.

(14) John was walking.
(15) John walked.
(16) John was crossing the street.
(17) John crossed the street.

Confusingly, *telicity*, *atelicity*, *bounded(ness)*, and *unbounded(ness)* have been used in various, sometimes contradictory, ways, as when Depraetere (1995) distinguishes *boundedness* and *telicity*, but Krifka (1998) uses *telicity* in the sense of her *boundedness*.

An event, containing an inherent end point or *terminal bound*, differs from a state or a process, which does not, though the latter can be explicitly assigned one, marking the end of an episode, as in (18). While events can be said to *finish*, states and processes can normally only be said to stop or to end (19).

(18) The puppy {was lonely/dozed/whimpered} until her owners returned.
(19) The puppy {stopped/ceased/?finished} {being lonely/dozing/whimpering} when her owners returned.

11.2.3 The Phasic Structures of Eventualities

Eventualities contain different phases. A durative, atelic eventuality may be divided into *initial*, *medial* (*cursus*), and *final* phases, defined respectively by *aspectual verbs* (*aspectualizers*) *begin* (*commence*, *start*), *continue* (*keep*, *keep on*), and *stop* (*cease*) (Freed 1979), but itself has no inherent phasic structure.

An event does, combining a *preparatory phase*, which is a durative process (say climbing up a mountain), with the *point of culmination*, an achievement (in this case, reaching the peak). With an eventive expression, aspectualizers such as *start*, *continue*, *resume*, and *stop* modify different sub-phases of the processual preparatory phase, not the event as a whole, so (20) neither paraphrases nor entails (21).

(20) Mr. Blandings stopped building his dream house.
(21) Mr. Blandings finished building his dream house.

However, (21) does entail (20). Freed (1979) argues that this is because the aspectualizer *finish* modifies a *terminal phase* following the preparatory phase, while *stop* modifies the preparatory phase itself. Compare example (22), where the process in question is the terminal phase of an event.

(22) Subcontractor Valley Fence was finishing building a new pedestrian bridge over Avalanche Creek.

Moens and Steedman (1987, 1988) define telicity in terms of *change of state* rather than boundedness. A telic eventuality then would be one serving as a transition from an *initial state* to a *result* or *consequent* state. The point of culmination is similarly the time of the transition into a new state. Atelic eventualities lack such a transition: (17), interpreted as eventive, entails (23), but (16), representing only the processual part of an event, does not.

(23) John was across the street.

To account for the *futurate* present tense (24), Freed (1979) and Johnson (1981) propose, before the eventuality proper, a *preliminary phase*, which Moens and Steedman (1987, 1988) identify with the initial state preceding an event (or episode, in this case).

(24) {We dine/we're dining} at 8 tonight.

Moens and Steedman consider the preparatory process, the culmination point, and the consequent state to be parts of the *nucleus* of an event, and interpret predicates as characterizing eventualities in terms of what part of this nuclear structure they include: *culminated process predicates* (i.e., eventual predicates) denote the entire nucleus (as in 25); *process predicates*, just the preparatory process (26); and *point predicates*, the culmination point alone (27), so (26) and (27) describe different phases of the event described in (25).

(25) Susan climbed the hill (in under an hour).
(26) Susan climbed the hill (for less than an hour).
(27) Susan reached the top of the hill (at noon).

11.3 Viewpoint Aspect

11.3.1 Expressions of Viewpoint Aspects

Perfective aspect (the default interpretation of the English simple tenses) presents the eventuality as a single, complete whole (as in (28)) while the imperfective does not (29).

(28) Mr. Blandings built his dream house.
(29) Mr. Blandings was building his dream house.

Many grammarians follow Comrie (1976) in recognizing two varieties of the imperfective, *habitual aspect* and *continuous aspect*. In many languages, the imperfective form of the verb has both interpretations (cf. 30), but the English progressive form conveys only a sub-type of the latter, *progressive aspect*, which represents the eventuality, as dynamic, in the course of development (31), and excludes eventualities lacking development (32).

(30) (Spanish) Juan llegaba. (Comrie 1976, p. 25; habitual: "John used to arrive," continuous: "John was arriving")
(31) This day, the low was off the coast […] and it was strengthening.
(32) *John was being an illiterate man (cf. Spanish: *Juan era hombre sin letras*).

While the simple tenses can receive habitual interpretations (as in (33)), English has other markers that can indicate habituality—*used to* (34) and the modal auxiliary *will/would* (35). As shown by the tag "and she still does" in (34), it is a cancelable implicature, not part of the meaning of *used to*, that the situation it marks is (usually) understood to no longer obtain.

(33) Susan {swims/swam} in the sea, never in a pool or a lake.
(34) Susan used to swim in the ocean regularly, and she still does.
(35) Every now and then, Susan {will/would} suddenly burst into song.

Structurally similar to the progressive form is the *perfect form* in (36). Many grammarians consider this to mark *perfect aspect* (Dillon 1973), though others do not (see Section 11.3.3). Fenn (1987, p. 247) argues against the aspectuality of the perfect from the fact that it can combine with a marker of progressive aspect (37) without causing a contradiction. McCawley (1971) and Michaelis (1994) point out the idiosyncratic behavior of the present perfect, which cannot co-occur with definite time adverbials (38), unlike other perfect tenses (39), which is difficult to account for if the present perfect simply combines present tense with perfect aspect.

(36) John has swum across the pool.
(37) John has been swimming all afternoon.
(38) Harry has joined the navy (*in 1960). (Michaelis 1994, p. 113)
(39) Both had joined the Navy in 1936.

The perfect presents an eventuality as past relative to a certain point of perspective. Futurate expressions (40) similarly present an eventuality as future relative to a given perspective and hence may be said to constitute *prospective aspect* (Anderson 1973; Comrie 1976, p. 64f.), as may (e.g., in Lewis 1986) futurate interpretations of the simple and progressive present tenses (41). The various expressions of prospectivity presuppose different grounds for the prediction of future events (Binnick 1974; Smith 1981; Goldsmith and Woisetschlaeger 1982; Prince 1982)—reasonable expectation (40), planning or scheduling (41), or intention (42).

(40) Watch out, it's {about to/going to} blow!
(41) Next Tuesday, Susan {performs/is performing} before the Queen.
(42) I'm {going to run, running} for public office.

11.3.2 Progressive Aspect and the Simple Tenses

Because of the differing portions of eventualities they encode, the perfective and the progressive define different co-occurrence restrictions on types of adverbials. Since the perfective encodes an entire occurrence, its default interpretation with an eventive expression excludes

adverbials referring to instants; in (43) *ran* is interpreted as "start to run," but progressive *was running* allows reference to an instant.

(43) At noon, Susan {ran/was running} out of the room.

The progressive represents an eventuality as dynamic; the perfective, as static (Marchand 1955). Possibly this explains why the progressive is incompatible with stative expressions (44) (Leech 1971, p. 20ff.; Comrie 1976, p. 35), except when they do not express "pure" states (Leech et al. 2009, p. 129; Levin 2013): that is, for temporary states (45) (Leech 1971, p. 22ff.), states in which there is a progressive change of intensity or degree (46), and ones resulting from the actions of an agent (47).

(44) *Paris is being between London and Berlin.
(45) I'm feeling tired.
(46) They're believing in God more and more.
(47) The children are being difficult.

It poses a challenge for theories of the progressive that there are types of sentences in which the progressive and perfective differ little in meaning, if at all ((1), (2); (48)–(50)) (Hatcher 1951; Comrie 1976, p. 37).

(48) {You're looking/you look} good.
(49) They {just said/were just saying} that….
(50) {We hereby inform/we are hereby informing} you that….

The simple tenses can receive imperfective (51) as well as perfective (52) *interpretations*, which has led some to conclude that they have no aspectual *meanings* in themselves (Hatcher 1951; Comrie 1976, p. 25), while others hold them to mark *neutral* (Smith 1991, p. 77ff.), or *indefinite* (Thelin 1990, p. 9), aspect. In theories in which aspect is obligatory, the simple tenses have perfective aspect as part of their semantics, their literal *meanings*, though they may receive imperfective (e.g., habitual) pragmatic *interpretations*.

(51) I drank only water for 2 weeks […].
(52) Phedon, were you by when Socrates drank the poison?

11.3.3 The Perfect and the Prospective

The perfect is the most debated—and debatable—of aspects (Comrie, 1976, p. 6; McCoard 1978, p. 11; Dahl 1994; Ritz 2012; Grønn and Stechow 2020). Since it is not definable in terms of boundedness, boundedness theories tend not to treat it as an aspect, but as *phase* (Trager and Smith 1951; Joos 1964; Palmer 1987), *status* (Bauer 1970), or something else. In the tradition of Priorian tense logic, it is treated as an indefinite past tense; the past-tense operator P is defined: "It has at some time been the case that …" (Goranko and Galton 2015).

On the meaning of the perfect, there is little or no agreement. It is generally recognized as having four principal *uses*, however: the *resultative* (53), *experiential* (54) and (55), *continuative* (56) and (57) perfects, and the *perfect of recent past* (58) (Leech 1971, pp. 30–38, Comrie 1976, pp. 56–61; Dahl 1985, p. 132), which McCawley (1971) terms the *stative*, *existential*, *universal*, and *hot news* perfects, respectively. The continuative perfect has also been called the *perfect of persistent situation* (Comrie 1976, p. 60).

(53) Mother has gone to the store (and is still there).
(54) Have you seen {the current/#last year's} exhibit at the museum?
(55) Mother has been to the zoo {twice/quite often}.
(56) The children have been outside all morning.
(57) John has {walked/been walking} for three hours now.
(58) The council has just voted to raise taxes.

The resultative perfect represents a present state of affairs resulting from a past event (53) and allows adverbials of recency (*just, just now*). The experiential perfect indicates that an eventuality has occurred at least once in the past, and is repeatable (54) (Leech 1971, p. 33; McCawley 1971). Leech (1971, p. 32) calls it an indefinite past, since it allows indefinite time adverbials of frequency (*often*) or quantity (*ever, never*) (55). The continuative perfect indicates that an eventuality which started in the past has held continuously up to the present (56). It occurs with adverbials of duration (*for an hour, since yesterday*). The major use of the perfect progressive is for processes in the continuative perfect, though the perfect may be used by itself (57). The perfect of recent past reports an event which has happened recently, and allows adverbials of recency, but need not be resultative (58).

Accounting for this variety of readings has proved a challenge for semantic accounts (Portner 2003). Although some theories treat one or more of these as different meanings, the various types of perfect are considered by many to be predictable contextual interpretations instead (Bauer 1970; McCoard 1978; Fenn 1987). The resultative (53) is the default reading with an eventive expression, though it depends on an explicit or implicit adverbial; an adverbial of frequency or quantity (55) allows an experiential reading. Out of context and in the absence of overt cues, either interpretation is possible (59). The continuative interpretation occurs when a non-eventive expression combines explicitly or implicitly with an adverbial of duration (56). The progressive renders an eventive expression non-eventive, thereby allowing the continuative perfect (57). The "hot news" reading is a contextual interpretation, not necessarily triggered by an adverbial of recency (58); (59), for example, could receive such a reading.

(59) Susan has built a kayak.

Theories of the perfect, including most, if not all, of the four types identified by McCoard (1978)—*current relevance theory*, *embedded past theory*, *extended now theory*, *indefinite past theory*—tend to be motivated by just one of the types of perfect (Grønn and Stechow 2020). The resultative perfect, for example, underlies the proposal of Moens and Steedman (1988) that the perfect refers to a result state. The experiential perfect motivates the perfect as a relative past (Reichenbach 1947; Johnson 1977, 1981; Klein 1992, 1994). Similarly, indefinite past theory holds, in line with Priorian tense logic, that the perfect simply represents a past event (or episode) not identified with a definite time. The continuative gives rise to the "extended now" theory, which proposes that the perfect is used for events occurring in an interval of time whose upper bound is the present, thus accounting for the use of definite time adverbials having present, but not past, reference (60).

(60) Mother has been to the store {today/this morning/*yesterday/*last evening}.

In addition, in current relevance theory the perfect presupposes "current relevance," which is subject to a number of complicated conditions, including the requirement that the subject be alive or extant (61) (though not invariably, viz., (62)). Embedded past theory sees the perfect as simply a past tense embedded within the scope of a present tense, as if (63) meant "it is the case that John went to the fair."

(61) {?Herman Melville/Amy Tan} has never written a novel about voles.
(62) Shakespeare has inspired lots of films in Hollywood, Bollywood, and beyond.
(63) John has gone to the fair.

Theories of the perfect differ in how they account for its uses, whether in pragmatic, semantic, or syntactic terms; none accounts equally well for all of them; and none has received universal acceptance. The perfect remains something of a puzzle.

If the perfect is indeed an aspect, a unified treatment of aspectuality is beyond the scope of boundedness theories. To provide such a treatment, *relational aspect theories* define all aspectual oppositions in terms of (different kinds of) temporal relations. The perfective and imperfective are differentiated by *inclusion*, while the perfect and prospective differ in the *temporal ordering* holding between two times, the *reference time* R (Reichenbach 1947) or *topic time* TT (Klein 1992, 1994), also called the *frame of reference* or *temporal frame*, and the time E (Klein's TSit, situation time) at which the eventuality takes place or obtains (Johnson 1981).

Klein (1994) proposes that in the imperfective, the reference time is a *proper subinterval* of the time of the eventuality, that is, TT (noon in 64) falls entirely within TSit (Susan's driving home), whereas in the perfective the reverse is the case, TSit being a subinterval of TT. TSit may, however, be either a proper subinterval of TT, falling entirely within it, as in (65), or coincide with it (TSit = TT) and thus fill its frame (66). In the perfect, TSit precedes the topic time TT and in the prospective the reverse is the case, TT preceding TSit. Thus, relational aspect theory defines four possible aspects: TSit < TT (perfect), TT < TSit (prospective), TSit ⊆ TT (perfective), and TT ⊂ TSit (imperfective).

(64) At noon, Susan was driving home. $\dfrac{\text{noon}\,(\text{TT})}{\text{Susan was driving}\,(\text{TSit})}$

(65) Yesterday, Susan saw a shooting star. $\dfrac{\text{saw a shooting star}\,(\text{TSit})}{\text{yesterday}\,(\text{TT})}$

(66) While Susan sat reading, John listened to the radio. $\dfrac{\text{Susan sat reading}\,(\text{TT})}{\text{John listened to the radio}\,(\text{TSit})}$

The *used to* construction not only locates the eventuality in the past but gives rise to an implicature of discontinuation: out of context, (67) implicates (68). For this reason it might be classified with the *anti-perfect* of other languages (Binnick 2005, 2006; Hantson 2005), rather than with habitual aspect, especially as sentences like (69) are non-habitual.

(67) John used to eat meat.
(68) John no longer eats meat.
(69) This quantity […] used to be known (and still is in some quarters) as Avogadro's number. (Iwasaki 2010, p. 31, from the British National Corpus)

11.3.4 Habituality

Comrie (1976, p. 25) identifies habitual aspect as a sub-type of imperfective aspect, and in many languages the imperfective verb form is ambiguously habitual or continuative.

Habituality, like iterativity, involves repetition, and so it is difficult to distinguish the two. Both involve the representation of a series of events or episodes as a single eventuality (but

see Comrie 1976, p. 27). Consequently, terms such as *frequentative*, *generic*, *habitual*, and *iterative* have been used in widely divergent ways.

For Bertinetto and Lenci (2012), iterativity is *event-internal pluractionality*, the repetition of an occurrence on a single occasion, regarded, or represented, as a *macroevent* (in (70), the complete waggling of the tail by the dog), comprised of a set of *microevents* (the individual waggings), while both *episodic sentences* (Krifka et al. 1995) referring to multiple occurrences (71) and habitual sentences (72)b constitute *event-external pluractionality*.

(70) The happy dog waggled his tail….
(71) She followed instructions and sang "Happy Birthday" twice.
(72) She coughed.
  a. "On one occasion, she gave a cough." (episodic)
  b. "She habitually coughed." (habitual)

But this in itself is insufficient to distinguish iterativity from habituality (the members of a series could be viewed as microevents in a macroevent). The difference between iterative and habitual sentences is not correlated with a formal difference—some sentences (e.g., (73)) allow both readings, and others (74) either episodic or habitual—but results from pragmatic interpretation.

(73) The happy dog wagged her tail.
  a. several times. (iterative)
  b. every time she saw her "mommy." (habitual)

(74) Susan read the letter.
  a. through twice. (episodic)
  b. every night. (habitual)

Habituality is also difficult to distinguish from genericity. Both habitual sentences (75) and generic sentences (76) characterize a period of time (Krifka et al. 1995) (in (76), implicitly the period in which dodos lived, and in (75), explicitly the subject's youth). Sometimes habitual sentences are classified as a sub-type of generics (Krifka 1987; Krifka et al. 1995), though sometimes generics are considered those containing reference to generic kinds (like dodos in (76)). Such references cannot be crucial to the interpretation of sentences, however, given the different readings possible with an ambiguous (77) or non-generic subject (78).

(75) When I was young, I would climb trees.
(76) Dodos nested on the ground.
(77) The Italian drinks wine with his dinner. (Krifka et al. 1995)
  a. "Italians typically drink wine with their dinners." (generic)
  b. "A particular Italian usually drinks wine with his dinner." (habitual)
(78) Mary handles the mail from Antarctica. (van Geenhoven 2005)
  a. "Mary is supposed to handle the mail from Antarctica." (generic)
  b. "Mary handles some particular batch of mail of Antarctica on one occasion." (episodic)
  c. "Mary handles the mail from Antarctica regularly/once in a while." (habitual)

Here we consider purely *dispositional sentences* (Boneh and Doron 2010) like (78)a and (79) to have generic readings even in the absence of reference to generic kinds like *dodos* (76) or *the Italian* (77)a. Generic sentences do not refer to specific occurrences, and indeed there may be none: (80) would still be true even if there were no truth-tellers and the truth was never told;

(81) is true by definition, though because *dweck* is a nonsense word, there is no guarantee that "dwecking" ever actually occurs. Habitual sentences, however, refer to a series (possibly incomplete), of actual events: (82) is simply false if "he" never goes to work in a suit and tie.

(79) John smokes. (Krifka 1987)
(80) Truth tellers tell the truth.
(81) Dweckers dweck: after all, that's what they do.
(82) He goes to work in a suit and tie.

The habitual is generally considered aspectual (Comrie 1976, p. 25; Lyons 1977, p. 716; Bybee 1985, p. 141), and does share properties with other putative aspects. It represents a view of an eventuality—(83) is an alternative presentation of the events in (84)—and its interpretation depends on the aspectual class of the predicate: with an eventive predicate (83), *used to* is interpreted as habitual but with a stative predicate (by default) as simply stative ((69), (85)). And it can trigger reinterpretation of an incompatible type of predicate (in (86), as a series of episodes).

(83) She {would/used to} return home often.
(84) She returned home often.
(85) The temple of Diana used to stand at Ephesus. (Comrie 1976, p. 28)
(86) On such occasions, John used to feel ill.

However, all of the markers appearing in habitual sentences are also used for both generic sentences (even *used to*, as in (87)) and episodic sentences, thereby giving rise to systematic ambiguities. The interpretation of a sentence as habitual does not depend on the presence of a marker in the way that interpreting progressive sentences as progressive does, for example. Moreover, disambiguation of examples like (77) and (78) requires interpretation in context. Nor is it clear that habituality is a covert category, standing in implicit opposition to non-habitual aspect.

(87) The Dodo used to walk around/And take the sun and air. (Hilaire Belloc, *The Dodo*)

Consequently, in the case of English, habituality is likely best viewed not as a semantic value, but as a pragmatic interpretation (cf. Smith 1991, p. 87). Out of context, (88) is simply ambiguous and requires added intra-sentential (89) or extra-sentential (90) context for its interpretation.

(88) Susan went to bed early.
(89) Susan went to bed early ({that night/as a rule}).
(90) {That year Susan's job required her/That day Susan decided} to get up at dawn, forcing a change in her sleep habits. She went to bed early.

11.4 Aspectual Compositionality

11.4.1 Aspect and Compositionality

The aspectual properties of the verb phrase are not merely inherited from its core verb but depend also on the properties of the sentence constituents accompanying it—its arguments, adverbial modifiers, grammatical aspect marker(s), and tense. Running, for example, is a process and *run* a processual verb, but running a marathon, running for an hour, and running

across the street are bounded eventualities and hence the corresponding verb phrases are eventive.

The principle of *compositionality* (Verkuyl 2012; Goldberg 2016) states that the meaning of a linguistic expression is a function of those of its constituent parts along with the way in which it is composed, its internal syntax.

Since the 1980s it has been observed that when co-occurring expressions are semantically incompatible, one of them is reinterpreted so as to render their collocation acceptable such as in the case of the non-stative interpretation of stative predicates with the progressive (91). Partee and Rooth (1983) call this *type shifting* and Talmy (1988) *implicit conversion*, but it is best known as *implicit type coercion* (Moens and Steedman 1988). To account for this, Moens and Steedman, and others, propose *phasic theories of aspect* (Section 11.4.2).

(91) I'm seeing a bright light. (Mourelatos 1978)

A special challenge to theories of aspect is posed by the progressive with an eventive predicate, which gives rise to the *imperfective paradox* (Dowty 1977). Since the progressive presents an interior, partial view of an eventuality, Bennett and Partee (1978) propose that a sentence like (92) is true if and only if the time of its processual phase is a subinterval of the interval over which the complete event (93) occurs. This is correct for non-eventive predicates like *push a cart* or *feel poorly* but fails for *build a house*, because Mary may never have finished it. More generally, the imperfective paradox is part of the *partitive puzzle* (Bach 1986). How is what Mary was doing in (92) part of a completed event that may never have occurred? In what sense is what she was building a house, when it was not yet one, and might never be?

(92) Mary was building a house.
(93) Mary built a house.

Solutions proposed for the imperfective paradox start from the observation that (93) would have followed if (92) had been allowed to continue to its natural conclusion (Vlach 1981), as do solutions couched in modal terms, utilizing the concept of possible future histories (Dowty 1979, chapter 3; Landman 1992; Portner 1998).

Solutions for the partitive puzzle start from the observation that an incomplete event is nonetheless part of a (potentially complete) event, and an incomplete object is part of a (potentially complete) object: what Mary was building in (92) was already, in *some* sense, a house (Parsons 1989, 1990), and an on-going process, as in (92), which affects a (real or potential) object, approaches completion of an event such as that in (93) (Åqvist 1977; Bennett 1977). Such a *mereological relation* between parts and wholes forms the basis for mereological theories of aspect; see Section 11.4.3.

11.4.2 The Interaction of Viewpoint and Situation Aspect

In phasic theories (Moens and Steedman 1987, 1988; de Swart 1998, 2000), situation aspect concerns an inherent typology of expressions and the eventualities they denote (Section 11.2.1), while the role of the grammatical aspectual markers, along with aspectual verbs (94) and adverbials such as *for half an hou*r (95), is to transform one aspectual class into another (de Swart 2000).

(94) Susan finished {*being happy/!running/*driving trucks for a living/building the kayak}.
(95) John swam for half an hour.

Such elements explicitly signal a type conversion but type coercion may also be implicit. For example, the perfect (generally) allows reference to the result state following an event (96).

(96) Susan has ingested poison (and now she's ill).

The progressive refers to the preparatory phase of an eventuality, and therefore excludes stative expressions, which lack such a phase. The progressive thus forces coercion of an accomplishment expression into a processual one (97) and an achievement expression into one for the preparatory phase of an accomplishment (98). Moens and Steedman (1987) view such a process as a dynamic state, progressing toward a culmination.

(97) They were climbing the mountain.
(98) They were reaching the summit of the mountain.

The perfective represents all phases of the eventuality (Comrie 1976, p. 16). Filip and Rothstein (Filip 2008, 2017; Filip and Rothstein 2005) consider a perfective form to "maximize" the eventuality description. Accordingly, with telic expressions (99), the perfective conveys a sense of completion, but not with atelic ones (100).

(99) They reached the summit of the mountain.
(100) Susan was asleep.

The perfect transforms eventive expressions into those for their result states, so that (101) (as a resultative perfect) and (102) entail one another (Moens and Steedman 1987). Therefore, strictly speaking, the perfect excludes states and processes, which lack result states. But a non-eventive expression in the perfect is reinterpreted as eventive, and hence consequential (103).

(101) The windows have broken.
(102) The windows are broken.
(103) Susan has been playing cards (and now she's {sleepy/broke/ashamed}).

The prospective transforms eventive expressions into those for their preliminary phase (initial states) (104). Accordingly, the prospective differs from the future tense in referring to an eventuality which, although future, has in a sense already begun. As with the perfect, coercion of an atelic into an eventive expression (105) may occur.

(104) They're bringing out your puppy next.
(105) They're playing (= "starting to play") with your puppy next.

De Swart (2000) attempts to account for the properties of series by arguing that habitual sentences in the simple tenses (106) result from coercion of eventive expressions into atelic ones. The same may be true of *used to* (107) and *will/would* (108).

(106) John usually falls asleep while watching TV.
(107) Susan used to hide (every time her aunt came to call).
(108) A light {will/would} flash (every so often).

11.4.3 Mereology and Scalarity

Champollion (2015), grounded in Verkuyl (1972) and Krifka (1986, 1989), defines aspectual composition as the problem of how complex constituents acquire the telic/atelic distinction from their parts. The search for a fine-grained analysis which can adequately account for

aspectual compositionality has fostered the development of mereological theories having their roots in lexical decomposition (Gruber 1965, 1976; Dowty 1979) and cognitive linguistics, especially conceptual semantics (Jackendoff 1983, 1990, 1991).

It is necessary to distinguish the semantic property of *telicity*, involving a point of termination (culmination) in a *type* of eventuality, from the pragmatic interpretation of *boundedness*, the occurrence of a termination in a *token* of an eventuality (cf. Depraetere 1995). Driving is a process and lacks an inherent terminal point, but a particular *episode* of driving by definition terminates. In the absence of either an inherent point of culmination (as in the case of *separate*) or an explicitly stated limit (*drive a car to the market*), an expression is atelic in *meaning*. But an atelic expression like *drive a car* may receive a telic *interpretation* if there is an implicit, contextually imposed, limit (109).

(109) John took a bus to the market and Mary walked. But Susan drove a car.

The bound imposed by an adverbial ((110) and (111)) or an argument ((112) and (113)) may be spatial, as in ((110) and (112)), or temporal ((111) and (113)).

(110) Susan drove to the market.
(111) Susan drove for an hour.
(112) The river flooded the town.
(113) She spent an hour there.

Motion along a (directed) path is limited by the goal location; motion *toward* the market in (110) is terminated *at* the market. A dynamic eventuality involving a change of state may be conceived metaphorically as motion along a directed path toward a goal state (Langacker 1986; Talmy 1991), in which case it is limited by the achievement of the goal (114). Or eventualities may be limited by the upper bound of a temporal extent (115).

(114) Picasso painted a masterpiece.
(115) Picasso painted for an hour.

Mereological theories of aspect are grounded in three principles.

First, events are things, which are countable and may be referred to (Davidson 1967, 1969; Parsons 1990).

Second, the difference between telic eventualities and atelic ones is analogous to that between count nouns and mass nouns (Taylor 1977; Mourelatos 1978; Bach 1981, 1986; Jackendoff 1991; Filip 2012). Events are discrete and finite and so *quantized*; they may be counted (116); cf. *ate only one muffin*. Atelic eventualities are mass-quantified like masses (117); cf. *ate a lot of bread*. Eventive expressions receive count-quantified nominalizations (118), but non-eventive eventualities, mass-quantified nominalizations (119).

(116) Susan returned home only once.
(117) John {slept/was ill} a lot.
(118) There were three eruptions of Vesuvius. (Mourelatos 1978; cf. Vesuvius erupted three times)
(119) But later there's running and screaming. (The Lost World: Jurassic Park; cf. *But later there's a running and a screaming.)

Because mass nouns denote homogenous, non-discrete "stuff" rather than the heterogeneous, delimited (bounded) kinds of things denoted by count nouns, mass nouns possess *partitivity* (*divisibility*): part of a mass of bread is bread, but part of an apple is not an apple. The corollary of this is that mass, unlike count, nouns are *cumulative* or *additive*: two loaves of bread are simply bread, but two apples are not an apple.

Similarly, homogenous eventualities are partitive and cumulative: every portion of an episode of running or being ill is, respectively, running or being ill. But no part of an event is an event *of the same type* (the culmination of any kind of event is an achievement).

An expression is semantically telic just in case it contains a reference to a limit, and receives a telic (i.e., bounded) interpretation just in case it either contains such an explicit limit or there is a contextually supplied implicit limit (Bach 1986; Krifka 1986, 1989). Such a limit is analogous to the bounds of a thing, though we usually think of a thing as spatially bounded and an eventuality (event or episode) as temporally bounded.

Third, there is a one-to-one mapping between the mereological (part-whole) structure of an eventuality and that of its argument (Filip 2012). For there to be a directed path, there must be a goal position/state and progression toward it. In the case of homogeneous eventualities, there can be no such progression. A process becomes an event when delimited by a goal position. The adverbial *across the street* and the object noun phrase *a marathon* thus convert *run* into the eventive expressions *run across the street* and *run a marathon*.

In the case of an expression like *eat an apple* there is a homomorphism (Krifka 1992) between the portion of the apple which is consumed and the distance traveled along the "path" toward the reduction of the apple to its inedible remnants. The parts of the eventuality correlate with parts of the object, and the eventuality is complete when the object is completely affected.

Grammatical objects which "measure out" (Tenny 1987, 1992) the eventuality in this way (cf. Verkuyl 1972's "add-to" relation) are called *incremental theme objects* (Dowty 1991; cf. *gradual patient*, Krifka 1986, 1989) and verbs like *eat*, *incremental theme verbs*. The apple *is eaten* when the apple *has been* (fully) eaten. *Holistic theme verbs* are those, like *watch*, in which the eventualities they denote contain neither a change of state of the object nor motion along an (actual) path.

Bach (1986), Krifka (1986), and others propose to "reconstruct" the opposition telic:atelic in mereological terms by relating it to the part/whole (≤) relation (Champollion and Krifka 2014), and defining telicity as quantized reference (Champollion 2015).

In the last two decades attention has increasingly turned toward *scalar* theories, grounded in the notion of scale associated with predicates like *cool*. In such cases, the change of state is not discrete (from, say, hot to cold) but, rather, scalar: from hot to less hot or more cool. Scalar approaches attempt to provide a uniform account of the degree of change of the thing denoted by a syntactic theme in the course of a dynamic eventuality, whether a change of state (120), a change of location (121), or a change in a property (122), by treating the different types of incrementality as cases of transition along a *scale* of values (Beavers 2013).

(120) Susan ate the apple.
(121) Susan pushed the cart to the wall.
(122) The cold froze the water.

In scalar accounts, starting with Hay et al. (1999), telicity is definable as a "bounded degree of change" (Filip 2012). "Open" scales lack a maximal value; therefore *expand* is atelic. Others are "closed," either on their lower bound (as soon as something is wetted, it is wet) or upper (something is not dry as soon as it starts drying, but there is a point beyond which it can dry no further).

Krifka (1992) and Filip (1993) argue for the independence of incrementality and telicity on the grounds that closed scales (e.g., those defined temporally, like *eat soup for ten* minutes) do not guarantee telicity (Crăiniceanu and Baciu 2009; Filip 2012).

There are a wide range of approaches to aspect based on mereology and/or scalarity, and the relationship between the two is unclear: Filip (2012, section 8) sees them as complementary, whereas (she notes) Jackendoff (1996) sees them as in competition.

11.5 The Discourse Functions of Aspect

11.5.1 Form, Meaning, and Function

An explanatory account of the aspects depends on understanding the functions of aspect in discourse.

The effect of the markers of viewpoint aspect is to transform basic types of aspectual classes into derived types that can perform different discourse functions. For example, the subsidiary, *background* material in a narrative discourse which accompanies the *foreground* events (Hopper 1979) as explanations, exemplifications, etc., consists primarily of stative sentences constructed from stative predicates (*hungry* in (123)) or non-stative expressions rendered stative by the progressive or perfect aspects (eventive *slaughter his guards* and *escape,* and processual *march north*, in (124)).

(123) John looked for a place to eat. He was hungry.
(124) News came. Kornilov's faithful *Tekhintsi* had slaughtered his guards at Bykhov, and he had escaped. Kaledin was marching north.... (Reed, *Ten Days that Shook the World*)

11.5.2 Global Discourse Structure and Genre

The textual function of aspect (Fleischman 1990, 1991; Waugh, 1991) is to create and maintain the coherence of the discourse at global and local levels of structure.

Global structure depends on the genre of the discourse. *Narrative* genres, for example, fiction, contrast with genres of *discourse* (Benveniste 1959) or *commentary* (Weinrich 1964), such as conversation or reportage, both in structure and the use of tense and aspect. Narrative has a foreground or main narrative line consisting normally of a chain of eventive clauses in the perfective aspect (Hopper 1979, p. 132) (125). Tense use is *anaphoric*, linking the reference time of each clause to a specific time introduced by another clause in the narrative. The background of narrative (Hopper, 1979) consists of non-eventive sentences (e.g., the second sentence in (126)) and/or ones in non-perfective aspects (the third sentence in (126)).

(125) I came, I saw, I conquered. (Caesar, Gallic Wars)
(126) Tom looked for a restaurant. He was hungry. He had not eaten for hours.

Genres of commentary are associated with non-eventive sentences (127). Tense use is *deictic*, the times of the eventualities relate directly to the *deictic center*, which is usually the time of utterance, and not to one another. Thus, in (127), unlike (128), there is no anaphoric relationship between the sentences; each relates only to the deictic center.

(127) The new stadium will be large. It will easily hold 100 000 people.
(128) John looked for Susan. He found her.

11.5.3 Local Discourse Structure and Discourse Coherence

In the local structuring of discourse, aspect serves to maintain coherence on three levels, the *linguistic*, *intentional*, and *attentional* (Grosz et al. 1995).

On the linguistic level, discourse coherence has to do with temporal relationships, the *binding* or *anchoring* of the reference point of each clause by some time referred to in the preceding discourse. The binding time may be denoted by a time adverbial (129), noun phrase (130), or clause (131).

(129) For the next few days the temperature was pleasant.
(130) The war years were hard on Tom's family.
(131) John entered the room. Jane was standing by the window.

In a narrative discourse, however, the reference points of linked clauses characteristically form a sequence in which each is slightly later than the preceding one (132); non-eventive, background clauses (133), however, do not in general trigger such *narrative advance* (Kamp 1979; Dry 1981, 1983; Kamp and Rohrer 1983; Partee 1984; Hinrichs 1986).

(132) John came in. Susan held up the newspaper.
(133) John came in. Susan was holding up the newspaper.

Phasic aspect theories account for narrative advance by assuming that foreground clauses take as their reference times the time introduced by the immediately preceding clause in the narrative sequence, including its result state, which is later than the reference time of the anchoring clause (Moens and Steedman 1988). No narrative advance occurs with backgrounded non-events (134) because they lack result states.

(134) Susan was unhappy. John decided to help her.

Since the aspectual class of the sentence may be modified by its aspectual form (Moens and Steedman 1987, 1988; Boogaart 1999), viewpoint aspect plays a central role in discourse coherence on the linguistic level.

Temporal sequence is not the only one that can hold between the events expressed by a sequence of eventive clauses. An event may precede (135), or form part of (136), the eventuality in the preceding clause. Sequences of non-eventive clauses ((137) and (138)) likewise define various temporal relations, including temporal sequence (138) (examples from de Swart and Verkuyl 1999).

(135) The ship sank on its maiden voyage. The crew ran it into an iceberg.
(136) John wrote a roman à clef. He wrote Susan into chapter 4.
(137) Hilary entered the room. Phil was reading in his chair.
(138) Hilary entered the room. Phil was happy to see her.

Temporal relations in discourse are correlated with *rhetorical relations* (Lascarides and Asher 1991, 1993; Lascarides and Oberlander 1993), also called *coherence*, *discourse*, or *topical relations* (Hobbs 1979, 1985; Polanyi 1985; Thompson and Mann 1987, Mann and Thompson 1988; Scha and Polanyi 1988), which hold between segments of the discourse. Thus, *narration* (139) and *consequence* (140) define temporal sequence; *explanation*, precedence (141); and *elaboration*, inclusion (142). When such a rhetorical relation is absent (143), a temporal relation does not suffice to assure discourse coherence (Caenepeel 1995).

(139) A car came slowly down the street. It stopped in front of Harry's house.
(140) The waste bin burst into flame. Someone grabbed the fire extinguisher.
(141) We ate leftovers for dinner. Mother forgot to cook.
(142) We had a great time. We danced, we sang, we talked.
(143) Max poured a cup of coffee. He had entered the room. (Lascarides and Asher 1993).

On the *intentional* level, local discourse coherence is a matter of the logic of the discourse, and consists precisely in attaching each clause to some segment of the preceding discourse by such a rhetorical relation.

On the *attentional* level, coherence is a matter of topical relevance, so discourse coherence is maintained by attaching each clause to a preceding segment of discourse, in narrative, an episode with a common line of events, and in non-narrative, a *thread*, a set of statements sharing a common topic (Grosz et al. 1995).

Rhetorical relations structure discourse by coordinating or subordinating material to the immediately preceding segment (Hobbs 1985; Lascarides and Asher 1993, Caenepeel and Moens 1994; Spejewsky 1996), thereby either maintaining the current segment or creating secondary narrative lines (144) or subordinate threads (145). Coordinating rhetorical relations, typically marked by perfective aspect, include narration (139) and *listing* (146). Subordinating rhetorical relations include consequence (140), explanation (141), and elaboration (142).

(144) Tom got home late and was very tired. He had worked a long, hard day and had had a frustrating drive home through dense traffic.
(145) I told Frank about my meeting with Ira. We had talked about ordering a Butterfly. (Webber 1988).
(146) Bill sang a song. Jane played the piano. And Susan told jokes.

A non-perfective often marks a shift into a subordinate thread. Thus, while (147) is ambiguous—the second sentence may maintain the thread (Frank and I talked about the Butterfly) or switch into a subsidiary thread (Ira and I talked about it)—in (145), the past perfect unambiguously indicates the latter.

(147) I told Frank about my meeting with Ira. We talked about ordering a Butterfly.

In secondary narrative lines, such as extended flashbacks, we may find non-perfective tenses such as the past perfect, which are not normally associated with narrative (148) (Kamp and Rohrer 1983).

(148) He had not been known to them as a boy; but … Sir Walter had sought the acquaintance, and though his overtures had not been met with any warmth, he had persevered in seeking it…. (Jane Austen, *Persuasion*)

Discourse subordination is often associated with *focalization*, a change in perspective or viewpoint. In (149) (Kamp and Rohrer 1983), the past perfect indicates the viewpoint of Mme Dupont, the perfective *ate* in (150) that of the narrator.

(149) The telephone rang. It was Mme Dupont. Her husband had eaten too many oysters. The doctor recommended a change in lifestyle.
(150) The telephone rang. It was Mme Dupont. Her husband ate too many oysters. The doctor recommended a change in lifestyle.

In *free indirect discourse*, part of a subordinate narrative line or thread takes the form of a structure, such as an independent clause, typical of independent, superordinate units. Free indirect discourse is focalized and a deictic element takes as its deictic center the reference time of its frame. Normally deictic tenses are anaphoric in their use. Thus, in (151) *now* means "at that time," and the past tense *was* is present relative to the time his foot touched the deck and his purpose dies out.

(151) As his foot touched the deck his will, his purpose he had been hurrying to save, died out within. It had been nothing less than getting the schooner under-way, letting her vanish silently in the night from amongst these sleeping ships. And now he was certain he could not do it. (Conrad, *Within the Tides*)

11.6 Conclusion

Tensed verbs and collocations of tensed auxiliary verbs with non-finite verbs receive interpretations in English involving aspectual distinctions. The twin goals of English aspectology are (1) to comprehensively and correctly describe those interpretations, and (2) to explain them in terms of the semantics of the expressions themselves and of their contextual pragmatics. Both goals depend on, and help to shape, a general theory of tense and aspect. Great progress has been made in recent decades in fulfilling these goals, but much remains to be studied.

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NOTE

1 This and following examples were found in internet searches during the writing of the chapter.

FURTHER READING

On grammatical and viewpoint aspect: de Swart (2012), Filip (2012).
On the progressive in English: Scheffer (1975); Williams (2001).
On the perfect in English: McCoard (1978); Ritz (2012).
On habituality: Carlson (2012), Bertinetto and Lanci (2012).
On phasic aspect theory: Steedman (2001).
On aspectual compositionality: Verkuyl (2012, section 3); Filip (2012, section 7).
On mereology: Champollion and Krifka (2014).
On scalarity: Beavers (2013).
On aspect in discourse: Sperber and Wilson (1986); Ehrlich (1990); ter Meulen (1995); Lascarides and Asher (2003).

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12 Mood and Modality in English[1]

ILSE DEPRAETERE AND SUSAN REED

12.1 Introduction

Modality is an area of meaning that is often defined by example: the term "modality" is a cover term for a range of semantic notions such as ability, possibility, hypotheticality, obligation, and imperative meaning. This is a serviceable definition for practical purposes. If, however, we wish to provide a more theoretically useful definition, we need to find what it is that all modal utterances have in common. This turns out to be by no means evident (cf., e.g., Krug 2000, pp. 39–43; Portner 2009). What, for example, does the imperative mood, whose prototypical function is to convey a command, have in common with the auxiliary verb *can* in its meaning of "ability," or the auxiliary verb *might* when it expresses a type of possibility meaning, as in *You might be right about that*? What does the hypothetical meaning of a sentence like *If the dog lost a bit of weight it could use the cat-flap* have in common with the obligation meaning of *You have to pay to get in*?

One feature that is common to all modal utterances is that they do not represent situations as straightforward facts (cf., e.g., Zandvoort 1964, p. 395; Declerck 2011). However, the wealth of literature on modality would seem to suggest that linguists intuitively feel that modality is something semantically far richer than "lack of factuality." We can get nearer to a positive characterization of modality if we say that modal meaning crucially involves the notions of necessity and possibility (Larreya 1984; Kratzer 1991; van der Auwera and Plungian 1998; Huddleston and Pullum 2002, p. 173), or rather, involves a speaker's judgment that a proposition is possibly or necessarily true or that the actualization of a situation is necessary or possible. But more semantically precise links between such meanings as we mention above are not forthcoming.

In what follows, we shall work on the basis that all modal utterances are non-factual, in that they do not assert that the situations they describe are facts, and all involve the speaker's comment on the necessity or possibility of the truth of a proposition or the actualization of a situation. We will return to the discussion of theoretical problems concerning modality in Section 12.4.3.

Modality may be coded in various ways, including verbal inflections, auxiliary verbs, adverbs, and particles. The grammatical coding of modal meaning in verb inflections is known as mood (Thieroff 2010; van der Auwera and Aguilar 2016). English makes relatively little use of inflectional systems to express modal meanings: the imperative mood is common in English, and there is limited use of the subjunctive mood,[2] but modality in English is primarily expressed by non-inflectional items. These include a variety of elements, including adverbials like *perhaps*, *in all probability*, etc., and "hedges" like *I would think* (*that*) (cf., e.g., Hoye 1997; Krug 2000; Huddleston and Pullum 2002, pp. 173–175; Portner 2009, pp. 2–8).

The Handbook of English Linguistics, Second Edition. Edited by Bas Aarts, April McMahon, and Lars Hinrichs.

A very important means of expressing modality in English is the set of modal auxiliary verbs such as *can*, *might*, and *must*, and a considerable part of this chapter will be concerned with the meanings expressed by these auxiliaries. We will begin, however, with a brief look at mood in English.

12.2 Inflectional Moods

In English, there are usually said to be three inflectional moods: the imperative, the subjunctive, and the indicative. The meanings they respectively communicate are captured quite nicely by the labels used by Jespersen (1949, p. 623): "will-mood," "thought-mood," and "fact-mood." Here, we will chiefly be concerned, after a glance at the imperative, with the subjunctive mood.

The unmarked function of an *imperative* utterance is to signal that the speaker wants a certain state of affairs to be brought about (i.e., considers it necessary), and directs the addressee to bring it about:

(1) *Come* here!
(2) *Have* some more cake!

The imperative is not marked for tense, being formally realized by the base form of the verb.[3]

The subjunctive mood creates an intensional domain in the sense that there is reference to a state of affairs that is the case in a possible world, but the speaker does not assert that the state of affairs holds (or held, or will hold) in the actual world.[4]

The traditional labels *present subjunctive* and *past subjunctive* (the latter only existing for the verb *be*) refer more to form than to meaning. The form of the present subjunctive is the base form of the verb, that is, the same form as is normally used for most persons in the present tense. The past subjunctive is only distinct from the past indicative for first-person and third-person singular, which are realized by the form *were*.[5] The terms *present subjunctive* and *past subjunctive* should not be taken to refer to the time reference of the forms in question. The present subjunctive can be embedded in a clause with present, past, or future time reference (cf. (5)c). The past subjunctive always refers either to a hypothetical (or "tentative"—cf. Declerck and Reed 2001) situation or to a counterfactual situation, but the hypothetical or counterfactual situation may be located in the present, the past, or the future:

(3) Jimmie wishes/wished/will wish his girlfriend *were* with him.

The present subjunctive is used in formulaic expressions (cf. (4)), in more or less fixed phrases functioning as conditional clauses (cf. (5)a and (5)b) and after expressions (verbs, adjectives, and nouns) that express volition (cf. (5)c), the so-called mandative subjunctive. In the latter case, *should* + infinitive is a less formal alternative:

(4) a. God *save* the Queen.
    b. If that's how you feel, so *be* it.
    c. *Perish* the thought.

(5) a. You can refer to this at a later date, if need *be*. (COBUILD, ukmags)[6]
    b. If truth *be* told, it all sounds a bit earnest. (COBUILD, ukmags)
    c. The board desires/ordered/will request that changes *be* (*should be*) made to the plans.

The past subjunctive is used productively in hypothetical (cf. (6)a) and counterfactual (cf. (6)b) conditional clauses and after the verb *wish* (cf. (6)c), but is not used as a mandative subjunctive:

(6) a. What would you say if I *were* to refuse to go?
b. If she *were* living closer, I'd visit her more often.
c. I wish I *were* in Phoenix now.

The indicative normally represents situations as facts, but the indicative past tense and past perfect can also be used modally, in specific structures, to represent situations as non-factual or counterfactual:

(7) It would be great if it *rained* tonight.
(8) If only Meg *was/had been coming* with us.
(9) I wish/wished he *had told* me about it.

The past form and the past perfect used with modal meaning do not have past time reference as part of their meaning (though the situations they refer to may be interpreted as located in the past). The past perfect still normally expresses anteriority with respect to a situation, but not necessarily to a past time situation; more importantly, the modal past perfect signals that the situation it refers to did not actualize, is not actualizing, or will not actualize, that is, is counterfactual.

As pointed out in the introduction, modality in English is overwhelmingly expressed by non-inflectional means, principally modal auxiliaries. This observation has led Huddleston (1984) to expand the category of purely inflectional mood to what he calls *analytic mood*, that is, non-inflectional verbal forms that establish modal meaning. While *mood* in this way becomes an extremely broad category,[7] this proposal has the advantage of effectively encompassing all the possible verb forms involved in establishing modal meaning.

Although most authors on modality agree that both moods and modal auxiliaries should be included within modality as expressing the possible and the necessary rather than facts, there is no tradition of treating mood and modal auxiliaries together, nor a practice of describing the function they share by means of a common stock of descriptive categories. It is perhaps due to the very large range of forms and meanings involved once the two categories are united that they tend to be dealt with separately. In everyday practice, modality in English is most commonly linked with modal auxiliaries, given the important role, noted above, played by modals in the expression of modality in English. Accordingly in the next section, we will list the formal characteristics of English modal auxiliaries before we go on to look Section 12.4 at the meanings that they can express and at ways of categorizing modality in English, focusing on what Huddleston calls analytic mood.

12.3 Analytic Mood: Formal Properties of Modal Auxiliaries

Traditionally, a distinction is made between central modals (*can*, *could*, *may*, *might*, *shall*, *should*, *will*, *would*, *must*) and peripheral or marginal modals (*dare*, *need*, *ought*). In addition, we find a group of verbs referred to as semi-modals, quasi-modals, emergent modals, or periphrastic modals. This somewhat open-ended category includes *have to*, *need to*, *have got to* (*gotta*), *be able to*, *be going to*, but can also include a variety of other verbs such as *be supposed to*, *be about to*, *be bound to*, *want to* (*wanna*), and *had better*.

The central modals have all the "NICE" properties that are criterial to the classification of a form as an auxiliary verb (cf., e.g., Palmer 1974, pp. 18–25). That is, they have a **negative** form consisting of the auxiliary followed by *not*, they can precede the subject in subject–verb **inversion** (e.g., in interrogatives), they can occur in "**code**," that is, they can be used instead of a full lexical verb which has occurred in the context (e.g., *She will help and so will I*), and

Table 12.1 Formal characteristics of modals.

	Central modals	*Peripheral modals*	*Semi-modals*
Do required in NICE (*Negation*, *Inversion*, *Code*, *Emphasis*) contexts	–	–[8]	–[9]
-s for third person singular	–	–	+
Non-finite forms	–	–	+[10]

they can be used in **emphatic** affirmation (*She probably won't help, but she MIGHT* (*do*)). This means that unlike lexical verbs they do not require the use of *do* in such contexts. In addition, unlike lexical verbs the central modals are invariable for person and number—they have no third person singular *-s* form—and have no non-finite forms.

Peripheral modals differ from central modals, in the case of *dare* and *need* because these auxiliaries only occur in non-assertive contexts and in the case of *ought* principally because it takes a *to*-infinitive. Most of the semi-modals are composed of *be* X *to* and they generally have the NICE properties in respect of the *be* part of their form, but unlike the central and peripheral modals they do inflect for person and number and they have nonfinite forms. In addition, they can co-occur with the central modal auxiliaries (cp. *She may be able to help* vs. **She may can help*). *Have to* and *need to* are frequently included with the semi-modals on the basis of their semantics, and we shall follow this tradition here. On the formal level, however, it must be acknowledged that there is little justification for their inclusion, as both require *do*-support in NICE contexts (cf. Huddleston and Pullum 2002, p. 112; Leech et al. 2009).

Table 12.1 summarizes the formal basis on which the distinctions are principally drawn (cf., e.g., Quirk et al. 1985, pp. 136–148; Westney 1995; Biber et al. 1999, pp. 483–486; Huddleston and Pullum 2002, pp. 106–114; Leech et al. 2009, pp. 81–98; Leech 2013).

For reasons of space, we cannot explore in detail the formal behavior of the different sets of verbs systematically. It is, however, important to add that while the central modals *can*, *may*, *shall,* and *will* (but not the marginal modals) all have past forms, these do not necessarily indicate past time (cf., e.g., (14) and (19)). It is often the case that periphrastic forms have to be used to refer to the past (e.g., *He managed to get* (**could get*) *to the station in time*), and/or that the past form of the modal can only be used with past time reference in a restricted number of contexts (e.g., *He could swim at the age of six*: reference to a state vs. *He is the only one who did not drown: he was able to swim* (**could swim*) *across the lake*: reference to an actualized event). Likewise, the location of modal meaning in the future requires the use of a periphrastic form (e.g., *He will be able to read when he's six*). (cf. Section 12.5.2) Issues of this type are covered in, for example, Declerck (1991a), Biber et al. (1999), Depraetere (2012).

12.4 Categorizations of Modal Meanings Expressed by Analytic Mood

12.4.1 Epistemic versus Non-epistemic (or Root) Meaning

In English analytic modality, we can make an initial distinction between epistemic and non-epistemic, or root modality. Both types of modality have as their basis the notions of necessity and possibility, but the former deals with the necessity or possibility of the truth (or non-truth) of propositions while the latter deals with the necessity or possibility of the

actualization of situations. *Epistemic* modality reflects the speaker's judgment of the likelihood that the proposition underlying the utterance is true, the epistemic scale of likelihood ranging from weak epistemic possibility (*That may be John*) to epistemic necessity (*That must be John* = "it is necessary that [that is John] is true" and *That can't be John* = "it is necessary that [that is not John] is true").

Root modality reflects the speaker's judgments about factors influencing the actualization of the situation referred to in the utterance. Within root modality we find root possibility, root necessity, and two categories that are normally treated separately within root modality, namely, ability and volition. Cutting across the root necessity and root possibility categorization is the category of deontic modality, which includes obligation (a type of root necessity) and permission (a type of root possibility). *Deontic* modality typically refers to "the necessity or possibility of acts performed by morally responsible agents" (Lyons 1977, p. 823). Deontic modality also implies an authority, or "deontic source"—which may be a person, a set of rules, or something as vague as a social norm—responsible for imposing the necessity (obligation) or granting the possibility (permission). Thus, *John must go home* means, on a deontic (obligation) reading, something like "it is necessary for John to go home" plus, for example, "I oblige John to go home," and *John can go home* means, on a deontic (permission) reading, "it is possible for John to go home" and, for example, "the rules permit John to go home."[11]

Non-deontic root possibility (sometimes simply referred to as "root possibility") (*You can get coffee from this machine*) and non-deontic root necessity (*The fish have to be fed every day*) concern possibility and necessity that arise, not via a particular authority but due to circumstances in general. They can be paraphrased simply "it is possible (for …) to" (cf. (10) and (16)) and, for necessity, "it is necessary (for…) to" (cf. (23)) or even just "it is important to" (cf. (32)). Note that non-deontic root possibility differs on the one hand from epistemic possibility and on the other hand (though more arguably) from ability. It differs from epistemic possibility in that it does not imply a speaker's evaluation of how possible it is that some proposition is true but rather refers to the effect of circumstances on the possibility of actualization of some situation; it differs from ability in that it refers to possibility arising out of enabling or disabling circumstances outside the subject referent, as opposed to enabling or disabling factors that are entirely internal to the subject referent (see below). The non-deontic root possibility meaning of *Can you come tomorrow?* can thus be paraphrased by "is it possible for you to come tomorrow?" plus "are there any external circumstances preventing you/do external circumstances allow you to do so?"

Finally, we come to ability and volition. These types of root modality, too, combine the meaning of possibility with the notion of specific factors affecting that possibility. The ability meaning of *Can you climb over that wall?* can be paraphrased by "is it possible for you to climb over that wall?" plus "do you have the physical (and perhaps mental) abilities and/or skills to make it possible?." The volition meaning of *I'll help you* can be paraphrased by "It is possible for me to help you" and "I am willing and intend to do so."

12.4.2 Meanings Expressed by the Central Modals

Each of the central modal auxiliaries can be used with more than one meaning. In the survey below, we provide a list of the principal meanings expressed by the central modals.

12.4.2.1 Can

(10) [The fact that] John Major can become Prime Minister [is] proof enough that class is no longer a barrier. (non-deontic root possibility) (ICE-GB], S2B-036)

(11) *Can* I hold you and kiss you, here and now? I can't stand this! "No, my darling, no." (permission) (COBUILD, UK books)

(12) *Can* you speak any East European languages? (ability) (ICE-GB, S1A-014)

12.4.2.2 Could

(13) For example, with the simple digging of a well a large amount of pasture *could* be reclaimed but they had no organizational features to allow for this. (non-deontic root possibility) (ICE-GB, W1A-012)
(14) There has been recurring speculation that Futura *could* be planning a full-scale bid for Headlam and the latter's directors repeated last October's statement that they have not been informed of Futura's intentions. (epistemic possibility) (ICE-GB, W2C-012)

12.4.2.3 May

(15) You never know, I *may* eventually get a full-time job. (epistemic possibility) (ICE-GB, W1B)
(16) Epilepsy causes movements, sensations and behavior of many sorts. The fit *may* be limited to an area of the brain and its functions partial epilepsy or *may* be generalized. (non-deontic root possibility) (COBUILD, UK books)
(17) *May* I sit down for a minute? (permission) (ICE-GB, W2F-018)
(18) No book or other library material *may* be taken from the library 's premises. (permission) (ICE-GB, W2D-006)

12.4.2.4 Might

(19) I suspect that you *might* be seeking a room in a house of young women in want of nocturnal company. (epistemic possibility) (ICE-GB, W1B-015)
(20) You said to me once you *might* come to London to visit. (epistemic possibility) (ICE-GB, W1B-008)

12.4.2.5 Must

(21) With all the bits of work you've done over the years, your CV *must* be pretty full? (epistemic necessity) (ICE-GB, W1B-001)
(22) You *must* tell DVLA as soon as you buy a used vehicle. (non-deontic root necessity) (ICE-GB, W2D-010)
(23) To track environmental change the gene pool *must* be able to: a) maintain and continuously update an adequate reserve of variants […]; also b) switch between alternative forms of phenotypic expression (…) or flexible phenotypic responses (…) (non-deontic root necessity) (ICE-GB, W1A-009)

12.4.2.6 Will

(24) Anyone who has flown over the tropics *will* have seen the persistent pall of smoke which all too often signifies forests on the wane. (epistemic necessity) (ICE-GB, W2B-028)
(25) Why *won't* anyone believe them? (volition) (www)

12.4.2.7 Would

(26) Columba then prophesied that he *would* become a beggar and that his son *would* run from house to house with a half empty bag and that he *would* die in the trench of a threshing-floor. (epistemic) (ICE-GB, W1A-002)
(27) W*ould* you get the Fairground Attraction album (on CD) for me? (volition) (ICE-GB, W1B-002)

12.4.2.8 Shall

(28) We *shall* be away on holiday for a fortnight from Wednesday 29 August. (epistemic) (ICE-GB, W1B-027)

(29) Rightly, the Government's policy is that the pound *shall* not be taken from our pockets against the will of the people. (deontic root necessity) (ICE-GB, W2E-001)

12.4.2.9 Should

(30) You *should* just about get this letter by the time I get home. (epistemic necessity) (ICE-GB, W1B-011)

(31) Did you know that smiling might make you feel better? Read our article on why you should smile to find out even more interesting facts! (deontic root necessity) (www)

Three things should be mentioned here. Anticipating the discussion in Section 12.4.3 somewhat, it should be pointed out that *will* and *shall* (and *would* and *should*) used for prediction (examples (27) to (26), (29) to (28) and (31) to (30)) do not fit as comfortably in the paradigm of "*either* possibility *or* necessity of the truth of a proposition." Prediction does involve some judgment of likelihood, but it is not clear whether a prediction says that something is "necessarily" or, rather, "possibly" the case. As will be pointed out in Section 12.4.3 it is a matter of debate whether these uses of *shall* and *will* are modal: the fact that it is hard to describe them in terms of the traditional modal labels is already indicative of a difference in their status. Second, while the dividing line between deontic possibility (i.e., permission) and non-deontic root possibility appears to cause few problems, it seems to us that the dividing line between deontic necessity (obligation) and non-deontic root necessity is considerably more problematic (see Depraetere 2015, pars. 27–55). For example: *The Franks did make great efforts to try and govern Brittany, so it must be asked what stood in the way of preventing their rule, what were the limiting factors to Frankish control?* (ICE-GB, W1A-003). Here, there is no authority insisting on the asking, and yet a suitable paraphrase would not be "so it is necessary to ask what stood in the way of preventing their rule" but rather "so we are obliged to ask..." or "this (circumstance) obliges us to ask...." Third, the examples given do not exhaust the range of modal meanings that each auxiliary can express. Finally, and relatedly, it will be evident from this list that the relationship between modal auxiliaries and modal meanings in English is many-to-many (cf., e.g., Coates 1983, p. 26): each auxiliary has a range of modal meanings, and a given modal meaning can generally be expressed by more than one of the modal auxiliaries, albeit sometimes with varying shades of meaning or with varying acceptability in certain registers. In Section 12.5, we will return to the question of the multiplicity of meanings expressed by modals and explore in more detail the way in which temporal information is communicated by modals. For detailed discussion of the various meanings of modal auxiliaries, we refer the reader to the in-depth treatments mentioned in the further reading section.

12.4.3 Approaches to the Classification of Modal Meanings

Partly due to the fact that, in classifying modal meanings, it is possible to use various parameters as criterial to their classification, there exists in the literature a fairly diverse assortment of classifications of modal meaning. In this section we outline a few of the recent approaches to classifying modality in English.

Coates's (1983) analysis of English modal auxiliaries leads her to a basic two-way split between epistemic modality and root modality. Her examination of corpus examples shows that root modals taken as a whole differ from epistemic modals in systematic ways: root modals have shared semantico-syntactic features, typically, for example, having animate

and agentive subjects, and they are linked by similarities in intonation patterns which distinguish them from epistemic modals (cf. Coates 1983, p. 21 *et passim*). However, Coates does not merely argue that types of root modality are in important ways homogeneous in their difference from epistemic modality, but also that the various types of root modality should not be grouped into subcategories such as "deontic" modality (see Section 12.4.1). Such subcategorization, she argues, would obscure the fact that there exist deontic and non-deontic meanings of a single modal auxiliary which form a single spectrum of meaning, rather than being discrete meanings (cf. Section 12.5.1).

Quirk et al. (1985) distinguish between intrinsic and extrinsic modality. This classification cuts across the root–epistemic division. *Extrinsic* modality involves "human judgment of what is or is not likely to happen" (1985, p. 219) and covers (epistemic and non-deontic root) possibility, (epistemic and non-deontic root) necessity, and prediction, while *intrinsic* modality involves "some kind of intrinsic human control over events" (*ibid*.). Deontic modality and volition are categorized together as intrinsic modality. As for ability, the authors note: "The 'ability' meaning of *can* is considered extrinsic, even though ability typically involves human control over an action" (1985, p. 221). For Quirk et al., an assertion or question about a being's ability to do something implies some sort of judgment about the likelihood of actualization of the situation, and it is this aspect of ability meaning that informs their categorization of ability as extrinsic.[12]

For Bybee and Fleischman (1995, based on Bybee 1985) (whose approach, in fact, is a broad cross-linguistic one, rather than one concerned purely with English modality), the division used in Coates's (1983) analysis is essentially the correct one, based on their observation that markers of obligation, desire, ability, permission, and non-deontic root possibility "predicate conditions on an agent with regard to the completion of an action referred to by the main predicate" (1995, p. 6). By contrast, epistemic modality, as Bybee and Fleischman point out, concerns the truth of the proposition as a whole, and rather than relating an agent to an action, it deals with the speaker's commitment to the truth of the proposition. The group of modal meanings referred to by Coates as "root" modality are referred to by Bybee and Fleischman as *agent-oriented* modality, in order to reflect the shared semantic feature on which their categorization is based.[13]

Palmer (2001) distinguishes between *propositional* modality, which is concerned with "the speaker's attitude to the truth-value or factual status of the proposition," and *event* modality, which is concerned with whether or not the event referred to in the utterance can or must be realized. Propositional modality subsumes *evidential* and *epistemic* modality, the essential difference between these being that "with epistemic modality speakers express their judgments about the factual status of the proposition [*John may/must/will be in his office*], whereas with evidential modality they indicate the evidence they have for its factual status" (Palmer 2001, p. 8). Within event modality, Palmer distinguishes between *dynamic* modality, which covers ability and volition, and *deontic* modality, which, as usual, accounts for permission and obligation. Dynamic modality "comes from the individual concerned," that is, from the subject referent, while deontic modality comes "from an external source" (2001, p. 10). Palmer also points out that ability sometimes has to "be interpreted more widely," in the sense that the circumstances that affect the subject's physical and mental powers also need to be taken into account. The effect of circumstances in general upon the possibility or not of a situation's actualizing is accounted for by Coates as non-deontic root possibility rather than as part of ability, on the basis of the fact that such circumstance-affected possibility is not associated with many of the semantic and syntactic features which are associated with ability meaning. However, non-deontic root possibility is not recognized as a distinct area of meaning by Palmer.

Huddleston and Pullum (2002), like Palmer (1990), make a threefold distinction between epistemic, deontic, and dynamic modality. The category of dynamic modality covers ability,

volition, and non-deontic root modality. The categorization of Huddleston and Pullum differs from Palmer (2001) in having no superordinate category (equivalent to "root") that includes dynamic and deontic modality. In other words, non-deontic root possibility, ability, and volition are not presented as (nontrivially) more closely related to permission and obligation than they are to epistemic modality.

In van der Auwera and Plungian (1998), whose aim is to provide a general account of modal meaning across languages, modal meaning is restricted to those "semantic domains that involve possibility and necessity as paradigmatic variants" (1998, p. 80). Their account places willingness (and non-inferential evidentiality, as in German *Er soll krank sein* (*He is said to be ill*)) outside the range of what is meant by "modality." The authors start from the distinction between modal meaning that has scope over the whole proposition and modal meaning that concerns "aspects internal to the state of affairs that the proposition reflects" (1998, p. 82). The basic distinction is thus one between epistemic and non-epistemic modality, the latter category consisting of participant-internal and participant-external modality. Participant-internal modality involves possibility and necessity that "is internal to a participant engaged in the state of affairs" (1998, p. 80); it covers what is called *ability* (with human or non-human subjects), *dynamic possibility*, and *capacity* by others, and also some cases of what others refer to as *necessity*, namely, examples such as *Boris needs to sleep ten hours every night for him to function properly*. Participant-external modality implies reference to circumstances external to the "participant engaged in the state of affairs and that make the state of affairs either possible or necessary." Non-deontic root possibility and deontic modality (since "circumstances" can also concern the will of another person or a norm (1998, p. 81)) are covered by participant-external modality.

In an attempt to arrive at a clearer distinction between those root possibility categories that are not ability and not permission, Depraetere and Reed (2011) use three criteria: (a) the scope of the modality, (b) the source of the modality, (c) the concept of potential barrier. This results in five categories: (a) ability (*Tom can cook well*), (b) opportunity (*We can buy a ticket at the station*), (c) permission (*You can leave now*), (d) general situation possibility (*This paint can deteriorate under strong light*), and (e) situation permissibility (*Dogs may be kept in the owner's room)*. The relationship between the three criteria and the five categories is shown in Table 12.2.

In the first three categories, the modality has narrow scope in that it predicates a property of the subject referent (*Cats can see in the dark = Seeing in the dark is something that it is possible for cats to do*); in the case of GSP and situation permissibility, it is the entire situation that is in the scope of the possibility (*Cracks can appear overnight = the situation of cracks appearing is possible*). If the source lies within the subject referent, it is internal; in all the other cases, it is external. When the source of the modality potentially functions as a barrier to actualization, Depraetere and Reed argue that the result is permission or permissibility meaning.

Table 12.2 Taxonomy of non-epistemic possibility in Depraetere and Reed (2011).

	Ability	*Opportunity*	*Permission*	*General situation possibility (GSP)*	*Situation permissibility*
Scope	Narrow	Narrow	Narrow	Wide	Wide
Source	Internal	External	External	External	External
Potential barrier	– Potential barrier	– Potential barrier	+ Potential barrier	– Potential barrier	+ Potential barrier

Table 12.3 Taxonomy of non-epistemic necessity.

	Narrow scope internal necessity	*Narrow scope external necessity*	*General situation necessity (GSN)*
Scope	Narrow	Narrow	Wide
Source	Internal	External	External

Depraetere (2014, p. 172) applies the same set of criteria to root necessity, with the exception of "potential barrier," which does not come into play in necessity meanings.[14] This results in the identification of three categories of root necessity meaning, as shown in Table 12.3: (a) narrow scope internal necessity (*If you must put it like that*), (b) narrow scope external necessity (*All sea-snakes must surface to breathe*), (c) (wide scope) general situation necessity (*Sanctions must go*).

Table 12.4 provides a (slightly simplified) summary of the classifications discussed above.

12.4.4 Theoretical Problems Regarding Modality and the Classification of Modal Meaning

Modal auxiliaries (including peripheral modals and semi-modals) in English are notably susceptible to evolution, both in terms of their meaning (cf., e.g., Sweetser 1990; Coates 1995; Myhill 1997; Nordlinger and Traugott 1997; Ziegeler 2016) and in terms of their grammatical behavior, which may affect the approximation of peripheral or semi-modals to the status of central modal (cf. Krug 2000). This variability across time requires care in handling corpus material in the analysis of a given modal (Leech et al. 2009; Leech 2013). In addition, the semantic diversity of the meanings that have been classed as modal (cf. Section 12.1) and the somewhat fuzzy boundaries of modality naturally bring some difficulties of analysis with them. Questions arise about, on the one hand, which modal verbs, in which uses, count semantically as modal, and on the other hand, which meanings themselves count as modal. We mention below two of the most common issues regarding the classification of English modal auxiliaries and their meanings.

One well-known debate concerns the question of whether *will* can always be said to be a modal auxiliary or whether in its most frequent use it is no longer modal, with a basic meaning of intention or willingness, but is purely a marker of future tense (cf. *The sales will start on Monday*.) (see, e.g., Declerck 1991b, pp. 8–13; Huddleston 1995; Larreya 2000; Salkie 2010). Another English modal which provides ground for debate is the auxiliary *can*, in various of its uses, most obviously, its ability use.

One use of ability *can* is essentially suppletive to the English aspectual paradigm (cf., e.g., Leech 1987, p. 25). In the absence of an acceptable progressive form of verbs of inert perception such as *hear*, *see*, *smell*—**I am hearing the sea*—and certain uses of state cognition verbs such as *understand*, English uses *can* plus infinitive instead. Thus, what is literally a statement of ability, *I can hear the sea*, is interpreted more or less directly as equivalent to a progressive interpretation of *I hear the sea*. This use of *can* is often argued to be non-modal.

More controversial is the normal use of *can* with ability meaning. A sentence such as *Tommy can reach the door handles now* may be seen not so much as giving a speaker's judgment about the likelihood of a situation actualizing as making a factual statement about Tommy's ability. Palmer (2001, p. 179) comments: "Dynamic ability is less central to modality than deontic permission in that it does not involve the speaker's attitude to the factuality or actualization of the situation." Indeed, Steele (1975, p. 38, cited in Palmer (1990)) claims that

Table 12.4 Overview of taxonomies of modal meaning.

Epistemic modality	*Root necessity (non-deontic)*	*Root possibility excluding ability and volition (non-deontic)*	*Ability*	*Obligation (deontic necessity)*	*Permission (deontic possibility)*	*Willingness or volition*	
Epistemic	Root						Coates (1983), Declerck (1991a)
Extrinsic				Intrinsic			Quirk et al. (1985)
Epistemic	n/a	Agent-oriented					Bybee and Fleischman (1985)
Propositional	n/a	n/a	Event modality				Palmer (2001)
Evidential / Epistemic			Dynamic	Deontic		Dynamic	
Epistemic	Dynamic			Deontic		Dynamic	Huddleston and Pullum (2002)
Epistemic	NSIN / NSEN / GSN	Opportunity / GSP	Ability	NSEN / GSN	Permission / Permissibility	n/a	Depraetere and Reed (2011) Depraetere (2014)
Epistemic	Non-epistemic					n/a	van der Auwera and Plungian (1998)
	Part. Internal	Participant-external: Non-deontic	Participant-internal	Participant-external: Deontic			

ability *can* is not a modal because it only describes "the potential" of the subject referent rather than the likelihood of the situation (cf. also, e.g., Palmer 1986, p. 102; Bache and Davidsen-Nielsen 1997, p. 325; Hoye 1997, p. 44). However, Quirk et al.'s classification of ability meaning alongside meanings reflecting "human judgment of what is or is not likely to happen" (cf. Section 12.4.2) gives us a clue to an alternative analysis, one in which asserting or questioning someone's ability to do X is equivalent to an (asserted or questioned) assessment of the likelihood that X will happen. It is arguable that if I say *Tommy can reach the door handles now*, this amounts to a judgment about the likelihood of the subject referent's carrying out the action referred to in the verb phrase: if Tommy *can* reach the door handles then the likelihood is that he *will* reach the door handles at the next opportunity. More recently, Salkie (2014) has argued that *can* communicates *enablement*, which crucially involves causality rather than modality, if the semantic core of modality is non-factuality.

Finally, mention should be made of evidentiality. For some, evidentiality is a category of meaning: "Evidentiality concerns the speaker's indication of the nature (the type and quality) of the evidence invoked for (assuming the existence of) the state of affairs expressed in the utterance" (Nuyts 2001, p. 27). On this view, the verb "hear" in *I hear Kate passed the exam* is a marker of evidentiality (as well as having, to a variable degree, its meaning as a verb of perception meaning). For others, evidentiality is more narrowly defined as the "grammatical marking of information source," (Aikhenvald 2018a, p. 1), that is, as a formal category, on a par with tense as the grammatical encoding of time. On this view, evidentiality is not a category which applies to English.

A distinction is often made between direct and indirect evidentiality, depending on whether the speaker has personally witnessed the situation or not. In the latter case, the proposition expressed may be the result of an inference or involve a reported state of affairs. In English, unlike in certain other languages, evidentiality (on the former of the two definitions provided above), if it is expressed, is expressed lexically: the speaker explicitly refers to the evidence that is at the origin of the proposition that is expressed. An example of direct evidentiality in English would thus be *She seems tired* and an example of indirect evidentiality would be *He told me there was a stranger on the opposite side of the street*. There has been considerable debate as to whether evidentiality is another modal category on a par with, for instance, epistemic modality, or is a type of epistemic modality, or is not a modal category at all. For a brief summary of some of the positions taken, see Whitt (2010, pp. 11–14).

12.5 Further Issues in the Meaning of Modal Auxiliaries

Having defined the categories of modality, we can now return to the multiplicity of meanings of modal auxiliaries, more in particular to the question whether modals are ambiguous or vague with respect to the meaning(s) they communicate. In Section 12.5.2, we will focus on the way in which temporal information is communicated by sentences with modal verbs.

12.5.1 Polysemy versus Monosemy

It has become clear in the course of the discussion that most modals can express both epistemic and root meanings: for instance, *must* can be used for epistemic necessity (*You must be cold*) and (deontic and non-deontic) root necessity (*You must stay in*); *may* can express epistemic possibility (*You may be right*) and root possibility, for example, permission (*You may come in*). Apart from this, modals also express a variety of meanings in another way: any random corpus of examples containing a particular modal auxiliary (e.g., *must*) used in a particular meaning (e.g., obligation) reveals differences in shades of meaning communicated. In the case of obligation *must*, for instance, obligation may be weak (e.g., "mere"

advice given by the speaker) or strong (e.g., an order imposed by the speaker) (cf., e.g., Coates 1983, p. 34, 39, Huddleston and Pullum 2002, pp. 175–177, 181, 186). The following examples, as far as one can judge them without taking a greater context into consideration, exhibit an increase in strength of the necessity:

(32) a. You *must* come and visit us as soon as you can. (ICE-GB, W1B-004)
b. I *must* go back to work now. (ICE-GB, W1B-001)
c. (mother to child) You *must* take your swimming costume tomorrow, because you have swimming lessons on Wednesday.
d. When sons marry fathers *must* give them a proportion of his herd. (ICE-GB, W1A-011)
e. You *must* be ordinarily resident in Great Britain (England, Scotland and Wales) and present there at the date of your claim. (ICE-GB, W2D-005)

In fact, corpus examples reveal a great deal of indeterminacy: it is often difficult to pin down the "meaning" communicated by the modal unequivocally. For the example in (33), for instance, it makes little, if any, difference whether we paraphrase this by "it is possible to double the dose," functioning as a suggestion, or by "it is permitted to double the dose":

(33) [The] dose *can* be doubled to last through the night or for long car journeys. (COBUILD, sunnow)

Two questions follow from these observations: (a) Do modals have a core meaning which is present in all their uses (the monosemy analysis) or are the different meanings sufficiently (semantically) independent to allow us to say that a modal is polysemous? (b) For each of the modal meanings communicated by a particular modal, what are its necessary and/or prototypical characteristics? While the two questions are not unrelated, for reasons of space we will have to limit ourselves to a few remarks on the question of polysemy, and refer the reader to the references in the section that deals with further reading for detailed descriptions of the modal meanings communicated by particular modals.

Many linguists defend the idea that modals are polysemous, with at least a sense distinction between root and epistemic meanings of a given modal (cf., e.g., Lyons 1977; Traugott 1989; Bybee and Fleischman 1995; Palmer 2001; Huddleston and Pullum 2002). Ambiguous examples constitute major evidence to that effect: in the examples in (34), for instance, it is impossible to decide—out of context—whether the modal has root or epistemic meaning:[15]

(34) a. At the same time he *must* remember one of the principal lessons of Vietnam: that wars cannot be successfully pursued without strong public support. (ICE-GB, W2E-004)
b. You *must* remember this.
c. You *may* have a car. (Hoye 1997, p. 42)

Since both interpretations cannot coexist, one has to decide which meaning is intended before the sentence can be understood. This observation is taken to be evidence for the fact that root and epistemic meanings are semantically distinct. Other criteria that are used to justify the semantic difference between root and epistemic meanings are: (a) each of them is associated with a number of clear syntactic and semantic criteria (e.g., scope of negation; cf. first paragraph in Section 12.5.2), (b) they have different paraphrases (e.g., root possibility: *it is possible for p*, epistemic possibility: *it is possible that p*).

It is arguable that indeterminate examples are not always ambiguous. Coates (1983, p. 17), argues, for instance, that in (35) the meanings of epistemic necessity and root necessity are

mutually compatible. There are clearly two separate meanings involved, but according to Coates, the distinction between epistemic and root necessity is "neutralized," resulting in a case of "merger":

(35) A: Newcastle Brown is a jolly good beer.
B: Is it?
A: Well it *ought to be* at that price. (Coates 1983, p. 17)

The fact that indeterminate examples of the kind shown in (33) and in (35) are numerous and do not cause a breakdown in communication used by "monosemists" to make their case: they argue that each modal has a core meaning, and that it is the contexts in which it is used that determine how it is interpreted, that is, each modal has one invariant meaning with different contextual uses (cf., e.g., Ehrman 1966; Tregidgo 1982; Haegeman 1983; Klinge 1993; Groefsema 1995; Papafragou 2000).

Most linguists (e.g., Leech and Coates 1980) argue for a semantic distinction between root and epistemic readings, but do not go as far as claiming that all the meanings communicated by one particular auxiliary are semantically distinct. Others argue that modal auxiliaries may be ambiguous between different root meanings (e.g., Depraetere 2014). If one argues for a unitary treatment of meaning, the unitary meaning will provide a relatively small base which needs to be considerably enriched so as to find ways of explaining how the multiple interpretations are pragmatically derived. While the polysemy/monosemy question is obviously important, in the end, one is basically pursuing the same aim: that of setting up a taxonomy into which all meanings can be fitted satisfactorily, the difference being that the semantics/pragmatics dividing line is drawn at different points.

12.5.2 Composition of a Modal Utterance

Although the phraseology is not always the same, there is general agreement that a sentence with a modal consists of two parts: P and M, that is, a proposition[16] which represents a particular situation, and a modal meaning. *You may be right about that* can be paraphrased as *It is possible* (M) *that you are right* (P). In a similar way, *You can park in front of the garage* is made up of *It is possible* (M) *for you to park in front of the garage* (P). A first consequence of this composition is that negation may bear either on the proposition (*You may/not be right about that*) or on the modal meaning expressed (*You cannot/park your car in front of the garage*) (cf., e.g., Palmer 1995).

This basic insight is also needed to describe accurately the temporal information that is contained in a modal utterance. A distinction should be made between, on the one hand, the temporal location of the modal meaning, for instance, in the case of obligation one might ask whether the obligation is located in the past, the present, or the future (compare *She* had to *be back by ten* vs. *She* has to *be back by ten* vs. *She* will have to *be back by 10*), and, on the other hand, the temporal relation between the modal meaning communicated and the situation referred to, that is, is there a relationship of anteriority, simultaneity, or posteriority between the modal meaning and the situation? (cf. *She may be in her room* (simultaneity: there is a present possibility that she is in her room at present), *She may be back by ten* (posteriority: there is a present possibility that she will be back by ten), *He may have missed his train* (anteriority: there is a present possibility that at some time in the past he missed his train)). Although this observation has not gone unnoticed (cf., e.g., Larreya 1984; Leech 1987, pp. 94–99; Declerck 1991a), it sometimes lies at the basis of inaccurate wording: what is actually a temporal relation between the modal meaning and the situation is referred to as the temporal location of the modal meaning (cf., e.g., Huddleston and Pullum 2002, p. 182) and a systematic, comprehensive description of the system of temporal location and temporal relations appears to be lacking.[17] To give an idea of the variety of combinations of temporal relations that are possible, in Table 12.5 we sketch out the possible combinations for the meaning "necessity" in English.

Three general observations may be made concerning this survey. First, as pointed out in Section 12.3, not all modals have a past form that locates the modal meaning in the past sector. For example, *must* cannot be used with the meaning past obligation in direct speech. In such cases, other modals, or periphrastic modals, may supply semantic gaps (cf., e.g., He *had to be* back by 10.).

Table 12.5 Root necessity and epistemic necessity: forms used to express temporal reference and temporal relations.

Time reference of modality	*Type of modality (root/ epistemic)*	*Temporal relation of P to M*	*Form*	*Example*
Present time	Root	Anteriority	/	/
		Simultaneity	/	/
		Posteriority	*must* (etc.) + present inf.	You *must be* back by 10.
	Epistemic	Anteriority	*must* + perfect inf.	There's a smell of tobacco in here. Someone *must have been smoking*.
		Simultaneity	*must* + present inf.	He *must be* stuck in a traffic jam.
		Posteriority	*be bound to/should* + present inf.	The truth *is bound to come* out. The parcel *should reach* her tomorrow.
Past time (direct speech)	Root	Anteriority	/	/
		Simultaneity	*had to* + present inf.	His mum was a teacher and he was her pupil when he was 10. He *had to call* his mum "teacher" at school, just like the other kids.
		Posteriority	*had to* + present inf.	He *had to be* back by 10.
	Epistemic	Anteriority	/	/
		Simultaneity	/	/
		Posteriority	/	/
Future time (direct speech)	Root	Anteriority	/	/
		Simultaneity	*will have to* + present infinitive	Once you are at Eton, you *will have to obey* your tutor's orders.
		Posteriority	*will have to* + present infinitive	You *will have to be* back by 10.
	Epistemic	Anteriority	/	/
		Simultaneity	/	/
		Posteriority	/	/

A second observation is that certain modal meanings are inherently incompatible with particular temporal relationships. For example, deontic modality expressed by *must* implies a relationship of simultaneity or posteriority; this means that there is no example of deontic root necessity with anterior P, since it is pragmatically impossible to give someone permission or oblige someone to do something in the past (cf., e.g., Lyons 1977, p. 813, 824; Declerck 1991a, p. 383).

A third, related, observation is that certain modal meanings cannot be located in particular time sectors in direct speech. Epistemic modality by definition entails the making of a judgment about the likelihood that it is true that something is the case. This means that the modality itself must be located at the time of the judgment—either speech time or some implicitly or explicitly evoked speech (or thought) time. This explains why the table has gaps for (direct speech) epistemic modality located in the past or the future. Epistemic modality can be located in the past provided the source of the judgment is some sort of reported speaker (or thinker), that is, provided the sentence is part of some kind of indirect (including free indirect) reported speech or thought. For example, *Long John had to have hidden the treasure somewhere* expresses a past epistemic judgment about an anterior situation—the judgment belongs to an implicitly evoked thinker, presented as thinking something like "*Long John must have hidden the treasure somewhere*." Similarly, epistemic modality can only be located in the future when it is explicitly embedded in a future speech-situation and is clearly "present modality" for the reported speaker or thinker, for example: *Hilda will say/think that you must be mad*. In other words, while it is possible to formulate epistemic necessity in the past or in the future, it always features in a context of indirect or free indirect speech.

12.6 Conclusion

We have seen that the range of meanings covered by the term "modality" is functionally very wide. "Modality" includes meanings such as ability and volition, which tend to characterize the subject referent; permission and obligation, which predicate compelling or permitting external conditions of the subject referent; epistemic possibility and epistemic necessity, which involve a speaker's confidence (or lack of it) in the truth of a proposition; the subjunctive, which creates possible worlds; and the imperative, which functions directly as a means of influencing the addressee's actions. Nevertheless, these categories have enough in common for linguists in general to treat the field as a unified one, albeit with a certain amount of variation as to what is included under modality. As far as English modality in particular is concerned, a clause containing a modal auxiliary becomes twin-faceted, providing complex possibilities for the temporal location and/or the negation both of the modality and of the proposition. The area of temporal interpretation of modal utterances in English is one which is yet to be fully researched. Above all, the modal auxiliaries display a suppleness and breadth of meaning, which, in combination with a marked tendency to continuous development, provide an absorbing challenge for current and future analysts.

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NOTES

1 The variety of English referred to throughout in this chapter is standard British English.
2 It has been argued by some authors that the use of the subjunctive is increasing in certain contexts. See, for example, the discussion in Leech et al. (2009, pp. 51–70).
3 Huddleston and Pullum (2002, pp. 89–90) point out that although the form used in the imperative construction is never tensed, there are grounds for considering an imperative clause to be more like a finite clause than it is like a nonfinite clause.
4 We have said above that modal meaning involves the notions of necessity and possibility. Strictly speaking, the subjunctive, as is clear from this description, is not used to express necessity or possibility, but rather shows that the speaker does not assert that the situation referred to is factual. This meaning is, of course, extremely close to those of necessity and possibility. For this reason, and in order to give readers a more comprehensive overview of the formal categories that are commonly included under the heading of "mood and modality" in English, we have chosen to include the subjunctive in our discussion here.
5 In this view of the past subjunctive, we follow Quirk et al. (1985). However, both the extent and the existence of the past subjunctive in current English are open to debate. See, for example, the different approach taken in Huddleston and Pullum (2002, pp. 86–88) and Aarts (2012).
6 Original examples come either from the COBUILD corpus, the ICE-GB (International Corpus of English, British English component) corpus, or the World Wide Web, and are marked accordingly. Note that disfluencies in the corpus examples have been removed to facilitate reading.
7 See van der Auwera and Aguilar (2016) for a historical overview of the denotations of the labels *mood* (*modus*, *mode*) and *modality*, the former term having been used with the meaning of modality as defined in this chapter until the mid-twentieth century, Lyons (1977), Palmer (1979), Halliday (1970), and Coates (1983) having played a major role in this terminological shift.
8 Note that *ought* occasionally combines with *do* (cf. Quirk et al. (1985, pp. 139–140)).
9 Note that *have to*, unlike the semi-modals constructed with *be*, requires *do*-support in NICE contexts.
10 The semantics of *had better* and *have got to* make these clear candidates for modal auxiliary status but their formal classification within modal auxiliaries is more difficult. While they are often classed as semi-modals, this classification is not unproblematic, since, for example, they differ from semi-modals (and resemble central modals) in having no nonfinite forms, and *had better* differs additionally from semi-modals in lacking third-person singular *-s*. For a discussion of *had better*, see Noël et al. (2013).
11 For a detailed discussion of the notion of "source of modality," in connection with *should*, *ought*, and *be supposed to*, see Verhulst et al. (2013).
12 Bolinger (1989) similarly considers that the divide between "extrinsic possibility" and "intrinsic possibility" cuts across the root/epistemic divide insofar as *can* and *may* are concerned. However, his use of these terms is different from that of Quirk et al. For example, neither human judgement nor human control is a factor in his distinction. "*Can* […] invokes what is immanent, inherent. *May* refers to the external, to what transcends the entity or situation" (1989, p. 7). The difference in meaning of the terms leads to a different classification of the meanings of *can* and *may*: Bolinger argues that all uses of *can* are intrinsic possibility and all uses of *may* are extrinsic possibility.
13 Bybee and Fleischman also refer to "speaker-oriented" modality, which is expressed by inflectional forms that mark directives, such as the imperative form in English.

14 Recall that the meaning component 'potential barrier' comes into play when the source owes its status as source in part to the fact that it can function as a barrier to actualization of the situation. (It thus applies only in the case of non-epistemic modality.) If a speaker asserts that it is necessary for a situation to actualise, the speaker is understood not to accept the possibility of the situation's not actualizing. For a speaker to use a form whose meaning entails that the source of the necessity is the source in part because it has the potential to impose a barrier to that actualization would seem to contradict this non-acceptance.
15 Note that these examples differ from that in (34), which is indeterminate between permission and possibility without any suggestion of ambiguity. Compare Larreya (1984, pp. 25–26) for a very good description of different kinds of indeterminacy.
16 As is for instance pointed out by Leech and Coates (1980, p. 86), P either refers to the proposition (in the case of, e.g., epistemic necessity or epistemic possibility) or to the event indicated by the predicate (in the case of, e.g., permission). Compare also Huddleston (1984, p. 167) and Larreya and Rivière (2014, p. 86).
17 Declerck (1991a), Biber et al. (1999), Depraetere (2012), and Depraetere (2017) address some of these issues.
18 As Coates's corpus-based analysis shows, prototypical examples are relatively few in number, most examples in her corpus belonging to the skirt.
19 An example of another approach to the meaning of modal auxiliaries, one based in discourse analysis, can be found in Myhill's (1997) discussion of the difference in meaning between *shall* and *ought*.

FURTHER READING

Coates's (1983 (2014)) corpus-based analysis remains an excellent starting point for understanding the English modal auxiliaries. She adopts a so-called "fuzzy set" approach to describe the meanings of the modals: the "core" of the set represents examples that have all the prototypical features associated with a particular meaning (e.g., root necessity). As we move away from the core, into the "skirt," we encounter examples that share fewer and fewer of these prototypical characteristics[18]. Larreya and Rivière (2014, pp. 85–151) is another very rich, corpus-based survey of modal meaning and modals in English. Useful introductions can also be found in Quirk et al. (1985, pp. 219–239), Declerck (1991a, pp. 360–446), and Huddleston and Pullum (2002, pp. 175–212). Palmer's books on modals (1979), (1990), (2001)—the last being concerned with modality from a cross-linguistic perspective—belong to the core literature on modals, as do Bybee and Fleischman (1985) and van der Auwera and Plungian (1998), which are also cross-linguistic studies. Nuyts and van der Auwera (2016) is the most recent state-of-the-art research into mood and modality, outlining a range of different theoretical approaches (functional linguistic, formal syntactic, formal semantic, and cognitive) as well as providing a description of modality and mood in different language families.[19] Facchinetti et al. (2003); Salkie et al. (2009); Tsangalidis and Facchinetti (2009); and Marín-Arrese et al. (2014) are four volumes of papers that address various topics in English modality. Aikhenvald (2018b) offers a detailed and wide-ranging treatment of evidentiality. The following papers offer analyses of the (recent) diachronic development of the English modals: Brinton (1991), Fischer (2004), Goossens (1987, 1992, 2000), Krug (2000), Kytö (1991), Lowrey (2012), Müller (2008), Nordlinger and Traugott (1997), Traugott and Dasher (2002), Warner (1993), Ziegeler (2000). Collins (2009, 2015), Hundt and Gut (2012) and Noël et al. (2014) are focused on the use and meaning of modals in different geographical varieties of English. Mair (2015) considers the corpus-based study of modal auxiliaries in different world Englishes and discusses the interaction between regional variation, genre, and diachronic trends.

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13 Information Structure

MARTIN HILPERT

13.1 Introduction

What is syntax good for? A straightforward answer to that question would be that the syntactic rules of a language allow speakers to arrange words into meaningful phrases and sentences, thereby enabling them to describe complex events and states of affairs. For example, the sentence in (1) expresses an event that involves two participants.[1]

(1) The detective arrested the suspect.

The rules of English syntax allow us to make sense of the order in which the words follow each other. We understand that an act of arresting took place, that a detective carried out that action, and that a suspect was affected by that action. Arranging words in terms of syntactic rules is thus a means of communicating how words semantically relate to each other. However, that cannot be the whole story, as the examples in (2) illustrate.

(2) The suspect was arrested by the detective.
It was the detective who arrested the suspect.
As for the suspect, he was arrested by the detective.
What the detective did was arrest the suspect.
What happened to the suspect was that the detective arrested him.

All of the examples in (2) describe the same event as example (1), but in each case, the order of elements is a little different. Also, while the lexical elements *detective*, *arrest*, and *suspect* are used in each example, the grammatical words, that is, the prepositions, pronouns, and the use of the auxiliary *was*, are not exactly the same. If the purpose of syntax is to let us understand who did what to whom, why should there be multiple syntactic patterns that encode the same meaning? What would motivate that apparent luxury? The answer, of course, is that syntax has a second important function besides conveying meaning via sequential order. The examples in (2) contain the same information as example (1), but they present this information in different ways. Reading through the sentences, you can tell that different aspects are highlighted. To illustrate, the sentence *It was the detective who arrested the suspect* places emphasis on the detective. By contrast, the sentence *What happened to the suspect was that the detective arrested him* presents its information in such a way that the arresting event as such is particularly prominent. It is this highlighting function of syntax that is captured by

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the term information structure (Firbas 1964; Halliday 1967; Prince 1981; Lambrecht 1994; Erteschik-Shir 2007; Birner and Ward 2009; Féry and Ishihara 2014), which is the topic of this chapter. In the grammar of English, information structure is managed by specific syntactic patterns. Constructions that allow speakers to emphasize or background specific aspects of a complex arrangement of information are called information structure constructions.

Why do grammars have information structure constructions? What is it that a speaker can achieve by making one part of an utterance more prominent than another? One central purpose of modulating the relative prominence of different parts of an utterance is to make it easy for the hearer to integrate a new piece of knowledge with information that is already shared between the speaker and the hearer. Information structure constructions allow the speaker to signal what part of a sentence is new, unexpected, or particularly important, and what part is assumed to be common ground, either because it already figured in the preceding discourse, because it is part of the situational context, or because it constitutes general world knowledge. During conversation, the speaker monitors the knowledge state of the hearer. For every piece of information that the speaker wants to communicate, it is assessed whether this information is going to be new to the hearer, or whether it is something that the hearer is already familiar with. In the words of Chafe (1994, p. 180), "the speaker's mind necessarily includes a dynamic model of what is happening in the mind of the listener." Information structure constructions are chosen by the speaker so as to make as clear as possible how the participants of a communicated event fit into the hearer's current knowledge state. This may sound like the speaker is doing a lot of cognitive work in order to make the hearer's life as easy as possible, and that is certainly true. However, there are benefits for both parties. Speakers want to be understood, and information structure constructions allow them to maximize the chances of getting their message across. Information structure constructions thus embody the cooperative principle (Grice 1975) that underlies human communication. They have the purpose of facilitating the effective transmission of ideas between speakers who actively engage with each other's mental states.

The remainder of this chapter will flesh out the basic notions of information structure and will illustrate how English information structure constructions work. Section 13.2 will develop a working definition of information structure on the basis of established research in the field. Section 13.3 will present four basic organizing principles that are at work in information structure. These are the given-before-new principle, the end-focus principle, the end-weight principle, and the complexity principle. Section 13.4 will go over an inventory of English information structure constructions in which these principles can be seen at work. The selection of constructions includes *it*-clefts and *wh*-clefts, the passive, dislocation constructions, as well as the ditransitive construction and the prepositional dative construction. Section 13.5 discusses psycholinguistic findings that document how information structure relates to language processing. Section 13.6 synthesizes the most important insights of the chapter.

13.2 A Working Definition of Information Structure

The term information structure was introduced into linguistics by Halliday (1967). Since then, the study of information structure has established itself as a major branch of linguistic pragmatics (Horn and Ward 2006; Féry and Ishihara 2014). The discussion in this chapter draws on Lambrecht (1994, p. 5), who defines information structure as follows:

(3) Information structure: That component of sentence grammar in which propositions as conceptual representations of states of affairs are paired with lexicogrammatical structures in accordance with the mental states of interlocutors who use and interpret these structures as units of information in given discourse contexts.

This definition captures five aspects of information structure that merit to be discussed one by one. First of all, the definition presents information structure as a component of sentence grammar, that is, as a syntactic phenomenon that manifests itself on the level of complete utterances. This is in keeping with the examples of information structure constructions that were discussed in the previous section. The formal difference between *The detective arrested the suspect* and *It was the detective who arrested the suspect* primarily concerns the arrangement of lexical and grammatical words into a sentence-level structure. Information structure thus operates in syntax, even though the full picture is more complex. In particular, distinctions in the prosodic realization of an utterance are of paramount importance.

Second, the definition mentions propositions as conceptual representations of states of affairs, which is a description of the meanings that speakers want to communicate. A proposition (Kintsch 1998) is a unit of knowledge that can be expressed linguistically by sentences such as *Emma is a professor*, *The cat sleeps*, or *Bob ate a muffin*. In these sentences, a verb form combines with one or more nominal participants. Within a proposition, the meaning that corresponds to a verb is called the predicate, and the verb's participants are called the arguments of the predicate.

The third crucial point of the definition is that information structure constructions are form–meaning mappings. They serve to map propositions onto lexicogrammatical structures, so that the predicates and arguments of propositions are expressed by lexical elements and the relations between the arguments are expressed by the syntactic order and morphological marking of those elements. This point corresponds to the very first observation that was made in the introduction, namely, that the grammatical form of a sentence allows speakers to combine several simple ideas into one complex idea.

The fourth point of the definition states that speakers use information structure constructions in accordance with the mental states of their interlocutors. This reflects the fact that speakers continuously monitor what their hearers do and do not know, so that they can mark given information and new information as such. This facilitates the hearer's job of integrating new information into their existing knowledge. Information structure constructions are syntactic patterns that allow speakers to organize and package information for this purpose.

The definition closes with its fifth point, namely, that hearers interpret the contributions that speakers make as units of information in a specific discourse context. This indicates that it is not only the speaker who monitors the hearer's state of knowledge. Rather, both the speaker and the hearer engage in a collaborative effort to build up common ground, which draws on the context of the speech situation, and to which new pieces of information are continuously added.

To summarize Lambrecht's definition in more approachable terms, we can say that information structure explains why the grammar of English provides several different syntactic patterns at the sentence level for the expression of what is basically the same idea. These different forms exist so that the speaker can signal to the hearer what part of the utterance is already part of the common ground and what other part may be new, unexpected, or particularly important. Both the speaker and the hearer make use of information structure for the purpose of aligning their respective states of knowledge. With this definition in place, the next section can address in more detail how information structure actually works in practice.

13.3 Organizing Principles

This section goes over four general principles that organize information structure, not only in English, but also in other languages. The principles that will be discussed are the given-before-new principle, the end-focus principle, the end-weight principle, and the complexity principle. What these four principles have in common is that they relate to the relative ease

of language processing. How can linguistic utterances be designed so that the processing needs of both the speaker and the hearer are met? As will become apparent, the principles often work hand in hand. However, they can also be in conflict. The dynamics of how the principles interact influences how speakers choose an information structure construction in a given situation. Two of the principles, namely, the given-before-new principle and the end-focus principle furthermore serve the purpose of creating coherence between utterances. Speakers rely on these principles to signal to the hearer how exactly the different parts of their utterances fit together into the broader discourse.

13.3.1 The Given-Before-New Principle

The given-before-new principle captures the overwhelming tendency for old information to precede new information (Halliday 1967, p. 205). While it may be intuitively clear what old and new information are, it is useful to state more explicitly what is meant by these terms. Lambrecht (1994, p. 52) offers relevant definitions in which he distinguishes the notions of pragmatic presupposition and pragmatic assertion.

(4) Pragmatic presupposition: The set of propositions lexicogrammatically evoked in a sentence which the speaker assumes the hearer already knows or is ready to take for granted at the time the sentence is uttered.

Pragmatic assertion: The proposition expressed by a sentence which the hearer is expected to know or take for granted as a result of hearing the sentence uttered.

It may be tempting to think that given information is whatever has been communicated in the previous discourse, and new information is what has not been communicated so far. While this is partly true, it does not capture the full picture. Given information corresponds to the speaker's best guess of what it is that the hearer can be expected to know at a given point in the conversation. New information is what is added to the hearer's knowledge state with a given utterance. That is, given and new are relative to the speaker's assessment of the hearer's knowledge, which is not only informed by the current conversation, but also by previous interactions, world knowledge, and the context in which the current conversation takes place. All of these notions come into play when a speaker arranges an utterance into a syntactic structure.

The given-before-new principle applies to longer stretches of natural discourse as well as to sentence-level utterances, which is illustrated in example (5) from the Santa Barbara Corpus of Spoken American English (Du Bois et al. 2000).

(5) … Now … one day,
… I met Elisa.
… A journalist.
She knew writers,
she knew artists,
she lived a bohemian life,
and I was very … attracted.

In the example, the speaker tells a story about a woman he met. The lines of the example correspond to intonation units. The example first introduces the hearer to the woman and then incrementally adds descriptive details. Each line contains one new unit of information that relates to what has already been presented. This illustrates what Chafe (1994, p. 108) has termed the "one new idea constraint." Speakers rarely introduce several new pieces of information at a time. New and old information behave differently in terms of their linguistic

encoding. Once the woman has been introduced, she is referred to with the personal pronoun *she*. The general logic of the given-before-new principle also applies within individual lines of the example. For instance, the line *she knew artists* starts with given information, namely, a reference to the woman. The new information appears at the end of the line.

The given-before-new principle is not an arbitrary rule, but rather reflects functional pressures that make this particular arrangement of information beneficial for both the speaker and the hearer (Clark and Haviland 1977; Wasow 1997; Arnold et al. 2000). From the hearer's perspective, the order of given-before-new minimizes processing costs that relate to working memory. If an utterance starts with new information, that new information has to be kept in working memory until it is clear how it fits into the context of given information. This is costly and potentially error-prone. Conversely, if an utterance starts with given information, that information is not only easily accessible, but it also facilitates the subsequent processing of new information that directly adds on to it. For the speaker, starting with given information is similarly beneficial. The high accessibility of given information facilitates language production, and by producing given information first, the speaker has more time to plan the part of the utterance that contains new information. Section 13.5 will discuss empirical evidence that further supports these ideas.

How does the given-before-new principle relate to information structure constructions? Birner and Ward (1998) make the case that one important function of information structure constructions is to allow the speaker to maintain the order of given-before-new in scenarios in which a canonical syntactic order would yield a different outcome. For example, English existential clauses with *there*, as in *There was every reason to believe that it would rain*, allow speakers to avoid sentences such as *Every reason to believe that it would rain was there*. What makes the latter pragmatically odd is the fact that the subject noun phrase (NP) represents new information, thereby violating the given-before-new principle. Grammatical subjects should be short forms that encode given information. Chafe (1994, p. 82) calls this the "light subject constraint." In order to avoid the processing costs that a violation of the light subject constraint incurs, speakers select an alternative construction that lets them comply with the constraint, and simultaneously with the given-before-new principle.

13.3.2 The End-Focus Principle

Up to this point, this chapter has characterized information structure in terms of a contrast between given information and new information. These notions have to be complemented with another pair of terms, namely, topic and focus. These terms are problematic insofar as their meanings as technical terms do not correspond exactly to what these words mean in everyday usage, where a topic may be understood as a set of ideas that represent the general theme of a conversation or a text, and the focus would be a more specific subset of those ideas. In this chapter, the terms topic and focus apply strictly to the level of single sentences. Following Lambrecht (1994, p. 118), the topic of a sentence is viewed here as what that sentence is about. The topic is a matter of current interest to the speaker and the hearer, and with every utterance, the speaker provides new information about that topic. Defined in this way, the term topic corresponds very closely to the grammatical subject of English sentences, and in many cases, the topic of a sentence is indeed realized as its subject. The examples in (6) illustrate this. Yet, the correspondence is imperfect. The examples in (7) show pairs of questions and responses, in which the latter are sentences with nontopical subjects.

(6) She is a journalist.
My brother just started a new job.
The train stopped in the middle of nowhere.

(7) A: What's wrong? B: My neck hurts.
A: Why is she so upset? B: Her father died last month.
A: What's that smell? B: Oh no, the toast is burning!

The topics that are addressed in the responses correspond to the targets of the respective questions that precede them. The subjects of the responses do not reiterate those topics, but rather encode new information that elaborates on the topic. This illustrates that the topic of a sentence is not even always overtly encoded in that sentence. Conversely, some information structure constructions reserve a designated slot for the topic. Three such constructions, in each of which the topic appears at the very beginning, are shown in (8).

(8) As for lunch, I thought we could make spaghetti.
My brother, he used to make spaghetti every Tuesday.
Spaghetti I usually make for the kids.

Topicalization constructions such as the ones in (8) not only mark a topic as such, they also illustrate the point that topics need not always constitute given information. With a topicalization construction, a speaker may actually set up a topic that is new to the discourse, and subsequently elaborate on that topic in the same utterance.

The term topic contrasts with that of focus, which can be thought of informally as the most important part of an utterance. Lambrecht (1994, p. 207) offers a technical definition of focus and describes it as the element of information that constitutes a difference between the pragmatic presupposition and the pragmatic assertion, both of which were defined in (4). This view corresponds very closely to proposals by Birner and Ward (1998, p. 12), who use the term open proposition (Prince 1986) to represent knowledge that is shared between the speaker and the hearer. This shared knowledge is open in the sense that not every detail is fully specified. These unspecified details can be thought of as variables, and in any given utterance, the focus of the utterance serves to specify a value for one such variable. The end-focus principle stipulates that the information that extends shared knowledge is usually positioned at the end of an utterance. Conceptually, the end-focus principle is thus very close to the given-before-new principle. It is nonetheless useful to keep the two principles apart because of two reasons. First, as was illustrated with topicalization constructions above, the topic does not always map on given information, and second, the focus is not always on an element that is new to the discourse. This can be seen in exchanges such as the one in (9).

(9) A: Would you like the soup or the salad? B: I'd like the salad.

All of the elements that are used in the response already occur in the question and thus form part of the open proposition. The open proposition does however contain a variable, namely, the possible choice between the soup and the salad. The response serves to specify a value for that variable, namely, that the speaker would like the salad, and this specification takes place at the very end of the utterance. In summary, the end-focus principle accounts for the fact that changes to the common ground between speaker and hearer tend to be communicated at the end of an utterance.

13.3.3 The End-Weight Principle

The syntactic constituents of a sentence can vary in terms of their length and their relative degree of complexity. The end-weight principle (Behaghel 1909, 1932; Quirk et al. 1985; Wasow 1997; Arnold et al. 2000) captures the fact that speakers will try to organize their

utterances in such a way that long and complex constituents are placed toward the end. This tendency is motivated by processing ease. To illustrate, the examples in (10) contain two complement clauses that differ in length.

(10) [That your brother does not simply tell us what he wants] is [what confuses me].
[What confuses me] is [that your brother does not simply tell us what he wants].

Except for the ordering of the two complement clauses, the examples are completely identical. Yet, there is a striking difference with regard to processing ease. The first example, which begins with the long complement clause, is much more difficult to process than the example that starts with the short one. This asymmetry is explained by the strain on working memory that a hearer of the first example has to deal with. In order to determine what the subject of the sentence is, the hearer's working memory has to store everything up to the copula, which takes a substantial effort. The end-weight-principle can also be interpreted from the speaker's perspective. Wasow (1997, p. 352) argues that starting with short constituents facilitates utterance planning because it gives the speaker additional time to work out the details of the longer constituent. A phenomenon that illustrates this is what is called heavy NP shift. A heavy noun phrase is a noun phrase that is long and complex, typically because it contains a relative clause or a complement clause. In heavy NP shift, the speaker positions such a noun phrase not at its canonical position, but rather at the end of the utterance. This contrast is shown in the examples in (11), where the first sentence exhibits heavy NP shift and the second one instantiates the canonical but dispreferred order. Apart from the variation in order, the sentences are exactly the same.

(11) I'd like to bring [to your attention] [the fact that the university reacted swiftly].
I'd like to bring [the fact that the university reacted swiftly] [to your attention].

The sentences in (11) contain the collocation *bring something to someone's attention*. In the first variant, the speaker can complete the collocation and use the time that it takes to pronounce it for the planning of the following complex noun phrase. The second variant would not only require the speaker to plan that noun phrase immediately, but it would also necessitate keeping the collocation in working memory, so that it can be finished at the end of the utterance. In summary, the end-weight principle results in the placement of long and complex constituents at the end of an utterance, which serves the processing needs of both the speaker and the hearer.

13.3.4 The Complexity Principle

In many cases, the grammar of English allows speakers to verbalize the same idea in two or more different ways. The examples in (12) present some of these alternatives.

(12) prouder
more proud

the tiger's eye
the eye of the tiger

I think you're right.
I think that you're right.

I helped him write the paper.
I helped him to write the paper.

That's the one I want.
That's the one that I want.

I promised to stay.
I promised that I would stay.

In each pair of alternatives, there is an asymmetry with regard to explicitness. One alternative is shorter and more condensed, whereas the other shows greater transparency. As a rule, the more transparent alternative contains at least one additional free or bound morpheme. The difference in transparency is perhaps most obvious in the last pair of alternatives, where a non-finite complement clause that consists only of a *to*-infinitive (*to stay*) contrasts with a finite complement clause that spells out explicitly who is acting (*I would stay*). The complexity principle (Rohdenburg 1996, 2003) states that the choice between these alternatives is guided by the level of processing difficulty that the current speech situation imposes on the speaker and the hearer. Rohdenburg (1996, p. 151) defines the complexity principle as follows.

(13) Complexity principle: In the case of more or less explicit grammatical options, the more explicit one(s) will tend to be favored in cognitively more complex environments.

This means that whenever the speech situation is cognitively demanding, speakers will try to mitigate that cognitive effort by choosing the alternative that is relatively more transparent. Cognitive effort can come about in different ways. One basic measure of how much effort is required is the amount of linguistic material that is contained in an utterance. Rohdenburg (1996, p. 196) gives the example of complement clauses with and without the complementizer *that*, as in *I think (that) you're right*. The longer a complement clause is, the more likely speakers are to produce the complementizer. Conversely, the shorter the complement clause, the more often the complementizer is omitted. Another measure of cognitive effort is the accessibility of a referent. A referent that has already been mentioned in the previous discourse is accessible, so that the speaker can use a pronoun to refer back to it. By contrast, referents that have not yet been introduced to the discourse need to be described with a full nominal. This distinction can be shown to be relevant across a range of different grammatical constructions, including relative clauses with and without relativizers. In the examples in (12), the relative clause construction *That's the one (that) I want* shows that the relativizer can be omitted in English object relative clauses. Relative clauses that contain a pronoun are cognitively less demanding than relative clauses that contain a full noun phrase. In accordance with the complexity principle, speakers are more likely to omit the relativizer in examples such as *That's the one I want*, and they are more likely to include it in sentences such as *That's the one that my dad wants* (Rohdenburg 1996, p. 172). In the same vein, Wasow et al. (2011, p. 179) observe that relativizers are frequently omitted in relative clauses with definite noun phrases (*the guitar I want*), while speakers are more likely to retain them in relative clauses with indefinite noun phrases (*a guitar that I want*).

These examples show that the complexity principle is sensitive to information structure. If the speaker can assume that the hearer is familiar with the main components of a planned utterance, that utterance can be realized as economically as possible. If, on the other hand, the utterance contains a substantial amount of new information, the speaker will be biased toward choosing a grammatical construction that is maximally transparent.

13.3.5 Interactions among the Principles

In spontaneous language use, the principles that were described in the previous sections have a tendency to work hand in hand. The following example illustrates the synergies that usually apply. In the example, which comes from the Santa Barbara Corpus, a veterinarian describes one of her patients, a dog who became sick after chewing on a dead bird. The example includes some annotation, such as inhalation (H) or prosodic lengthening (=).

(14) (H) Um=,
He's looking not too ba=d,
Um=,
… A little bit of pain in his abdomen.
It's hard to know if he just has,
a gastritis=,
.. or gastroenteritis,
from chewing on that dead pigeon,
(H) or what the … problem is.
(H) Um,
what we ended up doing was,
giving him some antibiotics=,
.. and sending him home=.

In the line *He's looking not too bad*, given information precedes new information, and the focus is situated at the end. The same is true for the sentence *It's hard to know if he just has a gastritis or gastroenteritis*, which furthermore illustrates the end-weight principle. The principles of given-before-new, end-focus, and end-weight are once more in perfect agreement in the final sentence *What we ended up doing was giving him some antibiotics and sending him home.* That utterance furthermore speaks to the complexity principle. The speaker produces a *wh*-cleft construction that consists of an initial relative clause *What we ended up doing*, the copula *was*, and the part that is called the focus phrase, which in this case is the coordinated verb phrase clause *giving him some antibiotics and sending him home* (see Flickinger and Wasow 2013, for an analysis of this construction type). It is a well-established finding in that *wh*-clefts in spoken language can have focus phrases that are fully finite (Guz 2015). An example of such a *wh*-cleft is given in (15).

(15) What we need to do,
is this board has to realize,
… in my opinion that,
.. that they have to come to grips with,
(H) the fact that they are responsible,
… for basically what they've created.

This means that a speaker who produces a *wh*-cleft has a choice. A clausal focus phrase can be realized as a finite clause or as a non-finite constituent. The speaker of example (14) thus could have finished her utterance in a different way, as shown in the constructed variants (b)–(d) of example (16).

(16) What we ended up doing was
a. giving him some antibiotics and sending him home.
b. we gave him some antibiotics and sent him home.

c. to give him some antibiotics and send him home.
d. give him some antibiotics and send him home.

The speaker's choice of the first variant is motivated by the fact that the object of the clausal focus phrase is accessible to the hearer—the dog is the main participant of the story. By contrast, the speaker of example (15) has to introduce the central referent of the clausal focus phrase with a full nominal, *this board*. The complexity principle predicts that more condensed structures should be chosen when the main referents are accessible, and that finite structures appear when new referents are introduced. Exactly this can be observed in examples (14) and (15).

While the principles typically align in natural language use, it is possible for them to be in conflict. Example (17) below shows that the end-focus principle can occasionally override the principle of end weight.

(17) Perry's most beautiful characteristic during his show career was his tail.

The example is part of a prepared speech that features in the Santa Barbara Corpus. The immediate context of the example is a longer passage in which the speaker talks about Perry, a horse with a successful show career. The syntactic form of the example is a predicative construction in which the subject, *Perry's most beautiful characteristic during his show career*, is significantly longer than the subject complement, *his tail*. Still, the speaker chooses to position the latter at the very end of the utterance.

Example (18) shows a conflict between the end-weight principle and the complexity principle, in which the latter prevails.

(18) … It's no=t a sport for the timid.
… You've gotta be … pretty brave.
To do it.

The example ends with the infinitive clause *to do it*, which is a highly condensed alternative to more explicit clauses such as *if you want to do that sport*. The speaker can afford to use this condensed form, since both the agent and the action of the complement clause have been verbalized in the recent context. The cognitive effort for the hearer is thus relatively low. While a longer, more explicit clause would satisfy the end-weight principle, the speaker still opts for the shorter alternative, which is in line with the complexity principle.

The main conclusion of the discussion up to this point is that speakers are highly systematic in the way they organize and present information because they are sensitive to the mental states of their interlocutors. Information is introduced gradually into the discourse, and the relative positioning of new and old information is carried out in accordance with several general principles that are mostly in alignment, but which occasionally exert opposing biases. Taken together, these observations motivate the fact that the grammar of English features a number of syntactic constructions with slightly different constituent orders. These information structure constructions are discussed in more detail in the following section.

13.4 Information Structure Constructions

Information structure constructions can be defined as sentence-level constructions that speakers use to express complex meanings in a way that shows awareness of the current knowledge of the hearer (Hilpert 2019, p. 106). This section will survey a selection of English

information structure constructions in order to show how speakers work with the principles of information structure that were discussed in the previous section.

13.4.1 Cleft Constructions

Sentences such as *It was the detective who arrested the suspect* or *What we ended up doing was giving him some antibiotics* are called cleft sentences, or clefts for short (Prince 1978). The first of these illustrates what is known as an *it*-cleft, the second is a so-called *wh*-cleft. Lambrecht (2001, p. 467) defines cleft constructions as follows.

(19) A cleft construction is a complex sentence structure consisting of a matrix clause headed by a copula and a relative or relative-like clause whose relativized argument is co-indexed with the predicative argument of the copula. Taken together, the matrix and the relative express a logically simple proposition, which can also be expressed in the form of a single clause without a change in truth conditions.

The structural basis of a cleft construction is a predicative construction, that is, a sentence of the form *X is Y*. This is what Lambrecht calls a matrix clause that is headed by a copula. The second central ingredient of a cleft is a relative clause construction. If we take the *it*-cleft *It was the detective who arrested the suspect*, the predicative construction is instantiated by *It was the detective*, and the relative clause is *who arrested the suspect*. These two are connected in such a way that *the detective* is co-referential with the relative pronoun *who*. Lambrecht's definition of clefts further states that the cleft could be expressed in the form of a canonical single clause, as in *The detective arrested the suspect*. Applying the definition to the *wh*-cleft *What we ended up doing was giving him some antibiotics*, it can be seen that the positioning of the constituents is different, as the construction starts with the relative clause *What we ended up doing*. Following the copula *was*, the predicative argument *giving him some antibiotics* is co-referential with the relative pronoun *what*. The single clause paraphrase that corresponds to the *wh*-cleft is *We ended up giving him some antibiotics*.

How do *it*-clefts and *wh*-clefts differ with respect to information structure? One important difference concerns the focus. The constituent that follows the copula is called the focus phrase, which carries the main stress in a cleft construction. Whereas the focus phrase appears early on in an *it*-cleft, it is the last element of a *wh*-cleft. This is illustrated in (20), where the main stress is indicated by means of capitalization. The contrast shows that *wh*-clefts satisfy the end-focus principle, while *it*-clefts do not.

(20) It was the DETECTIVE who arrested the suspect.
What we ended up doing was giving him some ANTIBIOTICS.

Due to their different structures, the choice between an *it*-cleft and a *wh*-cleft can be motivated by the relative lengths of the focus phrase and the relative clause. In line with the end-weight principle, speakers will be biased toward an *it*-cleft if the focus phrase is short and the relative clause is long. The inverse is true for *wh*-clefts.

The two types of cleft further differ with regard to the pragmatic presupposition that is expressed in the relative clause. In an *it*-cleft, the relative clause will encode information that is already fully activated in the hearer's mind. By contrast, *wh*-clefts allow the speaker to use the relative clause to verbalize ideas that have not been made explicit in the previous discourse. To illustrate this contrast on the basis of the examples in (20), the hearer of the

it-cleft is fully aware of the open proposition that someone arrested the suspect. In contrast to that, the hearer of the *wh*-cleft has not been informed that the speaker ended up doing something. Crucially, however, this information is not entirely unrelated to what has been said before. The relative clause of a *wh*-cleft can thus express information that is contextually related to the previous discourse.

13.4.2 The Passive

The English passive construction with *be* forms a counterpart to the use of transitive verbs in the active voice. The constituent that encodes the subject of a transitive clause can be omitted in the passive, or, in the case of a so-called long passive, it is expressed in a prepositional phrase with *by* (Huddleston and Pullum 2002, p. 1428). Conversely, the constituent that represents the object of a transitive clauses appears as the subject of a passive construction. The examples in (21) illustrate this.

(21) Mary paid the bill.
The bill was paid (by Mary).

Passives thus allow the speaker to avoid mentioning the subject, which can be convenient for example in utterances such as *Mistakes were made*. The reversal of subject and object further has the consequence that a speaker's choice between the active and the passive is influenced by the given-before-new principle. If the undergoer of an action is known, but the agent is not, speakers will be biased toward the passive, so that given information can precede new information. Birner (1996) shows on the basis of corpus data that the subjects of passive sentences tend to encode information that the hearer is familiar with, whereas the *by*-phrases of long passives contain information that is less accessible to the hearer. An asymmetry in familiarity that runs counter to this results in unacceptable or unintelligible utterances, as Birner and Ward (1998, p. 200) illustrate on the basis of the contrast in (22).

(22) The mayor's present term of office expires Jan 1. He will be succeeded by Ivan Allen Jr.
Ivan Allen Jr. will take office Jan 1. The mayor will be succeeded by him.

The first pair of sentences is an authentic example from the Brown Corpus (Francis 1965). The second pair, which is considerably less felicitous than the first one, is a constructed example in which the subject of the passive is less familiar than its *by*-phrase.

Further evidence for the status of the passive as an information structure construction comes from a study by Brooks and Tomasello (1999), who trained young children to use two nonce verbs, *meeking* and *tamming*. Half of the children were exposed to uses of these verbs in the active voice (*Big Bird is meeking the car*), the other half heard it only in the passive (*The car is meeked by Big Bird*). Brooks and Tomasello aimed to determine whether young children would be able to generalize across the two uses. In the test phase of the experiment, the children were prompted to use the nonce verbs. For this purpose, the experimenters used agent-focused questions (*What did Big Bird do?*), patient-focused questions (*What happened to the car?*), and unspecific questions (*What happened?*). While the responses showed that most children used the nonce verbs conservatively, that is, only in the form that they had witnessed, some of the responses were sensitive to the information structure of the question (Brooks and Tomasello 1999, p. 34). Children that learned the new verbs in the passive thus gave mostly responses in

the passive. They only generalized the verb to the active if they were prompted to do so by an agent-focused question.

13.4.3 Left and Right Dislocation

Dislocation constructions are information structure constructions in which one constituent is realized twice, in different forms. Once it appears as an argument of the main verb, where it is realized as a pronoun. The other time it appears in the shape of a full lexical phrase, either at the very left edge of the utterance, or at the right edge. In technical terms, dislocation constructions exhibit co-reference between an extraposed constituent and a pronominal argument. Like clefts, dislocation constructions can be paraphrased by simple clauses with canonical syntax. Two examples are given in (23).

(23) My brother, he rarely even calls me these days.
My brother rarely even calls me these days.
I love that, being a father.
I love being a father.

Why would a speaker opt for a dislocation construction instead of the alternative with unmarked word order? Prince (1997) develops an account that identifies several different factors. One factor relates to the light subject constraint. In cases in which canonical word order would violate that constraint, left dislocation allows the speaker to introduce a referent with a full lexical phrase, and then use a subject pronoun for that referent in the main clause. An authentic example from the Santa Barbara Corpus is shown in (24).

(24) .. (H) Well then you have to put it on the anvil,
and get the shoe stretched out,
(H) well then once you stretch the shoe out,
… well then,
(H) the two corners.
they go out,
too.

In this example, the speaker explains the process of making a horseshoe. The dislocated constituent, *the two corners*, has not been mentioned before. The left dislocation construction yields a structure that preserves the preferred pattern of a pronominal subject.

In right dislocation, a grammatically complete sentence with a pronominal argument is followed by a lexical phrase that is coreferential with that argument. The extraposed phrase has low and flat intonation (Michaelis and Lambrecht 1996, p. 223), and it encodes information that has either been mentioned or at least evoked in the previous discourse (Birner and Ward 1998, p. 146), which explains the speaker's earlier choice of a pronoun. Huddleston and Pullum (2002, p. 1411) suggest that right dislocation serves as a clarification, to make sure that the hearer correctly identifies the referent of the pronoun. Examples such as (25) below are more in line with a different interpretation, namely, that the extraposed phrase marks the end of a sequence of utterances on a given topic (Givón 1993, p. 215). In the example, the right dislocation, *and they stole it … the radio*, is the punchline of a story that the speaker had been building up. The subsequent discourse then moves on to other issues.

(25) Hector's radio=,
with --
I- it was bro=ken,

we were gonna s- --
take it out and send it back to the factory,
to get a new factory,
… (H) radio,
we never got a chance,
because,
the back window was broken,
and they stole it.
… The radio.

The example of right dislocation shows that information structure constructions are not only marking new information as it is introduced into the discourse. Speakers also actively manage the hearer's expectations with regard to the persistence of a current topic. By signaling that a current topic has come to a close, they prepare the hearer for the switch to a new topic in the upcoming discourse.

13.4.4 The Dative Alternation

Among the grammatical alternatives that the grammar of English has to offer, one pair of constructions has generated exceptional interest. What is called the dative alternation is the choice that speakers have between the ditransitive construction and the prepositional dative construction, which are illustrated in (26).

(26) John gave Mary a book.
John gave a book to Mary.

Both constructions express the transfer of a theme between an agent and a recipient. Corpus-based and psycholinguistic investigations of the dative alternation (Bresnan et al. 2007; Bresnan 2007) have shown that the choice between the two constructions is highly sensitive to information structure. In keeping with the given-before-new principle and the end-weight principle, speakers tend to choose the ditransitive construction if the recipient is accessible, pronominal, and short, and if the theme is new and relatively long. This would be the case in a sentence such as *He gave me a purple tie-dye shirt with a peace sign on it*. Conversely, the prepositional dative construction is chosen when the theme is accessible, pronominal, and short, and the recipient is new and relatively long, as in *He gave it to a guy with long hair and sandals*. As will be discussed in more detail in Section 13.5.1, these preferences are not perfect mirror images. Also, besides information status and length, other factors enter the equation. Both constructions have strong lexical preferences (Gries and Stefanowitsch 2004), inanimate recipients are generally more felicitous in the prepositional dative construction, and certain idiomatic meanings can only be expressed in the ditransitive construction (Bresnan et al. 2007). The alternation is also influenced by the complexity principle. The prepositional dative construction, which is relatively more explicit than the ditransitive construction, is used more often in syntactically embedded contexts, that is, within passives or interrogatives (Jäschke and Plag 2016). All of this illustrates that information structure constructions typically have functions that go beyond the management of given and new information.

13.5 Effects of Information Structure

The preceding sections have discussed how general principles of information structure lead speakers to choose syntactic constructions that allow them to communicate information in such a way that hearers find it easy to process. This section will discuss

empirical psycholinguistic work that illustrates measurable effects of information structure. Section 13.5.1 reports on experiments that use grammaticality judgments and self-paced reading times, and which provide evidence to suggest that syntactic constructions are conventionally associated with specific pattern of information structure. If these constructions are paired with a different pattern, acceptability and ease of processing decline. Section 13.5.2 discusses how information structure can be invoked as an explanation for why speakers find certain sentences grammatically unacceptable.

13.5.1 Information Structure and Language Processing

Section 13.4.4 offered a discussion of the dative alternation, which made the point that the ditransitive construction and the prepositional dative construction allow speakers to maintain the order of given-before-new in descriptions of transfers in which either the theme or the recipient is new information. Clifton and Frazier (2004) investigated whether adherence to the given-before-new principle actually leads to more efficient language processing in the hearer. In order to test this idea, they presented subjects with sentences such as the following.

(27) The senator mailed the woman a report.
The senator mailed a woman the report.
The senator mailed the report to a woman.
The senator mailed a report to the woman.

Sentences appeared as a whole on a computer screen, and the participants had to indicate as fast as possible whether or not a sentence was acceptable. Clifton and Frazier (2004, p. 889) found that the given-before-new arrangement that is shown in the first sentence was processed faster and had a higher acceptance rate than the new-before-given arrangement in the second one. This suggests that the ditransitive construction is associated with a specific information structure. Clifton and Frazier further observed no significant difference in the responses to the different variants of the prepositional dative construction. Here, the variant in which given information precedes new information does not yield a processing advantage. The conclusion that can be drawn from this is that the given-before-new principle does not apply blindly across all syntactic contexts. Rather, the principle is sensitive to specific syntactic constructions. The ditransitive construction is conventionally associated with a given-before-new configuration. By contrast, the prepositional dative construction is more flexible and adapts to a new-before-given configuration if other determining factors, such as the principle of end-weight or the complexity principle bias speakers toward an ordering with that information structure.

The experimental design used by Clifton and Frazier (2004) draws on offline data, that is, a decision that subjects make after language processing has taken place. Brown et al. (2012) tested whether the findings of Clifton and Frazier could be replicated in an experiment that taps into ongoing language processing. Brown et al. (2012) designed a self-paced reading task in order to determine when and how language processing is affected by information structure. In each trial, subjects were first exposed to a context, after which they had to click their way through the words of a test sentence. The test sentences were examples of the ditransitive construction and the prepositional dative construction in which the information status of theme and recipient was systematically varied.

(28)

Theme context:	An understudy for a new Broadway show kept a notebook to document the show's progress.
A: PO/Given-First:	The understudy showed the notebook to a violinist as he explained his ideas.
B: DO/New-First:	The understudy showed a violinist the notebook as he explained his ideas.
Goal context:	An understudy for a new Broadway show began conversing with a violinist who played in the orchestra.
C: PO/New-First:	The understudy showed a notebook to the violinist as he explained his ideas.
D: DO/Given-First:	The understudy showed the violinist a notebook as he explained his ideas.

Brown et al. (2012, p. 199) find a significant effect of information structure for ditransitive sentences in which new information preceded given information (condition B: DO/New-First). Ditransitive sentences that deviate from the conventional pattern of presenting given information first thus incur a processing difficulty, which results in the second noun phrase being read more slowly. This result corroborates the findings of Clifton and Frazier (2004), and it is consistent with the idea that information structure can be directly and conventionally associated with syntactic constructions.

13.5.2 Backgrounded Constituents Are Islands

A basic feature of the grammar of English is that speakers can reformulate declarative sentences as questions. The example below shows such a correspondence.

(29) John said that Mary was looking at her phone.
What did John say that Mary was looking at?

The declarative clause shows a complement clause construction, that is, a matrix clause with the verb *say*, which is followed by the complementizer *that* and an embedded clause. The question features the interrogative pronoun *what* instead of the final constituent of the declarative sentence, *her phone*, which is what the speaker is asking about. Also, there is a form of the verb *do*, which functions as an auxiliary in what is called *do*-support (Huddleston and Pullum 2002, p. 93). This kind of correspondence captures a pervasive generalization in the grammar of English, but interestingly, the generalization has limits. The examples below show that some declarative sentences cannot be reformulated as questions.

(30) John complained because Mary was looking at her phone.
*What did John complain because Mary was looking at?

She saw the documentary that was about Churchill.
*Who did she see the documentary that was about?

That he kept smoking marijuana bothered her.
*What did that he kept smoking bother her?

He regretted that he didn't bring an umbrella.
*What did he regret that he didn't bring?

He muttered that he didn't bring an umbrella.
*What did he mutter that he didn't bring?

He brought an umbrella and a raincoat.
*What did he bring an umbrella and?

Why is it that these questions are unacceptable? Ross (1967) coined the term island constraints to describe the phenomenon. A syntactic island is a type of constituent that constrains question formation, so that the individual parts of that constituent cannot be questioned with an interrogative pronoun. For example, since adverbial clauses with *because* are islands, the question **What did John complain because Mary was looking at?* is unacceptable. Likewise, complex coordinated noun phrases are islands. As a consequence, the question **What did he bring an umbrella and?* does not work. The explanation that Ross proposes is thus syntactic in nature. Certain syntactic constituents simply do not allow any of their component parts to be questioned. A problem with this proposal is that in some cases, questions with the exact same syntactic structure differ in acceptability. The questions in example (31) both contain complement clauses with *that*. The crucial difference is the complement-taking verb. With the manner-of-speaking verb *mutter*, the question is unacceptable, but with the verb *think*, it is fine.

(31) *What did he mutter that John did?
What did he think that John did?

Ambridge and Goldberg (2008) propose an explanation that accounts both for the island status of certain syntactic constituents and for the difference between *mutter* and *think*. Their explanation draws on information structure. Specifically, they advance the hypothesis that syntactic constituents are islands if they are conventionally associated with the encoding of backgrounded information. Ambridge and Goldberg (2008, p. 356) call this the backgrounded constituents are islands hypothesis, or BCI hypothesis for short. As the previous sections have discussed, speakers use information structure constructions in order to signal to the hearer which parts of an utterance encode information that is already mutually shared, and hence backgrounded, and which parts contain information that the speaker assumes to be new to the hearer. The BCI hypothesis states that question formation is not possible when the element that is to be questioned is part of a constituent that expresses given information. This can be illustrated with a concrete example. Section 13.4.1 discussed *it*-cleft constructions, which consist of a predicative clause that encodes new information and a relative clause that encodes given information. The BCI hypothesis predicts that it should not be possible to question a part of the relative clause. Example (32) shows that this prediction is borne out.

(32) It was the cocaine habit that killed him.
What was it that killed him?
*Who was it the cocaine habit that killed?

Ambridge and Goldberg (2008, p. 358) argue that the interrogative pronoun in a *wh*-question is the primary focus of the construction. If that question takes the shape of an information packaging construction in which the constituent corresponding to the interrogative pronoun presents backgrounded information, the result suffers from a pragmatic paradox, in which a piece of information is presented as new and given at the same time. Also the contrast in acceptability between questions with *mutter* and *think*, which was shown in example (31), can be explained in this way. Ambridge and Goldberg (2008, p. 357) point out that verbs such as *mutter*, *shout*, or *mumble* tend to be used primarily in contexts where the manner of speaking constitutes new information, whereas the content of what is spoken constitutes information that is given or at least accessible. By contrast, the verb *think* presents the content of what is thought as new information.

In order to test the BCI hypothesis empirically, Ambridge and Goldberg devised an experiment that tested whether the relative acceptability of questions such as **What did he mutter that John did?* or *What did he think that John did?* would be correlated with the relative backgroundedness that characterizes the complement clauses of verbs such as *say* and *mutter*. In a first step, participants were asked to rate the acceptability of questions with twelve different verbs. Relative backgroundedness was measured with another task. Participants had to indicate whether a negated matrix clause with one of the twelve verbs would imply that also the complement clause is negative. Two illustrations are given in (33).

(33) Does *I didn't think that* *I needed it* imply that *I didn't need it* ?
Does *I didn't mutter that* *I needed it* imply that *I didn't need it* ?

Ambridge and Goldberg (2008, p. 368) find that more participants give affirmative answers in response to the stimulus with *think*. Moreover, they find that verbs that yield more affirmative answers are also more acceptable in questions. This suggests that syntactic islands can indeed be characterized in terms of their information status. If a constituent encodes backgrounded information, it is not available for questioning.

13.6 Concluding Remarks

This chapter started out by asking what syntax is good for. It was argued that besides its capacity to arrange words into phrases and sentences, one major function of syntax is information structure. Speakers arrange the ideas they want to communicate in terms of their information status. They distinguish between given information, which is already shared between the speaker and the hearer, and new information, which is being introduced into the speech situation. This means that the participants of a conversation monitor each other's knowledge states and aim to present information in such a way as to make language processing as effortless and robust as possible. This process is governed by general principles, such as the given-before-new principle and the end-weight principle. In language use, speakers draw on information structure constructions, which are complex syntactic patterns that conventionally indicate the information status of their component parts. Constructions such as clefts, dislocation constructions, or the prepositional dative construction allow speakers to present several items of information in a sequential order that makes it easy for the hearer to process that information. Psycholinguistic results support this idea. Under controlled laboratory conditions, language processing is made more difficult when information structure constructions are used in ways that deviate from conventionalized patterns of information status.

NOTE

1 The linguistic examples in this chapter are constructed, unless indicated otherwise.

FURTHER READING

Classic accounts of information structure can be found in Halliday (1967), Chafe (1976), and Prince (1981). Monographs that provide excellent overviews include Lambrecht (1994), Birner and Ward (1998), and Erteschik-Shir (2007). *The Oxford handbook of information structure* (Féry and Ishihara 2014) offers up-to-date discussions of specific topics in information structure. The grammar of English

features a wide range of information structure constructions that the discussion in this chapter had to ignore for reasons of space. These include genitive constructions (Hinrichs and Szmrecsanyi 2007), obligatory adjuncts, (Goldberg and Ackerman 2001), null instantiation constructions (Ruppenhofer and Michaelis 2010), *the thing is* constructions (Tuggy 1996), *tough*-raising (Mair 1987), particle placement (Gries 2003), and contrastive reduplication, which is also known as the *salad-salad* construction (Ghomeshi et al. 2004).

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14 Current Changes in English Syntax

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14.1 Introduction

Since the publication of the first edition of the present handbook, the corpus-linguistic working environment for the study of current changes in English syntax has improved dramatically. In 2006, we mostly had to rely on small corpora of written English for the real-time investigations into ongoing change that we had in mind. The major source of data for our case studies was the "Brown family" of one-million-word reference corpora, then comprising no more than four members, namely, the original Brown and Lancaster-Oslo/Bergen (LOB) corpora with their matching 1961 samples of British (BrE) and American English (AmE) and their 1992 and 1991 updates produced in Freiburg in the 1990s (and generally referred to as Frown and F-LOB). The short-term diachronic study of spoken English was still in its infancy. The Diachronic Corpus of Present-Day Spoken English (DCPSE), which extended the Brown-family formula to the study of change in spoken (British) English, was not released until 2006. Similarly, the first version of the Corpus of Contemporary American English (COCA), an essential resource for the study of short-term diachronic developments in AmE, with 385 million words covering the years 1990–2008, was not released until 2008 (Davies 2009).

Since then, the four-member Brown family has added two more corpora extending coverage back into the 1930s (B-Brown and B-LOB) and four more documenting more recent developments since the 1990s.[1] COCA has been updated continuously since its first publication and been complemented by further diachronic corpus resources, for example, the Corpus of Historical American English (COHA), which extends diachronic coverage back to the beginning of the nineteenth century, and News on the Web (NoW), which documents current developments with minimal delay (cf. https://www.english-corpora.org). For the real-time analysis of change in spoken English, in addition to DCPSE, there is now the 2014 update of the British National Corpus (BNC Spoken 2014, see McEnery et al. 2017). Tools such as the Google Books Ngram Viewer (see, e.g., Newberry et al. 2017, on analogical leveling of irregular verbs) have made at least rudimentary corpus-linguistic analysis possible for even larger amounts of data than these "megacorpora."

Another noteworthy recent trend has been the exploration of the history of the New Englishes or postcolonial Englishes (cf., e.g., Noël et al. 2014). Collins et al. (2014) compare a Philippine Brown "clone" with data from the early 1960s and the 1990s material from the Philippine sub-corpus of the International Corpus of English (ICE) to study modal verbs in real time. This shows that the ICE corpora—a resource which was originally designed for the

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synchronic comparison of World Englishes—can also serve as a useful baseline for diachronic studies. There has also been considerable progress in the statistical techniques available for corpus analysis, from "collostructional analysis" (Stefanowitsch and Gries 2003; Hilpert 2012) to more recent types of multivariate modeling, such as linear mixed effects (Baayen 2008). One more thing which has changed for the better is that, within the discipline of linguistics, there is now a much more differentiated understanding of the sociocultural context, aims, and potential effects of the various currents of linguistic prescriptivism active in contemporary societies (see, e.g., Curzan 2014; Tieken-Boon van Ostade 2018; Tieken-Boon van Ostade and Percy 2017). This obviously helps us to better analyze and understand recent and ongoing changes in the language.

In view of this massive expansion of the database and the theoretical horizons, it is almost surprising to note a distinct continuity in the variables which are being studied. The ones which served as demonstration cases in the first edition of this chapter—modal and semi-modal verbs, the progressive aspect, nonfinite verbal forms, relative clauses, information density in the noun phrase (NP)—still figure prominently in recent research. The present version of the chapter will therefore update the original case studies in the light of more recent research to further illustrate some promising new departures which have emerged since 2006. This focus on change in some core grammatical processes in present-day English is partly dictated by considerations of practical expediency. As numerous studies demonstrate, current changes are certainly not restricted to these areas. A particularly high-profile instance of ongoing change on the borderline between the lexicon and the grammar is the new quotatives (particularly *be like*, as in *she was like, no way am I going to accept that*). This innovation cannot be traced back much further than American young people's usage in the 1980s, has since spread to practically the entire English-speaking world, and has inspired a vast amount of scholarly analysis (see Romaine and Lange 1991, for an early study and Buchstaller 2013, for a recent survey). Another inexhaustible driving force of change is grammaticalization—very much evident in the English modal system (dealt with here), but also far beyond that.[2]

14.2 On the Notion of "Current Change" in Syntax

Syntactic change differs from lexical change in at least two important ways. First, it generally unfolds much more slowly, sometimes taking hundreds of years to run its course to completion, and second, it tends to proceed below the threshold of speakers' conscious awareness, which makes impressionistic or introspection-based statements on ongoing changes in English grammar notoriously unreliable. A third difficulty in pinning down syntactic change in present-day English is that a rather small number of alleged syntactic innovations are strongly stigmatized. This has biased discussion in favor of such high-profile issues at the expense of developments which are, arguably, more comprehensive and far-reaching in the long run. Examples which come to mind include the use of *like* as a conjunction (as in *it looks like we could even lose John*) or the use of *hopefully* as a sentence adverb (*hopefully, they'll go back and set it up*).[3] Such shibboleths have aroused an inordinate amount of expert and lay comment, while developments which keep transforming the grammatical core of Standard English, such as the continuing increase in the frequency of the progressive or the spread of gerundial complements at the expense of infinitival ones, tend to go largely unnoticed. For the purposes of the present survey, "current" changes in English syntax comprise those developments for which there has been a major diachronic dynamic since the beginning of the twentieth century.

It is easy to draw a dividing line between lexical and grammatical/syntactic change as long as one sticks to clear cases. The nouns *Brexit, Brexiter, Brexiteer, remainer*, and *remoaner*,

for example, are all lexical innovations, coined in the wake of a political controversy in the United Kingdom, and have their own history, which has already been recorded in the *Oxford English Dictionary* (OED). Whether we say *grammar's relevance to contemporary language education* or *the relevance of grammar to contemporary language education*, on the other hand, is a grammatical choice. When we turn to grammaticalization, however, an important driving force in syntactic change, the situation is more complex. The development of binominal quantifier and size noun constructions proceeds in a complex web of grammatical (e.g., phrase structure and noun–verb concord), semantic ("bleaching"), and collocational constraints, which has led to expressions such as *a heap of bricks* and *heaps of atmosphere* coexisting in present-day English in a complex system of layering (examples from Brems 2010, p. 84).

As for modeling grammatical/syntactic change, there are currently two major approaches. Where the focus is on the diachronic development of grammars as decontextualized linguistic systems (Saussurean *langue*) or as idealized cognitive representation in the human mind (Chomskyan *competence*), syntactic change is usually seen as an abrupt or discrete alteration of structures, rules, and constraints (cf., e.g., Lightfoot 2006). But where the starting point for the analysis of historical change is the study of recorded performance data in their linguistic and social context—as, for example, in grammaticalization theory (Hopper and Traugott 2003; Lindquist and Mair 2004; Mair 2011), studies of constructionalization and constructional change (Traugott and Trousdale 2013) or the budding field of historical sociolinguistics (Hernández Campoy and Conde-Silvestre 2012)—the picture that emerges is one of gradual evolution rather than abrupt change.

Regardless of what theoretical stance is taken on the nature of linguistic change itself, what is always a gradual phenomenon is the spread of linguistic innovations throughout the community (or conversely, the dying out of obsolescent forms). This means that, in the timespan of a little more than one century that is the focus of this chapter, we are unlikely to see any one change run out its full course, from inception in particular genres, registers, or discourse communities to full establishment in the core grammar of Standard English. What we will be able to note instead are shifting frequencies of use for competing variants which—over the course of a century—may well build up into impressive statistical trends.

Not only will a change proceed gradually (if one looks at the language as a whole), but it will also proceed at differential speeds in different regional varieties of English and different styles and textual genres. This is why, after a necessarily brief review of the literature on ongoing grammatical change in present-day English, the present chapter will largely be corpus-based. As a point of departure, we will usually take Standard American and British English written usage as documented in the widely used matching reference corpora of the extended Brown family as described above. Most of the corpora are available in untagged and tagged versions,[4] making it feasible to study changes in textual frequency in terms of not only individual words and word sequences but also of grammatical categories. On this basis, we will branch out as appropriate into the rich working environment provided by the larger, if diachronically often less well-matched corpora now available (on the pros and cons of working with small and large corpora, see Davies 2012; Hundt and Leech 2012).

14.3 Some Previous Studies

The popular literature on ongoing changes in the English language (see Barber 1964 or Potter 1975, for two classic examples and McWhorter 2016, for a twenty-first-century addition to the list) tends to focus on phonetic and lexical rather than grammatical change. Among grammatical changes, the emphasis is on cases which have aroused the concern of prescriptivists. A typical list of changes suspected to be going on in present-day Standard English is the following one, which is largely based on Barber (1964, pp. 130–144) and Potter (1975, pp. 101–176).

a. Tendency to regularize irregular verb morphology (e.g., *dreamt* → *dreamed*).
b. Revival of the "mandative" subjunctive, allegedly inspired by formal US usage (e.g., *we demand that she* ***take*** *part in the meeting*).
c. Loss of *shall* as a future marker in the first-person singular and plural.
d. Main-verb syntax for *have*, *need*, and *dare* in interrogative and negative clauses (e.g., *have you any money?* → *do you have/have you got any money?*; *I haven't any money* → *I don't have any money/haven't got any money*).
e. Development of new, auxiliary-like uses of certain lexical verbs (e.g., *get, want*—cf. *the way you look, you* ***wanna/want to*** *see a doctor soon*).
f. Extension of the progressive to stative verbs (e.g., *were you wanting the car for the day only or for the entire week*?).
g. Extension of the progressive to hitherto neglected complex passive constructions (modal, present/past/future perfect (e.g., *the road* ***would be being built/has been being built***, etc.).
h. Increase in the number and types of multiword verbs (phrasal verbs, *have/take/give a ride*, etc.).
i. Demise of the inflected form *whom*.
j. Increasing use of *less* instead of *fewer* with countable nouns (e.g., *less people*).
k. Spread of the *s*-genitive to non-human nouns (*the book's cover*).
l. Omission of the definite article in certain environments (e.g., *renowned Nobel laureate Derek Walcott*).
m. "Singular" *they* (*everybody came in their car*).
n. *Like*, *same as*, and *immediately* used as conjunctions.
o. Tendency toward analytical comparatives and superlatives (*politer* → *more polite*).

Certain of these supposed changes do have support from corpus evidence—a, b, c, d, e, g, h, k, l, m, n—although in some cases the interpretative angles given for the changes are slightly misleading. Thus, *shall* (item c) has been undergoing a general decline, not restricted to the first person. Similarly, the *s*-genitive (item k) has been showing a general increase, not specific to non-human nouns (Hinrichs and Szmrecsanyi 2007). For some of the suspected changes, for example, the increasing frequency of the progressive with stative verbs (Potter 1975, pp. 119–120), there is no convincing empirical evidence from corpora. Such uses are usually pragmatically licensed—the progressive is used to make statements and requests sound more tentative and hence more polite (cf. the example given in item f)—or semantically, when normally stative verbs acquire dynamic overtones in particular contexts (cf. McDonald's *I'm lovin' it*, where the stative use of *love* as an expression of an emotional disposition is superseded by the more physical and dynamic sense of "enjoy"). All corpus evidence for the past 200 years shows that such exceptional uses keep cropping up in small numbers, but do not build up into a statistically significant upward trend (Mair 2006, pp. 88–95, 2012, pp. 812–822, for short-term and Visser 1973, pp. 1973–1986, for long-term historical documentation).

Impressionistic observation also generally makes ongoing changes appear more rapid and dramatic than they actually turn out to be in analyses based on corpus data. For example, the inflected relative pronoun *whom* has certainly been on the decline (de Haan 2002), but referring to this as a "current" or "ongoing" change means stretching these concepts somewhat. *Whom* has been optionally replaceable by *who* in many common uses since Early Modern English. By the nineteenth century, *whom* was a marker of formal style, really obligatory only if preceded by a preposition. As will be shown, this is very much the situation which has persisted up to today. Similarly, most of the truly recent change in the comparison of disyllabic adjectives (item o) has not been in the direction of more analyticity (i.e., use of *more* and *most* for comparatives and superlatives), but of reducing the variability of forms for individual adjectives (Bauer 1994, p. 80; cf. also Kytö and Romaine 1997, 2000).

In addition to the popular works referred to above, the present survey has benefitted from the following, more technical and academic studies. Denison (1998) is a survey of grammatical developments in Late Modern English since 1776 and is still unrivaled in its comprehensiveness. Most of the period under investigation was not covered well by corpora at the time of his writing, but the author nevertheless backs up many of his claims by small-scale quantitative studies. The first work to implement the corpus-based approach to the study of ongoing changes systematically is Bauer (1994), who at the time had to work with corpus sizes which are woefully small by present-day standards. Mair (2006, pp. 82–155), Leech et al. (2009), and Rohdenburg and Schlüter (2009) represent the corpus-linguistic state of the art of the first decade of the new millennium. For convenient surveys of the current state of the art, the reader is referred to Hilpert and Mair (2015), and the section "Observing recent change through electronic corpora" in *The Oxford Handbook of the History of English* (Nevalainen and Traugott 2012, pp. 157–255), which contains both methodological position papers and a number of empirical case studies.

The most valuable role of corpora in the study of syntactic change is not the "negative" one of correcting rash hypotheses, but their "positive" role in the discovery of ongoing changes which have not even been noticed by observers so far. Corpora now provide plenty of evidence for the recent development of grammatical constructions, for many of which Denison's 1998 survey has noted a pronounced diachronic dynamic since the late eighteenth century. It is likely that these changes are still with us today, and can be considered truly current. With some of them, such as the *get*-passive or the *going-to* future, the crucial structural changes had already taken place before the year 1776, Denison's starting point, so that any statistical increase in material from the twentieth and twenty-first centuries will represent the further spread of these innovations—for example, from less formal into more formal registers and styles (see, e.g., Hundt 2001 or Mair 1997). However, some other constructions (for example, certain new progressives) represent genuine recent innovations in the sense that they were not firmly established in any style before the twentieth century. Although the spotlight tends to fall on innovatory changes and their diffusion, corpora also provide evidence of changes in the direction of attenuation and loss. For example, the four corpora show a declining frequency in the use of many modal auxiliaries and of *wh*-relative pronouns. In the remainder of this survey, we will focus on four case studies, two relating to the grammar of the verb phrase, one to the noun phrase, and one to the spread of nonfinite clausal complementation.

14.4 Modals, Semi-Modals, and the Subjunctive

Variability and change in the English modal system have been the subject of an impressive number of corpus studies. Historical developments in British and American English have been covered, for example, by Krug (2000), Millar (2009), and Lorenz (2013). On the basis of the "Brown quartet" of corpora (Brown, LOB, Frown, F-LOB), Leech et al. (2009, pp. 71–90) reported fairly dramatic shifts in frequency for several modals and semi-modals[5] in a relatively narrow time window of around 30 years. Subsequent studies on the extended Brown family by Leech and Smith (2009), Leech (2011, 2013), and Mair (2015) increased the time depth for BrE to cover the periods from the 1930s (and even 1901, for BrE) to 2006. Expanding the geographical range beyond Britain and North America, Collins (2009a, b) and Collins and Yao (2012) surveyed modal usage in a number of New Englishes in comparative analyses mainly based on ICE, making possible indirect ("apparent-time") reconstruction of diachronic developments in World Englishes (see also Collins et al. 2014).

Table 14.1 presents the diachronic development of the nine core modals and the two marginal modals *need* and *ought* (*to*) in BrE from B-LOB to F-LOB, that is from the 1930s to

Table 14.1 Frequency development of modal verbs in B-LOB, LOB, and F-LOB.

	B-LOB (1930s)	*LOB (1961)*	*Change % B-LOB → LOB*	*F-LOB (1991)*	*Change % LOB → F-LOB*	*Change % overall*
Would	2673	3032	****+13.4%	2682	****–11.5%	+0.3%
Will	3055	2822	*–7.6%	2708	–4.0%	***–11.4%
Can	2039	2147	*+5.3%	2213	+3.1%	**+8.5%
Could	1433	1741	****+21.5%	1767	+1.5%	****+23.3%
May	1702	1333	****–21.7%	1100	****–17.5%	****–35.4%
Should	1486	1301	**–12.4%	1148	**–11.8%	****–22.7%
Must	1265	1147	–9.3%	814	****–29.0%	****–35.7%
Might	713	779	*+9.3%	640	***–17.8%	–10.2%
Shall	475	355	***–25.3%	200	****–43.7%	****–57.9%
Ought (to)	135	103	–23.7%	58	***–43.7%	****–57.0%
Need (n't)	94	76	–19.1%	44	**–42.1%	****–53.2%
Total	15 070	14 836	–1.6%	13 374	****–9.9%	****–11.2%

the 1990s, based on figures from Leech et al. (2009, p. 74, 283) and Mair (2015). The items are arranged in descending order of frequency, as recorded in LOB. In all tables significance levels are indicated by *, **, ***, and ****, respectively, and calculated using Log Likelihood [LL] G2 (as explained in http://ucrel.lancs.ac.uk/llwizard.html): LL G2 > 3.84 equals $p < 0.05$ and is indicated by *; LL G2 > 6.63 = $p < 0.01$ = **; LL G2 > 10.83 = $p < 0.001$ = ***; LL G2 > 15.13 = $p < 0.0001$ = ****.

There is straightforward diachronic continuity from the 1930s to the 1990s in several cases. The rare modals *shall*, *ought*, and (auxiliary) *need* show continuous decline from B-LOB to F-LOB, as do medium-frequency *must*, *may*, and *should*, and high-frequency *will*. With the exception of *should*, these trends continue into the twenty-first century: The 2009 BrE Clob corpus shows further decreases of around 50% (to 90, 30, and 21 instances, respectively) for *shall*, *ought*, and (auxiliary) *need*; *must* goes down from 814 instances in F-LOB to 542 in Clob (–33%), and *may* from 1100 to 965 (–12%).

Discontinuous developments, on the other hand, are documented for *would* and *might*. Here, the (statistically highly significant) decline in the 1961–1991 time window recorded in Leech et al. (2009, p. 283) reverses an equally significant previous trend. In the absence of a plausible motivation for these ups and downs, we must assume random fluctuation.[6] Another fact which deserves note is that the rather drastic overall decline in frequency of the core modals as a category (–9.9%) which Leech et al. noted for the 30-year period from 1961 to 1991 was preceded by a much more modest—and statistically insignificant—decline (–1.6%) in the preceding 30-year time window.

For BrE, it is possible to compare the developments in the spoken and written language, at least during the second half of the period covered by the extended Brown family. In their analysis of the DCPSE, Bowie et al. (2013, p. 80, 93) show that *must*, *may*, and *shall* show significant declines in informal face-to-face conversations, whereas *can* and *might* record increases. Table 14.2 shows developments in the much larger database provided by the spoken BNC (1990s and 2014). As the sizes of the two corpora differ (BNC: 10 409 858 words; BNC 2014: 11 422 617 words), normalized frequencies are given. Significance levels are indicated as in Table 14.1 and were calculated on the basis of absolute frequencies.

One striking contrast between the written and the spoken language is that there is no further decrease in frequency for (auxiliary) *need*. This modal had already reached vanishing

Table 14.2 Modal verbs in spoken BrE (normalized frequencies, per million words).[7]

Modal verb	*Search*	*BNC*	*BNC2014*	*Diff. (%)*
Would	{would/V}	4442.14	4433.05	−0.20
Will	{will/V*}	5464.34	4177.24	****−23.55
Can	{can/V*}	4795.45	4964.10	****+3.52
Could	{could/V}	1935.47	1947.63	+0.63
May	may_V*	473.49	119.50	****−74.76
Should	should	1161.21	923.78	****−20.45
Must	must_V*	583.97	425.30	****−27.17
Might	might_V*	802.51	901.98	****+12.39
Shall	{shall/V}	277.53	190.85	****−31.23
Ought	ought	122.67	22.76	****−81.45
Need	{need/V} _VVB* (_VV0*)	3.27	3.33	+1.83%

point in the early BNC; used in contemporary written language, it appears to have become an archaism. As in the written language, *may*, *must*, *shall*, and *ought to* are strongly decreasing in frequency. This trend indicates an across-the-board grammatical change that proceeds rather independently from medium, text-type, and genre.

Table 14.3 presents the findings for (written) AmE, obtained from a comparison of B-Brown, Brown, and Frown.

There are obvious parallels between British and American English. The rare modals *shall*, *ought*, and (auxiliary) *need* show continuous decline from B-Brown to Frown, and so do medium-frequency *must*, *may*, and *should*. All these trends continue straightforwardly into the twenty-first century, as documented by the frequencies found in the 2009 Crown corpus (51, 43, and 16, respectively, for the low-frequency *shall*, *ought*, and *need*; 864, 704, and 430 for mid-frequency *may*, *should*, and *must*). Note that *shall* is comparatively infrequent in the American corpora even in the 1930s, whereas *must* experiences an unexpected temporary increase between B-Brown and Brown. For the high-frequency forms *will*, *would*, *can*, and

Table 14.3 Frequency development of modal verbs in B-Brown, Brown, and Frown.

	B-Brown (1930s)	*Brown (1961)*	*Change % B-Brown → Brown*	*Frown (1992)*	*Change % Brown → Frown*	*Change % overall*
Would	2412	3053	****+26.6%	2868	*−6.1%	****+18.9%
Will	2606	2702	+3.7%	2402	****−11.1%	**−7.8%
Can	1718	2193	****+27.7%	2160	−1.5%	****+25.7%
Could	1332	1776	****+33.3%	1655	*−6.8%	****+24.3%
May	1357	1298	−4.3%	878	****−32.4%	****−35.3%
Should	1037	910	**−12.3%	787	**−13.5%	****−24.1%
Must	955	1018	+6.6%	668	****−30.4%	****−29.9%
Might	626	665	+6.2%	635	−4.5%	+1.4%
Shall	289	267	−7.6%	150	****−43.8%	****−48.1%
Ought (to)	111	69	**−37.8%	49	−29.0%	****−55.9%
Need (n't)	49	40	−18.4%	35	−12.5%	−28.6%
Total	12 492	13 991	****+12.0%	12 287	****−12.2%	−1.6%

could, there is short-term fluctuation rather than long-term directed change (as could mistakenly have been inferred from looking at the developments between either the pair B-Brown–Brown or Brown–Frown alone). For AmE, it is possible to compare the findings obtained from the Brown-family corpora with COHA, a checking procedure which is demonstrated in Leech (2011, p. 553).[8]

All in all, the development of the modal verbs throughout the twentieth century can be summarized as follows. There is an overarching diachronic tendency in British and American English for some core modals (in particular *may*, *must*, and *shall*) to decrease in frequency. In the course of this process, regional contrasts between British and American English may arise, but they tend to remain temporary, as the direction of the changes is the same in both varieties. For the highly frequent modals, the data show considerable fluctuation and volatility, which shows that variation determined by register, genre, and text-type is a powerful source of noise in any attempt to study the interaction of diachronic change and regional variability in varieties of English.

Tables 14.4 and 14.5 present recent diachronic developments for the semi-modals, combining findings from Leech et al. (2009, pp. 91–117) and Mair (2015). The semi-modals are a rather loosely defined grouping, generally more frequent in spoken than in written

Table 14.4 Frequency of semi-modals in B-LOB, LOB, and F-LOB.

	B-LOB (1930s)	*LOB (1961)*	*Change % B-LOB → LOB*	*F-LOB (1991)*	*Change % LOB → F-LOB*	*Change % overall*
BE *able to*	247	246	−0.4%	248	+0.8%	0.4%
BE *going to*	205	248	+*21.0%	245	−1.2%	*+19.5%
BE *supposed to*	33	22	−33.3%	47	**+113.6%	+42.4%
BE *to*	494	451	−8.7%	376	*−16.6%	***−23.9%
(HAD) *better*	23	50	**+117.3%	37	−26.0%	+60.9%
(HAVE) *got to*	31	41	+32.3%	27	−34.1%	−12.9%
HAVE *to*	505	757	****+49.9%	825	+9.0%	****+63.4%
NEED *to*	20	53	****+165.0%	194	****+266.0%	****+870.0%
WANT *to*	259	357	****+37.8%	423	**+18.5%	****+63.3%

Table 14.5 Frequency of semi-modals in B-Brown, Brown, and Frown.

	B-Brown (1930s)	*Brown (1961)*	*Change % B-Brown → Brown*	*Frown (1991)*	*Change % Brown → Frown*	*Change % overall*
BE *able to*	189	191	+1.1%	202	+5.8%	+6.9%
BE *going to*	170	216	*+27.1%	332	****+53.7%	****+95.3%
BE *supposed to*	46	48	+4.3%	55	+14.6%	+19.6%
BE *to*	425	344	**−19.1%	217	****−36.9%	****−48.9%
(HAD) *better*	20	41	**+105.0%	34	−17.1%	+70.0%
(HAVE) *got to*	36	45	+25.0%	52	+15.6%	+44.4%
HAVE *to*	362	627	****+73.2%	639	****+1.9%	****+76.5%
NEED *to*	35	69	***+97.1%	154	****+123.2%	****+340.0%
WANT *to*	277	323	+16.6%	552	****+70.9%	****+99.3%

English, some of which have acquired reduced pronunciations, reflected popularly in written forms such as *gotta* and *gonna*. In addition, the lexical verb *want* shows signs of auxiliation/grammaticalization, including phonetic erosion in *wanna* (Krug 2000, pp. 117–166); this is why, though not an established semi-modal yet, it is included in the list.

Be to is the only semi-modal which is in decline in both varieties. This continues a longer-term trend described by Hundt (2014), who points out that this construction has already lost a formerly current nonfinite form (cf. *a ship being to sail the next day…*—see Hundt 2014, p. 173). In present-day English, it is still productive in a wide range of usually rather specialized uses relating to the expression of modality and future time (Declerck 2010). The highest percentage increase is registered for *need to* (i.e., *need* with main-verb syntax in modal function)—a form whose dramatic spread in the very recent history of English has been noted in numerous studies (Taeymans 2004; Nokkonen 2006; Müller 2008; Leech and Smith 2009, p. 191, and Seggewiß 2013). *Have to* also shows the expected overall rise in both varieties, which in this case continues long-established historical trends. As regards interrogative uses of *have to*, subject–auxiliary inversion—recorded as a "somewhat old-fashioned" British option in Quirk et al. (1985, p. 145)—is attested just once even in B-LOB, the oldest British corpus:

(1) What on earth had she to be afraid of? (B-LOB, K28)

Note that this example is ambiguous between a modal obligation reading (*she had to be afraid of something*) and a possessive-existential one (*she had something to be afraid of*).[9]

Interesting findings are obtained for *have got*. This form, though fully grammaticalized, has never been much of a statistical success in written English. Among varieties of English, it is reported to be most common in informal and spoken BrE. In the Brown family, the frequencies are modest throughout, so that—if anything—the data show that (*have*) *got to* is a marginal presence in **written** English both in Britain and the United States.

The new BNC makes it possible to study trends in the use of selected semi-modals in **spoken** BrE. As expected, *be to* declines strongly from the 1990s to 2014: from 341 to 125 instances per million words (pmw). Clear gains are registered by high-frequency *have to*, from 1523 to 1726 pmw (+13.37%), which makes it far more common than *must*. In percentage terms, gains are biggest for the more recent innovations in the low- to mid-frequency bands: from 1165 to 1439 pmw for *want to/wanna* (+23.55%), and from 382 to 674 pmw for main-verb *need* (+76.36). The results for (*have*) *got to* show two things. First, with frequencies per million words ranging between 661 (BNC 1990s) and 465 (BNC 2014), the form is considerably more common in spoken British usage than in written. Second, and despite of this, it is rapidly going out of fashion, declining by almost 30% in less than three decades. Such a notable decrease in the form's geographical stronghold suggests that it might be one of the traditional grammatical Briticisms which are being leveled before the global advance of North American English. In this regard, its fate is similar to plural concord with collective nouns (e.g., *the band are playing three concerts in London*), which also peaked in British usage in the mid-twentieth century and then started on a similar decline (Depraetere 2003; Levin 2006). Of course, the decline of (*have*) *got to* in standard varieties of English around the world does not preclude further innovation in nonstandard usage; for example, a current reanalysis of the contracted form *gotta* as a main verb in North America (e.g., *who do I gotta ask?*), which so far has shown little sign of being taken up in Britain (cf. Mair 2014).

In diametric contrast to the semi-modals, the subjunctive in English is a historical relic, more characteristic of formal written style than of the spoken language. Only two forms of it survive with any degree of currency, and even these are not morphologically distinctive, and can usually only be identified following singular subjects (Anderson 2001). These are the

mandative subjunctive occurring in *that*-clauses following certain controlling items such as the verb *suggest* (2) and the so-called *were*-subjunctive signaling hypothetical meaning (3):

(2) Yesterday, he had suggested that he **sleep** in the spare room from now on. (F-LOB, K 22: 19ff)
(3) It felt as if she **were** alone in the world. (LOB, P 16: 79ff)

Of these two uses, the *were*-subjunctive shows a straightforward development—continuing decline—in BrE (from 95 occurrences to 41 in LOB and F-LOB). Trends are more complex for the mandative subjunctive. Like the *were*-subjunctive, the mandative subjunctive was assumed to have reached the end of a long road of decline in the early to mid-twentieth century.[10] But for the later twentieth century, the four corpora show a fascinating picture: whereas a gradual decline of the mandative subjunctive seems to continue in written AmE[11] (and even more so in spoken AmE—cf. Kastronic and Poplack 2014), it has seen a modest revival, from a very low ebb, in BrE—apparently under the influence of American usage.

14.5 The Progressive Aspect

Two different phenomena are involved in the continuing spread of the progressive form: (i) an increase in the frequency of occurrence of progressives in general, and (ii) the establishment of the progressive in a few remaining niches of the verbal paradigm in which it was not current until the twentieth century.[12] Both phenomena represent direct twentieth-century continuations of well-established long-term trends. The fairly dramatic increase in the frequency of the progressive from late Middle English onward has been confirmed, for example, by Jespersen (1909–1949, p. IV, 177), who used Bible translations from various periods as parallel historical corpora. Today's filling of structural gaps in the verbal paradigm also builds on such previous episodes, for example, the emergence of the progressive passive (*dinner was being prepared*) approximately 200 years ago, superseding "passival" *dinner was preparing* (on which see Denison 1998, p. 148ff; Hundt 2004).

The first real-time corpus-based study of progressives in present-day English was carried out on the press sections of the Brown quartet by Mair and Hundt (1995), who in a manual analysis of all progressives found increases of 18.2% and 11.8% in British and American English, respectively. The full versions of the four corpora were subsequently investigated by Nicholas Smith (2002) and the results published in summary form again in Leech et al. (2009, p. 123). Figures 14.1a and 14.1b in the following text show significant overall increases, both in British and American English, but increases which clearly do not affect all of the four major text types sampled to a comparable extent.

As these graphs show, overall geographical variation between Britain and the US is not as pronounced as stylistic and genre variation within each variety. The frequencies in the Brown family of corpora peak at around 2000 pmw (press), with the "learned/academic" genres polling at around 400 pmw.

In such a situation of massive genre-induced variability, it is of course vital to determine a baseline frequency of progressives in spontaneous spoken language. Leech et al. (2009, p. 126) present findings which are based on extracts from the DCPSE. These data suggest an increase in frequency that is even more dramatic than that observed in written texts. In face-to-face conversation, for example, they note an increase of 41.5%, from 6293 progressives per million words to 8906. Table 14.6 summarizes subsequent research by Rohe (2019), which is

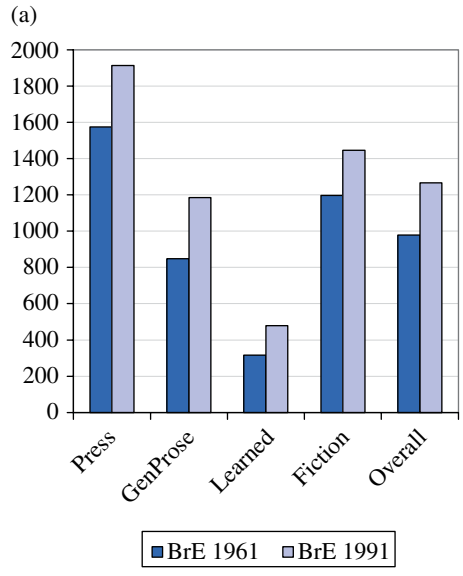

Figure 14.1a Distribution of present progressive (active) in LOB and F-LOB across sub-corpora: frequencies pmw (Leech et al. 2009, p. 123).

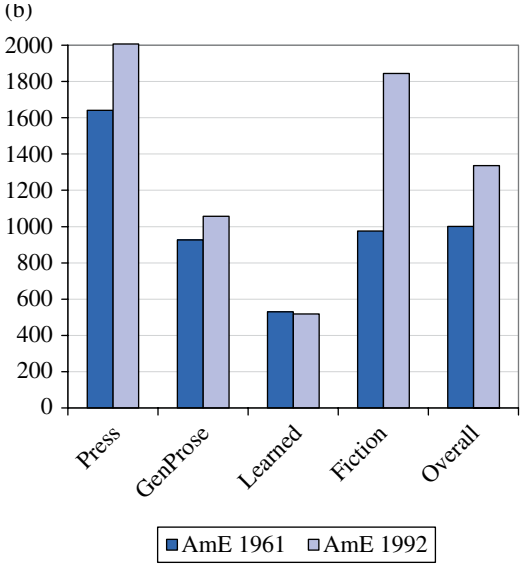

Figure 14.1b Distribution of present progressive (active) in Brown and Frown across sub-corpora: frequencies pmw (Leech et al. 2009, p. 123).

based on the completed DCPSE and the two versions of the BNC, and provides a more fine-grained picture.

As can be seen, the 41.5% growth rate obtained by Leech et al. is reduced to 29.5% for the whole DCPSE. Even at that more modest rate, however, the "New" DCSPE material, essentially data from ICE-GB, seems to represent an outlier, with unexpectedly high

Table 14.6 Frequency of the progressive in four samples of conversational data.

Corpus	*Amount of text (in words)*	*Normalized frequency of progressive (per million words)*
DCPSE "Old" (mainly 1960s)	218 307	6340
DCPSE "New" (early 1990s)	184 537	8210
BNC (early 1990s)	5 014 665	6440
BNC 2014	11 422 617	7590

frequencies for the progressive. Conservatively, and taking the BNC values as representative for the 1990s, we can assume an increase of ca. 20% for the past half century (i.e., somewhat more than the 17.9% increase recorded in the two versions of the BNC). This rate of increase is within the range observed for the Brown quartet press texts in the study of Mair and Hundt (1995). Rohe obtains increases of almost 50% for the genre "Broadcast Interviews and Discussions." These very high frequencies go beyond what one would expect from the general increase and therefore demonstrate the additional impact of colloquialization in these textual genres.

While most of the statistical increase in the progressive is due to the further spread of established uses, there is nevertheless one development which is genuinely new, namely, the so-called interpretative use (Huddleston and Pullum 2002, p. 165) in such contexts as:

(4) I can only add that when Paul Gascoigne says he will not be happy until he stops playing football, he **is talking** rot. (F-LOB, A 09: 81ff)

(5) When he speaks of apocalypse, however, he **is not speaking** of it in the literal and popular sense. (Frown, D 02: 120ff)

In (4), the two predications "says he will not be happy..." and "is talking rot" must refer to precisely coterminous situations, since the second is merely a more abstract interpretation of the first. There is apparently no reason why one should be treated as imperfective against the background of the other. But what we seem to have here is a further extension of the basic uses of the progressive, namely, seeing a situation "from the inside" (Comrie 1976, p. 4), to the metacommunicative level. As Huddleston and Pullum put it, "the internal (imperfective) view is appropriate to the explanatory function of the clause—in emphasizing duration, the progressive metaphorically slows down or extends the situation in order to be able to focus on clarifying its nature" (2002, p. 165). Example (5) is similar: here it is sufficient to note that the progressive (*is ... speaking*) and non-progressive (*speaks*) could by no means be interchanged.

Another semantic extension of the progressive, to a "future as a matter of course" interpretation (see Leech 1987, p. 68), appears to account for much of the increase observed between LOB and F-LOB in the modal progressive, especially with *will* (see Smith 2003):

(6) He **will be standing down** at the next general election. (F-LOB, B 20: 30)

(7) Why, you **will be asking** me to bomb Essen next. (F-LOB, F 24: 142)

Here the "in-progress" meaning of the progressive applies not to the action of "standing down" or "asking" itself, but to the circumstances already set in train and leading up to that

action, which is assumed to take place in the not-too-distant future. One possible motive for using *will* + progressive, rather than the non-progressive *will stand down*, is that *will* + V can imply that the action will be actuated by the volition of the speaker or the subject referent. By using the progressive, the speaker disclaims or at least backgrounds that implication.

A structural rather than semantic-functional change is at stake in the second phenomenon mentioned above, the establishment of progressives in those few remaining niches of the verbal paradigm from which they were excluded up to the twentieth century. With these constructions, the four corpora prove too small to yield conclusive results. The present perfect-progressive passive is attested in none of them. The British data yield three instances of modalized passive progressives, two from LOB and one from F-LOB. Here is the older one:

(8) We have also to notice that while the entropy of our given system will increase with external or given time, this relation is not reciprocal, for, if we first choose our time, a rare state in our stationary process **will just as likely be being approached** as **being departed from**. (LOB, J18: 197ff)

The first thing to note about these examples is that the progressive is not obligatory yet in such constructions, a sign of their recentness. Second, the yield of examples from the four corpora, while clearly not conclusive in itself, is not fortuitous. Modal forms of the type represented by example (8) are easy to find in the 100 000 000-word *British National Corpus*. The present perfect-progressive passive, on the other hand, is attested just once:

(9) That er, er, little action has been taken in the last thirty forty years since this **has been being discussed,** erm, I think the first international conference erm, produced their own report in nineteen sixty. (BNC, JJG 542)

Significantly, this example is from a transcription of spontaneous speech. Again, the use of the progressive is not yet obligatory. Summarizing the corpus data, we can say that the complex forms in question can be attested if the database is sufficient, and that their spread seems to take place more easily in the modal environments (*be being*) than in the present perfect (*been being*).

Another former lacuna in the use of the progressive was the progressive form of the copula—a use which can be traced back for about 200 years but probably was not fully established until late in the nineteenth century (Jespersen 1909–1949, p. IV, 225f.). Here, the four corpora suggest that this construction (although still rare) has grown in frequency in written English between 1961 and 1991/1992. There is an increase from 3 to 20 instances of the progressive copula from Brown to Frown, and from 8 to 17 from LOB to F-LOB.

14.6 Some Developments in the Noun Phrase: *Whom*, Relative Clauses, Information Density

Analysis of some aspects of noun phrase structure in the Brown quartet of corpora has shown changes in frequency of use just as impressive as those we have reported for verb constructions. The most basic and at the same time mysterious of these is a general increase in the frequency of nouns: over 5% in BrE and over 4% in AmE (for details, see Mair et al. 2002). So high is the frequency of nouns, particularly in prototypically written styles of English (e.g., news and academic prose—see Biber et al. 1999, pp. 609–611) that this increase, though apparently small, is statistically highly significant (with a log likelihood of 350). Moreover, it seems to run contrary to the assumption—also defended above—that written English is being influenced by the spoken variety (where nouns are much less frequent).

Table 14.7 Noun + noun sequences: increasing frequency from LOB to F-LOB (frequency counts based on unedited computer output).

	LOB	*F-LOB*	*Increase (%)*
All noun + noun sequences	32 201	38 016	****+17.7
Noun + common noun only	20 761	26 539	****+27.5

There is a corresponding increase in adjectives, together with a significant decrease in pronouns, articles, and other determiners, which suggests that, instead of an increase in the number of noun phrases, the increase in nouns is due to a greater density of nouns and adjectives per noun phrase. Further analysis has shown that the increase of nouns is partly due to an increase of proper nouns, especially the acronymic variety illustrated by *NATO* ("North Atlantic Treaty Organization"). Also, there has been a highly significant increase, in both AmE and BrE, of noun + noun sequences (e.g., *union leader*, *campaign coordinator*, *committee chairman*), as Table 14.7 shows.

The second row of the table indicates an even larger and more significant increase if the count excludes what the tagger regards as proper nouns in second position—in effect, excluding complex names such as *Kansas City*. This narrows down the nature of the change to common-noun compounding expressions, suggesting a resurgence of the Germanic preference for noun + noun sequences over the more Romance-favored prepositional phrase as a means of elaborating the content of noun phrases. This hypothesis is given some support from a decline (in LOB → F-LOB) of 2.9% for prepositions, and a greater decline of 4.7% for *of*-phrases in particular. For a more detailed and differentiated analysis of these phenomena, and additional data for AmE, the reader is referred to Leech et al. (2009, pp. 216–226).

All in all, the findings support Biber and Clark (2002) and Biber (2003), who have also noted that noun modification by clauses has been giving way to non-clausal modification strategies such as the use of premodifying nouns or postmodifying prepositional groups. Functionally, these structural trends suggest that noun phrases in written English are becoming somewhat denser and more compact in their presentation of information. This clearly goes against the tendency toward the informal and colloquial which was noted in many verb-phrase phenomena. Without going too far into detail, we would like to suggest one obvious way of resolving this apparent paradox. The compression of information remains one of the basic functions of the written language, which accounts for the increase in information density. However, in the contemporary communicative "market place," there is increasing pressure on writers to "dress up" this information in accessible, informal, and chatty verbal packaging, which accounts for the perceived colloquialization.

A more compact, premodifying style of noun phrase elaboration is also promoted by the increasing use of another Germanic form, the *s*-genitive.[13] The comparisons of LOB with F-LOB and Brown with Frown show an increase of the *s*-genitive of 24.1% and 41.9%, respectively, which certainly helps explain a decrease in the frequency of *of*-phrases. Inevitably, because the *of*-phrase is much more frequent and versatile than the *s*-genitive, the decline of *of*-phrases does not match the increase of *s*-genitives in percentage terms. But the competing relation between the two constructions shows up more sharply if the count is restricted to *of*-phrases which are semantically interchangeable with *s*-genitives. A provisional analysis of a small 2% sample of the four corpora on this basis showed a decline of *s*-genitive-matched *of*-phrases of 23.4% (BrE) and 24.2% (AmE).

As for postmodification in the noun phrase, the most intriguing phenomenon to study from the point of view of recent change is the relative clause. Here, we shall first turn to the

Table 14.8 Frequency of *whom* in the Brown family corpora.

	BrE	*AmE*
1930s	232	224
1961	219	146
1991/1992	177	166
2006	108	142
2009	114	128

long-announced demise of the inflected relative (and interrogative) pronoun *whom*—widely assumed to be inevitable ever since Sapir put the case for it in his classic *Language* (1921, pp. 166–174). Unsurprisingly, corpus data provide evidence for a gradual decline in frequency, but do not make us hold our breath. Table 14.8 provides the frequencies for the (extended) Brown family of corpora.

There is a parallel decline in both varieties. Interestingly, BrE starts from a slightly higher frequency for *whom* in the earliest period of observation to arrive at a frequency lower than AmE in the most recent period. In AmE, an early rapid fall is compensated by a temporary rise between Brown and Frown (i.e., the latter half of the twentieth century). The much larger COHA, by contrast, shows an almost continuous decline. *Whom* peaks at a frequency of 606 pmw in the decade ending in 1820, and then decreases to 480 pmw by 1850, 305 pmw by 1900, 191 pmw by 1930 (B-Brown has 224!), 160 pmw by 1960 (Brown has 146!), and 107 pmw by 1990 (Frown: 128!). One explanation for this disparity is to argue that the erratic ups and downs in the Brown family are leveled out in the larger COHA. On the other hand, genre may be a factor, too. The Brown formula provides for 15 different genres, whereas COHA reduces this complexity to four.

With regard to the baseline of face-to-face spoken interaction, COCA covers the more recent past for AmE—and yields an unexpectedly high frequency of almost 50 instances of *whom* per million words in its "spoken" component. This is likely to be due to sampling bias: Much of COCA's spontaneous spoken data are transcribed media broadcasts featuring professional speakers in relatively formal situations. The data from the BNC and its 2014 update are far more realistic in this regard. The informal conversational data from the original 1990s BNC ("spoken-demographic," ca. 4.2 million words) show a frequency for *whom* of ca. 5 per million words. By 2014, this has declined to 2 per million (in 11.4 million words of conversational interaction). Such a low frequency shows that *whom* is now practically absent from informal speech. In the written language, however, it is not likely to disappear soon, as it is still very much alive as a marker of formal style.

Beyond the isolated case of *whom*, the most significant general diachronic trend affecting relative clauses is *wh*-relative pronouns giving way to relativization using *that* or zero. As *wh*-relativization is strongly associated with prototypical written registers (e.g., news and academic prose), this has to count as another instance of the colloquialization of the written medium. A further parameter—closely connected with this—is the choice between the "pied-piping" construction with a preposed preposition (*the project* ***on*** *which I'm working*, etc.) and the preposition-stranding construction (*the project I'm working* ***on***, etc.), where the preposition typically occurs in final position in the clause. Again, the tendency is to move away from preposing and toward stranding—perhaps another case where a more learned Romance overlay on English syntax is being undermined by a native Germanic construction more at home in the spoken language.

Our frequency analysis of relativization (Table 14.9) was partly based on extrapolation from sample counts and (in the case of AmE) on tagging approximations with built-in correction

Table 14.9 Change in the use of relativization devices in the Brown quartet.

BrE	*LOB*	*F-LOB*	*Diff. (%)*	*AmE*	*Brown*	*Frown*	*Diff. (%)*
Which	4406	3997	****–9.5	*Which*	3516	2256	****–34.9
Who	2095	2013	–4.2	*Who*	2164	2223	+2.4
Whom[a]	214	170	*–20.6	*Whom*[a]	133	154	+15.5
Whose	293	244	*–17.0	*Whose*	246	255	+3.4
That[b]	(1353)	(1479)	*(+9.0)	*That*[b]	(1829)	(2710)	****(+48.3)
Zero[c]	(253)	(297)	(+17.1)	Zero[c]	(191)	(235)	*(+23.1)
Pied-piping	1401	1168	****–16.9%	Pied-piping	1153	972	****+15.9
Preposition-stranding[c]	(18)	(74)	****(+310.0)	Preposition-stranding[c]	(91)	(109)	(+19.5)

[a] Since we are counting relative *whom* only in this table, the counts are smaller than those in Table 14.8, where instances of both interrogative and relative *whom* are counted.
[b] The count of *that*-relatives is approximate: it depends on automatic tagging, and a margin of error is to be allowed for.
[c] These counts are based on sampling.

factors. In particular, the bracketed frequency figures lack the reliability of other tables. Nevertheless, subsequent research (e.g., Leech et al. 2009, pp. 226–233, 308–311; Hinrichs et al. 2015) has reassured us that the general picture presented here is still a valid one.

In BrE, there has been a general decline in *wh*-relative pronouns, whereas in AmE it is the single pronoun *which* that has suffered extreme disfavor. This change is presumably due to a well-known interdict, in American style guides, against *which* as an introducer of restrictive relative clauses, and clearly *that* is the beneficiary of this ban. Since the texts in Frown were published (in 1992), the switch from *which* to *that* will no doubt have gone further, as a result of the widespread incorporation of the anti-*which* "rule" in grammar checkers and word processors. For a comprehensive multivariate analysis of relativization in the Brown quartet of corpora, we refer the reader to Hinrichs et al. (2015), who have shown, among other things, that choice of zero relatives follows different constraints from the choice between *that* and *which*. In other words, while the increase observed for *that* is colloquialization pure and simple, without prescriptive interference, the choice between *that* and *which* is often taken consciously, in awareness of the rule laid down by style guides and other linguistic authorities, and corpus analysis thus opens a window on how effective such prescriptive guidelines are in particular varieties and text types at particular times. For AmE, the authors observe that the one other prescriptive rule which correlates with preference for *that* in restrictive relative clauses is preference for the active voice (i.e., another one of the relatively new prescriptions not going back to the eighteenth-century lore of correctness).

Before leaving the noun phrase, we should add a final word on pronouns, which provide one more exception to the rule that syntactic change takes place below the threshold of conscious control. In 1961, the so-called "generic" use of *he* for both male and female reference was well established, and hardly under threat. Conscious efforts inspired by the women's movement of the 1970s and 1980s, however, ensured that by 1991/1992, generic *he* was declining fast, and various alternatives were jostling to fill the semantic gap left by its fall. One of them, "singular" *they*, had the advantage of being simple, efficient, and available in vernacular use (Bodine 1975). Although the frequencies are low compared with third-person pronouns in general, the four corpora show the predictable changes. A sample of approximately 500 instances of *he/him/his/himself* from each corpus showed a decline of gender-neutral use from 32 (LOB) to 4 (F-LOB), and from 20 (Brown) to 7 (Frown). Oppositely, a comparable sample of *they* and its variants showed a rise in the use of singular *they* from 0 (LOB) to 9 (F-LOB), and from 7 (Brown) to 9 (Frown). Although rare in all four corpora, the gender-neutral coordinated pronouns *he or she* rose in frequency for the entire corpora from 11 to 37 (LOB → F-LOB) and from 9 to 56 (Brown → Frown).

Ultimately, the need to plug the gap left by the demise of gender-neutral *himself* may lead to the establishment of a new pronoun *themself*—possibly the clearest example of true grammatical innovation in Standard English in our period, because it would add a distinct closed-class item to the grammatical inventory.[14]

(11) You won't be the first or last man or woman who gets **themself** involved in a holiday romance. (BNC: K4D 386)

The spoken material from the original BNC contains 14 examples, which increase to 22 in the BNC 2014.

14.7 Nonfinite Verbal Forms

Nonfinite verbal forms—infinitives, gerunds, and participles—are another grammatical category which has become more functionally prominent, and correspondingly more frequent in discourse, since the Middle English period. To highlight the importance of these

Table 14.10 Gerunds and infinitives after *remember* in the OED quotation base—normalized frequencies, with absolute frequencies in brackets.

	(a) Prospective to	*(b) Retrospective -ing*	*(c) Retrospective to*
Eighteenth century	5.5 (15)	1.8 (5)	4.8 (13)
Nineteenth century	2.2 (17)	4.1 (31)	2.1 (16)
Twentieth century	5.8 (28)	12.0 (58)	0.8 (4)

developments, one scholar (Vosberg 2006) has even proposed the term "Great Complement Shift," modeled on the "Great Vowel Shift," the most important sound change to have affected the English language in the past seven centuries. There is no indication that the diachronic dynamic that characterized these forms in Early Modern English has abated in the recent past (cf. Mair 2002, 2006, pp. 119–141). Infinitival clauses with an explicit notional subject introduced by *for* (e.g., constructions such as *it is easy for common ground to be forgotten in disputes over methods* or *they arranged for us to be met at the station*) are clearly on the increase—from 294 instances in LOB to 332 in F-LOB[15]—and so are gerundial complement clauses (De Smet 2013; Fanego 1996b; Rudanko 2006, 2011).

For example, it is striking to see how recent the apparently rock-solid semantic contrast between infinitives and gerunds is after the verb *remember*. Since individual matrix verbs governing nonfinite complement clauses are usually not frequent enough to draw conclusions from the attestations in the four matching corpora, the data this time are provided by the quotation base of the OED (2nd edition on CD-ROM), and the time frame is extended to three centuries—from 1700 to the present. Three constructional types are distinguished: (a) prospective *to*, as in the current *I must remember to fill in the form*, (b) retrospective *-ing*, as in *I remember filling in the form*, and (c) the now defunct retrospective construction with the perfect infinitive, as in *I remember to have filled in the form*. Since the number of quotations available for the three centuries under review varies, frequencies in Table 14.10 are given as "occurrences per 10 000 quotations."

Table 14.10 reveals fluctuation—and structural stability—for prospective *to*, but a clear reversal of preferences for the retrospective uses, with the late nineteenth century acting as the pivotal period of transition. Note in particular that the gerund increases to an extent greater than would have been necessary merely to compensate for the declining retrospective infinitive (cf. also Fanego 1996a).

A final example, which is included chiefly because it shows BrE diverging from US usage in the course of the twentieth century, is provided by *prevent*. Well into the recent past (c. 1900), this verb was variously used with or without the preposition *from* before the gerund in both British and American English (cf., e.g., the relevant entries in the *OED* or *Webster's 3rd*). The variable "*prevent* + gerundial complement" has the following three variants: *prevent* + NP + *from* + V-ing (12), *prevent* + NP + V-ing (13), *prevent* + nominal V-ing premodified by genitive or possessive (14). They are all present in the B-Brown corpus:

(12) Small screws **prevent the bearings from coming out** of one end, and the end of the upright pipe, which is screwed into the pipe housing, also helps to hold the ball bearing in place. (B-Brown, E 16)

(13) **To prevent the operator slipping** into low gear unless he consciously exerts added pressure on the shifter handle, a spring-backed plunger restrains this action. (B-Brown, E 32)

(14) It would, however, **prevent their having to make** a public choice as between other candidates and would help them in getting elected as delegates. (B-Brown, G 35)

Table 14.11 Complementation of *prevent* in the Brown family corpora.

	NP + from + V-ing	*NP + V-ing*	*nominal V-ing (genitive/ possessive)*	*Total*
BrE 1931	53	15	3	71
AmE 1931s	21	3	1	25
BrE 1961	34	7	0	41
AmE 1961	47	0	0	47
BrE 1991	24	24	0	48
AmE 1992	36	1	0	37
BrE 2006	23	15	0	38
AmE 2006	27	0	0	27

As the figures from the extended Brown family in Table 14.11 show, the *from*-less variant was eliminated from AmE in the course of the twentieth century, whereas it became increasingly common in BrE:

The *from*-less variant is consistently present (with some fluctuation)[16] in BrE throughout the twentieth century, but has been largely eliminated from AmE during the same period. The genitive/possessive option is obsolescent in both varieties. The findings from the Brown corpora fit well into the following longer-term scenario of change. The ultimate cause of the emergence of the *from*-less construction is the eighteenth-century rise of the gerund (De Smet 2013). Throughout the nineteenth century, it remained a recurrent option both in British and in American English. The two varieties then parted ways in the early twentieth century, when the *from*-less variant continued increasing in frequency in BrE, but decreased to the point of obsolescence in AmE. We include this case of divergence in our discussion also because it shows that, despite a global trend for Standard English usage to converge on American norms, there is still scope for independent innovation in the grammar of the British standard.

14.8 A Final Note on the Discourse Embedding of Syntactic Change

Factors of genre, register, and style are essential for the study of any grammatical change in progress as they promote or constrain the spread of an innovation throughout the language and the community. The phenomena dealt with in this section have been selected because they provide particularly compelling illustration of this point, showing dramatic changes in written corpora long after the actual forms under consideration have become established in the grammar. The canonical *be*-passive has been structurally stable for many centuries, but nevertheless declining dramatically in frequency according to the evidence of the four written corpora, shown in Table 14.12.

The picture this gives of the passive is remarkably similar to that given of the modals above, although the percentage loss of 12.4% for BrE and 20.1% for AmE is somewhat more dramatic. The passive is one of the foremost grammatical indicators of textual genre, and most common by far in academic writing (category J in the four corpora). Over the last two

Table 14.12 Decline in frequency of the *be*-passive in the Brown quartet.

	1961	*1991/1992*	*Diff. (%)*
BrE (LOB/F-LOB)	13331	11708	****12.4
AmE (Brown/Frown)	11650	9329	****–20.1

Table 14.13 Rise in frequency of *get*-passives in the Brown quartet (significances: LOB–F-LOB $p < 0.05$; Brown–Frown $p < 0.01$; LOB–Brown and F-LOB–Frown $p > 0.05$).

	1961	*1991/1992*
BrE (LOB/ F-LOB)	34	53
AmE (Brown/ Frown)	35	64

decades, prescriptive recommendations concerning its use have changed, with many style guides now advising against the use of passives in academic writing, especially in the United States. In a genre-differentiated analysis, Hundt and Mair (1999, pp. 231–232) accordingly noted a particularly pronounced decline in the frequency of passives in the Frown J-category, but were able to point out that the trend was significant in BrE and some other genres (see also Seoane 2006; Seoane and Williams 2006).

In theory, *be*-passives need not necessarily be replaced by active paraphrases, but could be displaced by a rival construction, such as the *get*-passive. As Table 14.13 shows, this argument is impossible to defend. While the *get* passive has increased significantly, both in British and in American English, the increase is infinitesimal in terms of absolute figures and cannot compensate for the drop in *be*-passives.

Certainly not the *be*-passive, and not even the younger *get*-passive, have been involved in any direct grammatical changes in the past century. Rather, the drop in *be*-passives and the increase in *get*-passives is a discourse phenomenon, pointing to the fact that in the course of the past century written English has moved closer to the norms of spoken usage. The *be*-passive is comparatively rare in speech and is strongly associated with the written medium (particularly with academic writing—see, for example, Biber et al. 1999, p. 476). In the current social climate, demands for writing to be more accessible and readable affect writing practice in many fields—from journalism and academia to the design of official forms, and because of this a decrease in the frequency of the passive is to be expected. In those cases in which writers wish to use a passive, on the other hand, resistance to a traditionally spoken and informal form such as the *get*-passive will be minimized.

Another striking case of written language progressively adopting norms of spoken language is the marked increase in the use of contracted forms evidenced in the four corpora. This applies both to verb contractions (as in *it's*, *I'll*) and to negative contractions (*n't*)—see Table 14.14.

The shift toward contracted forms is much more dramatic in AmE, but is also strong in BrE. As was the case with the passive, it could be argued that writers are not entirely free in their choice of form but influenced by prescriptive recommendations or, in the case of journalists, by even stricter conventions of house-style. But even a change in house-style in this case would just be a belated reflection of actual change in community preferences, and support the argument for a growing tendency toward the colloquialization of written English.

Table 14.14 Verb and negative contractions in the Brown quartet.

		1961	*1991/92*	*Diff. (%)*
BrE (LOB/F-LOB)	Verb contractions	3143	3898	****+23.7
	Negative contractions	1950	2482	****+26.9
AmE (Brown/Frown)	Verb contractions	2822	5073	****+79.3
	Negative contractions	2098	2983	****+41.8

14.9 Conclusion

Although this survey of current change in English syntax has been necessarily selective, we have tried to achieve a reasonable coverage of core aspects of syntax by focusing on major categories in the verb phrase and noun phrase. Before concluding, it will be as well to consider very briefly what factors have been influencing the changes we have noted. One factor intrinsic to the functioning of any language at any time is grammaticalization—which, as we saw in the cases of the semi-modals, may take centuries to come to full fruition. Other factors are cultural, and hence more specific to the social context of English in the twentieth and twenty-first centuries. These include colloquialization, the tendency for written language to adopt features associated with spoken language, and densification, a counter-trend manifesting itself in ever higher rates of the compression of information in some written genres (see Leech et al. 2009, pp. 243–256; Biber and Finegan 1989; Biber and Clark 2002). In this chapter, we have noted colloquialization at work in such diverse phenomena as the increasing use in writing of the progressive and semi-modals; the decline of *wh*-relative pronouns and the rise in the use of *that* and zero relative clauses; the growing use of contractions in written texts; the use of singular *they*. In written BrE (less so in the spoken standard, see Mair 2007), a further factor—Americanization—intermingles with the other three. We have looked at one case—the apparent revival of the mandative subjunctive—where American influence seems to override colloquialization, but often these two sociocultural processes work together—for example, in the increasing use of semi-modals and the declining use of *be*-passives. Yet another driver of change was touched on at the end of Section 14.6—an ideological motivation (avoidance of male bias) for replacing an older pronoun usage by a newer one. Like the conservative tradition of grammatical prescriptivism, such conscious movements for language reform are almost always socially controversial, and rarely successful (if success is defined as the uptake of the recommended form in unselfconscious and unmonitored language use). Hence, there is something particularly unusual about this case, not least in the short time period that it took to produce a high-profile syntactic reform of language behavior. In this case, recommendations to make language more inclusive were clearly helped by the fact that singular *they*, which has a long history in the language, did not need to be promoted as a new form but was merely allowed to resurface in the standard after it had been proscribed by eighteenth and nineteenth century prescriptivists.

Although it may be fairly uncontroversial to say that such influences have been at work, it is virtually impossible to disentangle them, and to build a predictive model to account for kinds and degrees of frequency change taking place during a particular period (cf. also the extended discussion in Leech et al. 2009, pp. 237–272). Processes such as colloquialization and Americanization are patchy and unpredictable in their results. One important linguistic factor to bear in mind is the competing relation between a spreading syntactic phenomenon and an alternative means of conveying the same meaning. In almost all the changes we have discussed, it is possible to name one (or more) competing construction(s):

LOSING GROUND		GAINING GROUND
modal auxiliary	vs.	semi-modal
infinitive complement	vs.	gerundial complement
be-passive	vs.	*get*-passive
of-phrase	vs.	*s*-genitive
wh-relative	vs.	*that* or zero relativization
gender-neutral *he*	vs.	singular *they* or coordinated pronouns (*he or she*, etc.)

But the frequency picture rarely gives unequivocal support to the hypothesis that one form is being ousted or superseded by the other. The semantic and pragmatic parameters of linguistic choice are usually too complex to allow a simple inverse correlation to be observed of the kind "more of X means less of Y." In the longer term, such factors must be closely investigated if we are to develop more adequate models of syntactic change taking full account of changes in frequency or preference.

In sum, what this chapter has demonstrated is that there has been noticeable change in the past century even in a rigidly codified language variety such as written Standard English, and that the spread of individual innovations can be documented in language corpora. Further, we have shown that those accounts of ongoing grammatical change that are based on anecdotal or impressionistic observation are generally unreliable. They can err in three ways: (1) suspecting change where there is stable long-term variability; (2) overemphasizing the importance of a small number of often marginal shibboleths important to prescriptivists; and (3) failing to notice the ever-present groundswell of linguistic change, apparent in long-term developments in the core grammar. Since the first edition of the present handbook, the corpus-based study of syntactic change in progress has definitely matured. Over the past 10–15 years, a wealth of new corpus resources covering a broad range of spoken and written genres has become available and has been put to use in corpus-based real-time explorations of ongoing processes of grammatical change. At the same time, theoretical models of change and statistical methods used to study it have become more sophisticated as well.

The crucial challenge, however, has remained the same: how to understand the interrelations between diachronic change and synchronic (regional and stylistic) variability. In numerous instances, corpus analyses have revealed that what is suspected to be a straightforward regional contrast between, say, British and American English turns out to be ephemeral because both varieties are ultimately carried along in the same direction diachronically, if at slightly different speeds. And every so often, what is suspected to be primarily a diachronic trend turns out to be mediated in complex ways by factors of register and genre, reminding us of the basic axiom of usage-based approaches in linguistics: namely, that ultimately the history of the linguistic system is the history of ever-changing and socioculturally embedded traditions of speaking and writing.

NOTES

1 Corpora constructed on the Brown formula contain about a million words of running text, sampled in 500 chunks of ca. 2000 words each and covering a range of 15 written genres. The original Brown and LOB corpora sampled the publication year 1961, and their modern analogs Frown and F-LOB the years 1992 and 1991, respectively (Leech et al. 2009 pp. 24–50). For the two earlier corpora, the sampling windows had to be expanded to 6-year periods centering on the year 1931 for practical reasons, that is, the period from 1928 to 1934 (for B-LOB see Leech and Smith 2005, p. 87 and http://www.helsinki.fi/varieng/CoRD/corpora/BLOB-1931/index.html; for B-Brown, see Hundt and

Leech 2012, p. 177). Twenty-first-century usage is documented by the BE06 and AE06 corpora, produced and made available at Lancaster (cf. Baker 2009), and the Crown and Clob corpora, compiled at the Beijing University of Foreign Studies in China. The sampling years are 2006 and 2009, respectively (with Clob and Crown also including some material from the two years before and after the core sampling year, see Xu and Liang 2013, p. 177).

2 For an early example, compare Olofsson's (1990) study of prepositional uses of *following*, splitting off from the mainstream use of the form as a participle in nonfinite clauses, which—though clearly dealing with a process of grammaticalization—does not even mention the term. For a comprehensive corpus-based survey of the emergence of complex prepositions in the light of grammaticalization theory, see Hoffmann (2005). Rickford et al. (1995) study the emergence of *as far as* + NP as a new topic-introducing device. Mair (2010, 2011) explores the incipient grammaticalization of *on* (*the*) *basis* (*that*) as a subordinating conjunction.

3 It is only the second case which represents a genuine innovation—with a first OED attestation from 1932 (s.v. *hopefully*, adv. 2); the use of *like* as a conjunction can be documented from the Early Modern English period onward, and the only new thing about it is that it has lost the stigma still attaching to it in the eyes of some writers.

4 By a tagged corpus, we mean a corpus in which each word token is supplied with a grammatical label specifying its part of speech—see Mair et al. (2002) for further details.

5 In line with Leech et al., and with the same kind of reservations ("The so-called semi-modals," 2009, pp. 91–117), I use the term *semi-modals* as a convenient cover for the modal constructions. In the classification of Quirk et al. (1985, pp. 141–147), the semi-modals as defined here comprise a number of *modal idioms* (i.e., obligatorily tensed forms such as *had better* and *have got to*), *semi-auxiliaries* (constructions with the auxiliaries *have* and *be*, such as *have to* or *be going to*, which can occur as non-finite forms), and further verbal constructions (e.g., *want* + infinitive) which are developing modal uses in ongoing processes of grammaticalization. Collins (2009a, b) has suggested the term *quasi-modals* for a similar grouping.

6 This is also likely in view of the findings for AmE (see Table 14.3), which show only partial similarity for *would* and no significant diachronic trend at all for *might*.

7 I gratefully acknowledge the help of Julia Müller, who compiled Table 14.2 and provided the frequencies of the semi-modals from the BNC which are discussed further down.

8 In this connection, it may be useful to remind readers of a controversy between Leech and Millar on the relative merits of small generically balanced corpora of the Brown-type and the more recent megacorpora. In his response to Millar (2009), Leech (2011) showed that small corpora sampling several genres provide more representative results than large corpora based on a single text-type (or, as is the case in the *Time* magazine corpus used by Millar, on a single publication).

9 For a discussion of developments of the plain auxiliary *have* in questions and negations, see Varela Pérez (2007) and Leech et al. (2009, pp. 254–256).

10 Serpollet (2001, p. 531) quotes this statement from Harsh (1968): "the inflected subjunctive, though hardly in a state of robust health, has been taking a long time to die. But that it is still dying [...] can hardly be denied."

11 Serpollet (2001, p. 541) gives the following provisional frequency data for the mandative subjunctive from the four corpora: LOB 14 → F-LOB, 33 occurrences; Brown 91 → Frown, 78 occurrences. Hundt (1998, p. 163, 173), following a slightly different methodology, gets: LOB 12 → F-LOB, 44 occurrences. See further data on the British revival of the mandative subjunctive in Övergaard (1995).

12 As has been pointed out, a third possible cause—the phenomenon of the "stative progressive"—tends to be curiously overrated in the literature on recent changes, cf., for example, Potter: "Until recently, many verbs expressing mental states and attitudes—*believe*, *forget*, *hate*, *hear*, *hope*, *imagine*, *know*, *like*, *love*, *mean*, *remember*, *seem*, *smell*, *taste*, and *understand*—were seldom or never used in their progressive forms" (1975, p. 119).

13 Altenberg (1982, p. 302), in a study of seventeenth century genitives and *of*-phrases, surmises that "the drift away from [the genitive] that had begun in late Old English seems to have reached its peak in the seventeenth century." If so, this trend appears to be now undergoing some reversal. For a comprehensive study on genitive variation in the history of English, see Rosenbach 2002.

14 *Themself* is too rare in written English to appear in any of our four corpora. According to Huddleston and Pullum (2002, p. 494), it has been attested in Standard English since the 1970s. The OED, which had dealt with *themself* under the headword *themselves* in the first two editions, upgraded it to a separate headword in September 2013. The entry shows that *themself* has a venerable history going back to Middle English, although many quotations have a distinctly nonstandard ring. The "modern" use at issue here is dealt with under item 3b, with a first attestation from 1978 ("The person themself must feel pretty awkward.").

15 This includes all uses of this functionally very versatile constructional pattern, which, in addition to the noun-clause uses illustrated, also functions as postmodification in noun phrases (*a tendency for job satisfaction to decrease with age*) or as adverbial clause (*for the plan to be successful, we need money and manpower*), among others.

16 Note that the only statistically significant development in the long term is a decline in the frequency of *prevent* NP *from* V-ing. The use of the *from*-less variant shows ups and downs which—in these fairly small corpora—do not build up into a statistically significant diachronic trend.

FURTHER READING

State-of-the-art information on historical linguistics and the major theoretical and methodological issues in the study of language change is available in the following handbooks.

Joseph, B. D., & Janda, R. (Eds.) (2003). *The handbook of historical linguistics*. Oxford: Blackwell.

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Nevalainen, T., & Traugott E. (Eds.) (2012a). *The Oxford handbook of the history of English*. Oxford: Oxford University Press. In particular pp. 157–255, on "Observing recent change through electronic corpora," and pp. 261–361, on "Mass communication and technologies."

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15 Constructions in English Grammar

HANS C. BOAS

15.1 Introduction

The concept of "construction" has been at the center of a theory of language known as ("Construction Grammar" CxG) since the mid-1980s. A construction is understood as a conventional pairing of form with meaning and function, where form includes not only syntactic and morphological aspects, but also aspects such as phonetic and phonological form.[1] In the constructionist view, language consists of a vast network of interrelated constructions, including different types of form–meaning pairings such as morphemes (e.g., *anti-*, *-ment*, etc.), words (e.g., *Monday*, *to persuade*, *blue*, etc.), and frozen idiomatic phrases (e.g., *a perfect storm*, *under the weather*, etc.), to independently existing argument structure constructions such as the ditransitive to more abstract and schematic constructions such as the subject–predicate construction. This paper first provides an overview of how CxG emerged in the 1980s out of research on "Frame Semantics," the sister theory of CxG. It then presents the main concepts and methodologies underlying constructional research and it discusses the different varieties of CxG.[2] Finally, it shows how the concept of construction has been applied to a variety of linguistic fields and applications in order to broaden our understanding of the nature of language.

15.2 Case Grammar, Frame Semantics, and Construction Grammar

The approach to investigating language known today as CxG emerged in the 1980s as the result of previous investigations into how form and meaning in language are related to each other. In the 1960s, Charles Fillmore developed a new way of studying how the meaning of words, specifically verbs, might influence the syntactic patterns in which they occur. One major result of this research is Fillmore's seminal 1968 paper *The Case for Case*, in which he proposes a set of so-called universal deep cases (also known as semantic roles), which specify a verb's semantic valency. According to Fillmore, specific sets of semantic roles such as agent, patient, instrument, benefactive, etc., serve as a blueprint for how verbs realize their arguments in a sentence (i.e., which semantic role would be realized as subject, direct object, indirect object, etc.). Fillmore's seminal paper sparked a plethora of subsequent research, but during the 1970s more and more researchers found problems with Fillmore's deep cases,

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which eventually led to the abandonment of Fillmore's original idea of case frames (for discussion, see Levin and Rappaport Hovav (2005), Busse (2012), Boas (2014), Boas and Dux (2017)).

During the late 1970s and early 1980s, Fillmore revisited his original proposals, which, among other things, sought to present an alternative approach to the then prevalent transformational-generative Chomskyan paradigm. Fillmore's new approach to word meaning came to be known as Frame Semantics and built on insights from cognitive and ethnographic semantics. In a series of publications, Fillmore (1975, 1977, 1978) gave up his original idea of universal semantic roles and proposed situation-specific semantic roles (so-called frame elements) that are "relativized to scenes" (1977, p. 59), rather than defining verb meanings (or "situations") by the semantic roles of their arguments as in earlier research (for details, see Boas and Dux 2017). The main ideas of Fillmore's theory of Frame Semantics, the sister theory of Construction Grammar, are presented in Fillmore (1982, 1985).[3] Here, Fillmore demonstrates how cultural and world knowledge motivates and is embedded in linguistic expressions, emphasizing that solely truth-conditional semantic approaches (such as those proposed within the Chomskyan paradigm (see Davidson 1967) cannot account for these aspects of word meaning and demonstrating the need for a "semantics of understanding" (see also Fillmore 1975). The core ideas underlying research in Frame Semantics are summarized in the following quote:

> A word's meaning can be understood only with reference to a structured background of experiences, beliefs, or practices, constituting a kind of conceptual prerequisite for understanding the meaning. Speakers can be said to know the meaning of the word only by first understanding the background frames that motivate the concept that the word encodes (Fillmore and Atkins 1992, pp. 76–77).

But what does the frame approach to studying meaning have to do with English constructions? There are (at least) three relevant answers. First, the intellectual heritage of both Frame Semantics and Construction Grammar can be directly traced back to Fillmore's original research on case frames in the 1960s. As we will see below, several proposals during the 1980s about the nature of constructions grew directly out of research in frame semantics. Second, as discussed in the introduction, the central notion of construction, defined as a conventionalized pairing of form and meaning/function, requires an understanding of what meaning is and how to analyze it. Frame Semantics offers a systematic approach to investigating and analyzing meaning, thereby contributing to our understanding of the nature of constructions. Third, research on so-called argument structure constructions such as the ditransitive construction (e.g., *Joe baked Mary a cake* (Goldberg 1995)) has shown that many types of constructions are meaningful, and the meanings of these constructions can be represented using Frame Semantics. To demonstrate how meaning can be captured using semantic frames, I now turn to a brief discussion of semantic frames and how they can be used to describe lexical meanings. In this context, I also show how the description and analysis of meaning in Frame Semantics and Construction Grammar are closely tied to the form and function of how that meaning is realized.

Based on his research on semantic frames during the 1970s and 1980s (Fillmore 1975, 1977, 1982, 1985), Fillmore founded the FrameNet (FN) project at the International Computer Science Institute in Berkeley, California in 1997. FrameNet (http://framenet.icsi.berkeley.edu) is an online lexical database that seeks to document a wide variety of frame-semantic and corresponding syntactic information for the English lexicon. Put differently, the FrameNet database can be regarded as an applied implementation of the theory of Frame Semantics (and of Construction Grammar, as demonstrated below).[4] The information contained in FrameNet is the result of a workflow consisting of various steps in which

groups of lexicographers define semantic frames based on the words that evoke them, search for corpus evidence in the British National Corpus, annotate extracted corpus data, and compile lexical entries (for details, see Boas (2005)/2017a, Fillmore and Baker (2010), Ruppenhofer et al. (2017)). Users can search FrameNet by typing in a word such as *to take*, which evokes several different frames, including the `Taking` frame (as in the example sentence in Figure 15.1, *Milton took the can of beer out of the refrigerator*), the `Taking_time`, and the `Ride_vehicle` frames. Clicking on the name of a frame such as `Taking` presents the user with a definition of the frame as in Figure 15.1.

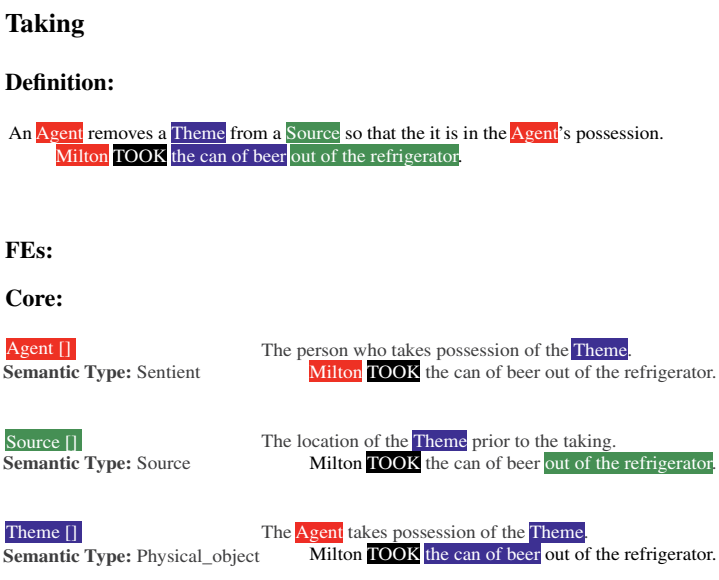

Figure 15.1 Frame and frame element definitions of `Taking` frame in FrameNet (Boas and Dux 2017).

At the core of FrameNet's architecture are the concepts of semantic frames, frame elements, and lexical units. Frame elements (FEs) are the participants/roles by which semantic frames are defined, as can be seen in the frame definition in Figure 15.1. For example, the FEs of the `Taking` frame are AGENT, THEME, and SOURCE, because a taking event minimally requires that some entity (AGENT) takes something (THEME) from somewhere (SOURCE).[5] A distinction is made between these core FEs that are crucial for the understanding of the frame and non-core FEs that do not define the frame but provide additional information such as time, place, and manner. Lexical units (LUs) are linguistic expressions (including all parts of speech and multiword units) that evoke a given semantic frame. LUs of the `Taking` frame, for instance, include specific senses of the verbs *take* and *grab* and the noun *seizure*.[6]

Clicking on one of the LUs evoking a frame leads the user to a new FrameNet page showing how, for a given LU, the semantics of the frame are realized syntactically in terms of phrase type (PT) and grammatical function (GF). For example, clicking on *to take* displays, among other things, the various ways in which combinations of various sets of FEs are realized syntactically. Figure 15.2 is an excerpt of the valence table of *to take* in the `Taking` frame, summarizing the results of the frame-semantic annotation of corpus sentences containing the lexical unit.[7]

Three combinations of frame elements are shown in the table, the first of which includes the core FEs AGENT, SOURCE, and THEME, and the non-core PLACE FE, as in the sentence [$_{\text{<Agent>}}$The Ottomans] *took*$^{\text{tgt}}$ [$_{\text{<Theme>}}$land] [$_{\text{<Place>}}$in what is now Turkey] [$_{\text{<Source>}}$INI]. The

1 TOTAL	Agent	Place	Source	Theme
(1)	NP Ext	PP[in] Dep	INI --	NP Obj
2 TOTAL	Agent	Source	Theme	
(1)	DNI --	DNI --	NP Obj	
(1)	NP Ext	PP[from] Dep	NP Obj	
1 TOTAL	Agent	Theme		
(1)	NP Ext	NP Obj		

Figure 15.2 Portion of valence patterns for *take* in the `Taking` frame in FrameNet (Boas and Dux 2017).

grammatical function and phrase type of each FE are listed below as the FE name, for example, the THEME is a nominal object, the AGENT is an external noun phrase, etc. The labels DNI and INI refer to FEs that are null instantiated, that is, they are not overtly expressed and are interpreted under definite or indefinite null instantiation, respectively (see Fillmore (1986), Ruppenhofer and Michaelis (2014), Boas (2017b)).

Users can access the types of information in Figures 15.1 and 15.2 for each LU in FrameNet, thereby allowing a systematic comparison of how LUs evoking the same frame realize the semantics of the frame differently at the syntactic level. For example, a comparison of the valence tables of the lexical entries of *to take*, *to grab*, and *to seize* shows that the three LUs differ in how they realize the semantics of the `Taking` frame differently at the syntactic level. This information is not only relevant for our understanding of how meaning is organized in terms of semantic frames in the lexicon of English. It is also important because the detailed information about how frame element configurations are realized syntactically can be regarded as a particular type of low-level construction (so-called "mini-construction" (Boas 2003)), that is, a pairing of form with meaning and function. In other words, each frame element configuration together with its syntactic realization in Figure 15.2 above can be regarded as a construction of English, because it is a pairing of form and meaning (see also Boas (2010a), Perek (2015), Dux (2016, 2018)). With this brief discussion of the relationship between Frame Semantics and Construction Grammar in hand, I now turn to the main ideas and concepts underlying a constructionist view of language.

15.3 Construction Grammar: Concepts, Data, and Methodology

CxG evolved out of the desire for a comprehensive (ideally full) coverage of linguistic phenomena within a single theoretical framework, which is why it is sometimes called a maximalist approach to grammar (Fried and Östman 2004, p. 24).[8] CxG aims to account for both peripheral intransparent grammatical phenomena such as partially filled idioms (e.g., *jog <someone's> memory*), semi-productive constructions such as What's X Doing Y? (e.g., *What's that fly doing in my soup?*) (Kay and Fillmore 1999) and fully regular semantic and syntactic structures such as passives (e.g., Subj Aux VP_{PP} (PP_{by})) (Ackerman and Webelhuth 1998, Lasch 2017) in terms of a non-modular and non-derivational architecture of grammar.[9]

One of the core ideas of CxG is that the basic units of language are constructions, that is, conventional pairings of form and meaning at varying levels of abstraction and complexity that must be learned. This is in contrast to the Chomskyan paradigm, which claims that children are not exposed to rich enough data within their linguistic environments to acquire every feature of their language ("poverty of the stimulus") (Chomsky 1988). Research on first and second language acquisition (Diessel 2013; Ellis 2013), psycholinguistics (Bencini 2013), and neurolinguistics (Pulvermüller et al. 2013) also suggests that constructions are organized in terms of a mental network of constructions. If an utterance cannot be licensed based on the existing inventory of constructions (or a combination of existing constructions), then one has to posit a new construction. This idea is captured by Goldberg's (1995) classic definition of a construction:[10]

> C is a CONSTRUCTION iff$_{def}$ C is a form–meaning pair <F_i, S_i> such that some aspect of F_i or some aspect of S_i is not strictly predictable from C's component parts or from other previously established constructions (Goldberg 1995, p. 4).[11]

Another significant contention in CxG is that the form of a construction is intimately tied to its meaning and function, as can be seen in the schematic representation of a construction in Figure 15.3 below. Since CxG is a sign-based theory of grammar, form and meaning cannot be separated from one another. In some cases, it might make sense to investigate form or meaning aspects in isolation for analytical reasons. However, form and function do not exist on their own, for example, as autonomous (sub-)modules as is often postulated in other syntactic theories. In CxG, form and meaning rather constitute inseparable parts of a linguistic sign as Figure 15.3 shows.

In the constructionist view, a difference in form typically implies a difference in meaning. For example, the words *pizza* and *spaghetti* are constructions that differ in meaning. Other examples are the FrameNet lexical entries discussed in the previous section, where each frame element configuration and its syntactic realization can be regarded as a construction. A difference in form in Figure 15.2 such as between [NP/Ext, NP/Obj] (e.g., *They took him*.) and [NP/Ext, PP[from]/Dep, NP/Obj] (e.g., *They take the religion away from thousands of Muslims*.) thus indicates a difference in meaning, in this case how the meaning of the underlying frame evoked by the LU *to take* in the `Taking` frame is realized on the form side. This relationship between form and meaning does not only hold at the very specific lexical level, but also at more abstract levels, for example, in the constructions listed in Table 15.1.

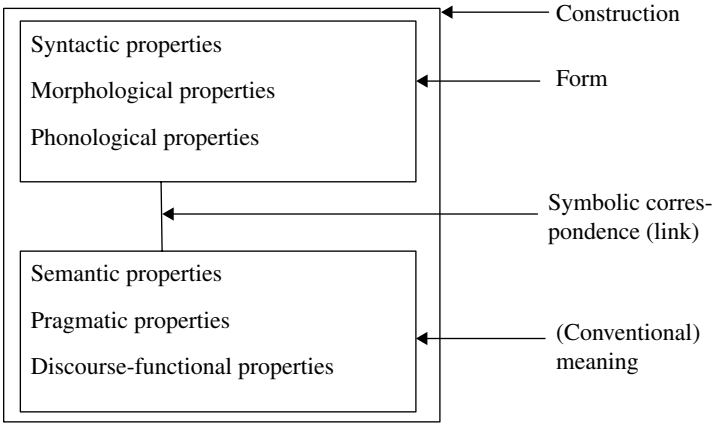

Figure 15.3 Types of information in constructions (Croft 2001, p. 18).

Table 15.1 Constructions at various levels of size and abstraction (cf. Goldberg 2006).

Subject–predicate agreement	NP VP-*s* (e.g., *Kim walks*)
Imperative	VP! (e.g., *Go home!*, *Buy that book!*)
Passive	Subj AUX V_{PP} (PP_{by}) (e.g., *The chocolate was eaten by the neighbors*)
Ditransitive	Subj V Obj_1 Obj_2 (e.g., *Lena baked Sophia a pizza*)
Covariational conditional	The Xer the Yer (e.g., *the more you run the fitter you get*)
Idiom (partially filled)	*Pat doesn't like cake, let alone brownies*
Idiom (filled)	*Hit the road*, *a penny for your thoughts*
Complex word (partially filled)	[N-s] (for regular plurals)
Word	*Pizza*, *walk*, *icy*, *but*
Morpheme	*Un-*, *-able*, *-ment*

Table 15.1 shows a partial inventory of different types of constructions illustrating the continuum between what has traditionally been characterized as "the lexicon" or "syntax," respectively. The constructions vary in terms of their complexity, schematicity, and abstractness.[12] Some constructions such as morphemes and words are very specific. Consider the verb *to take* as discussed in Section 15.2 above, which is an example of a very concrete low-level construction.[13] Other types of constructions, such as the *time-away* construction (e.g., *Sam slept the whole trip away*) and the incredulity construction (e.g., *Him, a trapeze artist*?!) are more abstract, since they are only partially lexically filled (see Goldberg and Casenhiser 2008), while other constructions such as argument structure constructions, sentence type constructions, or the subject–predicate agreement construction are even more abstract and schematic. Another important aspect in which constructions differ is how meaningful they are. For example, morphemes and words have a very low degree of schematization but clearly express meaning. More complex construction such as the covariational construction or the ditransitive are more schematic and carry less meaning than words and morphemes, while very abstract constructions such as the subject–predicate construction have a very high degree of schematization and carry very little meaning.

CxG offers an alternative to theories such as Chomsky's government-and-binding approach (Chomsky 1981) and minimalism (Chomsky 1995**)**, which proposes a strict separation into different linguistic modules (e.g., lexicon/syntax/phonology), by providing empirical evidence for a substantial overlap between lexicon and grammar.[14] In essence, this means that words and syntactic structures do not fall into different categories and consequently do not need to be treated separately in what in the Chomskyan paradigm has been traditionally labeled "the lexicon" and "syntax" (see also Herbst 2014, on the relationship between lexical valence patterns and constructions). As Goldberg (2006, p. 18) observes: "it's constructions all the way down."

Another important concept informing research in CxG is the notion of productivity (the degree to which speakers employ a particular pattern, rule, or construction). Earlier research regarded productivity as an all-or-nothing phenomenon (for an overview, see Barðdal 2008, p. 36ff.), but this view ignores that constructions can vary in terms of their syntactic and semantic restrictions. For example, due to its more numerous restrictions on its various slots, the English double-object construction (e.g., *They gave him a cold beer*) is less productive than the *way*-construction (e.g., *She elbowed her way out the door*). CxG views the productivity of constructions on a continuum, ranging from fully productive constructions to semi- and non-productive constructions. It takes the view that productivity has a crucial impact on the way a construction is shaped and related to other constructions in the constructicon. In this view, as Barðdal (2012, p. 467) notes with respect to argument structure constructions,

syntactic productivity does not primarily refer to the ability to generate new sentences, but rather to "the interesting question of how case and argument structure constructions are extended to new verbs." In other words, usage-based CxG takes

> the type frequency and the coherence of a schema to determine the actual level of schematicity at which the construction exists in the minds of speakers […]. This level of schematicity, i.e., a construction's highest level, also determines the construction's productivity. The higher the degree of schematicity, the more productive the construction is, and, conversely, the lower the degree of schematicity, the less productive the construction is (Barðdal 2008, p. 45).

On this view of productivity, certain meaningful argument structure constructions such as the *way*-construction are more productive than other argument structure constructions such as the caused-motion (e.g., *Lena crumbled the chocolate onto the pie*) and resultative constructions (e.g., *Sophia ran herself ragged*). In Goldberg's (1995) account of argument structure constructions, productivity is expressed by the number and types of constraints that regulate the fusion of a verb's lexical entry with a construction. The more constraints that are imposed on the fusion, the less productive the argument structure construction (for an alternative account, see Boas 2003, 2005a).[15]

Another important aspect of constructionist research concerns the types of data used. While research in many other theoretical paradigms has based its insights primarily on linguistic intuition, CxG takes a usage-based approach.[16] In this view, the mental grammar of speakers is shaped by repeated exposure to specific utterances and domain-general cognitive processes such as categorization play a crucial role in the entrenchment of constructions (see also Stefanowitsch and Flach 2016). More specifically, linguistic knowledge is viewed as emergent and constantly changing (Hopper 1987; Langacker 2000; Ziem 2014). In this view of language, type and token frequencies play a crucial role, which means that anything that has been encountered often enough to be accessed as an entire unit is considered a construction, even if it exhibits no idiosyncrasy of form and meaning (Bybee 2013).

Applying the usage-based approach to linguistic analysis means that constructionists rely on a variety of different data and methods, including introspection, corpus evidence, and experiments. Perhaps the most vibrant infusion of new techniques for collecting and analyzing data comes from the field of corpus linguistics. In this context, Gries (2013) discusses some crucial methodological innovations and techniques for constructionist research, including diverse association measures to quantify if and how much different linguistic elements are attracted to each other. One of the methods, known as collostructional analysis (Stefanowitsch 2013, 2014; Hilpert 2014), offers a unique way to quantify association strengths between different elements in an utterance. Using collocational approaches from corpus linguistics, this method offers different types of methods such as collexeme analysis (Stefanowitsch and Gries 2003), distinctive collexeme analysis (Gries and Stefanowitsch 2004), and co-varying collexeme analysis (Stefanowitsch and Gries 2005) to arrive at rankings of how much words and particular slots of constructions attract each other.

To illustrate this claim, consider Stefanowitsch's (2013, p. 292) discussion of the question of which verbs are strongly attracted to or repelled by the ditransitive construction (e.g., *Kim told Pat the news*). According to Stefanowitsch, the ditransitive construction occurs 1842 times in the International Corpus of English (ICE-GB; Nelson et al. 2002). According to his calculations, the frequency of a verb in a construction is assessed against its frequency in the corpus, to see if it occurs more or less often than expected, given its overall frequency. The verbs with the highest rate of attraction in the ditransitive construction, according to Stefanowitsch's (2013, p. 293) collexeme analysis, include *give*, *tell*, *send*, *ask*, *show*, and *offer*. One of the advantages of applying quantitative corpus-linguistic methods to the investigation of constructions is that the results can be

replicated and verified (or falsified). The promising results from more than a decade of collostructional analysis together with emerging research on machine-learning approaches (Chang and Maia 2001) and experimental approaches (Casenhiser and Goldberg 2005; Gries et al. 2005; Kidd et al. 2010) lead Gries (2013, p. 108) to the following conclusion: "Over time, the trend toward methods that are more rigorous and replicable than introspective judgments has only become stronger."

The chapter to this point has covered the main concepts and ideas underlying constructional research. I now turn to the question of how constructionists actually go about the details of analyzing linguistic data in terms of constructions, that is, conventional pairings of form and meaning at varying levels of abstraction and complexity. One of the core interests of CxG is to capture both generalizations and constraints on those generalizations that license those and only those expressions that can be found in a given language. In this sense CxG is generative. But in other senses CxG is not generative, especially when compared with the Chomskyan paradigm (Chomsky 1981, 1995), which assumes a modular architecture of language (syntax/semantics/phonology, etc.). CxG does not assume different levels of linguistic organization or modules and thus does not require any transformations or other mechanisms linking different levels of linguistic representation.[17] Instead, CxG focuses on surface forms ("what you see is what you get") and seeks to account for the licensing of utterances by simultaneously recruiting different constructions from a language's inventory of constructions (also known as the "constructicon") and combining them. To illustrate, consider the following sentence.

(1) The pizzas taste yummy.

The intransitive construction licensed by the one-place predicate *to taste* sets out the overall sentence structure, comprising an NP and VP construction, whereby the first is complex in itself such that it consists of a definite pronoun and a noun. Lexical constructions make up the lexical material combined into phrases. Again, lexical constructions may be simple in cases in which the items do not inflect (*the*, *two*, *cold*) or complex (*to taste*, *pizza*). The latter instantiate morphological constructions, such as plural constructions (*pizzas*) or other inflection constructions specifying number, tense, and mood (*to taste*).

15.4 Varieties of Construction Grammar

The discussion so far might have suggested that CxG is a monolithic research enterprise with one person or a small group of people at the top determining the goals of the research program and thereby determining the methods, ideas, and data to be investigated. However, this is not the case, as shown in this section, which first addresses the early stages of development of CxG and then shows how different varieties of CxG have emerged that pursue different goals while still remaining compatible with each other.[20]

As discussed in Section 15.2, CxG has its intellectual roots in Fillmore's early research on case grammar in the 1960s and his later research on Frame Semantics in the 1970s and 1980s. It is important to be aware of this important connection, because of the intimate relationship between meaning and form that is one of the basic ideas behind a construction as a linguistic sign. The "early" constructional research during the 1980s as carried out by Charles Fillmore, Paul Kay, and George Lakoff was primarily concerned with semi-idiomatic constructions of

English that exhibited some regular grammatical properties, yet at the same time also showed some other properties that did not fit the regular grammatical patterns of the language. As Fillmore (1988, p. 36) put it:

> Our reasons for concerning ourselves with otherwise neglected domains of grammar are not so that we can be left alone, by claiming territory that nobody else wants, but specifically because we believe that insights into the mechanics of the grammar as a whole can be brought out most clearly by the work of factoring out the constituent elements of the most complex constructions.

Fillmore's (1988) proposal to investigate both the neglected domains of grammar and the most complex constructions is displayed in one of the early in-depth analyses in the emerging CxG framework of the 1980s, namely, Fillmore et al. (1988). Focusing on the so-called *let alone* construction, which basically functions like a coordinating conjunction (*Shrimp Moishe won't eat, let alone, squid*), while at the same time not licensing the same syntactic arrangements (**Shrimp let alone squid Moishe won't eat*), Fillmore et al. (1988, pp. 515–516) argue that idioms should be seen as units of syntactic representation that are associated with unique semantic and pragmatic properties. Adding to the complexity of the let alone construction, according to Fillmore et al. (1988, pp. 516–517), is that it shares some contexts with comparative *than* (*John hardly speaks Russian let alone Bulgarian*), but it does not license VP ellipsis like *than* does (**Max won't eat shrimp let alone Minnie will*). Besides its intricate syntactic properties, Fillmore et al. (1988) point out that the proper use and interpretation of *let alone* requires a complex set of semantic and pragmatic knowledge that is particular just to *let alone*. Croft and Cruse (2004, p. 239) summarize the set of interpretative mechanisms required for *let alone* as follows:

> First the interpreter must recognize or construct a semantic proposition in the fragmentary second conjunct that is parallel to the proposition in the first full conjunct. More specifically … [t]he interpreter must construct a scalar model, which ranks propositions on a scale—for example, the distastefulness for eating seafood … the initial, full conjunct denotes the proposition that is stronger or more informative on the scale … This whole semantic apparatus is required for the interpretation of the *let alone* construction and is not necessary (as a whole) for other constructions.

Constructional research during the 1980s as carried out in Berkeley was in the early stages mainly concerned with discovering and examining the syntactic, semantic, and pragmatic properties of selected non-canonical patterns of English such as the *let alone* construction, the deictic *there* construction (*There goes the bell now!* [Lakoff 1987]), syntactic amalgams (*There was a farmer had a dog* [Lambrecht 1988]), *mad magazine constructions* (*Him, a doctor?* [Lambrecht 1990]). During the late 1980s and early 1990s, Charles Fillmore and Paul Kay started developing a more comprehensive approach toward covering the entire grammar of a language (in this case English) in terms of grammatical constructions, "the rules that unite formal and semantic information into various kinds of linguistic objects, together with the principles that constrain and connect them." (Fillmore 2013, p. 112)

This emerging framework eventually came to be known as Berkeley Construction Grammar (BCG) and sought to account for well-formed linguistic entities of English in terms of an assembly of the constructions that jointly license them. As discussed in the example in Table 15.2, constructions are only partial descriptions of well-formed linguistic entities that they license, and the "main operation is (naive) unification, so the grammar has no deep structure, no transformations, and no empty categories. What you see is what you get"

Table 15.2 Constructions instantiated by *The pizzas taste yummy*.

Types of constructions	*Instances*
Intransitive construction [[X]$_{NP}$ [Y]$_{V}$]	[[*The pizza*]$_{NP}$ [*taste*]$_{V}$]
VP construction[18] [[X]$_{V}$ ([Y] $_{NP}$) ([Z]$_{PP}$)]	*taste*
AdvP construction [[x]$_{Adv}$ ([y]$_{Adv}$)]	*yummy*
NP construction	[[*the*]$_{def\text{-}Pr.}$ [*pizza*]$_{N}$]
Plural construction [[X]$_{N\text{-}root\text{-}morph}$ [-y]$_{infl\text{-}morph}$]	[[pizza]$_{root\text{-}morph}$ [-s]$_{infl\text{-}morph}$]
Verb-inflection construction[19] [[X] $_{V\text{-}root\text{-}morph}$ [Y]$_{Infl}$]	[*taste*] [-Ø]]
Lexical constructions	[*taste*], [*the*], [*pizza*], [*yummy*]

(Fillmore 2013, p. 112). In contrast to research in other linguistic theories, BCG uses a "boxes within boxes" notation similar to phrase structure grammars whose nodes are complex features. Using attribute value matrices for capturing different types of linguistic information, ranging from syntactic to morphological, lexical, semantic, and pragmatic information, BCG aims to arrive at as complete a description of all the constructions of English as possible using the "boxes within boxes" notation (see Fillmore and Kay 1993; Kay and Fillmore 1999, 2013 for an in-depth overview).

Starting in the 1990s, CxG evolved into a broader paradigm interested in a variety of different methods, approaches, and goals. It is important to remember that at a fundamental level, the different varieties of CxG still all share the same basic set of concepts discussed in Section 15.3 above. This means that insights in one variety (or flavor) of CxG are in principle compatible with and transferable to other varieties of CxG, as we will see below. What is known today as CxG more generally thus subsumes a family of related constructional approaches to language including, besides BCG, the following.

Cognitive Construction Grammar is perhaps best known for its novel thesis that patterns of argument structure exist independently of lexical argument-taking predicates. In this view, proposed by Goldberg (1995), constructions such as ditransitive and caused-motion are capable of supplying a verb's semantics with additional arguments. This step allows Goldberg to avoid claiming that the syntax and semantics of a clause are exclusively projected from the specifications of the main verb, thereby avoiding implausible verb senses as in *They urged the poor guy out of the room* or *Sally baked Kim a cake*, where one would not want to posit extra (transfer) senses for the verbs *to urge* or *to bake*. Instead, the transfer meaning of *Sally baked Kim a cake* and its related argument are provided by independently existing argument structure constructions (see Boas 2003, 2005a, for an alternative account that argues for lower-level constructions instead of abstract argument structure constructions). One of the central goals of Cognitive Construction Grammar is to offer a psychologically realistic account of language by determining how different more general cognitive principles serve to structure the inventories of constructions. In contrast to BCG, which seeks a more formalized account of the constructional inventory of a language without paying too much attention to cognitive principles of linguistic organization, Cognitive Construction Grammar explicitly subscribes to incorporating a set of common principles of interaction that are argued to have influenced grammatical structures, such as iconicity (Haiman 1983), reasoning

through metaphor and metonymy (Lakoff 1987), categorization in terms of prototypes (Lakoff 1987), categorization based on basic experiential patterns (Johnson 1987), and the perception of figure and ground (Talmy 2000) (see Lakoff 1987; Goldberg 2006; Boas 2013, for more details). To capture the various linguistic insights and analyses, Cognitive Construction Grammar uses relatively informal boxed notations (when compared to Sign-based Construction Grammar (SBCG) or Berkeley Construction Grammar) to indicate the relationships between different types of constructions.

In contrast to Cognitive Construction Grammar, SBCG (Sag 2010, 2012) offers a rigorous formalism that allows researchers to arrive at very precise statements about the various phonological, syntactic, semantic, and pragmatic specifications of a construction and how it interacts with other constructions. Growing out of related research in BCG (Fillmore and Kay 1993) and Head-driven Phrase Structure Grammar, SBCG is focused on finding maximal generalizations without any redundancy. At the same time, SBCG practitioners are not that interested in offering a psychologically plausible account of language by determining how various general cognitive principles serve to structure the inventories of constructions or how frequency influences the status of item-specific instances (see Sag 2010; Boas and Sag 2012; Michaelis 2013, for details).

Other varieties of CxG are focused on yet other goals. For example, Embodied Construction Grammar (ECG) is not only interested in using insights into how people use grammar meaningfully and functionally, but it is aims to provide an empirically driven, computationally implemented, predictive theory of language use (Bergen and Chang 2013). Fluid Construction Grammar (FCG) is another variety of CxG that aims to provide computational implementations in terms of language processing based on insights from techniques now common in formal and computational linguistics.[21] Finally, Radical Construction Grammar (Croft 2001, 2013) grew out of typological research. This radical approach to CxG rejects grammatical categories such as subject and object independent of the constructions that define them, which essentially frees it from any representational commitment, except for the symbolic unit (the construction). According to Croft (2001, p. 6), constructions are the basic units of syntactic representation and constructions themselves are language-specific. This proposal is quite radical, because it means in effect that the categories and building block labels used to analyze one language should not and cannot be used to describe other languages. For example, on Croft's view the category "adjective" in English should not be applied to other languages such as French and German, because the corresponding words have different properties such as inflecting for case, number, and gender.

Although the different varieties of CxG differ somewhat in their methods of investigation, the types of phenomena they are interested in, the degree of formalization, the role of cognitive principles of linguistic organization, and some more general philosophical commitments to what a theory of language should accomplish, they all embrace the view that what has traditionally been regarded as lexicon and grammar essentially consists of constructions, that is, non-compositional (and compositional) form–meaning pairings of varying abstractness and syntagmatic complexity organized on a continuum.

15.5 English Constructions and Their Applications

Over the past two decades, CxG has evolved into an influential paradigm in linguistic research. Besides developing a psychologically plausible theory of human language, constructionist (and frame-semantic) insights have been applied to a variety of different subfields of linguistics that go beyond synchronic analyses of constructional phenomena in the areas traditionally thought of as syntax, semantics/pragmatics, morphology, and the lexicon. These include first and second language acquisition (Diessel 2013; Ellis 2013),

psycholinguistics (Bencini 2013), neurolinguistics (Pulvermüller et al. 2013), historical linguistics (Fried 2013; Hilpert 2013), language variation (Hollmann 2013), and language contact (Boas and Höder 2018).

One of the crucial points when determining the status and influence of a linguistic paradigm is the question of whether and how its theoretical principles and ideas can be applied and implemented. To this end, there are a number of interesting applications of constructional (and by extension frame-semantic) insights in a variety of domains. First, consider computational linguistics, where the application of Frame Semantics (and CxG) has enriched the fields of automatic semantic role labeling (Gildea and Jurafsky 2002; Das et al. 2010; Ruppenhofer et al. 2013), semantic parsing (Baker et al. 2007), and sentiment analysis (Ruppenhofer and Rehbein 2012). This research is made possible, among other things, because of the vast array of frame-semantic and constructional information contained in FrameNet. In other words, this research crucially relies on one of the central constructional concepts, namely, the construction as a pairing of form with meaning/function. Related computational research can be found in FCG (Steels 2013) and ECG (Bergen and Chang 2013). FCG has been developing a formalism that allows researchers to take constructional insights and formulate them in a precise way that allows for the testing of hypotheses in the context of parsing, production, and learning. Similarly, ECG aims to model the cognitive and neural mechanisms that underlie human linguistic behavior computationally. By focusing on the important role of simulation, research in ECG is aiming to determine the role of constructional knowledge and how it can be best represented and implemented in a computational infrastructure.

Another field benefiting from constructional (and frame-semantic) research is second language acquisition and foreign language pedagogy. The newly emerging field of Pedagogic Construction Grammar (Herbst 2016) adopts the key insights and concepts from CxG in order to propose a new methodology for teaching English grammatical constructions to speakers of German. At the heart of Pedagogic Construction Grammar is the proposal that foreign language students can greatly benefit from a more systematic presentation of different types of grammatical constructions. On this view, explicitly using the concept of form–meaning pairing helps students with learning grammar in the foreign language classroom more easily. Similarly, Atzler (2011), Heppin and Gronostaj (2012), Boas and Dux (2013), Boas et al. (2016), Cappelle and Grabar (2016), and Loenheim et al. (2016) apply frame-semantic and constructional principles to the design and implementation of online learners' dictionaries and grammars for English, German, and Swedish.

More recently, some researchers have also applied constructional insights to the analysis of oral poetics. This newly emerging field, also known as cognitive oral poetics, seeks to connect CxG and Frame Semantics to the central tenets of oral poetics, mainly the research tradition on oral formulaic style originated by the Parry–Lord theory of composition in performance. One of the goals of this effort is to systematically overcome the interpretative speculation of literary studies and to infuse a good deal of empirical rigor into the study of oral poetry while still maintaining interest in artistic value, cultural tradition, and particularities of style, or poetic effects (Antovic and Págan Cánovas 2016a, p. 9). To this end, Antovic and Págan Cánovas (2016b) discuss the similarities between formulas and constructions, the central theoretical concepts of the Parry–Lord theory of composition and of Cognitive Grammar, arguing that both concepts are based on the same view of linguistic knowledge as a result of instance-based generalizations (which can be expressed in terms of constructions). Similarly, Boas (2016) demonstrates how semantic frames and grammatical constructions can be applied to the study of oral poetics in order to systematically describe and analyze the forms and meanings communicated by oral poets during their performances. Going beyond the traditional method of close reading to interpret a text, Boas (2016) proposes that the analytical tool sets of Construction Grammar and Frame Semantics, together with empirical

data (in the case of oral poetics, this would be transcripts of oral performances), allow linguists to systematically identify constructions with their slots and fillers. This approach makes it possible to systematically assign meanings to constructions as well as their slots and fillers (typically words evoking semantic frames), resulting in a kind of full-text analysis that provides an empirical basis for determining the different layers of meaning in a text and allowing for a coherent strategy for arriving at possibly different interpretations given the context (see also Ziem et al. 2014).

Finally, constructional insights form the basis for the field of constructicography (parallel to lexicography) (Lyngfelt et al. 2018), more specifically for compiling an electronic database consisting of entries for English constructions.[22] This database, also known as the constructicon of English, is parallel in design and implementation to the more lexically oriented English FrameNet discussed in Section 15.2 above. The main idea behind the constructicon was already articulated by Fillmore more than three decades ago in his writing about the interconnectedness of the meaning of words and the constructions in which they may occur, as the following quote illustrates:

> If new-style lexical entries for content words were to be seen instead as constructions capable of occupying particular higher-phrase positions in sentences and included both the needed semantic role and the needed specifications of structural requirements (…), we could see such structures as providing expansions of their existing categories (Fillmore 1985b, p. 84).

Fillmore (2008) reports about the first prototype of an English constructicon (consisting of 73 entries) as an extension of the lexical FrameNet database. Using a modified FN database and annotation software enabled FN researchers to identify, analyze, and annotate English constructions in a very similar way as LUs (see Section 15.2 above). This is because LUs, too, are (lexical) constructions whose form pole is one or more word-forms, and whose meaning pole is usually represented as a specific semantic frame. Similarly, non-lexical constructions such as the passive, relative clause, or *way*-construction are also form–meaning pairings in which there is a clear form side of the construction. They differ, however, from lexical constructions in that the meaning evoked is less specific (cf. Baker 2012). Using a corpus-based workflow similar to that of FN, researchers compile construction entries that are stored in the constructicon database.

Each construction entry consists of a construction description, together with definitions of the CEs, and a list of annotated example sentences with summary tables highlighting the different ways that a construction's CEs are realized. To illustrate, consider a sentence such as *She elbowed her way into the meeting*, in which the verb *to elbow* appears with a possessive pronoun and the noun *way* (Goldberg 1995). The construction entry for the English *Way_manner* construction consists of three parts. The first part provides a prose description of the construction, including its meaning and function, together with the information that it evokes the `Motion` frame and that it inherits information from the *Way_neutral* construction (see Figure 15.4).

The second part of the construction's entry lists the construction-evoking elements (CEEs) (if there are any) and the construction elements (CEs, similar to FEs). The entry of an (semi-) idiomatic construction such as the *Way_manner* construction lists a specific CEE, in this case the noun phrase *one's way*, where *one's* is considered the Theme FE. One special feature of the *Way_manner* construction is the fact that its CEs are directly linked to the FEs of the `Motion` frame. The third part of a construction entry provides a summary of how the construction's CEs are realized syntactically (parallel to the valence tables in lexical FN). This summary is based on the annotated example sentences that accompany each construction entry. While the types and granularity of information displayed differs from construction to construction, they are still parallel to the valence tables found in the FN lexical entries.

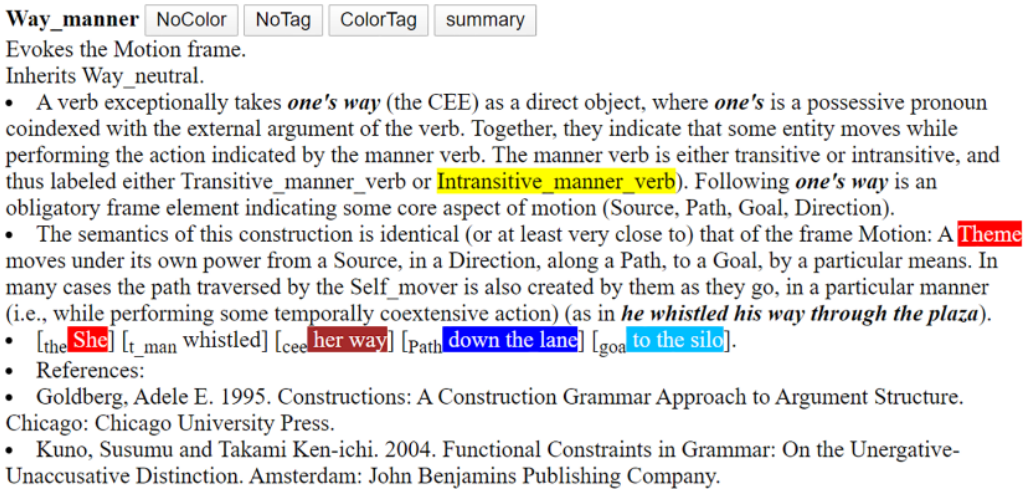

Figure 15.4 First part of *Way_manner* construction entry (Boas 2017b).

More recently, there is an effort underway to compile a much larger constructicon for English that goes beyond the Berkeley prototype. Perek and Patten (2018) report about their efforts at the University of Birmingham to combine the COBUILD grammar patterns (Francis 1993) with the semantic frames of FrameNet. More specifically, they are developing scripts that match the valency information contained in FrameNet entries with the verb patterns of COBUILD, in order to identify the frames that each pattern is associated with. While the automatic matching procedure produces many matches, it also involves a great deal of manual annotation. The resulting entries form the basis of a larger-scale English constructicon.

15.6 Beyond English Constructions

CxG is rooted in analyzing English constructions in order to develop a research paradigm whose goal is to arrive at a complete inventory of all constructions of English. This is in contrast to other generative linguistic theories, such as minimalism (Chomsky 1995), which make explicit claims about universal aspect of human language. Proposing the existence of "universal grammar" (an innate language faculty), Chomskyan approaches regard constructions only as epiphenomena, that is, collections of structures that are the results of the interaction of universal principles and parameter settings (Chomsky 1995, p. 129). Constructional research makes no a priori claims about the existence of an innate language faculty with universal principles. Instead, it has kept its focus primarily on analyzing individual languages such as English. The reason for this methodological choice becomes clear in the following quote from Fillmore and Kay (1993, pp. 4–5):

> We will be satisfied with the technical resources at our disposal, and with our use of them, if they allow us to represent, in a perspicuous way, everything that we consider to be part of the conventions of the grammar of the first language we work with. We will be happy if we find that a framework that seemed to work for the first language we examine also performs well in representing grammatical knowledge in other languages.

While some researchers such as Croft (2001) propose that all constructions are language-specific and that therefore it is probably difficult to arrive at constructional generalizations across languages, other researchers have shown that depending on the type of languages it is indeed possible to come up with constructional generalizations across pairs (and possibly larger groups) of languages. For example, the contributions in Boas (2010b) discuss a variety of linguistic phenomena by comparing English constructions with their counterparts in other languages such as German, Swedish, Spanish, Russian, Finnish, Japanese, and Thai. More recently, other groups of researchers have focused on investigating specific sets of constructions within particular language families such as Romance (see Boas and Gonzálvez García 2014) or within particular languages other than English (see Boas and Ziem 2018a). This contrastive constructional research has also inspired the creation of several FrameNets and constructicons for other languages, including French, German, Japanese, Brazilian Portuguese, Spanish, and Swedish (see Boas 2002/2009; Ohara et al. 2009; Borin et al. 2010; Lyngfelt 2012; Torrent et al. 2014; Lyngfelt et al. 2018). This contrastive line of research has shown that most of the constructional and frame-semantic concepts and ideas developed on the basis of English are also applicable to the description and analysis of other languages, while at the same time paying attention to language-specific typological differences.

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NOTES

1 Meaning and function are to be understood as broadly as possible, that is, including various levels of semantic and pragmatic information, including contextual functions.
2 The term "construction" has a long history of use in linguistics; see Goldberg and Casenhiser (2006) for its history. It has only been since the 1980s that the term "construction" has been used explicitly as a part of a name of a particular linguistic theory seeking to account for the entirety of language, known as "Construction Grammar" (CxG). CxG is used as a cover term to denote a variety of different yet related constructional approaches. While CxG subscribes to the view that all of language consists of constructions, researchers working on other theoretical paradigms prefer to use the term "constructions" only to refer to "certain grammatical patterns that have unusual quirks in either their formal properties or their semantic interpretation (or both) that make them ill-suited for universal status" (Goldberg and Casenhiser 2006, p. 344). See also Hoffman and Trousdale (2013, p. 2).
3 There is not enough room here for a detailed overview of the development of Frame Semantics. For more details on frame semantics, see Petruck (1996), Busse (2012), and Ziem (2014).
4 This section is based on Boas (2017a) and Boas and Dux (2017).
5 Following FrameNet practice, frame labels are in Courier New font and FE labels are in small capital font.
6 FrameNet deals with polysemy by positing multiple frames for each sense of a word. Frames are related to each other in a large network displaying frame relations such as inheritance (e.g., the `Taking` frame inherits from a more general `Getting` frame).

7 Clicking on a specific frame element configuration leads to the fully annotated example sentence exemplifying its use in context.
8 Parts of this section are based on Boas and Ziem (2018b).
9 CxG emerged in the 1980s as an alternative theory to the Chomskyan (generative-transformational) paradigm (Chomsky 1965, 1981). For details about the differences between CxG and the Chomskyan paradigm, see Goldberg (1995) and Goldberg (2006).
10 See Table 1 for examples of constructions. Goldberg (2006, p. 5) offers an alternative definition that includes the notion of frequency: any linguistic pattern is recognized as a construction as long as some aspect of its form or function is not strictly predictable from its component parts or form other constructions recognized to exist. In addition, patterns are stored as constructions even if they are fully predictable as long as they occur with sufficient frequency. For other definitions of constructions, see Croft (2001, pp. 17–21) and Fried and Östman (2004, pp. 18–23).
11 Note that CxG also subscribes to the notion of compositionality, see Michaelis (2012).
12 Schematicity refers to the degree to which constructions are lexically specified; double-object constructions, for example, are highly schematic, since none of their slots are lexically specified (even though their fillers have to meet a set of form- and meaning-related requirements, see Barðdal (2008); Boas (2008) and (2010b)).
13 Note that the verb "*to take*" is only a placeholder here for the many different low-level mini-constructions occurring with the various senses of *to take*, each of which evokes a different semantic frame.
14 Another way in which CxG differs from the Chomskyan paradigm is in that it does not make a distinction between the so-called "core" (phenomena assumed to be regular and worth studying) and "periphery" (exceptional phenomena that are hard to capture within a theory of universal grammar) (see Chomsky 1980, 1981). CxG rejects the idea of a principled difference between core and peripheral grammatical phenomena. Rather, both should be analyzed with the same analytical and methodological tool set, without losing track of either fully transparent, compositional constructions or opaque, idiomatic structures (Fillmore 1988, Michaelis 2012).
15 This "slot-based" view of productivity concerns the types of items that can occur in the various slots of a construction. But productivity may also relate to semantic variation, that is, to syntactic structures whose (abstract) meanings systematically change depending on the lexical items entering them (e.g., *He gives her a glass* vs. *He gives her a kiss* vs. *He promises her a kiss*). Constructions vary from entirely unproductive to highly productive units depending on type and token frequencies. In this view, type and token entrenchment determine the way a grammar is cognitively structured and organized (Clausner and Croft 1997).
16 For a critique of intuition-based linguistic research, see Sampson (2002) and Hanks (2014).
17 Since CxG subscribes to the view that constructions are learned and shaped in language use, rather than being derived from each other (as proposed by the Chomskyan paradigm), it also abstains from assuming empty categories, traces, and invisible derivation processes, which are empirically difficult to verify.
18 Even though we are dealing here with an intransitive construction, the VP construction offers options for licensing direct and indirect object NPs in cases involving transitive and ditransitive verbs.
19 The verb–inflection construction will need to access a subject–predicate agreement construction that licenses the verb's proper inflectional ending.
20 Parts of this section are based on Boas (2013).
21 For an overview of the differences between ECG and FCG, see van Trijp (2013); for a computational implementation of FCG, see http://www.fcg-net.org.
22 This section is based on Fillmore (2008), Fillmore et al. (2012), and Boas (2017a).

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16 Syntactic Variation in English: A Global Perspective

BERND KORTMANN

16.1 Introduction

Compared with the study of phonological variation, much less is known about syntactic variation in English, especially among non-standard (or vernacular) varieties, which will stand at the center of this chapter. For one thing, significantly more data are necessary to identify interesting instances and, above all, larger patterns of syntactic variation. Many differences between varieties, especially between the national (written) standard varieties, are not categorical (such that one variety has a certain grammatical element or syntactic construction which another has not). Rather the vast majority of differences are quantitative in nature (see Chapter 14), that is, a given construction may be preferred in one variety but used distinctly less frequently in another. Only once a critical mass of data is available can the semantic/pragmatic patterns underlying such marked differences in text frequency be identified. For non-standard varieties, much progress has been made since 2005, when the first edition of this handbook was prepared. And still we are only at the beginning of large-scale quantitative studies using the toolkit of corpus linguistics.

Since the 1990s, computerized corpora (based on transcribed recordings of oral history interviews or conversations among dialect speakers from the 1970s or later) have been or are currently being compiled for a growing number of non-standard varieties (e.g., the Freiburg English Dialect Corpus (FRED) with its newly developed interactive interface FREDDIE, the Helsinki Corpus of British English Dialects, or the Diachronic Electronic Corpus of Tyneside English (DECTE)[1]), even if they cannot rival in size the megacorpora for the national standard varieties of English (see Chapters 4 and 14). At the same time, we simply know much more about syntactic variation in non-standard varieties now than we did in the early 1980s (cf., e.g., Edwards et al. 1984) due to a much-increased number of relevant studies, especially in the 2000s. The majority of these deal with individual phenomena in individual dialects or dialect areas, as compiled for example in such a milestone collection as Trudgill and Chambers (1991), but there are also excellent structural surveys for regional and non-regional varieties of English, such as those provided in Milroy and Milroy (1993), Kortmann et al. (2005), Kortmann and Upton (2008), Szmrecsanyi (2013), Beal (2010), or Wright (2018) for the British Isles, and in Kortmann et al. (2004), Hickey (2012), or Kortmann and Lunkenheimer (2012) on a world scale. The latter also offers overall profiles of the morphological and syntactic variation (a) of individual variety types of English (L1, L2, pidgins, and creoles) and (b) of the varieties of English spoken in the different parts of the anglophone world (notably

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Africa, the British Isles, North America, the Caribbean, South and Southeast Asia, Australia, and the Pacific). The wealth of data and information in the new corpora, new questionnaire-based fieldwork, morphosyntactic open access online atlases (notably Yale Grammatical Diversity Project on English in North America since 2010 by Zanuttini et al., and eWAVE, the *electronic World Atlas of Varieties of English*, by Kortmann et al. (2020)[2]), and the constantly growing body of relevant research on syntactic variation puts us in the privileged position that, for the first time, it is now possible to systematically explore syntactic variation across (regional or social) non-standard varieties in and across different parts of the English-speaking world.

The present chapter will offer no more than a first attempt at providing an overview of syntactic variation in English on a global scale. As for the varieties included, its focus will be on non-standard varieties of English (besides L1 varieties, including indigenized L2 Englishes as well as English-based pidgins and creoles) and spontaneous spoken varieties of standard English. It is notoriously hard to define Standard English (cf. Trudgill 1999) and even more so what a spoken standard is (cf. Cheshire 1999; see also Chapter 27). Neither of them is a uniform concept, nor is it always possible to draw a sharp distinction between written and spoken Standard English, on the one hand, and standard and non-standard spoken English, on the other hand. If we follow Trudgill's characterization of Standard English as a social dialect "which is distinguished from other dialects of the language by its *grammatical* forms" (1999, p. 125), the fact must be acknowledged that nevertheless, even in the written language, there is (at times quite considerable) variation across the national standards like British, American, Irish, or Australian English. However, variation across (formal) written standard varieties, especially between British and American English, will be largely left aside in this chapter (but see Chapter 15, this volume). Also what will not be discussed here are a range of grammatical features which are widely known as typical of spontaneous conversational English, especially among young speakers (e.g., special reporting constructions with *go*, *be all*, *be like*, *be all like* or, from Multicultural London English, *this is* + speaker, as in *this is me/him/Sue*, cf. Cheshire et al. 2011), or characteristics of spoken language in general (e.g., ellipsis, run-on sentences, fragmented syntax), as described in Chapter 27, Miller and Weinert (1998) and Biber et al. (1999).

This chapter will offer an overview of the syntactic (and, marginally, morphological) variation in the following six grammatical subsystems: the noun phrase (NP), tense and aspect, mood and modality, negation, agreement, and subordination. What will be identified and illustrated in the relevant sections are (1) the most pervasive tendencies and distinctive patterns across (at least larger parts of) the English-speaking world and (2) properties of individual (types and areal clusters of) non-standard varieties which are striking from a cross-linguistic point of view. The examples used are all genuine and for the most part taken from the handbook volumes by Kortmann et al. (2004) and Kortmann and Lunkenheimer (2012). The latter, together with the interactive electronic database eWAVE 2.0 (Kortmann and Lunkenheimer 2013), will also be the major sources for statements on the (degree of) geographical pervasiveness or restrictedness of individual grammatical features. Note that almost all phenomena listed in these six sections belong to the set of 235 morphosyntactic features mapped in eWAVE. In addition to the section-internal numbering, each phenomenon will therefore also be identified by its eWAVE feature number for easier cross-reference to and consultation of this electronic atlas.

The focus of the descriptive part of this chapter will be on form, that is, on the coding devices which are available for the individual grammatical subsystems across the non-standard varieties of English. Functional variation, that is, the variation which can be found in the frequency and the ways in which these coding devices are put to use in individual varieties, will be touched upon only occasionally. Major conclusions to be drawn from the descriptions of the six grammatical subsystems will be discussed in Section 16.7, Among the

issues addressed will be the following: What can the syntax of non-standard varieties tell us about the standard English(es) of tomorrow? What can current linguistic theories learn from syntactic variation within individual languages? The answers to these and other far-reaching questions will show that over the past three decades the study of syntactic variation, and grammatical variation in general, has turned into one of the most exciting fields in English linguistics, with many fascinating discoveries having been made, and still holding many promises for anyone interested in language variation, language contact, language change, language comparison, and linguistic theory.

16.2 The Noun Phrase

16.2.1 Pronouns, Pronoun Exchange, Pronominal Gender

Apart from what is going on in relative clauses, the most interesting and pervasive instances of morphosyntactic variation in the noun phrase can be observed for pronouns. The following pronominal features are among the most widespread tendencies in (varieties of) spontaneous spoken English across the world or distinctive of either varieties in a particular part of the anglophone world or belonging to a particular variety type (L1, L2, pidgins, and creoles[3]).

(P1) F68: *Them* instead of demonstrative *those* (e.g., *in them days …*, *one of them things …*). This feature is found in 62% of the 76 varieties covered in eWAVE 2.0.

(P2) F34: Special forms or phrases for the second person plural pronoun (different from the second person singular *you*). For example, *youse* (Irish English, Northumberland/Tyneside), *y'all* (Southern US), *aay*, *yufela*, or phrases like *you … together* (East Anglia), *all of you*, *you ones/'uns*, *you guys*, *you people*. This is one of the most widespread morphosyntactic features in the anglophone world, documented in 91% of all eWAVE varieties (69 out of 76), thus qualifying as a true vernacular angloversal.

(P3) F11: A regularized reflexives-paradigm which extends the formation method "possessive pronoun + *-self/selves*" to all persons, thus *hisself* and *theirselves*, partly combined with the independent regularization tendency of using *-self* for singular and plural (e.g., *theirself*, *ourself*) as long as the possessive pronoun indicates number (thus, *yourself* = singular, *yourselves* = plural). With an attestation rate of 58% out of 76 varieties covered in eWAVE, this feature also belongs to the most widely found pronoun features worldwide[4].

(P4) F1: *She/her* used for inanimate referents (e.g., *Here she comes: Timber!*, *She was burning good* [about a house], *See that roof? We finished her yesterday*) or without clear referents (e.g., in fixed expressions like *she's fine*, *she's cool*, *she'll be joe*, all meaning "it doesn't matter" in Australian and New Zealand English); by contrast, only few varieties invariably use (F2) generic *he* (e.g., Gullah and Fiji English). F1 is found only in about half of the 76 eWAVE varieties (49%), it is however highly distinctive for one particular type of Englishes, namely, mother tongue varieties of English (attested in 80% of the 31 L1 varieties in eWAVE).

The following three phenomena relate to the marking of grammatical functions (subject, different kinds of objects) by unusual pronominal forms. While the first two can also be

observed relatively frequently, partly even in spoken Standard English (P5), the features under (P7) are considerably rarer.

(P5) F8: *Myself/meself* in a non-reflexive function, as a kind of avoidance strategy for subject *I/me* or object *me* (e.g., *my/me husband and myself*, *This is myself with a cow*, *The mail can have connections with myself*). This feature has an eWAVE attestation rate of 68%.

(P6) F7: *Me* instead of *I* in coordinate subjects (e.g., *Me and my brother/My brother and me were late for school*). This, in fact, is another vernacular universal, found in 89% of the varieties in eWAVE.

(P7) F25, F28–31: In several varieties, *us* can be used in at least one of the following functions: F25 as a possessive marker (e.g., *Us George was a nice one*, *We like us town*), F29 as a (mostly indirect) object form in the singular (e.g., *Show us* "me" *them boots*), or F28 as a subject: typically when followed by a nominal apposition, as in *Us kids used to pinch the sweets like hell*, more rarely by itself (F31), as in *Us'll do it*. Of these four, it is F28 that is not only the most frequent one (50% attestation rate vis-à-vis less than 30% for the other two), but also highly distinctive of L1 varieties of English (90% of 31 varieties possess this feature).

16.2.2 *Absence of Plural Marking and Plural and Genitive Marking on Noun Phrases and Article Use*

Outside the domains of pronominal usage and relativization, the following phenomena illustrate different kinds of syntactic variation within the noun phrase.

(NP1) F56: The absence of plural marking after measure nouns (e.g., *three yard*, *four pound*, *five year*), which for some nouns is also regular usage in the standard (as in *She's five foot four*), is attested in 42% of the 76 eWAVE varieties.

(NP2) F54: Almost equally frequently attested in the anglophone world are so-called group plurals (e.g., *That President has two Secretary of States*).

(NP3) F72: Rarer (32%) are group genitives (e.g., *The man I met's girlfriend is a real beauty*).

(NP4) F60–65: More varied is the use of articles, for which so far it seems impossible to come up with a pattern underlying the observable variation. Six scenarios can be distinguished; F62 the omission of a definite article (e.g., *Father rented the farm under Squire*, *Take them to market*), F63 the omission of an indefinite article (e.g., *I had nice garden*, *They had awful job*), or their insertion; F64 a definite article for Standard English zero (e.g., *I left the school in early age*, *Do they keep the goats?*) or F65 an indefinite article for Standard English zero (e.g., *about a three fields*, *about a seven inches square on a board*). Another option found in the same or other varieties is F60 the use of the definite article where Standard English uses the indefinite article (e.g., Irish English *I had the toothache*, *He's the wise boy*), or F61 vice versa. Out of these six patterns, the first two are by far the most frequent ones (58% for F62 and 53% for F63), whereas the use of the indefinite article instead of StE zero (F65) or definite article (F61) is attested only in 16%–22% of the world's varieties of English.

16.2.3 Comparison of Adjectives

(NP5) F78: Double comparatives and superlatives (e.g., *Sometimes that is so much more easier to follow*, *She's got the most loveliest clothes*) can be found in varieties of English in all parts of the world (e.g., spontaneous spoken American English, New Zealand English, dialects of northern England). With an attestation rate of 74%, this feature belongs to the exclusive group of the 10 most frequently attested morphosyntactic features in the anglophone world (attested in 56 varieties of English).

(NP6) F79–80: Regularized comparison strategies. Independently of double comparatives/superlatives, or in combination with them, many non-standard varieties use F79 the inflectional comparison strategy (e.g., in *He is the regularest kind a guy I know*) along with F80 the analytic one (e.g., in *one of the most pretty sunsets*) where Standard English allows only one of the two strategies for the relevant adjective (cf. Murray and Simon 2004). Both strategies are fairly frequent, with the analytic one the more frequent of the two (68% vis-à-vis 57%).

16.3 The Verb Phrase

In the verb phrase, the most interesting syntactic and morphological variation can be observed in the domain of tense and, especially, aspect. Many non-standard varieties, pidgins and creoles in particular, have richer aspectual systems than Standard English has.[5] Among the most pervasive tendencies are the first three:

16.3.1 Tense and Aspect

(T1) F89–90: A wider range of uses of the progressive. This involves not only a higher text frequency due to the use of the progressive as a marker of informality and speaker involvement but also due to its use F88 with a wider range of verbs (i.e., stative verbs) than in Standard English (e.g., *I'm liking this*, *So what are you wanting from me*?) and F89 its use in habitual contexts. Indeed, the progressive in non-standard and spontaneous spoken English seems to be well on its way toward an imperfective (cf. also Gachelin 1997; Sharma 2009, for Indian English), with F88 being more widely attested (63%) than F89 (49%) in the anglophone world.

(T2) F90–91, F93: A much more important role of habitual marking. The marking of habitual aspect is much more strongly grammaticalized in many varieties than it is in Standard British or American English. The most widespread habitual markers are F90 *be* (invariant as in African-American vernacular English *He be sick*, or inflected as in Irish English *He be's at home*), F91 *does/doz* (in practically all pidgins and creoles, e.g., Barbados *He does catch fish pretty*), or F93 combinations of the two (e.g., Irish English *There does be a meeting of the company every Tuesday*). *Be* or *do be* are often also combined with the progressive in marking habituality (e.g., African-American vernacular English *I always be playing ball* or Irish English *They do be shooting there a couple of times a week*). Most widely attested of these three habituality markers is the analytic marker *do(es) be* (F93), while the other two are found in only about a fifth of the world's varieties of English (*be*(*s*) at 22%, *does/doz* at 29%).

(T3) F99–101: A weakening or loss of the strict division between the present perfect and the simple past. The division of tasks known from (written) Standard British English is quite an exception among the varieties of English (cf. Miller 2004). This distinction is increasingly getting blurred, especially in the non-standard varieties. The two tense forms are either encroaching onto each other's territories, for example, F99 *just* + simple past for recent past (*Sorry, Bill's not in. He just went out*) or the experiential perfect (*Were you ever in London?*), or F100 present perfect with definite past time adverbials (*Some of us have been to New York years ago*), or a different tense form is used for at least some of the traditional functions of the present perfect (e.g., F101 the simple present in Irish English for the continuative perfect in *I know him since my schooldays*). The mildly dominant pattern across L1 varieties of English, including the standard varieties, clearly is F99 the simple past (increasingly) doing service for all major uses of the present perfect apart from the continuative perfect (attested in 59% of all 76 varieties documented in eWAVE). The present perfect as a marker of definite past time (F100) is found in only 43% of all eWAVE varieties. However, F100 is a top diagnostic feature for indigenized L2 varieties (found in 83% of the 19 L2 varieties in eWAVE) and a true South/Southeast Asian areoversal, as it is found in all eight eWAVE varieties from this anglophone world region. For book-length studies on the present perfect across L1 and L2 varieties of English as well as in English-based pidgins and creoles, see Davydova (2011) and Werner et al. (2016).

(T4) F102: *Be* as a perfect auxiliary. Some varieties, notably Irish English, have retained the older Germanic pattern of a *be*-perfect (e.g., *They're not left school yet*) along with the *have*-perfect, the former being used with verbs of motion and change like *come*, *go*, *change*, *improve*, *die*. The *be*-perfect is anything but a dying structure in varieties of English around the world, as shown by Werner (2016).

(T5) F91, F103–104: *Do* as a tense and aspect marker. In non-standard varieties of English, especially in pidgins and creoles, *do* is primarily used for the marking of aspect, notably F91 as a habitual marker (typically *does/doz*, exceptionally *did* as in *We've been up milking at 6 o'clock in the morning, and then we did go on haymaking*) and F104 as a completive/perfective marker (*done/don*; see (T6)), only rarely as a progressive marker. In the domain of tense, two uses stand out: F103 unstressed *do(es)/did* as a simple analytic tense carrier for present and past tense in the English Southwest (*This man what do own this*, *I thought you did mean a rubber*) and the anterior *did* in many pidgins and creoles, as in Panamanian Creole *Wen ai did smaal tiŋ woz chiyp* (cf. Kortmann 2004a). All of these uses of *do* are at most moderately frequent (with attestation rates ranging between 20% and 33%).

(T6) F104: Completive/perfect *done* "finish/stop, have already V-ed." This is a pervasive, indeed diagnostic, feature of US American non-standard varieties and English-based pidgins and creoles in the Caribbean (e.g., *He done go fishing*, *You don ate what I has sent you?*).

(T7) F111: Past tense/anterior marker *been*. The use of this marker, as in *I been cut the bread*, is attested in 41% of the eWAVE varieties set. It is found especially in several L1/L2 varieties and creoles spoken in North America (e.g., Newfoundland English, Gullah, Urban African-American vernacular English), the Caribbean (e.g., Jamaican English, Jamaican Creole, Bahamian English, Bahamian Creole), and Australia and the Pacific (Bislama, Norfuk/Pitcairn, Australian Aboriginal English, Roper River Creole).

(T8) F113: Loosening of sequence of tenses rule. An example is *I noticed the van I came in* (instead of: *had come in*) *was not really a painter's van*. This feature is twice as frequently found in the anglophone world (66%) than the phenomenon described immediately below (T9), which is often also considered a common feature of spontaneous spoken English.

(T9) F120: *Would* in *if*-clauses. An example is *If I would/I'd be you*, …, *If they wouldn't have made a scrap of slate*, …

(T10) F95: *Was sat/stood* with progressive meaning. Sometimes also discussed under the heading of "pseudo-passive," this phenomenon (e.g., *when you're stood* 'are standing' *there you can see the flames*) is among the rarest morphosyntactic features in the anglophone world, attested in no more than 14% of the 76 eWAVE varieties, but at the same time a top diagnostic feature of the British Isles. In England, *was sat/stood* is increasingly used in the spoken standard, too (cf. Cheshire et al. 1993, pp. 70–71; Klemola 2002, pp. 52–55; Stange 2016). This feature is also attested in varieties strongly influenced, historically or until now, by English dialects spoken in the UK and Ireland (Falkland Islands English, Newfoundland English).

16.3.2 Modal Verbs

(M1) Different paradigms of modal verbs.[6] Almost all spontaneous spoken varieties, least so perhaps in Britain, have largely abandoned, or are in the process of doing so, the use of *shall* (at least as a pure future time marker), *should* (at least for the marking of mere hypotheticality), and *ought* (*to*), closely followed by *may* (especially in the permission sense) and *must* (especially in its obligation sense). On the other hand, a number of new (semi-)modals can be seen to emerge (see Chapter 15), notably *gonna* (as a neutral predictive future marker), *wanna* ("should," as in *You wanna see a doctor*), *gotta* (deontic and epistemic "must"), *need to* (polite "must"), and *let's* (adhortative, as in *Let's you and him jump*). With regard to the interaction between the older core modal verbs and the newer semi-modal verbs, an interesting division of labor has been observed in the dialect of Tyneside, where *must* has become largely restricted to epistemic readings while *have to* and *have got to* (including *gotta*) predominantly express deontic readings (cf. Trousdale 2003).

(M2) F121: Double (or: multiple) modals. These constructions are a distinctive feature of Scottish English (especially in the Borders region; cf. Bour 2014) and Tyneside English, but are used most frequently in many varieties spoken in the southern states of the United States (cf. e.g. Nagle 2003). There seem to exist a number of restrictions on possible sequences of double modal constructions: for example, in Scottish and Tyneside English, *may* or *might* are usually found in initial position (roughly meaning "maybe"), *can* or *could* in second position. The low frequency of double modals in everyday speech seems to be due to their restriction to certain pragmatically governed contexts, notably one-on-one conversations (very often in the form of negotiations), and potentially face-threatening situations. Typical examples are *I tell you what we might should do*, *You might could try a thousand K*, *Could you might possibly use a teller machine?*

(M3) F122: Epistemic *mustn't/must not*. In a number of varieties (e.g., spontaneous spoken American English) *mustn't/must not* can be used or is even exclusively used (Scottish English, Northumbria/Tyneside) as an epistemic modal meaning "can't, it is concluded that … not," as in *This mustn't be true*, *This mustn't be the place*, *The lift mustn't be working* (cf. also Anderwald 2002, pp. 97–100).

16.3.3 Verb Morphology

(VP1) F128–131: Regularization (e.g., *draw–drawed–drawed*) and/or reduction of irregular verb paradigms. Either past tense and past participle verb forms are identical (with the past tense form doing service for both, as in *I've ate the apple*, or the past participle, as in *I seen one the other day*), or the base form also serves as past tense and past participle (e.g., *She give me that one the other night*, *She learnt cheese making here and I come here to live*).[7] With attestation rates ranging between 51% and 64%, these regularization patterns are quite frequently attested in the world's varieties of English. For the British Isles, see the book-length investigation by Anderwald (2009).

(VP2) F134: *A*-prefixing on *ing*-forms. As one would expect, this archaic feature, as in *They wasn't a-doin' nothin' wrong*, is rather rare in the anglophone world (attested in 17 out of 76 varieties, that is, 22%). Almost exclusively it is found in varieties spoken in the British Isles (e.g., in the dialect of East Anglia, but also in British Creole) and North America (e.g., Appalachian English, African-American vernacular English), or in varieties in other parts of the anglophone world historically related to British or American varieties, such as Falkland Islands English and Liberian Settler English, respectively.

16.3.4 Adverbs

(VP3) F220–221: Adverbs have the same form as adjectives (e.g., *Come quick*, *He treated her wrong right from the start*, *He done good*). This feature (F220) is highly widespread across spontaneous spoken and non-standard varieties of English (attested in 79% of all varieties in eWAVE). Even more widely attested, however, is F221 adverbs with the same form as adjectives which are used as degree modifiers (e.g., *a high technical job*, *That's real good*, *This pie is awful good*). With an attestation rate of 91%, this is another instance of a true vernacular angloversal.

16.4 Negation

In the domain of negation, the three negation features most widely known (not only to linguists) to occur in non-standard varieties are multiple negation (or: negative concord), invariant *ain't*, and invariant *don't*. But less publicly known negators, notably preverbal *never* and the invariant question tag *isn't it/in't it/innit*, are no less frequently found in different

parts of the anglophone world. Other negation features presented below (N5, N6) are used in considerably fewer non-standard varieties.[8]

(N1) F154: Multiple negation/negative concord (e.g., *He won't do no harm*, *I couldn't say nothing about them*, *I've never been to market to buy no heifers*). This notorious feature of non-standard English grammar is attested in 80% of the spontaneous spoken varieties of English around the globe and thus qualifies as a true vernacular angloversal. However, the frequency with which multiple negation is used in individual non-standard varieties may vary greatly. In white dialects of American English, for example, frequencies have been found to vary between 50% and 80% (Schneider 2000, p. 219). A striking pattern Anderwald (2002, pp. 109–114, and 2005) has found in corpus-based studies of England, Scotland, and Wales is a south–north cline, with rough proportions of multiple negation usage of 40%–45% in the south of England, 30% in the Midlands, and around 10% in the north of England, Scotland, and Wales. Interesting variation can also be found for syntactic and lexical constraints on multiple negation in different varieties (e.g., in African-American vernacular English multiple negation crosses clause boundaries, indefinite constituents of embedded clauses being marked negatively because the predicate of the superordinate clause is marked negatively; Schneider 2000, p. 219).

(N2) F155–157: *Ain't*. Invariant *ain't* in present tense declaratives, questions, and tags represents a neutralization in the negative between F155 (copula and auxiliary) *be* (e.g., *I ain't going out tomorrow*, *They're all in there ain't they?*) and F156 (auxiliary) *have* (e.g., *I ain't had a look at them yet*, *Gotta be lucky at something*, *ain't you love?*), as well as a neutralization of person distinctions of Standard English. In some varieties, especially pidgins and creoles, there is a tendency to extend the use of *ain't* to full verb *have* (e.g., *Ain't you trouble with your car?*). In fact, in African-American vernacular English *ain't* is also used as F157 a full verb negator equivalent to *don't/doesn't* and, especially, *didn't* (e.g., *sumpin' I ain't know about*, *You ain't expect to find her over here, did you?*; Schneider 2000, pp. 214–215). This latter use of *ain't* is attested in about 20% of the varieties of English around the world, and thus is considerably more rarely found than F155 *ain't* for *be* or F156 *ain't* for *have* (both with attestation rates of some 40%). F155 is indeed a top diagnostic for L1 varieties of English, with 74% of the 31 L1 varieties in eWAVE exhibiting this negation feature. In some pidgins and creoles, *ain't* (or: *in/en/eh*) has even acquired the function of a general (i.e., tense-independent) preverbal negator (e.g., Trinidadian English *The girl eh lie* "The girl didn't lie") as further described in (N5).

(N3) F158: Invariant *don't* for all persons in the present tense (e.g., *He don't like me*; for its history and current distribution in the British Isles, see Anderwald 2002, pp. 151–170) is another notorious non-standard feature of English and thus widely found in the anglophone world (in 52, i.e., 68%, of the 76 eWAVE varieties).

(N4) F159: Even more widespread than multiple negation, and with an attestation rate of 83% another vernacular angloversal, is *never* as (preverbal) past tense negator referring to single occasions or unspecified stretches of time in the past, equivalent to Standard English *didn't* (e.g., *He never came*, *I never found the berries till it was time to come home*, *Did you hit him? No, I never*). *Never* in these contexts is typically unstressed. According to Cheshire et al. (1993, p. 67), this use of *never* is frequent even in formal written (British) English.

(N5) F160: *No* used as a preverbal negator "… is a feature which is practically universal in English-related pidgins … and creoles" (Schneider 2000, p. 211), for example, *me no iit brekfus* (Guyana) or *I no bin get a breakfas dis-day* (Pitcairn). Indeed, 20 out of the 28 varieties in the eWAVE data set are pidgins and creoles. The negator *no* (instead of *not*) is of course also known from Scotland and closely related varieties (Orkney and Shetland, marginally Northumbria), where it is the default negator with *be*, *will*, and *have* (e.g., *She's no leaving*, *That's miles away, is it no?*, *A'm no ready yet*).

(N6) F163: *Was–weren't* split. For *be* in the past tense, many non-standard varieties across the world generalize either *was* or *were* for all persons in the singular and plural, in positive as well as negative sentences (for instance, the dialects of Southeast England exhibit a pervasive *was–wasn't* pattern; see also (A6) in the following section). In a considerable number of varieties, however, for instance in some southern US vernaculars and dialects in England (see Anderwald 2002, pp. 171–193), there is a mixed system: *was* is generalized for all persons in singular and plural only in affirmatives, while *were*, or rather *weren't*, is used for all persons in singular and plural in negative sentences, as in *The boys was interested, but Mary weren't*. At least in England, this mixed system is the most frequent one among *was/were*-generalizing dialects (and, indeed, within the anglophone world, where it is attested in no more than 14 varieties of English, it is a morphosyntactic feature that is highly distinctive of the British Isles). What has happened in these varieties can be interpreted as a process of remorphologization (Wolfram and Schilling-Estes 1996) or exaptation: the number distinction for the *was/were* choice, which has become largely redundant in Standard English, has been replaced by a polarity distinction. Interestingly, the second possible type of mixed system among *was/were*-generalizing varieties of English, namely, *were* in positive and *wasn't* in negative sentences, is not attested beyond idiolectal usage.

(N7) F165: Invariant question tag *isn't it/in't it/innit* (e.g., *They had them in their hair, isn't it?*, *But they make dustbins big enough now, in't it?*, *You can go with your Mum then, innit?*, *They are quite a couple, innit?*). Typical of London adolescent speech (*innit*) and Welsh English (*isn't it*; see Roller 2016, pp. 97–120), this tag is spreading in England and in other parts of the world (cf., e.g., Columbus 2010, for this and other invariant question tags in Indian English), with a current attestation rate of 67% (51 out of 76 varieties). For adults in England, *innit* is still largely used as the non-standard variant of *isn't it* (i.e., only following *is* in the main clause).

16.5 Agreement

There is a pervasive tendency in non-standard and spontaneous spoken varieties of English to do away with or at least considerably weaken subject–verb agreement. For affirmative sentences, this is illustrated in (A1–7), for negative sentences in (A8).

(A1) F170: Invariant present tense forms due to zero marking for the third-person singular (e.g., *So he show up and say, What's up*?) are found in 68% of the world's varieties of English, and thus about twice as often as the feature below.

(A2) F171: Invariant present tense forms due to generalization of third-person singular *-s* for all persons (e.g., *I sees the house*); in several varieties (e.g., in Southeast England, where this feature is recessive though) this involves *does* used for all persons (e.g., *You doesn't look too good*) and even full verb *has* for all persons (e.g., *I has no money*).

(A3) F172: *There's*, *there is*, *there was* in existential/presentational sentences with plural subjects (e.g., *There's/There is/There was two men waiting in the hall*, *There's cars outside the church*). This pattern is firmly established in spontaneous spoken English; with an attestation rate of 71% it belongs to the 5% of most widely attested morphosyntactic features of the anglophone world.

(A4) F174–178: Deletion of *be* as auxiliary (F174: *We___ going as soon as possible*, F175: *I __ gonna go work*) and copula (F176: *He ___ a good teacher*, F177: *She___ smart*, F178: *She ___ at home*). About half of all varieties of English permit one or more of these types of *be*-deletion; this cluster of features is found especially in high-contact L1 varieties for which they are a top diagnostic (Kortmann 2019). Interestingly, auxiliary *be*-deletion (F176–178) is completely absent in traditional, that is, low-contact, L1 varieties of English (ibid.).

(A5) F179: Deletion of auxiliary *have* (e.g., *I ___ eaten my lunch*) is found in about a third of the world's varieties of English (30%).

(A6) F180: *Was/were*-generalization. As mentioned under (N6) in the previous section, many non-standard varieties have abandoned the *was/were* distinction known from Standard English. Alternatively, they either generalize *was* or *were*. Anderwald (2002) found that in negated sentences this generalization of a past tense form of *be* is three times as likely as in non-negated sentences, with generalized *weren't* being much preferred over *wasn't* in negated sentences, while generalized *was* is preferred over *were* in positive sentences. About half of the varieties of English worldwide possess this feature; from a regional perspective, it is an areoversal and top diagnostic feature of the British Isles. *Was*-generalization is discussed by various authors, together with the pattern in (N6), under the heading of *default singulars* (e.g., Chambers 2004) or *singular concord* (Henry 1995, 2002). A special case of this non-agreement pattern is (A7).

(A7) F183: The so-called Northern Subject Rule (NSR). In the dialects of (especially Northern) Ireland, Scotland, and the north of England, the following variant of the (non-)agreement pattern in (A6) can be found (cf. Klemola 2002; Pietsch 2005, 2012): every verb in the present tense can take an *s*-ending unless its subject is an immediately adjacent simple pronoun. (Third-person singular verbs always take the *s*-ending, as in Standard English.) In other words, the NSR involves a type-of-subject constraint (pronoun vs. common/proper noun) and a position constraint (+/− immediate adjacency of pronominal subject to verb). Thus, in NSR-varieties we get examples like the following: *I sing* (vs. **I sings*), *Birds sings*, *I sing and dances*. Only seven varieties of English (9%) exhibit this feature.

(A8) Loss of subject–verb agreement in negative sentences as illustrated in the previous section, that is, through invariant *ain't* (N2), *don't* (N4), and either *wasn't* or *weren't* generalization (N6).

Taking all these points together, one must agree with Hudson (1999, p. 205) that English dialects seem to be on their way toward a system lacking subject–verb agreement, as we know it from the continental Scandinavian languages.

16.6 Subordination

Of the three major types of subordinate clauses, relative clauses and relativization strategies are by far the best investigated ones for non-standard varieties of English (cf. Herrmann 2005, for six dialect areas in England). Much less research has been done for complement clauses (but see Kolbe 2011, again for L1 dialects spoken in the British Isles), and almost none for adverbial clauses (with the exception of Häcker 1999, for Scottish English). This is why relative clauses will take center stage in this section. For relative clauses, there is a pervasive tendency in the non-standard and spontaneous spoken varieties of English to strongly prefer relative particles (i.e., invariant relativizers) over the case-marked relative pronouns (*who*, *whose*, *whom*), or to use relative particles exclusively (see (R1)–(R4)). These relative particles are typically used for inanimate and non-personal antecedents, but can also be used for animate and personal antecedents (e.g., for *which*: *and the boy which I was at school with …*; see Herrmann 2005).

(R1) F185: Relative particle *that* in non-restrictive relative clauses. The use of *that* for animate referents in restrictive relative clauses, as in *The man that painted the house …*, is part of the standard (especially in American English). However, in quite many non-standard varieties (45% out of 76) *that* is additionally used in non-restrictive relative clauses (e.g., *My daughter, that lives in London, …*).

(R2) F190: Relative particle *what*. In many non-standard varieties (47%), the relative particle *that* is rivaled in frequency only by *what* (e.g., *This is the man what painted my house*, *people what got families …*, *It were Aggie what done the trouble*). *What* as a relative particle is quite a newcomer and has, for example, significantly spread in England since the 1950s (see Herrmann 2005).

(R3) F187–188: Much rarer than the two previous features are the relative particles *as* (attested in merely 6 out 76 varieties of English worldwide; for example, *He was a chap as got a living anyhow, one chap as lived next door to us …*) and *at* (possibly just a phonological variant of *that* due to *th*-dropping; attested in 10 varieties). Both features are almost exclusively found in the United States and the British Isles, but are strongly receding.

(R4) F192: Use of analytic *that his/that's* or *what his/what's* (rarely: *at's*, *as'*) instead of *whose* is another fairly rare feature (24%), as in *The man what's wife has died, The chap what's house got burnt down*.

(R5) F193: Gapping (or: zero-relativization) in subject position. In Standard English, the omission of a relativizer is possible only for the object position (as in *The man ___ I saw …*, *The man ___ I gave the book to*). In non-standard varieties and spontaneous spoken English, gapping is possible in the subject position, too, especially in existential/presentational *there*-sentences (e.g., *There's a lot more children___ go these days*, *There was one or two people ___ made their living by this*), *it*-clefts (e.g., *I'll not say it was myself ___ was cause of this*, *It was the Common Market ___ done it*) and with definite head noun phrases (e.g., *The man ___ lives there is a nice chap, He was the boy ___ could have opened her up*). But this strategy is certainly not restricted to these three syntactic environments, as the following example shows: *And he had a lot of wooden traps ___ was set with a string*. Gapping in subject position is attested in 61% (46 out of 76) of the varieties in the eWAVE data set.

(R6) F194: Resumptive (or: shadow) pronouns (e.g., *This is the house which I painted* it *yesterday, they'd put a couple in the old anchor boat what we weren't using* it): Resumptive pronouns, attested in about half (47%) of the world's varieties of English, seem to be used especially in complex relative clauses like *They sold this and some at Cary and I jumped in and bought this, which I were lucky in a way to get* it (Southwest England).

In the domain of complementation, only the following two fairly widespread tendencies can be observed.

(C1) F227: Inverted word order in indirect questions, that is, the same word order in embedded and non-embedded interrogatives (e.g., *I'm wondering what are you gonna do, He asked me had I seen his daughter, I asked would there be a party*). This is typical for the Celtic Englishes, Orkney and Shetland English, but also for a considerable number of varieties of English in other parts of the world (e.g., Newfoundland English, urban African-American vernacular English, Surinamese Creole, South African English, Pakistani English) and spontaneous spoken English in general. In fact, Kortmann (2019, p. 652) considers this feature a top candidate for making it into the future global standard of English.

(C2) F202: In infinitival purpose clauses ("in order to"), about a third of all varieties of English (especially the Celtic Englishes) use unsplit *for to*, as in *We always had gutters in the winter time for to drain the water away*.

Less frequently found phenomena within the domains of complementation and adverbial subordination, attested only for individual varieties or very small sets of varieties, include unusual complementation patterns for individual verbs (e.g., in Irish English a wider range of verbs can be followed by a bare infinitive than in Standard English, as in *She allowed him stay out late*), or the special use of prepositions and/or subordinators in adverbial clauses (e.g., *till* "(in order) to," *from* "since," *whenever* "when (punctual)," *the time* (*that*) "when" in Irish English, or *while* meaning "until" in the central and northern dialects of England).

16.7 General Patterns and Tendencies

In this section, the grammatical phenomena described above will be looked at and interpreted from different perspectives. Each perspective by itself and, certainly, all perspectives taken together will show what makes syntactic variation so fascinating to study, and what it can contribute to a wide range of central issues in the study of language and the development of linguistic theory.

16.7.1 Conservativeness versus Innovation: Non-Standard Features Spreading to the Standard

The study of syntactic variation in non-standard varieties offers at the same time a look at the past and the future. On the one hand, non-standard varieties exhibit conservative features as found only in earlier periods of the English language and no longer in present-day Standard English. Examples include many morphological forms (e.g., irregular verb forms (VP1), *a*-prefixing (VP2), pronouns like *thou*, *thee*, *thy*), the *be*-perfect along with the *have*-perfect (T4), unsplit *for to* (C2), the relative particles *as* and *at* (R3), or the so-called Northern Subject Rule (A7), which can be traced back to the thirteenth and fourteenth centuries and whose regional distribution in present-day England is largely the same as in late Middle English. In many cases, of course, the relevant features are not used exactly in the same way as they were in previous periods; from their historical sources they developed their own life and developed in new directions. This is characteristic especially of contact varieties and transplanted Englishes. Many pertinent examples could be given from pidgins and creoles (for instance, from the tense and aspect domain, as illustrated for *do* in (T5) and (T6) above), which in the

course of their development have often expanded the syntax of their non-standard founder varieties (cf. Schneider 2000, on the role of diffusion and, especially, selection in the evolution of new Englishes).

So even where existing features of non-standard syntax and morphosyntax can be traced to earlier periods, there is often an element of innovation involved (cf. also Klemola 2002). It is the innovative aspects of non-standard syntax, that is, where we can observe innovations not observable in earlier and, especially, the present-day standard varieties, which will be addressed in the present section. More exactly, the focus will be on the question which, or rather what kinds of, grammatical features stand a chance to spread from the non-standard to the standard in the future (spreading first to the spoken, ultimately perhaps to the written standard; see also Chapters 15 and 28). As is well known in historical linguistics, spoken language is the motor of language change. Roughly, four broad classes of very widespread features of non-standard syntax may be distinguished (for details cf. Kortmann 2004b; for the potential US impact on the future shape of the grammar of spontaneous spoken global (non-) standard English, see Kortmann 2019).

(A) Pervasive features on a global scale, operating below consciousness (i.e., with a relatively broad social acceptance, at least in informal/spontaneous spoken English): for example, development of the progressive into an imperfective (T1), use of *would* in *if*-conditionals (T9), weakening and ultimately disappearance of the grammaticalized opposition between the present perfect and the simple past (T3), *never* as past tense negator (N4), *there's* + plural noun phrase (A3), further spread of *that* as relativizer (R1), non-reflexive *myself* (P5), *she/her* used for inanimate referents (P4), possibly even the reintroduction of a distinct second-person plural pronoun (P2).

(B) Pervasive features on a global scale, operating above consciousness (i.e., with some stigma associated with them): for example, multiple negation (N1), *ain't* (N2), relativizer *what* (R2), copula deletion (A4), and most of the phenomena leading to the loss of subject–verb agreement described in Section 16.5.

(C) Supraregional features (within individual parts of the English-speaking world), operating below consciousness: for example, for the British Isles *was stood/sat* for the progressive "was standing/sitting" (see T 10), marked word order in double object constructions involving two pronominal NPs (*Give me it*, *please*; cf. Cheshire et al. 1993, pp. 73–75; cf. Gerwin 2014, for ditransitives in British English dialects); invariant tag *isn't it* or *innit* (N7).

(D) Supraregional features (within individual parts of the English-speaking world), operating above consciousness: for example, completive or perfective *done* (North America; see T6).

Of these four classes, A and C stand the greatest chance of providing candidates for a future (at least spoken) standard, at least in a given part of the English-speaking world. These are the classes with those features which have the widest regional and social spread. By contrast, for the members of classes B and D, a spreading into the standard is much less likely. Regardless of how widespread across non-standard varieties, frequent and entrenched in spontaneous spoken English they may be, many of these phenomena are simply highly stigmatized.

Although they are "familiar to native speakers of English as are the features that are normally considered to be typical of standard English," as Cheshire et al. (1993, p. 83) state for the set of 13 currently most widespread grammatical features in British urban dialects (1993, pp. 63–64), the majority of these will probably not make it beyond what the authors call a "'standardizing' non-standard variety of English" (1993, p. 82).

Independent of which of the earlier-mentioned features will ultimately make it into the (spoken, perhaps even written) standard in the course of the next decades and centuries, an interesting question will be to what extent class A and C members will also find their way into International English, whose standard will increasingly be determined by non-native (second or foreign language) speakers of English.

16.7.2 Regularity, Consistency, Analyticity, Complexity

When leaving aside idiosyncratic features restricted to individual varieties, and looking rather at widely documented syntactic (and morphological) properties, it turns out that there are quite a number of domains of grammar which justify saying that non-standard varieties of English exhibit a higher degree of regularity and consistency (e.g., in terms of a higher degree of analyticity) than Standard English does.

16.7.2.1 Regularization

Of the features mentioned in the five sections of the descriptive part of this chapter, the following exhibit a higher degree of regularization in morphology (typically resulting in a higher degree of simplification):

(VP1) irregular verbs (e.g., normally fewer and/or leveled irregular verb forms compared with Standard English); (A2) inflectional paradigms in the present tense: for example, *have*: in many dialects either in all persons (singular and plural) *-s* (e.g., *I has*, *you has*) or no *-s* (e.g., *he have*); (P3) formation patterns of reflexives: most English vernaculars consistently use possessive pronoun + *self/selves* (e.g., *hisself*, *theirself/-ves*), and not the mixed system of Standard English using partly possessive pronouns (*myself*, *yourself*) and partly the object forms of personal pronouns (*himself*, *themselves*); negation strategies and negative markers (invariant *ain't* (N2), *don't* (N3)).

16.7.2.2 Consistency

A more consistent use of analytic constructions can be observed, for example, in those varieties that mark possession with the help of analytic (instead of case-marked) forms (e.g., in relative clauses *what his/what's* or *that his/that's* instead of *whose* (R4)), and in all those (admittedly much rarer) varieties making use of *do*-periphrasis in affirmative statements (recall T5 in Section 16.3.1). In the relevant varieties (e.g., those in Southwest England), the unemphatic *do* is on its way toward an analytic alternative for coding events in the (inflectionally marked) present and past tenses.

But in another respect, too, *do*-periphrasis in these non-standard varieties of English is an instance of a higher degree of consistency: in addition to the Standard English use of *do* as an analytic tense marker in questions, negative statements/questions/imperatives, and emphatic statements, *do* here is also used in unstressed affirmatives, that is, an important syntactic constraint on *do*-insertion in Standard English has gone. Further examples of a higher degree of consistency in non-standard varieties include the following: (R5) gapping (or: zero-relativization) in object and (!) subject position; (C1) subject–verb inversion in normal and (!) embedded interrogatives; (A6) *was-* or *were*-generalization (in some varieties involving the remorphologization of this distinction described in (N6)); (A8) loss of subject–verb agreement in negative sentences: the result is a grammar that is more consistent in the sense that in non-standard varieties no negative auxiliary shows agreement, whereas Standard English has some auxiliaries with agreement (*have*, *be*, *do*) and some without (i.e., the modals; cf. Hudson 2000, p. 211). In general, together with the pronounced tendency to make greater use of analytic constructions, the loss of subject–verb agreement definitely is

the most far-reaching property of dialects in terms of consistency. Just recall the bundle of features discussed in Section 16.5, all of which have in common that they either abolish or at least considerably weaken subject–verb agreement.

16.7.2.3 Complexity

Analyticity as opposed to syntheticity has also played a major role in the revival of the so-called complexity debate in (especially typological) linguistics since the early 2000s (for a survey of the relevant research literature, cf. Kortmann and Schröter 2019). This debate focuses on the equicomplexity claim first formulated in the mid-twentieth century according to which the structures of all languages are, on balance, equally complex, and that, on comparing the overall complexities of languages with each other, one will find a trade-off between individual subsystems of grammar, such that greater complexity in one domain will typically be balanced by less complexity (or: greater simplicity) in another structural domain of the same language. Meaningful contributions to this debate can of course only be made when operating with objective, falsifiable complexity metrics, which can be applied to the comparison of different languages. For the development and testing of such metrics, it may however be advantageous to design and apply them first to different varieties (and variety types) of the same language. Exactly this approach was adopted some 10 years ago (cf., e.g., Kortmann and Szmrecsanyi 2009; Szmrecsanyi and Kortmann 2009b) when developing frequency-based metrics for different kinds of morphological and syntactic complexity (overall grammaticity, analyticity, syntheticity, transparency) and making use of them in large-scale comparative quantitative studies on survey data (such as in eWAVE, Kortmann and Lunkenheimer 2013) and natural data (such as those from the ICE, *International Corpus of English*, family) available for a wide range of varieties of English around the world. Among the major outcomes of this novel line of research on morphosyntactic variation in English are the following: (i) The degree of (language and dialect) contact correlates inversely with the degree of what has sometimes been called *ornamental rule complexity*, that is, the number of features in a variety or language that adds contrasts, distinctions, or asymmetries without providing a communicative or functional bonus (e.g., the *be* perfect vis-á-vis the *have* perfect): low-contact varieties, such as traditional L1 dialects, exhibit a significantly larger number of such features compared with high-contact L1 varieties, indigenized L2 varieties, and English-based pidgins and creoles. (ii) There is no (!) trade-off to be observed within each of these four variety types once it comes to analytic versus synthetic marking of grammatical information or distinctions: L1 varieties (traditional dialects, in particular) exhibit simply a significantly higher degree of grammatical marking overall (measured in terms of text frequency; so-called *grammaticity*), and this marking may be synthetic or analytic, while indigenized L2 varieties exhibit considerably low(er) grammaticity levels, again both as regards synthetic and analytic marking (cf. Szmrecsanyi and Kortmann 2012, pp. 14–18).[9]

16.7.3 Syntactic Variation in English from a Typological Point of View

The role that the study of morphological and syntactic variation across varieties of Englishes has come to play in the complexity debate is a first illustration of how cross-varietal and cross-linguistic studies (in other words: how a modern conception of dialectology and language typology) can complement and cross-fertilize each other. From a typological perspective, which has been strongly pushed by the present author over the past two decades and has led, among other things, to the instructive textbook by Siemund (2013), three points are

worth noting when looking at variation in the syntax of non-standard varieties of English. First of all, several of the grammatical features mentioned in the previous sections are typologically very rare, or have at least only very rarely, if at all, been described in the typological literature. This applies, in particular, to the Northern Subject Rule (A7) with its type-of-subject and position-of-subject constraints on subject–verb agreement, to the grammaticalization of *do* as a tense and aspect marker (T5 and T6), and to a phenomenon variously known as *gendered pronouns*, *gender animation*, or *gender diffusion* (P4; cf. Wagner 2005; Pawley 2004; Siemund 2008). The latter relates to a semantic gender system which is sensitive to the mass–count distinction such that *it* is used only for mass nouns (e.g. in *Pass the bread–it's over there*) and count nouns take *he* (e.g., in *Pass the loaf–he's over there*; *My car*, *he*'s *broken*) unless they refer to female humans, in which case *she* is used. This assignment of animate gender to inanimate nouns is largely restricted to Germanic dialects. Among varieties of English, gender systems of this kind have only been observed in the English Southwest, Newfoundland, and Tasmania.

Second, in quite a number of cases, the grammars of non-standard varieties are typologically "more well-behaved" than Standard English, in that they follow a majority pattern in the world's languages or conform to cross-linguistic tendencies where Standard English does not. Relevant examples include the following: in the domain of tense and aspect, the increasing loss of the (typologically rare) sharp division between the present perfect and simple past (T3) as well as the development of the progressive into an imperfective (T1). In the domain of negation, non-standard varieties of English follow a frequent pattern in the European and the world's languages in permitting multiple negation (N1). In Europe, for example, only the standard varieties of the Germanic languages do not allow sentence negation to co-occur with negative quantifiers. Another pervasive feature of non-standard varieties, namely, the use of invariant negative markers such as *ain't* (N2) and *don't* (N3), appears in a different light, too, when looked at from a cross-linguistic point of view. To start with, obligatory auxiliaries like *don't/doesn't/didn't* in Standard English are an absolute exception in Europe. Apart from English, only Finnic languages exhibit a similar feature, namely, inflected negative verbs or auxiliaries literally meaning "to not." In these exceptional languages, however (for example, in Estonian), these verbs or negative auxiliaries tend to develop into invariable negation markers. This is exactly the development that led to the spreading use of *don't* as the invariable negated auxiliary for all persons in the present tense (including *he/she/it don't*) and of *ain't*, which does service for *haven't*, *hasn't*, (*amn't*,) *aren't*, *isn't* (cf. Anderwald 2002, pp. 169–170). Furthermore, the invariant negation markers *ain't* and *don't* are in full accordance with the powerful typological concept of markedness: as was found for many languages, morphological distinctions tend to be reduced under negation. With regard to the three features mentioned for *ain't* under (N2), what is additionally noteworthy from a typological perspective is that they exhibit partly even perfect implicational relationships (see Szmrecsanyi and Kortmann 2009a, pp. 1647–1649). There is an almost perfect (94%) biconditional implication holding between *ain't* for *be* (F155) and *ain't* for *have* (F156): 94% of the varieties of English around the world either have both of the features or none of them. Moreover, a perfect one-way implication holds between these two features and *ain't* as a generic negator before a full verb, that is, *ain't* for *don't/doesn't/didn't* (F157): only such varieties possess the latter feature, which also have F156 and F155. This can be (and has been: Anderwald 2002, p. 48) interpreted as reflecting a diachronic change, with F157 representing the latest step in the evolution of invariant *ain't*.

The gapping (or zero) strategy in relative clauses may serve as a last example where Standard English is the odd one out in light of typological principles, whereas the non-standard varieties are in full accordance with them. As was pointed out in Section 16.6,

Standard English allows gapping only in object position (*The man ___ I saw*), whereas it is a pervasive feature of non-standard varieties to allow gapping also in subject position (*It ain't the best ones ___ finish first*). In doing so, they conform to one of the central constraints on one of the most famous hierarchies in functional typology, namely, the noun phrase accessibility hierarchy formulated for relative clauses: subject > direct object > indirect object > oblique > genitive > object of comparison. According to this hierarchy, if a language can relativize any NP position further down on the hierarchy, it must also be able to relativize all positions higher up, that is, to the left of it. This constraint is supposed to apply to whatever relativization strategy a language employs. For the gapping strategy, Standard English evidently fails to conform to this constraint, whereas the non-standard varieties do.

When contrasting the syntax of Standard English with that of non-standard differences, a third relevant issue from a typological viewpoint is that, in individual domains of grammar, English would qualify as a different language type if the majority pattern found in the non-standard varieties was taken to represent "the" English language. Two examples may suffice. As mentioned earlier, the dominant relativization strategy in non-standard varieties is the use of relative particles (e.g., *that*, *what*), that is, uninflected relativizers; in typological accounts, however, English is classified as a language using predominantly relative pronouns (i.e., case-marked relativizers like *who* and *whom*). Another striking example is the pervasive loss of subject–verb agreement in non-standard varieties documented in Section 16.5, Indeed, they seem to be on their way toward a system as known from the continental Scandinavian languages. And yet, in a recent typological survey of the European languages, English is classified as a language with strict subject–verb agreement, in contrast to Norwegian and Swedish (cf. map 107.11 in Haspelmath 2001, p. 1500).

What has been said above about syntactic variation in non-standard varieties of English (and could be said for non-standard varieties in many other languages, too) raises important methodological issues in language typology. In what way, for example, may, or even should, our knowledge of widespread properties of and pervasive tendencies in syntactic variation in non-standard and spontaneous spoken varieties of English influence the views of English as a language type commonly entertained in language typology? This question is relevant for judgments in typological research concerning individual subsystems of English grammar when compared with a large number of languages across the world, such as the language type English represents with regard to relativization or complementation strategies, or ways of marking agreement, negation, tense, and aspect. In many of these domains of grammar, a vast range of spontaneous spoken and non-standard varieties differ quite markedly from written Standard American or, especially, British English. And yet these standard varieties are taken to represent English in cross-linguistic comparison, just as, where relevant structural descriptions are available, it is generally the case that the standard (written) varieties are taken to represent "the" languages in typological research. In other words, this is a methodological issue of fundamental importance, all the more so since for many less well-described languages, especially those lacking a literary tradition, it is the spoken varieties that serve as the basis of typological observations, generalizations, and explanations (cf. Kortmann 2004c). The study of syntactic variation may thus serve as a corrective in language typology (cf. also Chambers's call (2004) for a new research program which he labels *variationist typology*). This has come to be acknowledged by a growing number of typologists, with the consequence that increasingly data from varieties of individual languages also find their way into typological studies (cf., e.g., contributions to Kortmann 2004c, or Siemund 2011).

16.7.4 Syntactic Variation and Linguistic Theorizing

One of the major reasons why at the turn of the twenty-first century the study of syntactic variation turned into a budding field was a broadening of the perspective taken in (broadly) formalist syntactic theories and, much less pronounced and considerably later, in functional approaches to syntax, especially in functional typology (see for example Black and Motapanyane 1996; Barbiers et al. 2002; Hudson 1999, 2000; Kortmann 2004c). No longer was it cross-linguistic variation only that mattered. Variation within individual languages, too, was increasingly attributed important theoretical significance. As a consequence, a strong need was and still is felt to improve the empirical basis for reliable descriptive generalizations and for drawing conclusions for linguistic theory.

In formalist linguistics, variation seriously started to matter with the advent of the principles and parameters approach in the 1980s, that is, the idea that universal grammar (UG) is an invariant system of highly abstract principles some of which, within a given language, permit at most a specified degree of variation. The (core) grammar of any particular language is considered to consist of these universal principles and the language-specific settings for a small number of parameters. The concept of parametric variation thus accounts for variation observable across languages. In the late 1980s, a crucial step was taken in generative studies from the study of parametric (more exactly, macroparametric) variation to the study of microparametric, that is, language-internal, variation. With regard to the further development of formalist theorizing, the study of microparametric syntax is expected to yield novel insights into the form and range of syntactic parameters, as well as into the effects which variation along a single parameter may have. It is also argued that it needs to be taken into consideration in "studies of language acquisition based on that theoretical model" (Henry 2002, p. 280), just as so-called *vernacular universals*[10] may help illuminate the innate set of rules and representations hypothesized to constitute the human language faculty (cf. Chambers 2004, p. 129). For a long time, research on microparametric syntax was strongest in Italian and Dutch linguistics, but after very modest beginnings (cf. Henry 1995, 2002) this approach is now more firmly established in English linguistics, too (cf., e.g., Trousdale and Adger 2007, on British dialects and the impressive studies on microsyntactic variation in North American dialects by Zanuttini and co-authors: Zanuttini and Horn 2014, Zanuttini et al. 2018; also visit https://ygdp.yale.edu).

16.8 Conclusion

The present chapter aimed to show what makes the study of syntactic variation within a single language (here: English) such a fascinating field of research, especially when adopting a global perspective. Since the publication of the first edition of this handbook in 2006, this field has literally exploded. And yet it still holds a huge potential for a wide range of issues in linguistics and linguistic theory. Everyone in English linguistics, from advanced undergraduate level onward, is invited to contribute to the various lines of research that the exploration of geographical or typological variation in the domain of grammar opens up.

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NOTES

1 FRED: https://freidok.uni-freiburg.de/proj/1 or https://fred.ub.uni-freiburg.de/
FREDDIE: http://www.anglistik.uni-freiburg.de/seminar/abteilungen/sprachwissenschaft/ls_kortmann/FREDDIE
DECTE: https://research.ncl.ac.uk/decte/

2 http://ewave-atlas.org. Note that this chapter is based on the 76 varieties in eWAVE 2.0. In 2020 eWAVE 3.0 was released: Kortmann et al. 2020; among other things it includes one variety more than eWAVE 2.0, i.e. 77 in all.)

3 For the most fine-grained corpus-based study to date of the functional diversity of personal pronouns across the L1 dialects of Britain, compare Hernández (2011). For a concise global survey on pronominal systems, see Wagner (2012).

4 For an areal survey of reflexive (and intensive) self-forms, see Siemund et al. (2012).

5 Major areal patterns in the anglophone world for tense and aspect are identified in Lunkenheimer (2012).

6 See Hansen (2018) for a monograph offering a corpus-based account of variation and change in the modal systems of Englishes around the world.

7 See Anderwald (2009) for a still unrivaled account of the patterns of regular and irregular verb morphology in the forming of past-tense forms and past participles in the English dialects of England and Scotland.

8 For negation, Anderwald (2012) identifies some major areal patterns across varieties of English around the world.

9 Compare Brunner (2017) for a book-length account of simplicity and typological effects in two New Englishes (Singaporean and Kenyan English), focusing on the structural domain of the noun phrase.

10 Chambers's (2004) notion of a vernacular universal has been interpreted differently in the literature, and has inspired a range of studies and typologies of generalizations concerning structural properties shared by (almost) all varieties of English, or at least (almost) all varieties belonging to the same type or anglophone world region, yielding additional terms like *angloversals*, *varioversals*, or *areoversals*. Cf., e.g., Sharma 2012, and especially the contributions to the volume edited by Filppula et al. (2009).

FURTHER READING AND HANDS-ON EXPLORATION

Kortmann (2019), Kortmann and Schröter (2017), the regional and typological profile chapters in Kortmann and Lunkenheimer (2012), the synopsis chapters in Kortmann et al. (2004), and as an easily workable data source and electronic tool in the undergraduate and graduate classroom for dialects of England, Scotland, and Wales: FREDDIE by Kortmann et al. (2019); as a counterpart for US American dialects: https://ygdp.yale.edu by Zanuttini and her team (2010–present). For English-based pidgins and creoles, cf. Michaelis et al. (2013b) as well as their excellent electronic *Atlas for Pidgin and Creole language structures online* (APiCS 2013a; http://apics-online.info).

For little known varieties of English, cf. the two volumes by Schreier et al. (2010) and Williams et al. (2019). It has also become standard in book-length descriptions of individual varieties of English to include substantial descriptions of their morphology and syntax, thus explore especially publications in series like *Dialects of English* (De Gruyter Mouton) or *Varieties of English Around the world* (John Benjamins). Increasingly useful for tracking down descriptions of and publications on individual varieties of English is *Glottolog* (http://glottolog.org; Hammarström et al. 2019).

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Section 3: Phonetics and Phonology

17 English Phonetics

JENNIFER NYCZ

17.1 Overview

Phonetics encompasses all the physical aspects of human language: how the sounds[1] of speech are articulated, how they are perceived, and their acoustic characteristics. Phonetics is usually distinguished from *phonology*, which deals with the more abstract mental representation of speech sounds (see Chapter 21 by Paul Foulkes in this volume). Insofar as speech is produced and perceived by human bodies, and all modern humans have more or less similar physiological characteristics (vocal tracts built a certain way, cochleas with a particular shape), all spoken human languages operate within the same phonetic space; within this space, however, there are many dimensions along which languages can vary.

Like "French," "Spanish," and other language names, *English* is a superordinate term encompassing many varieties that are more or less mutually intelligible, largely because they share (again, more or less) a lexicon and a grammar. At the same time, physiological variation, random drift, and the need to convey social distinctions result in extensive phonetic variation both across speaker groups and within individuals. This is perhaps especially true of English, a global language used by about 1.5 billion native and non-native speakers across diverse geographical regions and communities (Eberhard et al. 2019). For nearly all of the phonetic characteristics discussed in this chapter, there is arguably as much variation within English as there is between English and other, non-mutually intelligible languages. My goal in this chapter is to describe those phonetic features which are typically characteristic of English varieties, while also giving a sense of the phonetic diversity to be found within this language.

17.2 The Phonetician's Toolbox (for Studying English or any Language)

This chapter will provide detailed descriptions of how the sounds of English are produced as well as some of their salient acoustic characteristics. How do phoneticians acquire these descriptions? Many methods have been used to study speech production. These include technologies which directly track the movement of supralaryngeal articulators, such as electropalatography, X-ray microbeam, and electromagnetic midsagittal articulography (EMA), as well as technologies which produce images of the vocal tract for observation and analysis (x-ray, magnetic resonance imaging (MRI), and ultrasound). Ultrasound imaging has been particularly favored recently as a noninvasive method for obtaining relatively clear images

The Handbook of English Linguistics, Second Edition. Edited by Bas Aarts, April McMahon, and Lars Hinrichs.

of the tongue surface and movement (e.g., Davidson 2005; Lawson et al. 2013; Mielke et al. 2016). Other technologies have been adapted to study movements of the larynx and vocal folds (e.g., laryngeal endoscopy and the electroglottograph), nasal airflow (nasoendoscopy and nasal airflow masks), movements of the lips and face (video), and even reactions of the brain to phonetic stimuli (fMRI and magnetoencephalography[MEG]); for good introductions to some of these methods, see Gick et al. (2013).

Examining speech production directly using any of these technologies is logistically complex, and makes it difficult to observe natural speech of the kind that is most useful to understand how language varies within and across speakers. For this reason, phonetic variation in production is often studied indirectly, by analyzing speech acoustics. Using easy-to-access programs that run on one's personal computer, phoneticians can carry out analyses that use fast Fourier transform (FFT) or linear predictive coding (LPC) algorithms to decompose the complex sound waves associated with specific speech sounds into their component frequencies. The most prominent frequencies in a sound's wave reflect the resonant characteristics of the vocal tract as that sound was being produced, so we can use this information to reverse-engineer the articulations that gave rise to the sound, and even to compare fine-grained differences in articulation within or across speakers. To learn more about acoustic phonetics, consult Johnson (2011).

Studying the acoustic results of speech production is also important for understanding the *cues* that listeners might rely on in perceiving speech. Phoneticians can then design experiments to study speech perception and the various factors that affect it. Much early work on speech perception focused on how listeners distinguish sounds from one another, where they put perceptual boundaries between sound categories, and how top-down factors (such as knowledge of the discourse context) affect identification of sounds (see Johnson 2011). Increasingly, laboratory phonologists and sociophoneticians are exploring how speech perception is influenced by social factors, and vice versa. Of course, listeners draw conclusions about the social identity of speakers based on the acoustic cues they perceive. But studies have also shown that perception of the sounds themselves is affected by information about the speaker (see Drager 2018, for an overview of methods used in such research). For example, category boundaries may shift depending on the perceived gender of a voice (Strand 1999) or what region a speaker is thought to be from (Niedzielski 1999), while ability to discriminate between sounds may be influenced by a speaker's perceived age or gender (Hay et al. 2006).

17.3 How Phoneticians Refer to Sounds

The sounds of language vary gradiently in a continuous phonetic space, and the instrumental tools of phonetics allow us to describe the fine articulatory and acoustic detail of specific utterances and their parts. Yet phoneticians must also have some way of referring to linguistically relevant classes of sounds to make meaningful comparisons both within and across languages. Most phoneticians use the International Phonetic Alphabet (IPA) for this purpose. While many orthographies, including that of English, are segmental and phonemic, they rarely feature perfect one-to-one correspondences between symbol and sound. The IPA was created to remove the ambiguity of any single natural language orthography while allowing phoneticians to capture all the segmental variations found in language (see Figure 17.1).

Sociophoneticians working specifically on language variation and change in English have developed additional conventions for referring to vowels in their work. A common system in use among British sociophoneticians is the Wells lexical sets (Wells 1982), which identifies historically coherent word classes using a set of keywords (Table 17.1). Studies of North

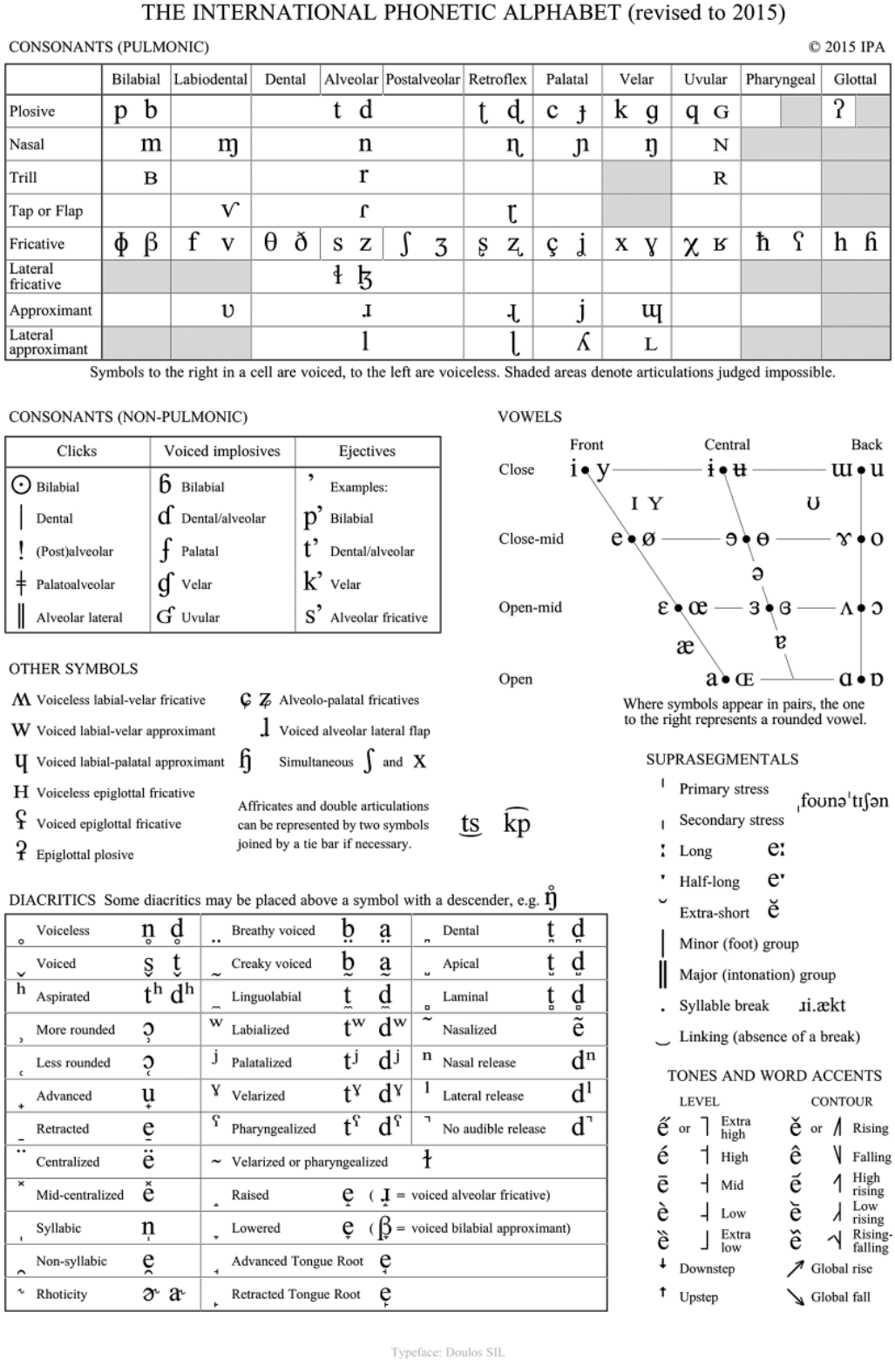

Figure 17.1 IPA Chart, http://www.internationalphoneticassociation.org/content/ipa-chart, available under a Creative Commons Attribution-Sharealike 3.0 Unported License. Copyright © 2015 International Phonetic Association.

Table 17.1 The standard lexical sets of Wells (1982) with typical realizations in received pronunciation and general American English (sets with * are typically realized with [r] only before another vowel).

Keyword	*RP*	*GenAm*	*Keyword*	*RP*	*GenAm*
KIT	ɪ	ɪ	THOUGHT	ɔː	ɔ
DRESS	ɛ	ɛ	GOAT	əʊ	o
TRAP	æ	æ	GOOSE	uː	u
LOT	ɒ	ɑ	PRICE	aɪ	aɪ
STRUT	ʌ	ʌ	CHOICE	ɔɪ	ɔɪ
FOOT	ʊ	ʊ	MOUTH	aʊ	aʊ
BATH	ɑː	æ	NEAR	ɪə*	ɪr
CLOTH	ɒ	ɔ	SQUARE	ɛə*	ɛr
NURSE	ɜː*	ɜr	START	ɑː*	ɑr
FLEECE	iː	i	NORTH	ɔː*	ɔr
FACE	eɪ	eɪ	FORCE	ɔː*	or
PALM	ɑː	ɑ	CURE	ʊəˈ	ʊr

Table 17.2 The binary notation (with keywords) used in Labov et al. (2006, p. 12) to represent the North American vowel system.

	Short		*Long*					
			Upgliding				*Ingliding*	
			Front Upgliding		*Back Upgliding*			
Nucleus	*Front*	*Back*	*Front*	*Back*	*Front*	*Back*	*Unrounded*	*Rounded*
High	i *bit*	u *put*	iy *beat*		iw *suit*	uw *boot*		
Mid	e *bet*	ʌ *but*	ey *bait*	oy *boy*		ow *boat*		oh *bought*
Low	æ *bat*	o *cot*		ay *bite*		aw *bout*	ah *balm*	

American English varieties, meanwhile, typically use a binary notation (e.g., Labov et al. 2006), which represents coherent word classes relevant in those varieties while also reflecting how individual sounds are related to others in phonological subsystems (Table 17.2). These two systems, which enable linguists to refer to sets of words that have changed or are currently changing their phonetic realization as a group over time, serve a different purpose from the IPA, which is used to notate actual phonetic realizations. For example, one may observe that the lexical set DRESS, or (e) in binary notation, is realized as [ɛ] by American English speakers from New Jersey but with something closer to [æ] by Canadian English speakers in Toronto.

17.3.1 How Speech Works

All speech production boils down to the same basic process: a sound is created somewhere along the vocal tract, then shaped by the particular configuration of the articulators to create the acoustic signal that is received and interpreted by listeners. This understanding of the mechanics of speech is known as the *source–filter theory* of speech production (Fant 1960; Lieberman 1984).

17.3.1.1 Airflow Mechanisms

Before there can be sound, however, there must be airflow. Airflow mechanisms are characterized in two ways: the location where the airflow is initiated and the direction of air movement. The vast majority of speech in any language involves air moving outward from the lungs on a controlled exhale, or a *pulmonic egressive* airstream mechanism. While it is also possible to produce intelligible speech with a *pulmonic ingressive* (inhaled) airflow, this seems to be rare in most dialects, reserved for isolated cases where pausing for an in-breath is undesirable (for example, when counting to oneself; see Catford 1977). That said, pulmonic ingressive airflow has been observed during brief assents or dissents (*yeah*, *aye*, *no*) in English dialects spoken in the Orkney Isles of Scotland (Sundkvist and Gao 2015) and in Newfoundland, Canada (Clarke and Melchers 2005).

Other airflow mechanisms are sometimes observed in the production of certain English consonants. *Glottalic* airstreams occur when air is moved out of or into the vocal tract via movement of the larynx with a closed or constricted glottis. In *glottalic egressive* sounds, the larynx moves up in the vocal tract, compressing the air contained between it and a closure higher in the oral tract; release of the oral closure results in a fairly intense release of pressure and the characteristic "popping" sound of *ejective* consonants. Ejectives sometimes occur as variants of the voiceless plosives, particularly at the velar place of articulation and in phrase-final position. For example, ejective [k'] has been observed in Glaswegian English (McCarthy and Stuart-Smith 2013), and in other varieties of Scottish English (Gordeeva and Scobbie 2011) and English English (Catford 1977; Ogden 2009).

Glottalic ingressive sounds, or *implosives*, involve a downward movement of the larynx and a constriction in the oral tract. When the oral constriction is released, air rushes into the vocal tract, creating a characteristic "swallowing" sound. While implosives have rarely been reported in English,[2] they may occur in the speech of certain individuals as allophones of voiced plosives, especially /b/ (see, e.g., Ladefoged and Johnson 2015, re: Carl Sagan, and Eddington and Turner 2017, on "cowboy B").

Finally, the sounds known as *clicks* are created using a *velaric ingressive* airstream. Clicks involve a complete closure made by the back of the tongue at the velum and a complete closure at some anterior point in the vocal tract; the tongue then lowers before the anterior closure is released, air rushes in to fill the vacuum, and a transient click sound is heard. Clicks may have paralinguistic or indexical function in varieties of English, conveying for example disapproval (the *tsk tsk* of a dental click) or a scholarly/intellectual identity (Bucholtz 1999; Benor 2004); they are also used in interaction management, to mark the start of turns or other transitions (Wright 2007; Ogden 2009).

17.3.1.2 Sources of Sound

Mere airflow out of or into the vocal tract is not enough to create sound; consider normal breathing, which may be all but silent. There are three major types of sound sources in speech. By far the most common is the laryngeal ***buzz***, resulting from regular vibration of the vocal folds; this sound source underlies all vowels, sonorant consonants, and phonetically voiced obstruents in English, and gives rise to the regular periodic waveforms associated with these sounds.

Speech-related ***noise*** is generated when a volume of air is forced through a passage that is too small to permit it to flow smoothly. The resulting turbulent airflow is characterized by an aperiodic waveform which looks and sounds similar to white noise; phoneticians call this acoustic/auditory effect *frication*, and it is the sound source underlying *fricative* consonants. Finally, there is the ***burst*** of closure and release: when a full constriction is made somewhere in the vocal tract, air pressure builds up behind the constriction; when the constriction is abruptly released, this results in a transient explosion of high intensity noise at many frequencies. This sound source underlies the oral *stop* or *plosive* consonants.

Multiple sound sources can be combined within a segment. For example, a voiced fricative like [z] involves both buzz from the larynx and noise from the turbulence created by the constriction at the alveolar ridge.

17.3.1.3 Shapers of Sound

Each of the sound sources described above gives rise to a complex waveform containing many frequencies. This complex wave is further shaped by the qualities of the *filter*, or the parts of the vocal tract located above or anterior to the sound source. The resonant qualities of the filter serve to amplify certain frequency components while dampening others, giving rise to a characteristic acoustic signal. All sounds are shaped by the configuration of the oral cavity, which is composed of active articulators (such as the lower lip and parts of the tongue) that move to form constrictions with passive articulators (upper lip, teeth, hard and soft palates). Lowering the soft palate or velum can also allow air flow through the nasal cavities, adding additional resonant characteristics which further shape the sound. Major articulators are shown in the midsagittal section pictured in Figure 17.2.

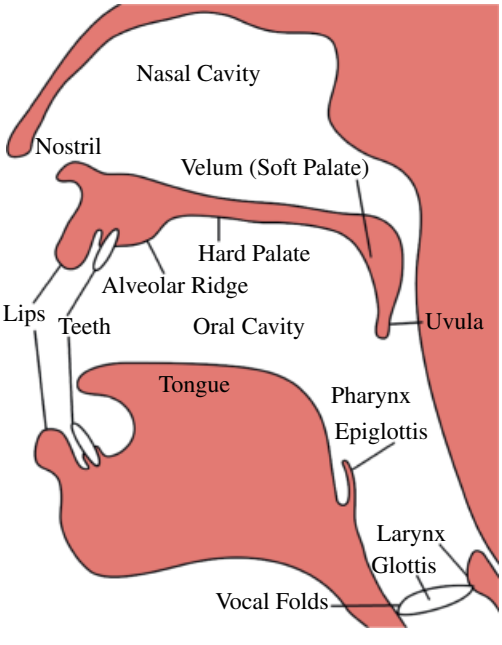

Figure 17.2 A midsagittal view of the vocal tract, with relevant articulators labeled. (The Ohio State University 2016).

17.4 The Timbre of English: Phonation Type and Voice Quality

As noted in the previous section, the main source of sound across languages is movement of the vocal folds in the larynx, the cartilage-filled structure which sits at the top of the esophagus. The precise manner in which the vocal folds move can vary, however, resulting in different *phonation types*. "Phonation type" is sometimes used interchangeably with the term "voice quality"; while phonation refers specifically to conditions of the larynx, voice quality is a more general term, also encompassing configurations of the supralaryngeal vocal tract which may audibly change the overall sound of speech (see Laver 1980). I consider each of these in turn.

The most common (and linguistically unmarked) type of vocal fold motion is known as *modal* phonation, and is characterized by a regular pattern of nearly complete vocal fold closure followed by opening, resulting in a smooth-sounding periodic sound wave (though just how regular modal vibration actually is will vary in practice across speakers, depending on idiosyncrasies of physiology). *Creak* (also known as *vocal fry*, especially in popular articles) involves the slow, irregular vibration of the anterior part of the vocal folds, with tight adduction of the artytenoid cartilages.[3] *Breath* occurs when a part of the length of the vocal folds is left open during the closure phase of voicing. Variation in phonation type is not used to contrast lexical items in English, but it is subject to complex contextual conditioning which reveals its interactional and socioindexical functions. For example, breathy voice is favored at the beginning of intonational phrases (Podesva 2011b), while creaky voice is favored in phrase-final position (Henton and Bladon 1985), suggesting that phonation provides an important cue in turn-taking. Breathy voice seems to be more common among women than men, perhaps ultimately for physiological reasons (Henton and Bladon 1985; Klatt and Klatt 1990), though creaky voice is increasingly associated with the young, upwardly mobile American women who are leading a more widespread change toward creak (Yuasa 2010). Indeed, recent research shows that the meanings associated with phonation type are complex and dynamic, with creak, breath, and other types used to index various aspects of gender, age, ethnicity, stance, and persona (Podesva and Callier 2015). Other phonation types which do not contrast lexical items in any language (as far as we know) are similarly used by (subgroups of) English speakers to index aspects of social identity or stance. Falsetto, for example, can be used by gay speakers to index a diva persona (Podesva 2007) or by African-American boys to express indignation (Nielsen 2010), while harsh voice may indicate a transient emotional state such as anger, or convey a more enduring "villain" persona by character actors (Callier 2012).

The configuration of the supralaryngeal vocal tract may also contribute to an overall impression of voice quality. While individual physiological differences determine much about the voice's timbre, some component of this variation may be learned and manipulated by the speaker for social ends. For example, while physical differences leading to generally greater airflow through the nasal cavity may lead some speakers to be perceived as having more "nasal" voices overall, nasality can also be consciously used by voice actors to construct non-threatening personas (Podesva et al. 2013). Other aspects of voice quality have been identified and used for voice identification purposes in forensic contexts (see Stuart-Smith 1999).

17.5 The Melody of English: Pitch and Intonation

One salient aspect of speech is that it is produced as a melody or series of pitches. Regular opening and closing of the vocal folds during voiced speech gives rise to a periodic waveform; the lowest frequency component of this wave (which corresponds to the rate at which

the vocal folds open and close) is known as the *fundamental frequency* (usually abbreviated F_0), and is the acoustic correlate of the perceived pitch.

Variation in overall pitch across speakers is largely determined by the size of the larynx and the flexibility of the vocal folds; men, who typically have longer and thicker folds than women, also tend to have lower overall pitches (Simpson 2009). At the same time, anatomical differences do not account for all pitch variation: differences are found between prepubescent boys and girls, who do not yet exhibit the physical differences underlying biological pitch differences (Graddol and Swann 1983), and differences between adult men and women are typically greater than those that would be expected from their actual physical differences. The magnitude of the gender difference, moreover, varies across languages, underscoring the social component of this feature (Yuasa 2008; Traunmüller and Eriksson 1995). Studies of American English speakers have observed a gender-based difference in mean fundamental frequency of about 90 Hz, with men averaging around 118 Hz and women around 210 Hz (Takefuta et al. 1972; Pepiot 2014).

Variation of pitch within speakers, whether within or across utterances, is known as *intonation*, and largely reflects the syntactic and semantic structure of the utterance. Intonational contours are more abstract than absolute pitches, and are usually described as sequences of relative units of H(high), and L(ow)[4]. Languages vary in the intonational contours they use for particular types of utterances. That said, it is difficult to identity aspects of intonation that distinguish English as a whole, given variation and ongoing changes across its dialects. For example, African-American English (AAE) speakers and "Mainstream American English" (MAE) speakers use boundary tones differently in yes–no questions and declaratives (Foreman 1999). Yet there is also intonational variation across speakers of AAE, depending on age, socioeconomic class, and idiolect (Holliday 2019). Similarly, there seems to be a shift in intonational contour toward "uptalk" in declarative statements for MAE speakers, led by young women but adopted by other groups of speakers for interactional purposes (e.g., Podesva 2011a).

17.6 The Rhythm of English

Another key contributor to the overall sound of a language is *rhythm*. Rhythmic characteristics of a language include speech rate, use of pauses, and relative timing of syllables.

Speech rate is usually measured in syllables per second, either excluding or including pauses. Within American English, speech rate has been shown to vary between regions (Jacewicz et al. 2009; Kendall 2013) and ethnic groups (Kendall 2013). Use of pauses themselves also varies. Cultural groups defined by region or ethnicity, for example, use different pause lengths in conversational contexts (Tannen 2000; Kendall 2013). Pausing may also vary within individuals according to context, influenced by one's social positioning in a given interaction or their cognitive state.

The most well-studied aspect of rhythm involves the relative time apportioned to adjacent syllables. English is typically considered a *stress-timed* language: it has syllables of varying length depending on stress, with unstressed syllables showing reduction in both duration and segmental quality. Canonical *syllable-timed* languages (such as Spanish), in contrast, show little to no reduction based on stress, so that stressed and unstressed syllables are realized with about equal length. Recent work has shown, however, that there are gradient differences in timing within English, with some varieties being more on the syllable-timed end of the continuum, often due to substrate or other language contact effects (see, e.g., Low et al. 2000, on Singapore English, Fought and Fought 2002, on Chicano English, Thomas and Carter 2006, on African American English, Coggshall 2008, on Eastern Cherokee and Lumbee Englishes, Torgersen, & Szakay 2012, on Multicultural London English). These studies

quantify rhythm by using some version of the pairwise variability index, which calculates the average difference in duration between adjacent syllables (Nolan and Asu 2009).

Rhythm may also distinguish members within a community; for example, English-speaking Puerto Ricans in Spanish Harlem may be more or less syllable-timed in their English depending on their social network composition and desire to leave or stay in Spanish Harlem (Shousterman 2014).

17.7 Vowels

Vowels are produced with a relatively open vocal tract and vary along a number of articulatory dimensions, including tongue height, tongue backness, configuration of the lips (rounded or spread), nasality (whether the velum is lowered, allowing airflow through the nose during vowel production), and position of the tongue root (advanced or retracted). Vowel trajectory may also vary: while *monophthongs* involve a fairly consistent lingual articulation throughout the duration of the vowel, *diphthongs* involve some change in tongue position.

In typological terms, English has a fairly large vowel system,[5] consisting of around 15 phonologically distinct sounds, depending on variety (Figure 17.3). English vowels are contrastive in four dimensions: height, backness, rounding, and tenseness, with the tense vowels in tense/lax pairs being realized in more peripheral positions in the vowel space; the tense/lax distinction, however, is more phonologically determined than phonetic. Vowel duration, while not itself contrastive in English, is an important secondary cue to quality distinctions.

Only three of these vowels—/aɪ/, /aʊ/, and /ɔɪ/, or the sounds used in the lexical sets PRICE, MOUTH, and CHOICE, respectively—are typically considered phonological diphthongs. However, the actual phonetic trajectory of these sounds and others varies across varieties of English. For example, /aɪ/ is variably realized as monophthongal /a:/ in Southern American dialects, while /aʊ/ is variably monophthongized by speakers in Pittsburgh (Labov et al. 2006). Similarly, while the mid vowels /e/ and /o/ are indeed realized as monophthongs by some speakers of Northern British English dialects (Wells 1982; Watt 2002), these vowels are realized as diphthongs ([eɪ], [oʊ]) in American English (Labov et al. 2006). In *non-rhotic* English dialects, post-vocalic r-vocalization in the NEAR, SQUARE, and CURE lexical sets can give rise to additional phonetic diphthongs (see, e.g., Bauer et al. 2007, on New Zealand English).

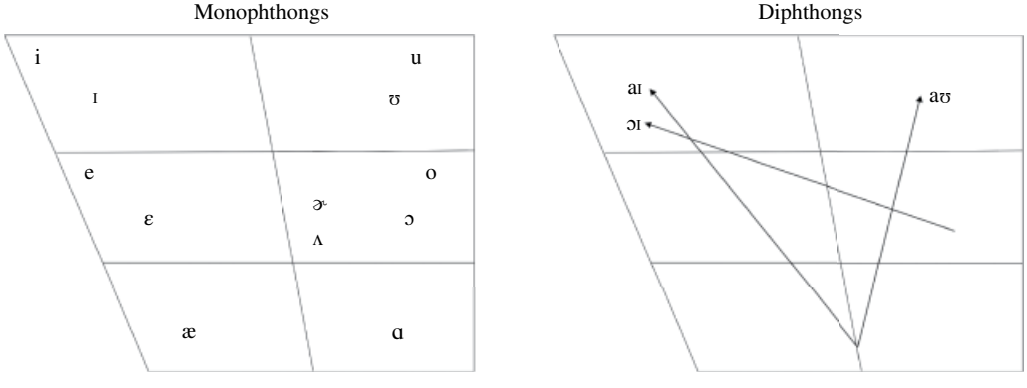

Figure 17.3 The monophthongs and diphthongs of American English.

Alongside the stressed monophthongs and diphthongs defined by their placement and/or trajectory in the two-dimensional vowel space, rhotic varieties of English may also have *r-colored* vowels. The canonical r-colored vowel is that found in the words *bird* [bɜˠd] and *hurt* [hɜˠt]: in these words, an essentially mid-central unround vowel also has a [r]-like gesture. When the vowel in this word does not have r-coloring, it is transcribed with the symbol [ɜ].

English also has a couple of vowels found in unstressed position. The default unstressed vowel is schwa [ə], a mid-central unround vowel which may in practice be realized over a wide area of the vowel space. Underlying full vowels which do not receive surface stress are typically reduced to schwa (compare *photograph* [ˈfoʊrəˌgɹæf] vs *photography* [fəˈtʰɑgɹəˌfi]), though there are also many surface schwas for which it is difficult to identity a "fuller" underlying form, as none ever appears in an alternation (e.g., as in *sofa*, *about*). Unstressed vowels in certain contexts (e.g., between alveolars) may be realized with a somewhat higher tongue position than the canonical central schwa; for these realizations, the symbol [ɨ] may be used to contrast such vowels with typical schwa, as in *roses* [ɹoʊzɨz] versus *Rosa's* [ɹoʊzəz] (Flemming and Johnson 2007). Rhotic varieties of English also have an r-colored unstressed vowel, appearing in words like *summer* and *ladder*; this vowel, called *schwar* [əˠ], is transcribed using the same rhoticity diacritic as the stressed central r-colored vowel.

In all varieties of English, vowels are subject to contextual variation, in that the quality of adjacent segments or the prosodic context of the vowel influences how it is realized. The alternation of full vowel qualities with schwa or some other reduced form is perhaps the most common. Co-articulatory processes, in which sounds take on some aspect of adjacent elements, are also common; for example, vowels in English are partially nasalized when appearing before nasal consonants (Cohn 1990). Vowel qualities are also highly affected by adjacent sonorant consonants: quality contrasts between neighboring vowels are often reduced before /r/ or /l/, for example, which probably accounts for the ubiquity of contextual mergers before these sounds in many varieties of English (Labov et al. 2006). Certain attributes of vowels may also be affected by adjacent obstruents. For example, vowels occurring after voiceless stops are typically realized at a slightly higher pitch than those following voiceless sounds (Silverman 1987). Vowel length is affected by the voicing of following consonants, with vowels being longer before voiced sounds; however, the degree of lengthening varies across varieties, as does the exact details of conditioning environment (see, e.g., Aitken 1981, on the Scottish vowel length rule).

Even for those varieties which share the same number of vowel sounds, there is wide regional variation in the phonetic position of these sounds, due to large scale and in many cases ongoing vowel rotations. These are often conceptualized as *chain shifts*, in which the movement of one vowel "pushes" or "pulls" another vowel out of place, with knock-on effects throughout the system. For example, the Canadian shift (also known as the "elsewhere shift," due to its increasing presence in other North American regions) involves the lowering and retraction of the front lax vowels in TRAP, DRESS, and KIT (Clarke et al. 1995), while the New Zealand shift moves in essentially the opposite direction: KIT retracts, while DRESS and TRAP raise (Watson et al. 2000). There is additionally evidence for a pan-regional set of parallel vowel changes involving the fronting of back vowels, which has been observed throughout the United Kingdom and North America (see Haddican et al. 2013, for a review). Of course, speakers within a region do not pattern totally uniformly—people vary in their degree of participation in local vowel shifts, in ways that can be traced to characteristics both social (gender, age, ethnicity, social class) and attitudinal (e.g., feelings about place).

17.7.1 Vowel Acoustics and Normalization

Vowel sounds (in English and other languages) are most often described in empirical work according to their acoustic characteristics. Regular movement of the vocal folds creates a

complex, periodic sound wave, while the position of the tongue in the mouth shapes the resonant qualities of the vocal tract, determining which frequency components of the sound are ultimately amplified or damped. The complex sound wave that results will thus have several *formants*, bands of frequencies with particularly high amplitude relative to other frequencies in the wave. Vowels are usually identified in terms of their first two formants, with the first formant reflecting (more or less) tongue height and the second formant reflecting tongue backness.

Of course, human vocal tracts vary in size and exact configuration, depending on gender, age, and other individual factors. Two tokens of the same [a] sound spoken by a large man and a small woman will have very different raw formant measurements. The human auditory and perceptual system unconsciously factors out differences due to physiology; a key methodological issue in phonetics is how to replicate this natural *normalization* of acoustic data so that raw measurements can be converted to values which reflect the differences and similarities actually perceived by listeners (Barreda and Nearey 2018) and used by both speakers and listeners to index social traits such as regional background, gender and ethnic identities, and other social group affiliation. Numerous normalization procedures have been proposed which vary in how much information they require and how well they reach the goals described here (see, e.g., Fabricius et al. 2009; Flynn and Foulkes 2011; Thomas and Kendall 2007 for comparisons of various methods).

17.8 Consonants

According to the World Atlas of Language Structures, English has an "average" number of consonantal phonemes, around 24 total with some dialect variation.[6] Consonants in English are chiefly identified by *place* of articulation in the oral tract, *manner* of articulation (which captures the degree of constriction made), and *voicing* (referring to the state of the larynx during, or in the vicinity of, the consonant).

Consonants are usually divided into two major classes. *Obstruents*, which in English include *plosives*, *fricatives*, and *affricates*, involve a substantial obstruction of airflow in the vocal tract. *Sonorant* consonants—which include *nasals*, *liquids*, and *glides*—are produced with a more open vowel tract.

17.8.1 Plosives

Like all languages, English has a series of *plosive* consonants. Plosives involve a full closure in the oral tract and a build-up of air pressure behind this closure, resulting in an "explosive" release. Linguists often use *plosive* and *stop* interchangeably when referring to this class of sounds, but *stop* is a more general term that also includes the set of *nasal* consonants[7].

English contrasts plosives at three places of articulation: the *bilabial* plosives [p] and [b] are made with a closure at the lips, the *alveolar* [t] and [d] involve a closure at the alveolar ridge, and the *velar* [k] and [g] are produced via a closure at the velum (soft palate). The two stops at each of these places are distinguished from one another phonetically by voice onset time, or VOT (Lisker and Abramson 1964). VOT is a measure that captures the timing of the onset of voicing (vocal fold vibration) relative to the release of the plosive closure. In some varieties of English, there is actual voicing during the closure portion of [b d g], which contrasts with a lack of closure voicing during [p t k] (see, e.g., Docherty et al. 2011, re: Scottish English); in such cases, the *voiced* plosives [b d g] can be described as having "negative VOT," while *voiceless* [p t k] would likely have a VOT that is slightly positive or close to zero. In most dialects of English, however, there is actually no vocal fold vibration during the plosive closure itself: for the sounds [b d g], voicing begins at the same time or immediately after the release of closure, while for [p t k], there is often a lag of 40 ms or more before voicing begins, resulting in audible *aspiration*.

English also has a single (voiceless, by physical necessity) *glottal* plosive [ʔ], created by a brief closure at the vocal folds. This sound appears in the phrase *uh oh*; it does not contrast with the other plosives in English, though it may appear as an allophone of /t/ in words like *button*.

English plosives exhibit a great deal of contextual variation conditioned by both linguistic and social factors. For example, while voiceless [p t k] are aspirated in stressed, syllable-initial position, they are typically unaspirated elsewhere; [b d g], while typically voiceless during the closure phase at edges of words, may be voiced between vowels. VOT has also been shown to vary according to factors like ethnicity, gender, and age (Ryalls et al. 1997; Docherty et al. 2011); there is well-documented ethnolectal variation in VOT depending on contact with and orientation to communities of speakers of true-voicing languages (e.g., Newlin-Łowicz 2014). Some British English varieties show pre-aspiration of syllable-final plosives, which manifests as a devoicing of the immediately preceding vowel (Docherty and Foulkes 1999). In word-medial position, plosives are variably glottalized in certain British varieties (Docherty and Foulkes 1999). After a stressed syllable, intervocalic alveolar /t/ and /d/ are lenited to *taps* or *flaps* (both represented with the IPA symbol [ɾ]), in North American varieties of English, and increasingly in New Zealand English (Hay and Foulkes 2016), while plosives at other places of articulation may weaken their closures to become fricatives. Plosives of all kinds may be unreleased, partially lenited, or deleted in word final position or before other consonants; the details of such reduction vary systemically across varieties and show fine-grained phonetic, phonological, and morphological conditioning, making this phenomenon the focus of much sociophonetic research (for studies of t/d deletion specifically, see, e.g., Guy 1980, on Philadelphia and New York dialects; Santa Ana 1992, on Chicano English; Tagliamonte and Temple 2005, on York (British) English). Plosives also show minor variation in place of articulation due to coarticulation; for example, alveolar plosives are typically produced with a more dental articulation before interdental fricatives, while velar plosives are realized with a fronter articulation before the high front vowel /i/.

17.8.2 Fricatives

English also has a number of fricatives at various places of articulation. Fricatives result when articulators come close enough together that air flow through the narrow aperture becomes turbulent, resulting in frication noise. In most varieties of English, this happens at five places of articulation: *labiodental* (where the upper teeth meet the lower lip, for [f] or [v]), *interdental* (tongue tip between teeth, for [θ] and [ð]), *alveolar* (where the tongue tip may be pointed up or down, very near to the alveolar ridge, for [s] and [z]), *post alveolar* (the tongue blade comes close to the hard palate, for [ʃ] and [ʒ]), and *glottal* (air flows noisily through an open glottis, for [h]). Like the plosives, each of the (non-glottal) pairs is distinguished by voicing, though for fricatives the voicing contrast can be detected during constriction. Some speakers of Scottish varieties maintain a voiceless velar fricative [x] in words like *loch*, though this sound seems to be marginal within those dialects' phonologies (Scobbie and Stuart-Smith 2008). In speakers who maintain a distinction between words like *which* and *witch*, the voiceless *labiovelar* [ʍ] is often realized as a fricative.

Like stops, fricatives may also vary according to linguistic and extralinguistic contexts. Voiced fricatives often partially or completely devoice in coda position (Haggard 1978). Voicing also varies in particular words or prosodic contexts, with possible regional conditioning; some speakers variably voice the final interdental in the word *with*, for example, depending on following segment, while words like *greasy* vary according to region (Atwood 1950).

Fricatives produced at marked places of articulation may also vary in place or manner depending on dialect; the interdentals [θ ð] are especially apt to undergo some "repair" toward a less-marked segment. For example, New York City English exhibits variable [θ ð]

stopping (Labov 1966), so that words like *these and those* are pronounced *dese and dose*, while Multicultural London English has [θ ð] fronting, so that the word *thing* might be realized as *fing* (Cheshire et al. 2013). These repair processes are also common in L2 speakers of English, with the specific repair depending on the grammar of the L1 (Lombardi 2003).

17.8.3 Affricates

Affricates are in some sense like a sequence of a stop and a fricative, with a brief closure followed by a short period of narrow opening at the same place of articulation, but the sequence patterns as a single segment. English has two affricates, one voiced and one voiceless, at the postalveolar place of articulation—the [dʒ] in words like *judge* and the [tʃ] in words like *church*.

Affricates seem to be understudied relative to stops and fricatives, but there is some evidence that these sounds may also vary according to linguistic and social factors; for example, speakers of Mexican-American English may realize affricates as fricatives in certain contexts, with the likelihood of doing so correlated with age (Thomas and van Hofwegen 2019). "Phonetic" affricates may also occur as allophones of plosives in certain varieties of English (see, e.g., Honeybone 2001, on Liverpool English).

17.8.4 Nasals

English has three nasal consonants, made at the same three places of articulation as the oral plosives: bilbial [m], alveolar [n], and velar [ŋ]. These are produced in the same manner as the obstruent stops in the oral tract, though for each of these sounds the soft palate is lowered, allowing air to escape through the nasal passage. All nasal consonants are phonemically voiced, though may devoice in certain contexts, for example, after a word-initial [s] in words like *smile*. Coda nasals show contextual variation, sometimes assimilating in place to a following obstruent consonant; many speakers realize an underlying coronal nasal as labiodental before labiodental sounds (as in *i[*ŋ*]formation)* or a dental before interdental fricatives (as in *te[*n̪*]th*).

17.8.5 Approximants

The non-nasal sonorant consonants in English, which do not involve a full obstruction of airflow in the oral tract, are known as *approximants*. The approximants in (most varieties of) English comprise two *liquid* consonants, /l/ and /r/, and two *glides*, /w/ and /j/. The liquids are produced with complex, vowel-like articulations. Approximant [ɹ] (see discussion below for tapped and trilled rhotics) varies in its articulation both within and across dialects. The most common basic articulations in American English are *bunched*, involving a bunching of the tongue body, and *retroflex*, in which the tongue tip is curled back (Mielke et al. 2016); the choice of variant seems to be idiolectal rather than dialectal, with many American speakers using both or combinations of the two articulations. In Scottish English, however, [ɹ] articulation shows clearer social stratification, with working class speakers preferring tongue-tip and tongue-front-raised variants while middle class speakers favor bunched [ɹ] (Lawson et al. 2013). Many dialects also show secondary rounding on onset /r/; for some speakers in southeast England, this tendency is advanced enough to give rise to an auditory distinct labiodental variant (Foulkes and Docherty 2000). Variation in the realization of coda /r/ is a noted feature distinguishing regional varieties of English: most varieties of North American English are rhotic, while many English, Australian, and New Zealand varieties are non-rhotic, either vocalizing or deleting /r/ in coda position. For varieties showing variable rhoticity (including, famously, New York City (Labov 1966), the frequency of realized coda is conditioned by numerous social and stylistic factors (Labov 1966, Becker 2014).

The lateral approximant /l/ is defined by the movement of the sides of the tongue, where one or both sides lower to allow airflow. Otherwise, two main lingual gestures constitute the lateral consonant in English: raising of the tongue body to approximate the soft palate and raising of the tongue tip to touch the alveolar ridge or thereabouts. It is the relative timing and the magnitude of these gestures that underlie both positional and social variation in /l/. When the tongue tip gesture and the tongue body gesture are both realized fully and happen at roughly the same time, the percept of a "light" or "clear" [l] is created; this [l] tends to occur in onset position (before vowels) in American and other varieties of English. When the tongue body gesture occurs first or is of greater magnitude, a "dark" [ɫ] is realized; this allophone is characteristic of coda positions. Dialects of English vary, though, in the overall lightness or darkness of their /l/s; Scottish English, for example, tends to have darker laterals regardless of position (Johnston 1997; Stuart-Smith et al. 2011), while the English spoken by Mexican-Americans is often marked by lighter laterals (Thomas and van Hofwegen 2019). If the tongue tip gesture is sufficiently reduced in coda position, this may give rise to the percept of l vocalization or deletion, a feature which has been observed in varieties of English in the United States (Ash 1982; van Hofwegen 2010), the United Kingdom (Wright 1989; Hardcastle and Barry 1989; Stuart-Smith et al. 2006), and Australia and New Zealand (Borowsky and Horvath 1997; Horvath and Horvath 2002).

The glide consonants /w/ and /j/ are produced with the least amount of constriction. Indeed, they are the consonant versions of the high vowels /u/ and /i/, respectively, produced with slightly more constriction and appearing in the onset or coda of syllables rather than as nuclei. The labiovelar [w] is produced with loose constrictions at both the lips and the velum, while the palatal [j] involves approximation of the tongue body toward the palate. Glides are associated with some regional variation in English; for example, word-initial /h/ before /j/ in words like *huge* is variably deleted by older speakers from the New York region.

17.8.6 Taps and Trills

Finally, there are a set of sounds which appear as allophones of other sounds in various English dialects. The *tap* or *flap* sound, represented as [ɾ] in IPA, is created when the tongue tip briefly and ballistically taps or flaps against the alveolar ridge. In varieties of North American English, taps/flaps appear as allophones of the alveolar stops /t/ and /d/ (in words like *latter* and *ladder*); these variants are also starting to appear in other varieties of English around the world (Hay and Foulkes 2016). In Scottish English and some varieties of English, taps appear as allophonic variants of the rhotic in words like *very* or *brood* (Stuart-Smith 2008). *Trills* (represented with [r]) sound very much like a series of taps (and look like taps, acoustically), but their articulation is quite different: while taps are driven by muscular motion, trills are aerodynamic events which result when the airstream allows the tongue tip to "flap in the breeze." Trills are less common across varieties of English; they also appear in some varieties of Scottish English as variants of rhotic /r/, though this use seems to be waning (Watt et al. 2013).

17.9 Future Research

Much is known of the broad outlines of phonetic variation in English, particularly about the English spoken in "inner circle" countries by native speakers. As this chapter has attempted to sketch, however, there is wide variation both across and within even large standardized varieties of English; every variety is a moving target, and tracking these changes and variations between speaker groups will continue to be a rich source of research questions. There is also increasing work on how this variation is learned and realized by speakers of English as an L2 or L3 (e.g., Fox and McGory 2007; Drummond 2010; Ferragne and Pellegrino 2010),

unsurprising as English is a global language. These two strands come together in the study of variation within contact varieties in urban centers such as Multicultural London English (Cheshire et al. 2011). All of these areas, of course, will need to continue to focus on the social indexing of phonetic variation to ultimately account for the patterns found.

NOTES

1 Signed languages such as American Sign Language (ASL) also have phonetics, though these are realized through the manual-visual channel (see e.g. Tyrone and Ma 2010).
2 This is possibly due to the fact that implosives tend to develop from voiced stops, and English, being an "aspiration" language, does not have phonetically voiced stops (Lisker and Abramson 1964).
3 Recent research indicates that the articulation of what is perceived as creak may be more complex and variable that previously suggested; see, for example, Esling and Edmondson (2011).
4 Many scholars use the Tone and Breaks Intonation (ToBI) system (Beckman and Elam 1997) for annotating intonation.
5 The World Atlas of Language Structures Online defines a "large" vowel system as consisting of 7–14 vowels; the "average" vowel system contains only 5–6 (https://wals.info/feature/2A#2/19.3/152.9, accessed October 17, 2019).
6 https://wals.info/feature/1A#2/19.3/152.9, accessed October 17, 2019)
7 Like plosives, nasal consonants involve a full closure in the oral tract. However, because air continues to flow out of the vocal tract via the nose, there is no build-up of pressure behind the oral constriction, and thus no explosive release, when producing a nasal consonant.

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18 English Phonology and Morphology

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18.1 Introduction

When it comes to rich phonological and morphological systems, English is probably not the first language that springs to mind. In the realm of phonology, English might seem relatively unremarkable, lacking features such as phonemic tone, clicks, and vowel harmony. In terms of morphology, English has a developed derivational system, but only a handful of inflectional suffixes. However, a careful look at the data reveals interesting patterns and restrictions which are often glossed over in introductory textbook treatments, and sometimes even in the linguistics literature. In this chapter, we illustrate the complexity and interest of English phonology and morphology through the lens of two case studies: aspiration of voiceless obstruents, and the so-called sibilant suffixes. These are the morphemes—plural, possessive, and others—which show surface alternations between [s], [z], and [ɨz].[1] Our focus will be on documenting individual variation in these areas, of which there is much more than usually assumed. We also examine various theoretical proposals, new and old, to account for the range of variation that is found, and highlight cases where the data connect to larger theoretical discussions about phonology and morphology.

The analyses provided in this chapter could be formulated in virtually any phonological and morphological theories. Largely for expository convenience, we rely on theoretical descriptions which we hope are intuitive for the majority of readers, and which require little additional explanation. Thus, our phonological analyses rely on abstract underlying representations which are converted into more concrete surface representations using simple rewrite rules of the form A → B/C _ D ("A goes to B in the environment between C and D"). In the realm of morphology, we use the notational conventions of Distributed Morphology (Halle and Marantz 1993). If the phonological, underlying form of an affix denoting plurality is /z/, we write this as follows:

PLURAL ⟷ /z/

Our focus on individual variation in the domains of phonology and morphology naturally means that certain aspects of the data are left out of the discussion in this chapter. For example, we do not discuss intraspeaker variation, and do not provide much discussion of fine phonetic detail (but see Sections 18.10 and 18.13 on aspiration). We refer interested

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readers to work such as Theodore et al. (2011), Mealings et al. (2013), and Plag et al. (2017) for sibilant suffixes, and Klatt (1975), Cooper (1991), and Iverson and Salmons (1995) for aspiration.

18.2 Sibilant Suffixes

English is often cited for its impoverished inflectional system, as in the following description which attributes to the language only eight inflectional suffixes:

> English has a relatively small set of inflectional suffixes, consisting of plural -s (e.g., girls, houses), possessive -s (e.g., John's hat, the girl's hat), third-person present tense -s (e.g., She runs), past tense -ed (e.g., John guessed), participle -ed (e.g., He has helped), progressive -ing (e.g., He is running), and the comparative and superlative endings -er and -est (e.g., smaller, smallest). (Wolfram and Schilling 2016, p. 79)

Both phonologically and orthographically, however, there are only five different forms here:

[s]~[z]~[ɨz]	plural, possessive, third-person present tense
[t]~[d]~[ɨd]	past tense, participle
[ɪŋ] ([ɪn])	progressive
[ɚ]	comparative
[ɨst]	superlative

We focus here on the "sibilant suffixes" (adopting the terminology of Wójcicki 1995), which always contain a sibilant but vary in the voicing of this sibilant, and in the presence or absence of a preceding reduced vowel.[2] The distribution of the three variants of the sibilant suffixes is as follows in Standard English (Swadesh and Voegelin 1939; Francis 1958, and many others):

[ɨz]	after sibilants (s, z, ʃ, ʒ, tʃ, dʒ)
[s]	after voiceless non-sibilants (p, t, k, f, θ)
[z]	after all other consonants, and after all vowels

This same distribution applies to the plural (*shops*, *hands*, *bridges*), possessive (*shop's*, *hand's*, *bridge's*), and present-tense suffixes (*shops*, *hands*, *bridges*). However, a number of complications in different varieties of English change this picture. Below, we discuss a number of constraints applying to various instantiations of the sibilant suffixes in different varieties of English, including: a fourth allomorph [ɨs], the sibilant suffix after s + voiceless stop stems (sT), the co-occurrence of possessive and plural markers, and the existence of double plurals. We begin, however, with some discussion of the standard system sketched above, and how it should be analyzed.

18.3 The Underlying Form of the Sibilant Suffixes

A number of proposals have been defended in the literature regarding the underlying representation (UR) of the sibilant suffixes. The most common of these assumes underlying /z/, and the traditional argument in favor of the voiced but vowel-less UR is that it is the only choice which is consistent with the rest of English phonology (analyses with /z/ include

Wells 1949; Langacker 1967; Dale 1972; Kuiper and Allan 2004, p. 181). Consider the following derivations of *cups*, *cubs*, and *buses* assuming /z/ as the plural marker:

UR		/kʌp-z/	/kʌb-z/	/bʌs-z/
Epenthesis	Ø → ɪ/[+strident] _ [+strident]#[3]	-------	---------	bʌsɪz
Assimilation	[+voice] → [−voice]/[−voice] _ #	kʌps	---------	-------
Other rules		$k^hʌps$	$k^hʌbz$	bʌsɨz
SR		[$k^hʌps$]	[$k^hʌbz$]	[bʌsɨz]

These derivations produce the correct results by virtue of the bleeding interaction between epenthesis and assimilation. Reversing the rules would yield the incorrect /bʌs-z/ → bʌss → *[bʌsɨs] (but see the next section). Assuming underlying /s/ instead of /z/ would require a rule turning /s/ to [z] in /fɑl-s/ → [fɑlz] "falls." However, words such as /fɑls/ → [fɑls] "false" show that this rule would require morphological conditioning. /z/ should therefore be favored if we follow the often-implicit assumption made explicit by Zwicky (1975, p. 138): "Basic forms should be chosen so as to minimize morphological conditioning of allomorphs." Perhaps because of the prevalence of this assumption, very few people have defended underlying /s/ in print. Kiparsky (1982) and Honda and O'Neil (2017) are exceptions, but these authors do not provide full-fledged analyses, and do not discuss minimal pairs of the *falls–false* type. Sloat and Hoard (1971) partly opt for the /s/ solution, retaining /z/ only for the plural suffix and using /s/ for all other sibilant suffixes because /s/ is cross-linguistically unmarked. /z/ for the plural is justified as a departure from the markedness criterion by virtue of voicing alternations such as *knife ~ knives*, which are absent with the other sibilant suffixes (e.g., *knife ~ knife's*).

The situation for underlying /ɪz/ or /əz/ (/Vz/) is slightly different. Hockett (1958, p. 282, cited in Zwicky 1974, p. 208) argues that such underlying forms run into problems when we consider the contrast between [boʊz] "bows" and [boʊəz] "boas." Why does the vowel of the plural delete in one, but not the other? However, this question can be answered even without invoking morphological differences between the forms. If the plural is /ɪz/, we have /boʊ-ɪz/ "bows" versus /boʊə-ɪz/ "boas," and we can say that [ɪ] deletes in this context, while [ə] does not. Clearly /ɪ/ survives in unstressed position in words like *infinity*, but by restricting the deletion rule to word-final position before [z], this problem is avoided. Even if we take the plural to be /əz/, as it would be for speakers with the same vowel in *roses* and *Rosa's*, *bows* and *boas* are still distinct, as /boʊ-əz/ versus /boʊə-əz/. With a rule that deletes exactly one schwa, we would derive the correct surface forms [boʊz] "bows" and [boʊəz] "boas."

In light of the paragraphs above, it is perhaps not surprising to note that analyses with /Vz/ are more common than analyses with /s/. URs with vowels have been defended by Bloomfield (1933, p. 212) and Nida (1948), by parallelism with the reduced forms of *is* and *has*. These words clearly do have underlying vowels, and yet they can be reduced to a non-syllabic form which shows the same [s] ~ [z] variation as the other sibilant suffixes. This apparent parallelism is criticized extensively by Zwicky (1975), who points out that the various syntactic restrictions on reducing *is* and *has* to *'s* have no parallel among the other sibilant suffixes.

18.4 Counterbleeding

For some speakers, the sibilant suffixes actually have four allomorphs, adding [ɨs] to the three standard forms. The distribution of allomorphs in these varieties is as follows:

[ɨs] after voiceless sibilants (s, ʃ, tʃ)
[ɨz] after voiced sibilants (z, ʒ, dʒ)
[s] after voiceless non-sibilants (p, t, k, f, θ)
[z] after all other consonants, and after all vowels

By reordering the assimilation and epenthesis rules with respect to the standard English system, we derive the desired results. This case is thus parallel to Canadian raising and its interaction with flapping, where two different but closely related varieties differ in their rule ordering (Joos 1942).

UR		/kʌp-z/	/kʌb-z/	/bʌs-z/
Assimilation	[+voice] → [−voice]/[−voice] _ #	kʌps	---------	bʌss
Epenthesis	Ø → ɪ/[+strident] _ [+strident] #	-------	---------	bʌsɪs
Other rules		$k^hʌps$	$k^hʌbz$	bʌsɨs
SR		[$k^hʌps$]	[$k^hʌbz$]	[bʌsɨs]

Baković (2007, p. 247) claims that such a counterbleeding system "would be impossible to replicate" in his theory, and argues that it is unattested. However, he refers to Basbøll (1972, pp. 40–41) who claims that this is in fact attested for some speakers of American English. This claim was subsequently reported independently by Anderson (1973, p. 41), although he claims that the [ɨs] ~ [ɨz] distinction is only really present at an intermediate level, since he believes that American English has "neutralization of obstruent voicing distinctions finally after reduced vowels" (Anderson 1973, p. 51). Although optional and whole or partial devoicing of final voiced fricatives in English is a fact (see, for example, Gonet and Święciński 2012; Cruttenden 2014, p. 193), we disagree with Anderson that this results in complete neutralization. We think that for most speakers, for example, *nutritiou*[s] and *Trisha'*[z] do not rhyme.

18.5 sT Stems

For a number of sibilant suffixes, there is variation across speakers in what happens to stems ending in s + voiceless stop (we symbolize all voiceless stops with T). The standard English system has [sTs] in these words, but as we will see, various forms of deletion, epenthesis, metathesis, and zero marking are also attested. This section describes the range of variation we find with sT stems and provides rule-based analyses of each system.

For some speakers, sT-final stems trigger epenthesis just like sibilant-final stems do. Thus, writing about the south and southwest Midlands region in England, Wright (1905, p. 261) mentions forms such as [biːstɨz] "beasts" and [$p^həʊ$stɨz] "posts," noting that such forms are confined to stems ending in /st/ rather than /sp/ or /sk/. Similar forms are also noted by Jespersen (1948, p. 189), as Fruehwald and Gorman (2011) discuss. The plural is not the only sibilant suffix to trigger epenthesis: in African-American English (AAE) some allow [$k^hənsɪ$stɨz] "consists" and [dʌstɨz] "dusts" (Fruehwald and Gorman 2011, p. 42). Jespersen cites examples from all over Southern England, from Somerset to London.

In the United States, it seems that /sp/ and /sk/-final nouns can also trigger epenthesis in the relevant varieties. Miller (1999) and references therein document this pattern in white Appalachian speech (Labov 1972, pp. 22–23) and, less commonly, in AAE (Fasold and Wolfram 1970). Examples include [dɛskɨz] "desks" and [wɑspɨz] "wasps." For speakers with forms like these, the epenthesis rule must be rewritten as Ø → ɪ/[+strident] (t) _ [+strident]# or Ø → ɪ / [+strident]([−continuant, −voice]) _ [+strident]#, depending on whether /t/ is the only trigger.

sT stems sometimes also trigger epenthesis because of stop deletion, giving forms such as [wɑsɨz] "wasps," [goʊsɨz] "ghosts," and [dɛsɨz] "desks," which occur in AAE (Fasold and Wolfram 1970; Burling 1971; Labov 1972; Miller 1999). The authors writing about such forms often do not give the corresponding singulars for their speakers, which is of great relevance for interpreting the data correctly. If speakers have [dɛs] ~ [dɛsɨz] "desk" ~ "desks," there is

no argument for underlying /k/ at all (final cluster reduction is "very frequent" in AAE; Bailey and Thomas 1998, p. 80), and we would set up /dɛs/, retaining the same set of rules as for standard English. Only in the case of [dɛsk] ~ [dɛsɨz] do we have to modify the rules, perhaps including a rule of the sort C → Ø/[+strident] _ [+strident]. However, we have not been able to verify that speakers with this system exist.

A further variation on the sT system is to delete the voiceless stop without epenthesizing, giving forms like [dɛsː] "desks" and [goʊsː] "ghosts" (Labov et al. 1968, p. 331; Fasold and Wolfram 1970, p. 45; Dillard 1972; Wolfram and Christian 1976, p. 39; see discussion in Miller 1999, p. 273). The rule immediately provided above, C → Ø/[+strident] _ [+strident], applies in these varieties, and is ordered between epenthesis and voicing assimilation:

UR		/mɛs-z/	/dɛsk-z/
Epenthesis	Ø → ɪ/[+strident] _ [+strident] #	mɛsɪz	--------
Deletion	C → Ø/[+strident]_[+strident] #	--------	dɛsz
Assimilation	[+voice] → [−voice]/[−voice] _ #	--------	dɛss
Other rules		mɛsɨz	dɛsː
SR		[mɛsɨz]	[dɛsː]

Deletion counterfeeds epenthesis, since derived dɛsz is subject to epenthesis, like underlying /mɛs-z/. Like the counterbleeding system with both [ɨs] and [ɨz], this represents another case of opacity in the phonological derivation of the sibilant suffixes.

Metathesis is also attested, so that the plural of [dɛsk] "desk" is [dɛsːk] "desks," for example (Allen 1973–1976; Wolfram and Christian 1976, p. 39). For these speakers, we would have the following derivations, where epenthesis must precede assimilation, and metathesis must follow epenthesis.

UR		/mɛs-z/	/dɛsk-z/
Epenthesis	Ø → ɪ/[+strident] _ [+strident]#	mɛsɪz	--------
Metathesis	[−voi, −cont] s → s [−voi, −cont]/[+strident] _ #	--------	dɛszk
Assimilation	[+voice] → [−voice]/[−voice] _ #	--------	dɛssk
Other rules		mɛsɨz	dɛsːk
SR		[mɛsɨz]	[dɛsːk]

The variation described above appears to be phonological, in the sense of involving regular alternations in phonologically specified contexts. However, in some cases, there is also the possibility of a morphological analysis, as with people who have no singular–plural distinction for sT stems: [dɛsk] "desk(s)." Miller (1999) and the sources cited there report that this was common in Middle English, at least for /st/-final stems, although a wider distribution including /sp/ and /sk/ is found for some American English speakers today. This could in principle be analyzed as a null spellout of the plural morpheme in the environment of sT-final stems, or else as a phonological rule of the type [+strident] → Ø/[+strident][−voi, −cont] _. If this pattern were general across all sibilant suffixes, and not just the plural, this would be a reason to favor the phonological treatment. Unfortunately, this question does not appear to have been systematically investigated for the relevant speakers, leaving both analytical options as possibilities.

Moving beyond the more common sibilant suffixes, there is another case of a sibilant suffix surfacing as Ø. This is the situation reported by Spradlin (2016) for the hypocoristic sibilant suffix found in truncated forms such as [ɑks] *awks* "awkward" and [tʰoʊts] *totes* "totally." She finds 17 sT-final truncations in her data, but none of these ever surface with the hypocoristic suffix: [mədʒɛst(*s)] *majest*(*s) "majestic" (for similar restrictions in nicknames of hockey players, see Kennedy and Zamuner 2006). According to Spradlin, this is part of a general

"restriction against two sibilants co-occurring in the coda of any one truncation" (2016, p. 281), but we believe this is too broad given the occurrence of forms like [kʰwɛsʧ] for "question" in the data. It does appear to be the case, however, that both sibilant- and sT-final stems disallow the addition of the hypocoristic sibilant suffix. This can be handled morphologically with spell-out rules of the following type:

HYPOCORISTIC ⟷ Ø / V(C)[+strident](C) _
HYPOCORISTIC ⟷ /z/

If the last vowel is followed by a sibilant, with or without additional consonants, the suffix does not surface. In all other contexts, however, the form is /z/, and behaves like the other sibilant suffixes in undergoing voicing assimilation in the relevant environments.

In conclusion, our survey of sT stems has uncovered a number of different ways in which sT sibilant suffixes undergo different rules than in Standard English. The variation we find is interesting in its own right, but also relates to broader theoretical topics. For example, we have seen that some speakers have an opaque counterbleeding interaction between epenthesis and assimilation rules, where the standard system has transparent bleeding. We have also seen variation in whether phonology or morphology is the best tool for modeling the variation we find, especially in the domain of sT restrictions on hypocoristics.

18.6 Double Plurals

In some varieties of English, double plurals are found next to forms where the plural is singly marked. Wright (1905) discusses forms of this type, as does Jespersen (1948). For the speakers analyzed in these sources, who are found in the Midlands and Southern England, double plurals are frequent in the environments where they can appear, but phonologically restricted to occur with sT stems. In addition to [biːstɨz] "beasts" and [pʰoʊstɨz] "posts" (for the epenthesis after sT, see the previous section), we also find [biːstɨzɨz] and [pʰoʊstɨzɨz] (Wright 1905, p. 261).

Double plurals can also be found in AAE even for non-sT stems, and Harrison (1884, p. 245) mentions not only examples like *beastesses* "beasts" but also *umbrellases* "umbrellas" and *fokeses* "folks." Since these forms are given by Harrison in orthography, it is difficult to know what the pronunciations were, but judging by the <ss> in *beastesses*, a voiceless [s] realization of the first plural marker must have been possible, that is, [bistɨsɨz]. The pronunciation [bɹɛstɨsɨz] "breasts" is used by Jay Z in the Beyoncé song Drunk in Love, confirming that even today such pronunciations are possible for some speakers. Double plurals outside of sT stems are also found in Hiberno-English, in forms such as *bellowses* "bellows" and *pantses* "pants" (Walshe 2009, p. 76, citing Taniguchi 1972, and Dolan 2006). Dolan's (2006, p. 102) transcription of *galluses* "braces" (from an obsolete form of *gallows*) is /gæləsəs/, with two voiceless sibilants. We suspect that the final /s/ is a mistake, given other plurals like /brʌd̪ərz/ "brothers" (Dolan 2006, p. 50), and the explicit statement that double plurals add /əz/ (Dolan 2006, p. xxvii). However, it seems likely that Hiberno-English allows [gælɨsɨz] following the AAE pattern, a form which is also mentioned by Wright (1905, p. 264) for northern England.

For speakers who have a [z] in both plural markers, we can simply admit two spell-out rules of the plural, with speakers being free to choose which to use:

PL ⟷ /z/
PL ⟷ /zz/

The application of the epenthesis rule can either be simultaneous or iterative. The direction of the iterative process is unimportant, although we show left-to-right application here:

		Simultaneous	Iterative L→R
UR		/bistzz/	/bistzz/
Epenthesis	Ø → ɪ/[+strid]([−cont, −voi])_[+strid]$_0$#	bistɪzɪz	bistɪzz → bistɪzɪz
Assimilation	[+voi] → [−voi]/[−voi] _ #	--------	--------
Other		bistɨzɨz	bistɨzɨz
SR		[bistɨzɨz]	[bistɨzɨz]

With speakers for whom only one plural marker surfaces with a voiced sibilant, we believe that the best analysis is underlying /s/. A morphologically conditioned rule voices a word-final plural marker after voiced segments, but since only one of the markers is word-final, only one is voiced. If the other sibilant suffixes behave similarly with respect to double marking, we could state the rule instead over all (voiceless) suffixes. In the absence of such data, we restrict ourselves to the plural here. Sample derivations in Jay Z's idiolect would then run as follows:

UR		/fɑls/	/fɑl-s/	/bɹɛst-s-s/
Epenthesis	Ø → ɪ/[+strid]([−cont, −voi])_[+strid]$_0$#	------	-------	bɹɛstɪsɪs
Assimilation	PL s → [+voi]/[+voi] _ #	------	fɑlz	bɹɛstɪsɪz
Other		------	-------	bɹɛstɨsɨz
SR		[fɑls]	[fɑlz]	[bɹɛstɨsɨz]

This analysis is usually deemed implausible for the reasons discussed in the section on underlying forms: why propose a morphologically conditioned rule when regular phonology works? However, for some speakers of AAE and Hiberno-English, there is evidence from double plurals for an analysis of exactly this sort. This illustrates how speakers faced with very similar data can come to assume different analyses, here reflected in a different division of labor between phonology and morphology.

18.7 Possessive and Plural Co-occurrence

In standard English, the possessive and the plural suffix do not appear alongside each other:

Basic form	dog	[dɑg]
Plural	dogs	[dɑgz]
Possessive	dog's	[dɑgz]
Possessive plural	dogs'	[dɑgz], *[dɑgzɨz]

Stipulating that the possessive and plural suffixes do not co-occur is one thing, but which suffix is the /z/ representing? Zwicky states that "S representing the Gen[itive] doesn't occur along with S representing the Pl[ural]" (Zwicky 1975, p. 133), while Kruisinga (1932) takes the sibilant suffix at the end of *dogs'* to be the possessive marker, with the plural marker being dropped. Kruisinga's analysis relies on generalizing from other cases where the attributive noun expresses a plural idea but is not marked with a plural suffix, such as *a peasant family* "a family of peasants." However, there is evidence from nouns with irregular plurals which favors Zwicky's analysis:

Plural	knives	crises
Possessive	knife's	crisis's
Possessive plural	knives', *knifes'	crises', *crisis'

Possessive plurals take the same irregular form as the plural, rather than the regular form of the possessive, suggesting that the sibilant suffix in these cases is the plural.

It is important to note that irregular plurals that do not end in /z/ add the sibilant suffix to their irregular plural form, as in *children's*, *women's*, and indeed *mice's* and *geese's* (Payne 2009, p. 326, citing Zwicky 1987). This shows that there is no morphological restriction against forms which mark both plurality and possession. Avoidance of possessive plurals thus seems to be at least partly phonologically motivated.

This issue also crops up when the possessive clitic is attached to something other than the head of a plural noun phrase:

	Non-possessive	Possessive
Singular	parent-in-law	parent-in-law's
	the student in the lecture	the student in the lecture's
Plural	parents-in-law	%parents-in-law's
	the students in the lecture	%the students in the lecture's

Kruisinga (1932) states that "the plurals fathers, fathers-in-law, and such groups as the queens of England never take a possessive suffix, although the groups father-in-law or queen of England do" (Kruisinga 1932, p. 39). This claim—which we refer to as "Kruisinga's generalization" and which is echoed by Carstairs-McCarthy (1987), Zwicky (1988), Picard (1990), and Payne (2009)—is not true for all speakers, however. We conducted an informal survey to investigate the acceptability of *queens of England's* as a possessive modifier ($N = 26$). Our respondents were split exactly in half, with 13 following Kruisinga's generalization, and the other 13 finding *queens of England's* acceptable. There is variation already noted in the literature about whether irregular plurals such as *men* and *sheep* are also subject to this restriction. Many speakers obey Kruisinga's generalization only with regular plurals, while some have a stricter interpretation which rules out even the irregular examples (Carstairs-McCarthy 1987; Zwicky 1988; Picard 1990; Payne 2009).

We can add to the typology of possessive–plural interactions by considering speakers who have no restrictions on co-occurrence whatsoever. In the relevant varieties, we can thus have phrases like *the farmerses cows* (Wright 1905, p. 265). Perhaps surprisingly, Wright claims that this is "a general tendency in all dialects of Sc[otland], Irel[and], and Eng[land]" (Wright 1905, p. 265). We thus seem to have at least the following systems for different speakers of English (gray cells and * indicate ungrammaticality, white cells and ✓ grammaticality):

	Zwicky (1988)	*Carstairs-McCarthy (1987)*	*Our survey*	*Wright (1905)*
The sheep in the pen's food	*	✓	✓	✓
The queens of England's victories	*	*	✓	✓
The farmerses cows	*	*	*	✓

In this table, we can see that although the system we report in this chapter had not previously been identified in the literature, it nicely completes the typology in filling in a gap between maximally unrestrictive and maximally restrictive systems.

18.8 Conclusion on Sibilant Suffixes

In the preceding sections, we took a careful look at interspeaker variation in the English sibilant suffixes. The main fact to highlight is the amount of diversity found when speakers' individual systems are considered in detail. For example, even for something as well-studied

as the English plural suffix, there are a number of non-standard systems that are not usually discussed in the literature. Many of these concern variation in the scope of epenthesis, but various processes of stop deletion and metathesis are also found. This variation in the data is reflected in the analyses that we have provided: speakers vary in the underlying forms, in the set of rules, in the ordering of those rules, and in the involvement of morphology. In summary, every core aspect of the analysis is subject to some form of variation. We have seen similar patterns for other sibilant suffixes, such as the hypocoristic suffix in truncated forms. No doubt there are many other systems which we have not discussed here. In our discussion of the co-occurrence of plurals and possessives, where the literature goes back to Kruisinga (1932), we have shown that some speakers have a previously unidentified system. Our findings fit perfectly in the existing typology of plural–possessive co-occurrence, adding a cell whose existence we might predict based on previous work.

18.9 Aspiration

We now turn to the question of aspiration in English. We begin by surveying a number of claims in the literature which go against the received wisdom on when, where, and to what, aspiration applies. A common generalization is that /p, t, k/ are aspirated word-initially and at the beginnings of stressed syllables, but remain unaspirated after /s/ (see Trubetzkoy 1958, p. 147; Kahn 1976; Kenstowicz 1994, p. 507, among others). We will show that /s/ is not the only fricative which can block aspiration on a following stop, that aspiration may occur in unstressed positions word-medially, and that the English aspiration system also targets affricates and fricatives. We then formulate a new analysis of the distribution of aspiration that we believe is preferable to earlier alternatives, which often fail to incorporate many of the facts we discuss here.

18.10 /sp, st, sk/ vs. /sb, sd, sg/

All phonological analyses of aspiration that we are aware of treat initial [sp, st, sk] as underlying /sp, st, sk/, entailing that something must be said about the absence of aspiration in this environment. We review data which could be taken to argue for /sb, sd, sg/ as the underlying representations of these clusters, dispensing with any need to say something special about aspiration, since /b, d, g/ are not typically aspirated in English. However, we will ultimately defend the traditional analysis with /sp, st, sk/, on the basis of alternations between [p^h] (after non-s) and [p] (after s).

We begin by noting that spellings from preliterate children seem to support [sp, st, sk] being analyzed as phonologically /sb, sd, sg/. There is much anecdotal evidence for spellings with <sb, sd, sg> for the relevant clusters, but formal studies of the phenomenon have also been carried out. For example, Hannam et al. (2007) tested the spelling preferences of newly literate children. Their "[r]esults confirm that children relate words with stops after /s/ to words with initial /b, d, g/ rather than to words with initial /p, t, k/" (Hannam et al. 2007, p. 399). There is some evidence, we think, that these spellings are not merely recording non-distinctive phonetic detail. Specifically, there seem to be children who spell unaspirated [p, t, k] as <b, d, g> *only* after /s/, while using <p, t, k> for [p, t, k] in other positions. This is seen in a small corpus of the child SP's preschool spellings (Perez 2018):

SP	Conventional orthography	Comment
SgR	Square	[sk] as <Sg>
Srko	Circle	[k] as <k> when not preceded by /s/
sDr	Star	[st] as <sD>

While /sb, sd, sg/ may be the analysis used by some English-speaking children, we believe that most adult grammars nevertheless use /sp, st, sk/. This is evidenced by alternations where words beginning in [p^h, t^h, k^h] can appear with [p, t, k] when a formative ending in [s] precedes, as we exemplify below. Data on how common these pronunciations are come from Zuraw and Peperkamp (2015). We will return to the question of morphological and/or syllabic conditioning in these cases in Section 18.12 below.

Base	[s]-form	Proportion of speakers
[p^h]*lease*	%*di*[sp]*lease*	50% (8/16)
[t^h]*rust*	%*di*[st]*rust*	50% (8/16)
[k^h]*over*	*di*[sk]*over*	100% (16/16)

There is significant interspeaker variation in which words show deaspiration after *dis-*. However, we believe that virtually all speakers show deaspiration in at least some words. As illustrated by *discover*, this can happen even in prefixed words which are formally (*dis-* + *cover*) and semantically transparent (for the semantics, cf. *uncover*). There is some evidence from less common alternations that this pattern is productive. The word *it's* can be pronounced [s] in colloquial registers, a possibility used frequently in the song *S'Wonderful*. In the rendition by Fred Astaire and Audrey Hepburn in the 1957 movie Funny Face, we hear forms such as [sp]*aradise* for "it's paradise."[4] And in supersymmetric particle physics, there is a prefix /s-/ used for the hypothesized supersymmetric counterparts of certain particles. We thus have forms such as [sk]*uark* (supersymmetric partner of a quark) and [st]*op* (supersymmetric partner of a top quark), homophonous with monomorphemic *stop*.[5] Alternations such as these are telling: most speakers have never heard these words, so to the extent that there are clear intuitions about their pronunciation, these intuitions must represent an extension of already-existing phonological generalizations about aspiration.

Some have claimed that the photoelectric glottography data by Yoshioka et al. (1981) support the view that the [+spread glottis] specification in /sT/ clusters is shared between the fricative and the stop. If there is phonetic evidence that these [p, t, k] stops have a phonological [+s.g.] specification, this would strongly argue against the interpretation where they are really voiced. The claim from Kingston (1990), based on the data of Yoshioka et al. (1981), is as follows: the peak glottal width in single-fricative onset /s/ occurs relatively early, but shifts to occur later in /sT/ clusters. If [+s.g.] is only attached to the /s/, it would be unexpected that the phonetic realization of aspiration shifts toward the stop. But if [+s.g.] is shared between the onset consonants, it makes sense that the phonetic realization should occur midway between the fricative and the stop. While Kingston (1990, p. 427) claims that this temporal compromise is exactly what happens, comparing glottal width data for /s/ and /sk/ onsets from Yoshioka et al. (1981) reveals that there is no shift in when the peak occurs (Figure 18.1).

Kingston's (1990) claim has been cited in other well-known work on aspiration, including Iverson and Salmons (1995), but based on the original data provided above, it is not clear to us that it is supported by phonetic evidence. Thus, while we agree that the stop in [sp, st, sk] is phonologically and phonetically voiceless, we do not believe that there is phonetic justification for treating it as phonologically aspirated, [+s.g.].

18.11 Is /s/ special?

Because of the traditional analysis of [sp, st, sk] clusters as /sp, st, sk/, it has been claimed that the position after /s/ is special for the purposes of aspiration in English (see references below). We argue that /s/ shows no special behavior when it comes to aspiration. Other

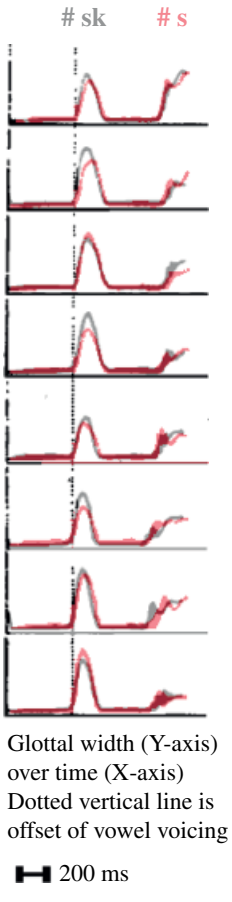

Figure 18.1 Plot of glottal width (Y-axis) over time (X-axis) in word-initial [sk] and [s], from Yoshioka et al. (1981). Dotted vertical line represents the offset of vowel voicing.

fricatives, including /f/ and /ʃ/, pattern in exactly the same way. However, since /s/ is the only fricative allowed natively before word-initial voiceless stops, there are fewer contexts where absence of aspiration after other fricatives can be observed.

A number of authors have singled out the position after /s/ as showing special behavior when it comes to aspiration. Thus, Ewen and van der Hulst (2001, p. 126) say that "no aspiration takes place if the stop is preceded by /s/," and Spencer (1996, p. 208) writes that "if the syllable or word begins with /s/ […] the [aspiration] rule will not apply." Kingston (1990, p. 428) predicts that loss of aspiration "may not be generalizable to other sequences of a continuant followed by a stop," since "only sibilants and not all fricatives, much less all continuants, are frequently incorporated with following stops within single glottal gestures." However, it is fairly easy to show that other fricatives can also block aspiration on following stops. For example, we have only unaspirated [p, t, k] in loanwords such as *spiel* /ʃpiːl/, *spritz* %/ʃpɹɪts/, *s(c)htick* /ʃtɪk/, *shtetl* /ʃtɛɾəl/, *shtup* /ʃtʊp/, *Skoda* %/ʃkoʊdə/. Examples with initial /f/ followed by a voiceless stop are hard to come by, but we do have examples like [fɪfˈtiːn], where [t] is possible for many speakers even when *-teen* is stressed (many speakers also allow [tʰ] here).

18.12 The Role of the Syllable and Morpheme

Above, we discussed the aspiration or lack thereof in morphologically complex words such as *dis-cover*. A common assumption about such words is that the aspiration status of the root-initial stop is predictable from morphological considerations, mediated by syllable structure. For example, in *dis*[t]*end*, *tend* is not a free morpheme with the relevant meaning. This means that there is resyllabification across the morpheme boundary, giving *di.stend*. Since the /t/ is now not in absolute syllable-initial position, there is no aspiration. Compare this to *dis*[tʰ]*aste*, which does include a free morpheme with the relevant meaning (*taste*). This stops resyllabification, so that we get *dis.taste*. The /t/ is now in absolute syllable-initial position, and therefore surfaces as aspirated. This line of reasoning can be found in several works about aspiration: the point about syllables is mentioned by Churma (1990, p. 50), Nusbaum and DeGroot (1991), and Wells (1990, p. 44), while the importance of morpheme boundaries is emphasized by Barna (1998, p. 5). The idea that aspiration is determined by syllabification, mediated by morphological factors, is present in Ogden et al. (2000).

While we acknowledge a strong tendency in this direction, we believe that there are cases which are not accounted for by this theory. Note first that there are cases where stops may be aspirated after fricatives even though there is no morpheme boundary involved, whether with a free or a bound morpheme. For example, most native speakers who are not themselves from Wisconsin have aspiration in *Wis*[kʰ]*onsin*, even though this name does not contain a free morpheme *consin*. Cases like this show that morphology is not sufficient for predicting post-fricative aspiration. This case may be salvaged by syllabification: *Wis.con.sin*. It should be mentioned that this approach requires lexically stored syllabification, since other words with similar phonological shape do not show aspiration in this environment: *Mus*[k]*ogean*. However, even this is insufficient. In the section provided above, we noted the pronunciation [fɪfˈtiːn], which would have to be syllabified *fi.fteen* in order to explain the [t]. Needless to say, this syllabification does not agree with native speaker intuitions. Even though we have *fif.teen*, [t] is still possible. This shows that aspiration blocking by fricatives is not limited by syllable boundaries.

18.13 Not Just Stops

Aspiration is traditionally taken to apply to voiceless stops, and is explicitly ruled out for affricates and fricatives by Cho's (1999) constraint *[+s.g., +cont]. Acoustically, there is a longer VOT (Voice Onset Time) for all voiceless obstruents in aspirating positions, not just stops (Tatham and Morton 1980). Kingston (1990, p. 408) says that "voiceless fricatives exhibit the widest glottal aperture of any voiceless consonant," and Stevens (2000, pp. 36–37) also discusses the open state of the glottis in the production of voiceless fricatives. The duration of glottal opening is "almost constant" across voiceless stops and voiceless fricatives (Tsuchida et al. 2000, p. 171). English /s/ and /t/ also show similar positional effects, including a higher centroid frequency in typical aspirating positions, such as at word beginnings and in stressed syllables (Phillips et al. 2018, citing Cho and Keating 2009). Thus, while traditional analyses ignore this, we think that it is clear that all voiceless obstruents are affected by the phonological statements determining aspiration. Consequently, the rules for aspiration that we propose will target [−voice] rather than [−voice, −cont].

18.14 The Role of Paradigmatically Related Forms

There is a debate in the literature concerning how to account for the dataset below:

mili[tʰ]*ary* *capi*[ɾ]*al*
mili[tʰ]*aristic* *capi*[ɾ]*alistic*

Despite the near-identical context in the second row, the underlying /t/s of these words surface with the same realization as in their base forms. Withgott (1982) argues that for *capitalistic*, we begin with (*capi*)*tal*, and once *-istic* is added, there is refooting to give (*capital*)(*istic*). For *militaristic*, however, we have (*mili*)(*tary*), with refooting giving (*mili*)*ta*(*ristic*). A separate adjunction rule applies to this form, providing the final representation (*mili*)(*ta*(*ristic*)). The /t/ in question is now foot-initial, which for Withgott (1982) means that it will be aspirated.

An alternative analysis is that of Steriade (2000), arguing that this is a paradigm uniformity effect. The /t/ in *militaristic* is not aspirated because of the environment it is in, but because the /t/ in the related form *military* is aspirated. Similarly, flapping in *capitalistic* is parasitic on flapping in *capital*. Steriade specifically suggests that uniformity makes reference to non-contrastive information, namely "duration of consonantal constrictions" (Steriade 2000, p. 314). Twelve speakers of American English read a list of base nouns and adjectives, and their derived forms in *-istic*. With one exception, all forms from all speakers showed correspondence between the base and the derived form (though see Riehl 2003, who replicated Steriade's experiment, and argued that the results do not support uniformity).

Davis (2004) argues instead that aspiration in *militaristic* is a regular phonological pattern, and cites words such as *Medi*[tʰ]*erranean*, *Lolla*[pʰ]*alooza*, *Nebu*[kʰ]*adnezzar*, and *abra*[kʰ]*adabra*. It should be mentioned here that Withgott (1982) eventually rejected the cyclic explanation given above because of words like these. Steriade (2000, p. 324 fn. 4, 334) claimed that *Mediterranean* should instead be explained by influence from the orthographic geminate <rr> inducing a sort of illusory secondary stress. Davis's (2004) forms above show that a following orthographic geminate is not necessary. Something else is now needed to account for *capitalistic*. While Davis (2004, p. 108) claims to "argue for a different view than Steriade's," he still invokes paradigm uniformity for these flapping cases. However, the uniformity is at the level of foot structure, a phonological property, rather than Steriade's (2000) explicitly non-phonological constriction duration.

In this debate many different frameworks are used, and there are incompatible sets of assumptions about what phonology can(not) refer to. For example, Eddington (2006) claims that flapping and aspiration are exclusively determined through analogical relations rather than rules or constraints, the psychological reality of which he rejects. We believe that the right results can be obtained through relatively simple modifications of Withgott's (1982) original idea. Aspiration is indeed regular in words such as *militaristic*, by virtue of the foot-initial status of the third syllable (see Davis 2003, for a proposal deriving this foot structure, based on the so-called superfoot; cf. also Jensen 2000; Pater 2000; Davis and Cho 2003). Forms like *capitalistic* are derived cyclically as in Withgott (1982), where we first create (*capital*) and then use this to create (*capital*)(*istic*). The /t/ is in an unstressed, non-foot-initial syllable, and therefore does not aspirate. This proposal does not rely directly on a paradigmatic correspondence between properties of surface forms, nor does it incorporate non-phonological information into the analysis.

18.15 Aspiration in Clusters

Virtually no sources on aspiration in English discuss what happens in words such as *opt*, *opts*, etc. We have no doubt that there is much interspeaker variation here, as well as intraspeaker variation. However, our rules will assume what we believe to be a fairly common system for voiceless obstruents in clusters, based on the intuitions of the authors. We use T for any voiceless stop:

opt / act / sect …	T˺T˺ ~ TʰTʰ
opts / acts / sects …	T˺T˺
optics / actor / sector …	T˺ T
optician / nocturnal / sectarianism …	T˺Tʰ ~ TʰTʰ

We see here that there is generally aspiration in absolute word-final position (noted in the literature by Pulgram 1970, p. 53; Wells 1982, p. 46; Kreidler 1989, p. 117; Barna 1998, p. 9–10; Shattuck-Hufnagel 2000, among others), with unreleased allophones typically surfacing before other stops. Before aspirated stops, aspiration is possible but optional.

18.16 A New Analysis of Aspiration in English

In this section, we attempt to formulate rules for the distribution of aspirated and unaspirated stops in English. We focus on the traditional analysis where stops are underlyingly unaspirated, but also consider the alternative solution where English has /pʰ, tʰ, kʰ/ undergoing deaspiration in certain environments. While there are some problems for the traditional /p, t, k/ analysis, we believe that it is nevertheless preferable. If voiceless obstruents are underlyingly [-s.g.], the following rules will assign [+s.g.] in all and only the contexts where aspiration is possible:

a.	[-voi] → [+s.g.] / [$_F$ _ …]	
b.	[-voi] → [+s.g.] / _ #	optional
c.	[-voi] → [+s.g.] / _ [+s.g.]	optional

This proposal assumes that all stressed syllables are foot-initial (see discussion in Kager 1995). Without this assumption, a rule could be added for aspiration in absolute syllable-initial position. We also assume that the difference between *Muskogee* and *Wisconsin* is one of footing: ($_F$ mə)($_F$ skoʊgi) but ($_F$ wɪs)($_F$ kɑnsɪn). We might wonder why, in the surface form [ɑp˺t˺s] "opts," aspiration of the /t/ is not possible by rule (c) given above. We analyze the [s] of this word as [-s.g.], a result that can be derived by applying devoicing of /z/ to [s] late, after the rules for final aspiration and aspiration spreading. Below, we illustrate some cases in which the aspiration rules do and do not apply, using as inputs the URs with footing and stress:

Input	($_F$ tɑp)	($_F$ stɑp)	($_F$ tə)($_F$ ɹɛɪn)	($_F$ dɪ)($_F$ tɛɪn)	($_F$ mə)($_F$ skoʊgi)
a.	tʰɑp	sʰtɑpʰ	tʰəˈɹɛɪn	dɪˈtʰɛɪn	məˈsʰkoʊgi
b.	tʰɑpʰ	sʰtɑpʰ	----------	----------	----------
c.	-----	--------	----------	----------	----------
SR	[tʰɑpʰ]	[sʰtɑpʰ]	[tʰəˈɹɛɪn]	[dɨˈtʰɛɪn]	[məˈsʰkoʊgi]
Transl.	"top"	"stop"	"terrain"	"detain"	"Muskogee"

Input	($_F$ wɪs)($_F$ kɑnsɪn)	($_F$ ɑpt)	($_F$ itɪŋ)	($_F$ sɛktɚ)
a.	wɪsˈkʰɑnsɪn	--------	--------	ˈsʰɛktɚ
b.	----------	ɑptʰ	--------	----------
c.	----------	ɑpʰt̚ʰ	--------	----------
SR	[wɪsˈkʰɑnsɨn]	[ɑpʰt̚ʰ]	[ˈiːɾɪŋ][6]	[ˈsʰɛktɚ]
Transl.	“Wisconsin”	“opt”	“eating”	“sector”

However, the assumption that voiceless stops in English are underlyingly unaspirated is not shared by everyone. Underlying [+s.g.] obstruents in English have been argued for in the laryngeal realism framework (see Iverson and Salmons 1995; Hall 2001; Honeybone 2002 among others). There are some clear virtues to this analysis. In American English, some /t/s may undergo flapping. In environments where this is optional, the realization is always aspirated, as in *eating*: [ˈiːɾɪŋ] ~ [ˈiːtʰɪŋ]. The aspiration rules given above do not predict aspiration here. However, there is dialectal variation, and in many varieties of British English, for example, *eating* does indeed surface as [ˈiːtɪŋ] rather than [ˈiːtʰɪŋ]. The American English case could perhaps be modeled by applying different footing rules in casual and careful speech. There is also aspiration in *Washing*[tʰn̩], where the only way to defend the aspiration rules provided above is to claim that [tʰn̩] represents a well-formed foot in English, a proposal which may be controversial to many. Nevertheless, we believe that it is preferable to accept this theory despite its somewhat unconventional feet, since it straightforwardly models the data on English aspiration with a small set of simple rules.

18.17 Conclusions on Aspiration

We have argued that the distribution of aspiration is significantly different than what is usually presented in both textbooks and well-informed phonological analyses. We hope to have highlighted the importance of paying close attention to the full range of facts concerning aspiration in English, and in phonological datasets more generally. For example, we have dismissed the role of the syllable and the morpheme, which have been important in several earlier analyses. We have also shown that several valid generalizations about aspiration have a wider scope than previously assumed: aspiration can be blocked not only by /s/ but also by other voiceless fricatives, and aspiration affects all voiceless obstruents and not just the stops. Once all of the data are taken into account, the idea that aspiration can be captured using a single phonological rule cannot be maintained. At least three aspiration rules are necessary in our account, and with other assumptions about underlying forms perhaps more would be needed. Even when armed with this set of rules, there is little doubt that many English speakers have different grammars of aspiration which we have not accounted for here. Beyond empirical differences between speakers, there is also ample scope for theoretical disagreement on the system we have provided: at many times, we have relied on particular proposals about prosodic structure which are not shared by everyone. We hope nevertheless that our setting out of the data and the generalizations will be useful in future linguistic treatments of English aspiration.

18.18 General Conclusions

This chapter has focused on individual variation in English phonology and morphology, as exemplified by sibilant suffixes and aspiration. We believe that this kind of careful study is important in its own right, to ensure that the data we work with as linguists are accurate, and to remind us of how much linguistic variation often goes unnoticed. Another consequence of carefully considering the data is a new perspective on formal simplicity in analyses. We have used three rules for aspiration in English, and it is likely that for some speakers even more are needed. In some cases, it will be possible to write a neat and simple analysis which accounts for the data, but in many cases this is simply impossible. Even without paying much attention to gradience and optionality, language data are often messy, and the analysis cannot be a single unified statement about where a feature occurs. Although we believe that striving for simple analyses is desirable, we should recognize that in many cases the messiness comes from the data rather than the theory or the analysis.

In addition to the points provided above, there is no doubt that studying individual variation is also important from a theoretical perspective. Throughout this chapter, and especially in relation to the sibilant suffixes, we have attempted to highlight that even small variations in the outputs of different speakers can justify rather striking differences in the analysis. There seems to be little in our data to justify the position that different systems simply involve minor changes to some more basic, standard analysis. Although we saw an example of this with counterbleeding and bleeding interactions for the English plural, in many other cases one small change in the data makes a large difference in the analysis. An example of this is the voicing variation in double plurals, where some speakers have [bistɨzɨz] and others [bistɨsɨz] for "beasts." The -ɨzɨz system involves more or less the standard rules with some minor changes to allow for the double plural. However, for -ɨsɨz, it appears that the underlying form of the suffix is /s/ rather than /z/, and there is a morphologically restricted rule of voicing rather than a phonological rule of devoicing. Studies of this type illustrate how speakers with very different grammars can produce similar outputs, and, conversely, teach us more about how very similar data can lead to speakers constructing different grammars.

NOTES

1 Our transcriptions throughout this article generally assume a variety of American English with features such as rhoticity and the COT–CAUGHT merger.
2 We transcribe this vowel as [ɨ] throughout the chapter, and analyze it as a reduced version of /ɪ/ for varieties which distinguish between *roses* with [ɨ] and *Rosa's* with [ə] (Flemming and Johnson 2007).
3 In the feature system we assume, [+strident] segments are all and only segments with a sibilant portion (as in Kosa 2010; see La Charité 1993, for explicit arguments in favor of this interpretation). Unlike for Halle (1961) and Reiss (2019), for example, dental and labiodental fricatives are [−strident] here.
4 Some speakers would produce aspiration here, despite the preceding [s]. This is likely due to the prosodic boundary between the clitic and its host.
5 Both of these words can be heard pronounced in this way in John Eckel's PhD defense: https://www.youtube.com/watch?v=7vfTU9Yjpw0
6 We do not discuss here the complicated set of generalizations about where flapping is allowed in varieties of English.

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19 Prosodic Phonology

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19.1 Introduction

Chomsky and Halle (1968) inaugurated generative phonology with a spectacular analysis of English. The linchpin of this analysis was their treatment of the vowel shift (as reflected in synchronic alternations like: *opaque–opacity* [òpʰék]–[òpʰésəri], *convene–convention* [kʰənvín]–[kʰənvénʃən], *line–linear* [lájn]–[líniər], etc.). Their analysis suggested, in fact, that the vowel shift was probably the defining property of English phonology.

While the vowel shift was certainly a cataclysmic event in the history of English, subsequent work has drawn into question whether it can be taken as a central organizing aspect of synchronic English phonology. First, synchronic alternations based on vowel shift are quite limited in scope, only occurring with certain suffixes. In addition, the contexts where we expect to find these alternations are rife with exceptions. Moreover, there is a whole body of literature showing that vowel shift alternations do not extend readily to neologisms or new words.

In addition, there has been increased attention paid to the prosodic aspects of English phonology—syllable and foot structure—and it has become clear that English enjoys a remarkable prosodic organization that plays a role in virtually every aspect of its phonological system.

In this chapter, we review the evidence for the prosodic underpinnings of English phonology. We start with the syllable, first reviewing the extralinguistic evidence for this unit and then the classical arguments for syllable structure in English. We then turn to the more controversial aspects of English syllable structure, for example, final clusters, ambisyllabicity, and timing units.

We next turn to higher-level foot structure. Again, the exposition begins with a discussion of the extralinguistic evidence for this unit, followed by the classical evidence in English. We then turn to the controversial aspects of foot structure, for example, ternarity, quantity-sensitivity, and predictability.

19.2 Structure in Phonology

What is prosody generally? Here, we take prosody to be the organization of phonological material into phonologically motivated sequences. It can thus be opposed to the simultaneous grouping of features or feature-like elements into segments, but also opposed to the sequential grouping of segments into morphemes (since these are not phonologically motivated sequences).

The Handbook of English Linguistics, Second Edition. Edited by Bas Aarts, April McMahon, and Lars Hinrichs.

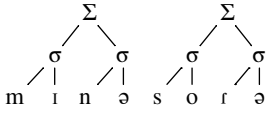
There are two clear prosodic units that can be motivated in English on the basis of both intuitive and linguistic arguments: the syllable and foot.[1] For example, English-speaking subjects will readily agree on the number of syllables in words like *hat* [hǽt], *candy* [kʰǽndi], *potato* [pʰətʰéro], and *Minnesota* [mìnəsóɾə]: one, two, three, and four, respectively. As a first approximation, we can characterize the syllable as a vowel plus surrounding consonants. We might syllabify the words above as follows (using a period or full stop to mark syllable edges):

.hat. .can.dy. .po.ta.to. .Mi.nne.so.ta.

The foot is a higher-level unit that groups syllables together. Interestingly, as we will discuss further in Section 19.4 below, foot structure is not so accessible to conscious intuition, but we can find compelling evidence from a variety of sources to posit feet as follows for the words above (using curly brackets to mark the edges of feet):

{hát} {cándy} po{táto} {Mìnne}{sóta}

Basically, a foot in English is composed of a stressed syllable along with some number of adjacent stressless syllables. In other languages, feet may have different configurations. See Hayes (1995) for many examples.Most phonologists take syllables and feet as levels in some sort of tree structure, but there is a great deal of controversy about the precise nature of those trees. Minimally, we might have something like the following for a word like *Minnesota* [mìnəsóɾə].



In Sections 19.3 and 19.4, we consider the evidence for and precise structure of these two units. For clarity, the representations used at any point in this article will reflect the structures justified to that point.

19.3 Syllables

What is a *syllable*? The standard definition has it that a syllable is a peak of sonority, where sonority refers to the intrinsic "loudness" of sounds.[2] For example, the first syllable of *candy*, [kʰæn], has the high-sonority element [æ] as its peak and two less-sonorous consonants as peripheral elements. This definition is both too general and too specific, but we can start with it as a first approximation.

19.3.1 Extralinguistic Evidence for the Syllable

Evidence that there is such a grouping comes from a variety of sources. Consider first the extralinguistic evidence for the syllable.

One source of evidence is poetry. There are several poetic traditions in English where the number of syllables is regulated. For example, in iambic pentameter, each line must have 10 syllables.[3] Shakespeare's famous eighteenth sonnet is a fine example.

Shall I compare thee to a summer's day?
Thou art more lovely and more temperate:
Rough winds do shake the darling buds of May,

And summer's lease hath all too short a date:
…

Language games also provide evidence for the syllable. For example, the language game *Geta* involves inserting the sequence *-idig-* [ɪɪg] into each syllable. For example, a word like *Minnesota* would be pronounced in Geta as [mɪɪgìnɪɪgəsɪɪgótʰɪɪgə]. Thus, we start with a syllabification with four syllables and insert the string *-idig-* [ɪɪg] into each one:

mì.nə.só.ɾə → mɪɪgɪnɪɪgəsɪɪgotʰɪɪgə

Another game with similar properties is *Op*, where the sequence [ap] is inserted into each syllable, for example, [mapìnapəsapóɾapə]. In both cases, the game is best described in terms of the unit syllable.

Another argument for the syllable in English comes from hyphenation, the principles which govern how orthographic words can be split up to accommodate line breaks. For example, a word like *Minnesota* can be hyphenated in certain places, but not others, for example, *Min-ne-so-ta*. These potential hyphenation positions are controlled by several factors: morphology, spelling, and syllabification. Morphology plays a role in that hyphens are preferentially placed at morpheme boundaries, for example, *unable* [ənébəl] is better hyphenated as *un-able,* rather than *u-nable* because *un-* is a prefix. Spelling also plays a role. For example, double letters are better split by a hyphen than not, for example, *at-test* [ətʰést] is much better than *att-est* or *a-ttest*. Finally, the relevant fact in the present context is that syllabification plays a role. There must be at least a syllable on each side of the hyphen. For example, one cannot hyphenate *four-th* [fórθ], even though the morphemic criterion is met. The word *fourth* has only a single syllable; hence, there is no way to hyphenate it and end up with at least a syllable on each side of the hyphen. In addition, all else being equal, hyphens prefer to go at syllable junctures, for example, *ca-vort* [kʰə.vórt], not *cav-ort*.[4]

Yet another argument for syllables comes from their conscious accessibility; as noted at the beginning of this chapter, English-speaking subjects can readily identify the number of syllables in most words.

Interestingly, there are problematic cases, for example, *flower* versus *flour* [flawər]/[fláwr] or *towel* versus *cowl* [tʰáwəl]/[kʰáwl] where some subjects treat these words as monosyllabic and others as disyllabic. In cases like these, subjects seem perhaps unduly influenced by the spelling.[5] In addition, one can argue that these ambiguities are a consequence of there being "too much" material for one syllable.[6]

Intuitions are also rather confused about the precise boundaries between syllables. For example, when asked what the syllables of a word like *about* [əbáwt] are, subjects will consistently divide the syllables before the [b]: [ə.báwt]. On the other hand, a word like *any* [éni] is far less clearly divided. It turns out that the conditions under which this ambiguity occurs are rather clear. First, when the second syllable is stressless, an intervocalic consonant is more likely to be affiliated to the left. Second, the more sonorous the intervocalic consonant, the more likely it is to affiliate to the left. Third, an intervocalic consonant is more likely to affiliate to the left if the preceding vowel is lax.[7]

This ambiguity has potential consequences for what an appropriate representation of syllable structure should look like. If we interpret the ambiguity above as meaning that there is a single-syllable structure in which the intervocalic consonant is in *both* syllables, then our simple "dot" notation will not suffice. Rather, we need some sort of tree notation where the intervocalic consonant can be simultaneously in two syllables:

We return to this issue below.

19.3.2 Linguistic Evidence for the Syllable

The simplest linguistic argument for the syllable in English comes from the distribution of segments. If we assume that all syllables in English are composed of a vowel with some number of surrounding consonants and we assume that words are exhaustively broken up into syllables, it then follows that all word-internal consonant sequences must be decomposable into a syllable-final sequence followed by a syllable-initial sequence. This makes the empirical prediction that the set of medial clusters can be *predicted* from the set of word-initial and word-final clusters.

For example, we expect to find words like *hamster* [hǽmstər] because we have words that end in [m] and words that begin in [st], for example, *seem* [sím] and *store* [stór]. This logic would seem to imply that a word like *hamster* should be syllabified as [hǽm.stər]. On the other hand, we do not expect to find words like *[bǽdvdə], since there is no division of [dvd] that results in both a possible word-final and a possible word-initial sequence.

	Word-final	*Word-initial*	*Word-final*	*Word-initial*
bǽdvd.ə	dvd	∅	**none**	apple
bǽdv.də	dv	d	**none**	door
bǽd.vdə	d	vd	bad	**none**
bǽ.dvdə	∅	dvd	spa	**none**

Interestingly, this argument should apply biconditionally, but it does not. Thus, there are no medial clusters that cannot be decomposed into at least one instance of a legal word-final cluster followed by a legal word-initial cluster. On the other hand, there are quite a few examples of clusters that can be constructed from legal word-final sequences followed by word-initial sequences that do not occur, for example, [s-ʃ], [kst-str], [ŋks-fr], etc.[8] Some of these gaps follow from linear restrictions on the distribution of English sounds, for example, [s-ʃ]; others are yet to be explained satisfactorily.

Another argument for the syllable in English comes from the distribution of stress. (We return to this in more detail in Section 19.4 below.) Basically, the distribution of stress in English depends on the syllabic analysis of a string. For example, unsuffixed verbs and adjectives are generally stressed on one of the last two syllables of the word.

Penult	*Ultima*
edit [édɪt]	acquiesce [ækwiés]
abandon [əbǽndən]	appertain [æpərtʰén]
abolish [abálɪʃ]	cajole [kʰaəʤól]
alter [ɔ́ltər]	careen [kʰərín]
deliver [dəlívər]	harass [hərǽs]

If the generalization is best stated in terms of the syllable, then this constitutes an argument for the syllable.

Unsuffixed nouns are generally stressed on one of the last *three* syllables of the word.

Ultima	*Penult*	*Antepenult*
affair [əfér]	abbot [ǽbət]	abacus [ǽbəkos]
bazaar [bəzár]	bagel [bégəl]	banister [bǽnɪstər]
parade [pʰəréd]	carat [kʰǽrət]	caramel [kʰǽrəməl]
pecan [pʰəkʰán]	fuchsia [fjúʃə]	emerald [ɛ́mərəld]
saloon [səlún]	hundred [hʌ́ndrəd]	hyacinth [hájəsɪnθ]

Again, if the generalization is best stated in terms of the syllable, then this constitutes an argument for the syllable.

The arguments just given from stress are not as compelling as one might hope when given in this form. The problem is that the generalizations as given could equally well be stated in terms of *vowels*, rather than syllables per se. We can, however, refine the argument so that reference to syllables cannot be replaced with reference to vowels.

We can do this by considering the distribution of stress with respect to syllable *weight*.[9] The basic observation is that the rightmost stress in English nouns can only occur three syllables from the right (on the antepenult) if one of three conditions hold:

1. The penultimate syllable is not closed by a consonant, for example, *abacus* [ǽbəkəs].
2. The noun is suffixed, for example, *humbleness* [hʌ́mbəlnəs].
3. The final syllable is [or] or [i], for example, *carpenter* [kʰárpəntər].

In the latter two cases, the penult *may* be closed by a consonant.[10]

The argument for an account in terms of syllables comes from a consideration of what it means empirically to be "closed by a consonant." Specifically, if the penultimate vowel is followed by some number of consonants that can begin a word (and thus begin a syllable), then the antepenult can be stressed. On the other hand, if the penult is followed by some sequence of consonants that cannot begin a word—and thus cannot begin a syllable—then the word cannot have stress on the antepenult.

Thus, a word like *agenda* [əd͡ʒɛ́ndə] cannot bear stress on its antepenult because [nd] cannot begin a word in English. The fact that it cannot begin a word means that it cannot be a syllable onset[11] and that it must therefore be split into two syllables when it occurs medially, that is, [.ə.d͡ʒɛ́n.də.]. On the other hand, the consonant sequence that occurs in the same position in a word like *algebra* [ǽld͡ʒəbrə] can occur word-initially—for example, in *brew* [brú]—and therefore does not need to be split into two separate syllables.

The same point applies to larger clusters, for example, the contrast between *conundrum* [kʰənʌ́ndrəm] and *orchestra* [órkəstrə]. The word *conundrum* cannot bear antepenultimate stress because the cluster [ndr] cannot occur at the beginning of a word and at least one consonant must occur in the penultimate syllable. On the other hand, the [str] cluster in *orchestra* can begin a word (as in *string* [stríŋ]) and therefore need not close the penultimate syllable.

Summarizing thus far, we have presented evidence of several sorts in favor of incorporating syllables into the analysis of English words.

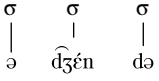
19.3.3 The Formal Representation of the Syllable

To accommodate this evidence, we can suppose that words are organized into syllables. There is a bit of a paradox, however. We can write rules or principles that can predict how words are syllabified. Under normal generative assumptions, this would imply that

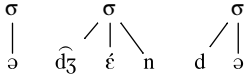
underlying or input forms are not syllabified and that syllables are added in the course of the phonological derivation.[12]

One problem with this view is that there is psycholinguistic evidence that the lexicon is organized in terms of prosody. That is, various experiments involving lexical access suggest that the mental lexicon contains information about the syllabification (and stress) of words. Some analyses have taken these facts to heart and posited input representations with prosodic structure already encoded, for example, Golston (1996).

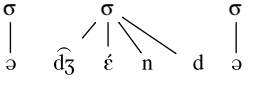
Setting aside the question of when words are syllabified, consider first *how* they are syllabified. Let us represent syllables with Greek σ and affiliation of segments to syllables with association lines. As a first approximation, we can represent the syllabification of *agenda* as follows.



This is not explicit enough as it does not indicate the affiliation of individual elements. The following diagram adds this additional detail.



This includes the same information as the "dot" notation that we used above, but more directly captures the intuition we have been working with: syllables are hierarchically organized segmental structure, not pseudo-segmental boundary elements, like "dot."The structures above are only one possible way of grouping the segments of *agenda* together. Focusing just on the [nd] cluster, there are three possible divisions: [.nd], [n.d], and [nd.]. The first, we have ruled out on the grounds that [nd] is impossible word-initially. Nothing we have said so far would distinguish between the representation above and the following one.



There is, in fact, a huge debate on how such ambiguous clusters are partitioned: the most orthodox position holds that ambiguous consonants are affiliated as onsets. This is termed the *maximal onset principle* and has the effect of preferring [.ə.d͡ʒén.də.] over other alternatives (Kahn 1980).

There is clear evidence for something like the maximal onset principle from a number of languages, but the facts in English are quite ambiguous. Kahn argues that syllabification in English depends at least partially on the distribution of stress. The facts come from the distribution of aspiration and flapping in English. First, voiceless stops and affricates are aspirated when they occur at the beginning of a word.

pan [pʰǽ n] tan [tʰǽ n] can [kʰǽ n] Chan [t͡ʃʰæn]

This aspiration is usually notated as devoicing of the following segment, when the voiceless stop occurs first in a cluster.

ply [páj] pry [pl̥áj] cry [kr̥áj]

Voiceless stops are not aspirated when they occur after an [s] in a word-initial cluster.

span [spǽn] stan [stǽn] scan [skǽn]

In at least some dialects, word-final stops are unreleased:

nap [næpˀ] gnat [nætˀ] nack [nækˀ]

From what we have seen so far, we can say that voiceless stops and affricates are aspirated word-initially. It is also possible to characterize this in terms of syllables: syllable-initial voiceless stops and affricates are aspirated. However, the facts presented so far do not require this.

Let us now consider word-internal examples. An intervocalic voiceless stop is aspirated if the following vowel is stressed, regardless whether the preceding vowel is stressed or stressless.

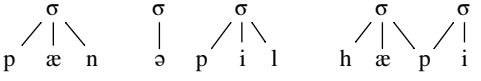
Unstressed–stressed	*Stressed–stressed*
appeal [əpʰíl]	topaz [tʰópʰæz]
attack [ətʰǽk]	atoll [ǽtʰæ̀l]
accost [əkʰɔ́st]	recap [ríkʰæ̀p]
mature [mət͡ʃʰúr]	recharge [rìt͡ʃʰárd͡ʒ]

On the other hand, if the following vowel is stressless, then the consonant is unaspirated. In some dialects, if it is coronal, then it is flapped.

Stressed–unstressed	*Unstressed–unstressed*
happy [hǽpi]	canopy [kʰǽnəpi]
pity [pʰíɾi]	vanity [vǽnəɾi]
tacky [tʰǽki]	comical [kʰámək̀əl]
catchy [kʰǽt͡ʃi]	literature [l̩ɪɾərət͡ʃər]

These facts show that a simple word-based analysis will not suffice: the consonant can be aspirated word-medially, in addition to word-initially. On the other hand, a simple syllable-based approach will not work either.

To accommodate these additional facts, Kahn proposes that syllabification in English depends on stress. Specifically, when the following vowel is stressed, an intervocalic consonant affiliates as an onset; when the following vowel is stressless, the consonant affiliates to *both* syllables. This results in the following representations for the relevant portions of *pan*, *appeal*, and *happy:*



Aspiration occurs when a voiceless stop occurs at the left edge of a syllable. This groups together initial cases like *pan* and medial prestress cases like *appeal*.

There are a number of complications that result when consonant clusters are considered (Kahn 1980), but also with morphologically complex items. For example, Withgott (1982) cites the opposition between *militaristic* [mìlətʰəɾístɪk] and *capitalistic* [kʰæpərəl̩ístɪk] as evidence that the morphological structure of an item can affect the likelihood of aspiration/flapping. Stress-based resyllabification is a controversial question to this day and we return to it in Section 19.4 below.

Another classic argument for the syllable in English comes from *closed syllable shortening* (Myers 1987). Vowels are shortened when they occur in what we can think of as a closed syllable. Here are some medial alternations.

retain [rìtʰén]	retention [rìtʰénʃən]
abstain [æ̀bstén]	abstention [æ̀bsténʃən]
conceive [kʰənsív]	conception [kʰənsépʃən]
redeem [rìdím]	redemption [rìdémpnʃən]

There are also examples in final position.

five [fájv]	fifth [fɪfθ]
wide [wájd]	width [wítθ]
leap [líp]	leapt [lépt]
mean [mín]	meant [mént]
dream [drím]	dreamt [drémt]
kneel [níl]	knelt [nElt]
keep [kʰíp]	kept [kʰept]
clean [kl̥ín]	cleanse [kl̥énz]

This phenomenon is complicated by several factors. First, the length alternation is mediated by vowel shift; thus, vowels are not paired in the intuitively obvious way, but through the various changes introduced by vowel shift. The second complication is that there are lots of exceptions. For example:

change [t͡ʃʰénd͡ʒ]	reaped [rípt]	child [t͡ʃʰájld]
seemed [símd]	quaint [kwént]	steeped [stípt]
eighth [éθ]	ninth [nájnθ]	

The main problem with this argument is that it requires a more complex notion of what constitutes a closed syllable. Specifically, medially, a single consonant is sufficient to close a syllable, but word-finally, two consonants are required to close a syllable. Thus, there is shortening in *retention* [rìtʰénʃən] because the relevant syllable is closed by [n]. In *wide* [wájd], the single consonant [d] is insufficient to trigger shortening and it only applies when a second consonant is added: *width* [wid0].

In fact, there is good reason to believe that final syllables are to be treated differently from medial syllables in other regards. For example, Harris (1994) argues that while syllables like text [tʰékst] are possible in final position, they are disallowed medially.[13] Final syllables allow more final consonants than medial syllables. This fact—and the preceding one about closed syllable shortening—can both be accommodated if we revise the claim that words are exhaustively parsed into syllables. Following Harris, let us suppose that a word can be construed as a sequence of syllables followed by a lone consonantal position. This will allow for extra consonants word-finally and also allow for a simpler characterization of closed syllable shortening. Syllables are shortened when they are closed by a single consonant. The reason why a word like *wide* does not undergo shortening is because the final consonant can be accommodated in the extra word-final consonantal position.[14]

19.3.4 Summary

We have seen that there is clear evidence for syllables in English. This evidence allows us to conclude that English words are parsed into units organized in terms of sonority.

We have also seen that English phonology is sensitive to syllable weight, but we have left open precisely how this weight might be encoded.[15]

Finally, we have seen that the affiliation of intervocalic consonants is unclear. It can be argued that intervocalic consonants might be preferentially affiliated with stressed syllables (or preferentially not affiliated with stressless syllables), but other analyses are possible as we will see in Section 19.4.

19.4 Feet

Another unit of word-level prosody is the *foot*. The foot groups a stressed syllable together with some number of adjacent stressless syllables. There is extensive evidence for such a unit from a number of sources.

19.4.1 Extralinguistic Evidence for the Foot

The main extralinguistic evidence for the foot comes from poetry. For example, a line of iambic pentameter can be characterized as a sequence of five "iambic" feet. The effect of this characterization is that the even-numbered positions can readily support a lexically stressed syllable (a syllable that would be marked as stressed in a dictionary); odd-numbered positions do so only under duress. The former have been dubbed "strong" positions, the latter "weak" positions. For example, the first line in the sonnet cited above has lexical stresses on the fourth, eighth, and tenth syllables. The same lines cited above are repeated below with all lexical stresses marked with acute accents. In addition, lexical stresses that occur in odd-numbered positions have been underlined.

Shall I compáre thee to a súmmer's dáy?
Thou art more lóvely and more témperate:
<u>Róugh</u> wínds do sháke the dárling búds of Máy,
And súmmer's léase hath all too shórt a dáte:
…

Relatively few stresses occur in odd positions; the only case in this example is a line-initial monosyllabic word adjacent to another lexical stress: "Rough winds…." This is fairly typical of the English metrical tradition (Hammond 1991; Hanson and Kiparsky 1996; Hayes 1983, 1989b; Kiparsky 1977).

The force of the current argument comes from viewing each line as a sequence of five binary units, rather than 10 syllable-sized units. This follows from the typological observation that "strong" metrical positions typically alternate with "weak" positions. The existence of triple meters, for example, anapestic (wws), dactylic (sww), or amphibrachic (wsw), undercuts this argument in obvious ways.

Notice too that this argument does not address the "grouping" aspect of feet; it does not give a direct rationale for why any particular medial syllable should be grouped either to the left or to the right. For example, consider a string of three syllable positions in the middle of some line alternating from strong to weak and to strong. The only reason to group the weak syllable with the following strong one is to insure the full parsing of the line into feet:

{w s} {w s} {w s} {w s} {w s}

Were we to group them the other way—grouping the weak positions with the preceding strong positions—we would not achieve a complete parsing of the string:

w {s w} {s w} {s w} {s w} s

This is an argument for feet in general, but not an overpowering one. It is built purely on the alternating distribution of strong and weak positions.

A more compelling argument for the foot in English comes from the "Name Game" (Hammond 1990). This language game is played by fitting different names to a particular template. For example, here is how the game is played with the name Joey [ʤói].

Joey, Joey, bo-boey	[ʤoiʤoi bo boi]
Banana fana fo-foey	[bənæno fænə fo foi]
Me my mo-moey	[mi maj mo moi]
Jo-ey	[ʤo i]

The game comes from a popular song by the same name from 1965 by Shirley Ellis. The game is still played by children who have never heard the original song.

There are two interesting aspects to the game. First, notice how the game involves substituting various consonants for the initial consonant(s) of the name. It turns out that this substitution is for the entire string of onset consonants, not just the first consonant. This is confirmed by the pattern with a name like *Brenda* [bréndə].

Brenda, Brenda, bo-benda	[brɛndə brɛndə bo bɛndə]
Banana fana fo-fenda	[bənænə fænə fo fɛndə]
Me my mo-menda	[mi maj mo mɛndə]
Bren-da	[brɛn də]

This pattern of substitution has interesting implications for the nature of English onsets and rhymes, but we will not pursue this here (Hammond 1990).

The foot-related restriction on the game is that it can be played with only certain types of names. For example, it can be played with any monosyllabic name, but with only certain polysyllabic ones. With disyllabic names, the game can only be played with names with a single stress on the first syllable (like those in the first column below); all other stress patterns are unacceptable in the game.

́σ	σ́	́̀	̀́
Joey	Annette	Anton	Diane
Larry	Ramon	Omar	Danielle
Mona	Jerome	Gertrude	Tyrone
Bridget	Marie	Carmine	Eugene

For example, with a name like *Annette* [ənét], subjects will either refuse to play or convert the name to an acceptable stress pattern, for example, [énət] or [nét]. The facts presented so far would suggest that a stressed syllable followed by a stressless syllable forms a special unit in English: a trochaic foot.

This is confirmed by the behavior of longer words which generally eschew the game. Names composed of a stressed syllable followed by two stressless syllables are, however, marginally capable of undergoing the game, for example, names like *Christopher* [kŕ̩stəfər], etc. These suggest that perhaps a three-syllable unit might be more apropos, but we return to this issue below.

19.4.2 Linguistic Evidence for the Foot

We now consider more traditional linguistic evidence for the foot in English. The most compelling evidence comes from *expletive infixation* (McCarthy 1982; Hammond 1997, 1999). In certain dialects of English, the expletive *fuckin', bloody,* or *damn* can be infixed into another word, for example, as in *Minne-fuckin'-sota* [mìnəfʌ́kɪnsórə]. (To accommodate the faint-hearted, we notate the infix as *f** in subsequent untranscribed examples.)

What is important in the present context is that (i) not all word types can undergo this infixation, and (ii) the locus of infixation is strictly limited. Moreover, while not all dialects of English exhibit this phenomenon, speakers readily learn the construction. Strikingly, these adult learners of the construction exhibit the same restrictions as those speakers for whom the construction is native.

The restrictions are as follows. To allow infixation at all, a candidate word must exhibit more than one stress. In addition, the primary stress of the domain cannot be the first stress. The first restriction distinguishes ungrammatical *ba-f*-nana* [bəfʌ́kɪnnǽnə] from grammatical *ban-f*-dana* [bænfʌ́kɪndǽnə]. The second restriction distinguishes ungrammatical *anec-f*-dote* [ǽnəkfʌ́kɪndòt] from grammatical *Tenne-f*-ssee* [tʰɛ̀nəfʌ́kɪnsí].

Confining our attention to words with these properties, the infix can only go in certain positions. First, it must occur before the main stress. This accounts for the position of the infix in *bandana:* [bænfʌ́kɪndǽnə], rather than *[bændǽfʌ́kɪnnə]. Likewise, in a word like *formaldehyde* with a secondary stress following the primary stress, the infix must go before the primary stress, rather than after it, for example, [fòrfʌ́kɪnmǽldəhàyd], rather than *[fòrmǽldəfʌ́kɪnhàjd].[16]

Second, if there is a single stressless syllable, then the infix must go to the right of that syllable. Thus, in a word with adjacent stresses, the infix goes between the stresses, for example, *robust* [ròfʌ́kɪnbʌ́st]. This allows for multiple infixation sites if there is more than one stress before the primary stress, for example, *Timbuktu* [tʰɪmfʌ́kɪnbə̀ktʰú] or [tʰɪmbə̀kfʌ́kɪntʰú]. When there is a single stressless syllable between stresses, the infix must go after the stressless syllable. Thus, *Tennessee* is infixed as [tʰɛ̀nəfʌ́kɪnsí], rather than *[tʰɛ̀fʌ́kɪnnəsí]. Likewise, *Minnesota* must be infixed as [mìnəfʌ́kɪnsórə], rather than as *[mìfʌ́kɪnnasórə].

Finally, if there are two stressless syllables between the stresses, then the infix must follow the first stressless syllable, but may follow the second as well. For example, a word like *Winnepesaukee* can undergo infixation to [wìnəfʌ́kɪnpəsóki] or [wìnəpəfʌ́kɪnsóki].

These facts suggest—like the Name Game—that there is a privileged grouping of a stressed syllable with a following stressless syllable. The locus of infixation can thereby be defined as occurring between two feet.

Notice that, as with the Name Game facts, there is some unclarity about whether there is a ternary foot. One possible characterization of the possibility of infixation after two stressless syllables in a form like [wìnəpəfʌ́kɪnsóki] is that the first *three* syllables comprise a foot. We return to this below.

The central argument for the foot in English, however, has been the distribution of stress. The basic empirical observation has been that stresses in English are distributed in an

alternating fashion from right to left and that this alternation can most effectively be captured with trochaic feet built from the right edge of the word.

Recall the distribution of stress presented in the charts on page 9 above. There we saw that with unsuffixed verbs stress must fall on one of the last two syllables; with unsuffixed nouns, stress must fall on one of the last three syllables. Stresses further to the left are subject to a similar restriction, not specific to lexical category: there can be no more than two stressless syllables intervening between stresses. In addition, a word cannot begin with more than one stressless syllable.

These restrictions interact in very complex ways with syllable weight (Chomsky and Halle 1968; Hammond 1999; Pater 2000) and a full treatment of the effect of syllable weight on pretonic stress is far beyond the scope of this chapter. The two restrictions provided above, however, are true regardless of syllable weight.

We now go through the basic cases to see that this is so. A single syllable before a stressed syllable can be stressed or stressless.

Stressed	*Stressless*
caffeine [kʰæfín]	platoon [plətʰún]
tattoo [tʰætʰú]	canal [kʰənǽl]
bamboo [bæmbú]	confetti [kʰənfɛ́ri]
vendetta [vɛ̀ndɛ́rə]	obsidian [əbsíɹiən]

Two syllables before a stressed syllable can exhibit every combination of stresses, except both stressless.

σσ̀	chimpanzee [t͡ʃʰɪmpʰænzí]
	Timbuktu [tʰɪmbʌ̀ktʰú]
	Istanbul [ìstànbúl]
σ̀σ	Alexander [æ̀ləgzǽndər]
	magazine [mæ̀gəzín]
	Minnesota [mì̀nəsórə]
σσ̀	electricity [əlɛ̀ktkì̀səɹi]
	employee [əmplɔ̀jí]

With longer spans, there are far fewer relevant cases and—though the restrictions we have posited are indeed satisfied—there are unexplained gaps. With three syllables preceding the main stress we get these patterns:

σ̀σσ́ Marionette [mæ̀riənɛ́t]
Indianapolis [ɪndiənǽpəlɪs]
Kilimanjaro [kʰɪləmənd͡ʒáro]

σσ̀σ́ aperitif [əpʰɛ̀rətʰíf]
Louisiana [ləwì̀ziǽnə]
Scheherazade [ʃəhɛ̀rəzád]

σ̀σ̀σ́ phantasmagoria [fæ̀ntʰæ̀zməgóriə]
Alcaptonuria [æ̀lkʰæ̀ptənúriə]

ɔ̀σɔ̀σ́ Daffodowndilly [dæfədàwndɪ́li]
Halicarnassus [hæləkʰàrnǽsəs]
Buenaventura [bwènəvɛ̀ntʰúrə]

Even when we include rather obscure words and names, we are still missing two patterns: σɔ̀ɔ̀σ́ and ɔ̀ɔ̀ɔ̀σ́.[17]

The key generalizations still hold however. Moreover, they can be used to argue that there is a unit foot that organizes English syllables into words. Recall that the generalizations governing monomorphemic words were (i) that there cannot be three stressless syllables in a row, and (ii) that a word cannot begin with two stressless syllables. If we assume that a foot in English is composed of a stressed syllable followed by at most a single stressless syllable, then the generalizations given can be captured by assuming that words are well-formed when unfooted syllables cannot occur next to each other. There is no way to foot a word that begins with two stressless syllables without violating either the definition of the foot or this restriction. Likewise, a word with three stressless syllables next to each other would also have to violate one of these restrictions. These ideas are shown diagrammatically in the following tables. (As before, feet are indicated with curly braces.) First, we see that a medial span of three stressless syllables is unparsable.

Canton	… σ́ } { σ́ …
Minnesota	… σ́ σ } { σ́ …
Winnepesaukee	… σ́ σ } σ { σ́ …
IMPOSSIBLE	… σ́ σ } σ σ { σ́ …

Then we see that an initial span of two stressless syllables is also unparsable.

Hat	{ σ́ …
Cavort	σ { σ́ …
IMPOSSIBLE	σ σ { σ́ …

Notice that an account of these distributional regularities in terms of a ternary foot would not fare so well. The basic idea would presumably be to adopt a foot where a stressed syllable can be followed by at most *two* stressless syllables. To account for the fact that no more than two stressless syllables can occur in sequence, we would say that a word must be exhaustively parsed into these ternary feet. A stressless three-syllable span would then necessarily involve at least one unparsed syllable.

Canton	… σ́ } { σ́ …
Minnesota	… σ́ σ } { σ́ …
Winnepesaukee	… σ́ σ σ } { σ́ …
IMPOSSIBLE	… σ́ σ σ } σ { σ́ …

The problem is that the ternary account would then stumble with the prohibition against two stressless syllables word-initially. The absence of these would seem to suggest that at most one unfooted syllable can occur at the beginning of a word, not two. That, however, does not gibe with the assumption that there can be no unfooted syllables medially. We would be left saying that medially there can be no unfooted syllables, but initially there can be at most one.

Hat	{ σ́ …
Cavort or IMPOSSIBLE?	σ { σ́ …
IMPOSSIBLE	σ σ { σ́ …

The distributional facts then argue that English words are organized into feet. Those feet are trochaic: composed of a stressed syllable followed by at most one unstressed syllable. Moreover, unlike with syllabic parsing, parsing by feet need not be exhaustive. A single syllable may be skipped between feet.[18]

Confirming evidence for a trochaic foot in English comes from syncope (Hammond 1999, pp. 165–166). A stressless syllable may be elided in certain circumstances in English. For example, a word like *parade*, normally pronounced [pʰəréd], may be pronounced as [p̩réd] in more casual or rapid speech. There are a number of interesting segmental and lexical restrictions on when this can occur, but relevant in the present context are the syllabic and stress-based restrictions.

First, an initial stressless syllable can be syncopated:

parade	[pʰəréd]	[p̩réd]
Toronto	[tʰəránto]	[tkánto]
marina	[mərínə]	[mrínə]
Canadian	[kʰənéɾiən]	[kkéɾiən]

Second, a medial stressless syllable can syncopate after a stress and before a stressless syllable:

opera	[ápərə]	[áprə]
general	[ʤ̍ènərə]	[ʤ̍ènrə]
chocolate	[ʧ̍ʰákələt]	[ʧ̍ʰáklət]

Third, when two stressless syllables occur between two stressed syllables, either can syncopate:[19]

respiratory	[rèspərətʰòri]	[rèsprətʰòri]	[rèspərtʰòri]
glorification	[glòrəfəkʰéʃən]	[glòrfəkʰéʃən]	[glòrəfkʰéʃən]

Strikingly, syncope cannot occur when the stressless syllable occurs directly between two stresses. The following pairs of words can be compared.

Syncopates	*Does not syncopate*
opera	operatic [àpərǽɾɪk]
general	generality [ʤ̍ènərǽləɾi]
glorification	glorify [glórəfàj]
respiratory	respirate [rèspərèt]

The environment for syncope can be expressed very simply on the assumption that feet are trochaic: syncopate when it would result in more complete parsing of the word. The following chart shows how in each case, syncope results in a better, more complete, parse.[20]

	Before syncope	*After syncope*
opera	{ápə}rə	{áprə}
parade	pʰə{réd}	{pkéd}
respiratory	{réspə}rə{tʰòri}	{résprə}{tʰòri}

19.5 Syllables and Feet

Syllabification and footing interact in several interesting ways. In this section, we consider two: quantity-sensitivity and flapping.

We have seen that the location of the rightmost stress in English is contingent on syllable weight. There are two principal analyses of these facts. One view has it that feet do not count syllables, but instead count *moras*: Hayes (1995).[21] On this view, feet contain precisely two moras and sensitivity to syllable weight follows from this restriction. The other view has it that stress can be attracted to heavy syllables directly, via the *weight-to-stress* (WSP) principle (Prince and Smolensky 1993).

Consider a word like *aroma* [ərómə], with a heavy bimoraic penultimate syllable. Under the bimoraic foot approach, the penultimate syllable gets stress because, after skipping the rightmost syllable, the foot must be built as close to the right as possible.[22] Since the penult is bimoraic and the foot must contain precisely two moras, the foot settles on the penult: a{ro}ma. Were the stress to settle on the antepenult, the foot would have to be trimoraic: *{aro}ma.

Under the WSP approach, the final syllable is skipped as well. The left-headed foot must also be built on the right edge, all else being equal, placing stress on the antepenult. The WSP forces stress on the penult instead: a{ro}ma.

The two approaches thus make the same predictions for nouns with heavy penults. They also make the same predictions for words with light antepenults and penults, for example, *Canada* [kʰǽnərə] {Cána}da. They make different predictions, however, for words with a heavy antepenult, for example, *fantasy* [fǽntəsi]. The bimoraic foot places stress on the antepenult, but does not include the penult: {fan}tasy. The WSP analysis also places stress on the antepenult, but includes the penultimate syllable: {fanta}sy.

Hayes argues the virtues of the bimoraic foot for its typological implications and Mester (1994) argues its virtues for its consequences with respect to the lexical phonology of English, but it fails to describe the facts of syncope and expletive infixation as described above. If, for example, feet can contain only two moras, then a word like *candelabra* [kʰæ̀ndəlábrə] should be footed as follows: {can}de{labra}. This, in turn, predicts that expletive infixation should be possible after the first or second syllable, yet it is only possible after the second: *cande-f*-labra*, **can-f*-delabra*. In addition, this would predict that the second syllable of such a form should be able to undergo syncope, yet it cannot: *[kʰæ̀ndlábrə]. Thus, the evidence from English prosodic phonology is that quantity sensitivity should be affected by direct constraints on quantity (the WSP), rather than on foot size per se.

Another argument that supports this conclusion is that syllables with three moras are arguably possible in English. For example, Hammond (1999) argues that the difference between well-formed sequences like *bike* [bajk] and ill-formed sequences like *[bawk] follows from a trimoraic maximum on English syllable structure: the diphthong [aw] is trimoraic and the diphthong [aj] is bimoraic. Since the [k] also contributes a mora, this rules out the sequence [awk] (among others). If this is so, then this analysis of syllable structure poses a challenge to a theory of footing predicated on a two-mora foot maximum.

The other domain where syllables and feet interact is stress-conditioned allophony-like aspiration and flapping. In Section 19.3.3 above, we showed how Kahn proposes a theory of resyllabification that depends on stress. His proposal then accounts for the distribution of aspiration (and flapping in relevant dialects) based on syllable structure.

Kiparsky (1979) proposes a different analysis of those facts where aspiration depends directly on foot structure. The basic idea is that foot-medial obstruents, as in *happy* [hǽpi], *city* [sɪ́ɾi], and *hockey* [háki], become "lax." This laxity prevents aspiration. In relevant dialects, a lax intervocalic coronal, as in *city* [sɪ́ɾi], will undergo flapping. The issue is quite complex, but the facts we have cited above would argue against a foot-based analysis. Specifically, the possibility of flapping between two stressless syllables, as, for example, in *vanity* [vǽnəɾi], is accounted for directly under the syllable-based analysis, since resyllabification to the left is triggered by a following stressless vowel. Cases like this would require some reorganization of foot structure to be accommodated under the foot-based analysis, since the final syllable is unfooted: {vǽnə}ɾi.[23]

Both accounts require some readjustment of prosodic structures to accommodate the distribution of aspiration. The syllable-based analysis requires some form of resyllabification and the foot-based account requires various sorts of syllable adjunction. Another argument in favor of the syllable-based analysis is that intuitions about syllabic affiliation of unaspirated intervocalic stops are somewhat ambiguous (Treiman and Danis 1988; Treiman and Zukowski 1990). On the other hand, there does not appear to be intuitional support for the required syllable adjunctions on the foot-based approach.

19.5.1 Summary

We have seen that there is evidence of a variety of sorts for trochaic feet in English. A trochaic foot is composed of a stressed syllable followed by at most one stressless syllable. In addition, feet are subject to the restriction that at most one unfooted syllable may occur in a row.

A number of controversial issues have been touched on. The foremost is how to treat syllable weight. The stress pattern of a word is clearly a function of syllable weight, but, as argued above, precisely how to accommodate this is a matter of some debate (Harris 1994; Hayes 1995; Hammond 1999; Pater 2000).

Another important issue that we have only scratched the surface of is the degree to which the stress pattern of English is *predictable*. There are many examples where we simply cannot predict which stress pattern might occur, for example, *banana* [bənǽnə] versus *Canada* [kʰǽnərə]. Researchers have taken a number of positions on how to treat these cases (Halle and Vergnaud 1987; Hammond 1999; Pater 2000).

As noted above, a third controversial issue is the treatment of aspiration (and flapping).

Finally, the size and nature of feet pose a controversial question. We have already discussed the *moraic trochee* proposal (Hayes 1995), but there are other approaches to foot structure as well (Burzio 1994).

19.6 Statistical Phonology

There has been a fair amount of recent work on statistical approaches to phonology, for example, Boersma (1997, 1998), Boersma and Hayes (2001), Coetzee (2006, 2008), Albright (2008, 2009), Albright and Hayes (2011), Coetzee and Pater (2011), Coetzee and Kawahara (2013), etc. (Much of this is reviewed in Hammond to appear.) This work has interesting implications for our understanding of prosody in English.

An early very important paper in this thread is Coleman and Pierrehumbert (1997). They propose a probabilistic theory of syllabification making use of a variant of a probabilistic

context-free grammar. The basic idea is that we can use probabilistic syllabification to predict the well-formedness of nonsense words in English.

More recently, there is a fair amount of work on *maxent* approaches to phonology, most saliently Hayes and Wilson (2008) and a number of subsequent papers using this framework. The basic idea here is to model phonotactics with machine-learning techniques. The idea is that constraints are language-specific. Moreover, they and their weights can be deduced from the statistical distribution of occurring forms. This approach has been especially successful in modeling experimental data. As already noted above, it has also been invoked to treat poetic meter (Hayes and Moore-Cantwell 2011; Hayes et al. 2012). The maxent treatments of poetic meter are particularly interesting as they combine maxent modeling with explicit encoding of syllable structure and stress.

What is striking about the maxent work is that, aside from the treatments of poetic meter cited above, prosody is not generally an explicit part of the model, yet the model performs surprisingly well. This issue is addressed head on by Daland et al. (2011). This paper investigates experimental sonority projection effects. The basic observation is that subjects judge nonsense words with falling sonority onsets as worse than nonsense items with rising sonority onsets *even when both clusters are unattested*. Thus, English speakers find a nonce item *ntap* worse than a nonsense item *tnap*. Daland et al. replicate this effect and then show that these patterns can follow from a statistical model of the phonology built from the forms of the language. In other words, English speakers can acquire this distinction simply by exposure to the words of English. What is critical is that the model is equipped with two things: features and syllables.

Features are necessary so that the models can generalize from occurring clusters to nonoccurring clusters. Syllables are necessary so that the models can generalize from onset clusters and not just any consonant sequence. (Daland et al. do note that with sufficient context a model without syllables can perform rather well, e.g., a sufficiently high-order *N*-gram model.)

The take-home message here is that even though statistical learning is a powerful tool that can be invoked in phonological modeling, to model sonority projection, it must be accompanied by syllable structure.

19.7 Conclusion

In this chapter, we have discussed the arguments and nature of prosodic organization in English words. There is clear evidence that words should not be construed simply as a string of segments, but that those segments are further organized into syllables and feet.

There are higher-level prosodic structures as well, governing the combination of words into phrases. For example, there are structures encoding phonological cliticization, phrasal timing, and intonational structure.[24]

There are many controversial aspects of these structures, but there are quite clear points as well. For example, syllabification before a stressed syllable is sharp, but syllabification before a stressless syllable is subject to different interpretations. Feet are generally trochaic, though one might be able to argue for dactylic feet in at least some circumstances.

The central conclusion is that one cannot hope to understand the organization of sounds into words in English without attending to the prosodic grouping that we have discussed.

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NOTES

1 There are higher-order prosodic units as well—for example, prosodic words, phonological phrases, intonation phrases, etc.—but we confine our attention to prosody within the word here.
2 See Chomsky and Halle (1968) for this definition and further discussion. See Hooper (1972) for an early characterization in generative phonology.
3 There are additional restrictions on the stress patterns of lines that are discussed in Section 19.4 below.
4 In general, orthographic systems provide a compelling extralinguistic argument for syllables as syllable-based writing systems are widespread. The English orthographic system is, of course, alphabetic, and so the argument from English is more subtle (Kessler and Treiman 1997).
5 Though see Brewer (2008) for interesting discussion of the role of spelling in English phonology.
6 We return to this question below.
7 See Treiman and Danis (1988) and Treiman and Zukowski (1990) for discussion of the experimental evidence for these factors and Hammond (1999) for how these factors can be modeled linguistically.
8 All of these can occur in morphologically complex items like compounds; we confine our attention here to monomorphemic examples, which are more restricted.
9 The basic facts here were first brought up in Chomsky and Halle (1968); the import of these facts for syllabification was first published in Hayes (1981), though the idea had been circulated several years earlier in a widely cited, but never published manuscript: Halle and Vergnaud (1977).
10 Note that this generalization applies to the rightmost stress, whether it is the strongest stress in the word or not. Thus, a form like *mackintosh* [mə́kəntʰàʃ] does not constitute an exception because of the final secondary stress.
11 The term "onset" refers to the consonantal material that occurs on the left side of a syllable; the term "rhyme" refers to the syllable peak and all the material to the right.
12 We can remain agnostic about the precise nature of that derivation, whether it proceeds in a multistep rule-based fashion or in a single step with constraints.
13 Hall (2001) offers a similar analysis.
14 Precisely what this position is and how it is to be treated theoretically is controversial question. See Harris (1994) and Hammond (1999) for discussion.
15 See Hayes (1981), Levin (1985), Kaye and Lowenstamm (1984), and Hayes (1989a) for discussion.
16 This latter position is possible only if the base form is altered so that the primary stress falls on the last syllable: *[fòrmæ̀ldəfə́kɪnhájd].
17 Some speakers distinguish among stresses I have marked as secondary; I leave these distinctions aside here.
18 See Hayes (1995) for a proposal of this sort on general typological grounds.
19 Note that *respiratory* is not a relevant case in some dialects of English where there is no secondary stress.
20 One alternative account has it that syncopation occurs unless that results in adjacent stresses. This accounts for many of the cases presented, but incorrectly predicts that syncope should be possible in trochaic words like *coda* [kʰórə], *[kʰód].
21 The classical definition of the mora, due to McCawley (1968), maintains simply that a light syllable has one mora and a heavy syllable has two.

22 The rightmost syllable of nouns is generally unfooted if short; this is due to "extrametricality" or NONFINALITY (Hayes 1981; Hammond 1999).
23 See Hammond (1982, 1999), Jensen (2000), and Harris (2013) for more discussion.
24 See Nespor and Vogel (1986) and Hayes (1989b) for discussion.

FURTHER READING

The classic straw man for prosodic phonology is Chomsky and Halle (1968), who propose a completely linear/segmental treatment of English phonology.

Kahn (1980) offers the first treatment of English syllable structure in generative phonology.

Liberman and Prince (1977) offer the first treatment of English stress in terms of hierarchical structure. Hayes (1981) offers the first use of "feet" in the treatment of English stress.

Recent treatments of English prosodic phonology include Harris (1994) and Hammond (1999).

Hayes and Wilson (2008) present the basic *maxent* approach to phonology. Daland et al. (2011) discuss syllable structure in the context of maxent. Hayes and Moore-Cantwell (2011) and Hayes et al. (2012) treat poetic meter in this framework.

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20 Intonation

FRANCIS NOLAN

20.1 Introduction

This chapter is set out as follows. The present section explains what intonation and prosody are and discusses briefly their role in language. Section 20.2 gives an introduction to what intonation consists of, and how we can visualize it and analyze it phonologically. The section also draws attention to the aspects of prosody which are characteristic of English. Section 20.3 gives some examples of the kinds of information which intonation can carry and the intonational forms which are used in English. Section 20.4 looks at the variation in intonation to be found in dialects[1] of English. Section 20.5 concludes the chapter with some general observations. In no respect does this chapter attempt to give a comprehensive account, which would be impossible within its scope; rather it samples the phenomena of English intonation to provide an overview. Readers who want more comprehensive accounts, both of English intonation and intonational theory, can follow up references in the "Further Reading" section as well as specific references cited in the text.

The term *intonation* refers to a means for conveying information in speech which is independent of the words. Central to intonation is variation in speaking pitch, and intonation is often thought of as the use of pitch over the domain of the utterance. The pitch of the voice depends on the rate of vibration of the vocal cords. It is a fortuitous design feature of the vocal mechanism that the vocal cords can vibrate at frequencies independent of the resonances of the vocal tract tube, therefore independently of the vowel or other sound being articulated. By contrast, for instance, the vibrating lips of a brass player must match one of resonances of the tube of the trumpet or other instrument. While pitch is central to intonation, however, the patterning of pitch in speech is so closely bound to patterns of timing and loudness, and sometimes voice quality, that we cannot consider pitch in isolation from these other dimensions. The interaction of intonation and what we may broadly call stress—the patterns of relative prominence which characterize an utterance—is particularly close in many languages, including English. For those who prefer to reserve "intonation" for pitch effects in speech, the word "prosody" is convenient as a more general term to include patterns of pitch, timing, loudness, and voice quality. In this chapter, however, intonation will be used to refer to the collaboration of all these dimensions, and, where necessary, the term "melody" will be used to refer specifically to the pitch-based component.

Intonation is used to carry a variety of different kinds of information. It signals grammatical structure, though the mapping of grammar to intonation is not one-to-one; for instance, while the end of a complete intonation pattern will normally coincide with the end of a grammatical structure such as a sentence or clause, even quite major grammatical boundaries may lack intonational marking, particularly if the speech is fast. Intonation can reflect

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the information structure of an utterance, highlighting constituents of importance. Intonation can indicate discourse function; for instance, most people are aware that saying "This is the Leeds train" with one melody constitutes a statement, but, with another, a question. Intonation can be used by a speaker to convey an attitude such as friendliness, enthusiasm, or hostility; and listeners can use intonational phenomena in the voice to make inferences about a speaker's state, including excitement, depression, and tiredness. Intonation can also, for instance, help to regulate turn-taking in conversation, since there are intonational mechanisms speakers can use to indicate that they have had their say, or, conversely, that they are in full flow and do not want to be interrupted.

Intonation is not the only linguistic device for which pitch is recruited by languages; many languages use pitch to distinguish words. In languages around the world as diverse as Thai, Hausa (Nigeria), and Mixtec (Mexico), words are distinguished not only by vowels and consonants but also by the use of one of a limited set of distinctive pitch movements, and/or heights, on all or most syllables. Such languages are called tone languages. All tone languages also have intonation, but in general the greater a language's use of pitch for distinguishing words, the less scope it has to develop an elaborate intonation system. English, on the other hand, is not a tone language, which allows it to have relatively complex intonation.

The examples of intonation patterns given in the chapter assume, unless otherwise stated, an accent of the type which has sometimes been termed "standard Southern British English (SBE) pronunciation" or more commonly in the past "received pronunciation" (RP)—the prestige variety of the south east of England which also serves in varying degrees as a prestige target elsewhere in the British Isles. However, the patterns used for examples will mostly be similar to patterns in General American, and so the examples should be accessible not only to the large number of speakers of those two varieties but also to the much larger population of English speakers who have passive knowledge of those pronunciations.

20.2 Intonation: Substance and Representation

20.2.1 The Acoustics of Intonation

Figure 20.1 shows two acoustic analyses of the utterance "But Melanie's never been *near* the manuscript," spoken as a sharp retort to someone who might have said for instance "I think Melanie's damaged the manuscript." The top analysis is a spectrogram, showing how the resonances and other acoustic components of speech evolve and change over time. A phonetic transcription has been added to show roughly which parts of the signal correspond to which linguistic elements. The bottom analysis shows a plot of the fundamental frequency, the acoustic consequence of the rate at which the vocal cords are vibrating in voiced speech. The fundamental frequency contour is more or less what we hear as the changing pitch of the speech. The contour is not continuous because voiceless sounds inevitably interrupt it; and, furthermore, whenever the vocal tract is obstructed the fundamental frequency is perturbed. However, the general trend of the pitch is clear. The utterance starts mid-low on "But," goes low on "Mel(anie)," rises to a peak on "near," and falls sharply and thereafter stays low and level. This of course is not the only way the sentence could be said, but it is one appropriate way given the context described above.

Remember that intonational pitch works hand in hand with other prosodic dimensions, notably duration. It is clear from the spectrogram that the most prominent syllable in the utterance "near" takes up a disproportionate time compared to other syllables. Other durational correlates of prominence are less straightforward, since they interact with

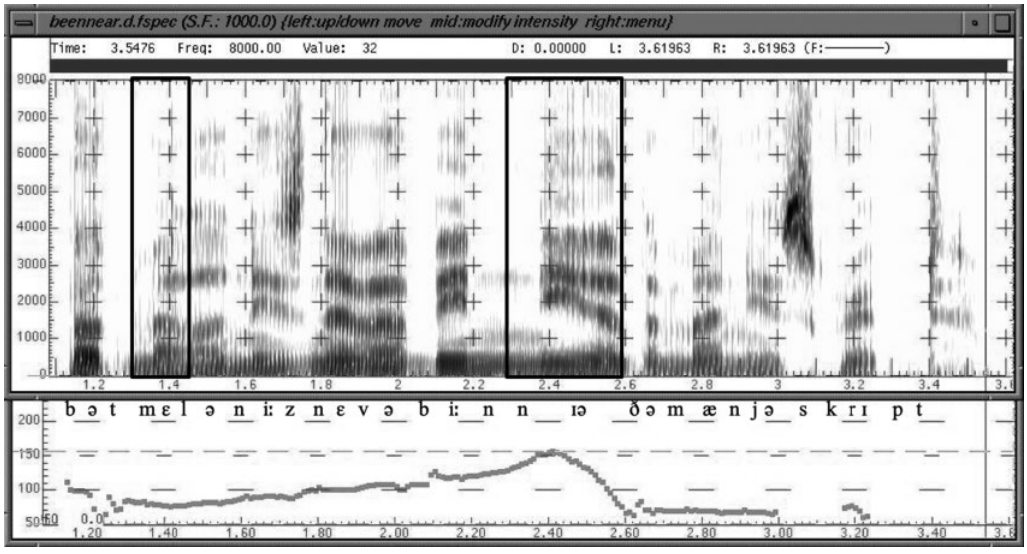


Figure 20.1 Acoustic representations of "But Melanie's never been *near* the manuscript." Top: spectrogram revealing segmental timing information; bottom: time-aligned fundamental frequency contour. The parts of the acoustic signal corresponding to the syllables "Mel(anie)" and "near" are enclosed in rectangles.

segmental determinants of duration (e.g., phonological vowel length); but it can be seen for instance that the unstressed vowel of "the" is shorter than the immediately following vowel, that of "man(uscript)." Note too that the trisyllable "manuscript" is more than 50% longer than "Melanie," also trisyllabic; this is partly as a result of the former's more complex syllable structure, but also because a lengthening of sounds (a *rallentando*) is found at the end of an intonation pattern. Voice quality, too, may play a part; often low pitch, whether at the end of an utterance or in the dip of a falling–rising melody, may be associated with creaky phonation.

20.2.2 General Characteristics of English Prosody

All languages have ways of making given linguistic elements stand out in the stream of speech, of making them "prominent." One or more syllables in a word may be "stressed" (as underlined in "diversification"); and some words in an utterance will be more prominent than others ("I told you to go home"). Languages differ, however, in what might be termed their "prominence gradient," the steepness of change between prominent and non-prominent elements. At the syllabic level, English is characterized by a steep prominence gradient. Prominent syllables have full vowels, that is, vowels which are not schwa ([ə]) or unstressed [ɪ] (as in the first and last syllables of "decided" in those dialects where schwa is not used in this context), and have relatively long durations. Non-prominent syllables often have reduced vowels, where reduction implies shorter duration and a quality less extreme in the vowel space (most commonly schwa, the mid-central vowel, in English). By contrast in Spanish or Korean, for example, the average gradient between a prominent and a less-prominent syllable is shallower; vowels in those languages are generally not reduced.

The fact that English is characterized by a steep prominence gradient is central to its intonation. One of the few things on which there has been a consensus among intonation analysts is that, put simply, interesting things happen to the pitch in the vicinity of prominent

syllables; such syllables are associated with a pitch *landmark*. This is seen most clearly in Figure 20.1 in the case of the word "near" (enclosed in the right-hand rectangle), which coincides with a high point, a *peak*, after which the pitch drops sharply over the whole range used in the utterance. "Mel(anie)" (left-hand rectangle) coincides with a low point, a *trough*, after which the pitch climbs steadily to the peak. Could we look at prominence the other way around, and say "these syllables are prominent *because* they are associated with pitch landmarks?" The factor which breaks the circularity is that the prominence pattern of an English word is independent of pitch. A word's stress pattern, or metrical prominence pattern, is often predictable from its phonological and morphological structure; and it is also realized, mainly through timing relations, even when spoken without a pitch accent. The word "manuscript" in Figure 20.1 has no pitch landmark associated with it (it is low and level), but it is still apparent from the rhythm that the syllable *man* is the stressed syllable (we will return in Section 20.3 to why this word should lack pitch prominence). In fact, if we were to resynthesize the utterance on a monotone, the prominence relations would still be completely clear. In describing English intonation, the "association" of a pitch landmark with a particular stressed syllable is crucial; it is termed a *pitch accent* (or often just *accent*). The melody of an utterance consists to a large extent of the sequence of its pitch accents, and the description and classification of these landmarks form a central part of current models of intonation.

English, then, is a language in which there is a relatively sharp difference between prosodically prominent events and those which lack prosodic prominence. The melodic part of intonation involves tonal events associated with elements which are metrically strong, and others associated with boundaries of intonational phrases.

20.2.3 The Phonology of Intonation

The history of intonation analysis is marked by a gradual realization that intonation, like the segments of speech, manifests a phonological organization (see Nolan, in press). Early analyses such as Steele (1775) and Jones (1909), using musical notation as a basis, provided impressively detailed representations of the melody of speech. This is comparable to making a narrow transcription of the vowels and consonants in an episode of speaking. But for a full understanding of the segmental phonetics of a language, we need to recognize that while some identifiable differences in sound, such as the difference between the *phonemes* /l/ and /r/ in "lip" and "rip," serve to distinguish words, other differences, such as that between *allophones* such as a "clear" [l] and a "dark" [ɬ] as in "Lill" [lɪɬ], are contextual variants of /l/ and cannot support lexical contrast. We therefore posit an abstract set of discrete, contrastive linguistic units (phonemes) for a language, and then consider what sound variants may stand for these units in speech.

In the case of intonation, recognizing a "phonology" implies that there are discrete, contrastive[2] linguistic units underlying the continuously variable melody of speech, and that these units do not have meaning in themselves (any more than an individual phoneme has a meaning), but rather can function in context, singly and in combination, to convey meaning. In this way, intonational phonology mediates between meaning and melody, rather than meaning being mapped directly onto particular melodic patterns. Phonology, moreover, defines structures (such as the syllable, in the case of segments, and the intonational phrase, in the case of intonation) into which the units are organized, and specifies the allowable combinations of units (comparable to "phonotactics" in the case of segments). These implications of a phonological view are now widely accepted in the context of intonation analysis.

In (1) provided below, there are two alternative phonological (or "intonological") analyses of the intonation of the utterance in Figure 20.1—a possible retort to an accusation such as "I think Melanie's damaged the manuscript." The melody of this retort is now represented as a stylized pitch curve,[3] with two forms of intonational representation: above the

curve embedded in the text, one that uses iconic symbols for pitch movement, and below the curve, one which uses L for low pitch and H for high pitch (both are explained in more detail below):

(1) But ↗ MELanie's · never been \ NEAR the · manuscript

L* * H*+L * 0%

The symbols embedded in the sequence of words (in which small capitals indicate pitch accents) are from an analysis within what has become known as the British tradition, developed in works such as Palmer (1922), Kingdon (1958), O'Connor and Arnold (1961/1973), Halliday (1967), Crystal (1969), and Wells (2006). The intonational elements are shown by the diacritics before the stressed syllables of words (the symbols used vary from author to author, but the ones chosen here illustrate the general point). Before "near," for instance, there is a sloping line which indicates a fall. In this example, the fall is specifically the *nucleus*, that is, the accent which occurs last and often constitutes the most salient point of the utterance. The stressed syllable of "Melanie" initiates a prenuclear rise, represented by the diagonal up-arrow. The elements of the system, then, are generally pitch movements; the exception in this example being the dots before "nev(er)" and "man(uscript)," which mark a stressed syllable within an existing pitch trend (here rising and low level, respectively).

If the retort to "I think Melanie's damaged the manuscript" were instead "But ↗ JOHN's ad \ MITted damaging it" with the same contradiction intonation, the phonetic detail of the pitch contour would be different. Instead of the prenuclear rise being cued by an ascending sequence of syllables ("MELanie's never been"), most of the rise would take place over one syllable ("JOHN") and over a much shorter period of time. It is the phonological principle which allows us to treat the two semantically equivalent, but realizationally distinct, pitch contours over the two utterances as instances of the same intonational category.

Below the stylized pitch curve is an equivalent "autosegmental-metrical" (AM) analysis of the phonological structure (for the term AM, see Ladd 2008, Chapter 2). AM descriptions take as their atoms the H (high) and L (low) tones of autosegmental phonology, originally applied to tone languages, combining these tones when needed into "bitonal" (or potentially larger) elements. The Hs and Ls can been seen as pitch targets or turning points,[4] and pitch movements arise from interpolating between (or "joining up") these targets. The "metrical" part of the name arises because, crucially, certain tones are tied to metrically strong events in the utterance (in effect stressed syllables) as noted in Section 20.2.2 above; this is represented in the notation by adding an asterisk to the tone. Thus, the syllable "near" in the example is stressed and associated specifically with the high tone of the H*+L bitonal pitch accent. Metrically strong syllables without a pitch accent are not marked in most AM transcription systems, but here they are marked by an asterisk, this being a logical extension of the H*, L* notation to cases where there is no new pitch target.

The AM framework became the dominant paradigm in intonational research under the influence of Pierrehumbert (1980) and subsequent work, for instance Beckman and Pierrehumbert (1986). For a wide-ranging introduction to AM, and a critique, see Ladd (2008). A modified version of Pierrehumbert's (1980) description is captured in the ToBI transcription system which was agreed on as a unified set of conventions for transcribing American English, particularly in work on speech corpora (see Silverman et al. 1992; Beckman 1999; Beckman et al. 2005). There are a number of language-specific adaptations of ToBI such as G-ToBI for German (Grice et al. 2005), ToDI for Dutch (Gussenhoven 2005), B-ToBI for Bengali (Khan 2014), and Cat-ToBI for Catalan (Prieto 2014).

The particular variant of the AM class of descriptions used in the present chapter is the IViE system (the acronym standing for Intonational Variation in English), which was developed as part of a research project[5] into the intonation of a number of urban centers in the British Isles (Nolan and Post 2014). The IViE system in some ways constitutes a compromise between the British and AM traditions. Superficially, the latter two look very different, but there is a high degree of compatibility. Most of the intonational phenomena which can be expressed in one can be expressed in the other, and some of the differences between specific analyses in the two traditions are incidental. For a summary of similarities and differences, see Nolan (in press). Henceforth, in this chapter examples will be presented and discussed in terms of the IViE transcription system, albeit a somewhat simplified version. For a link to the full IViE inventory of pitch accents, boundary tones, and intonational processes, see the "Further Reading" section.

One important difference between the British tradition and AM concerns the boundary of an intonation unit, or *intonational phrase* (IP), as it is now commonly known. AM models assume that an intonational phrase boundary may (or in most versions must) have a *boundary tone* associated with it. We can illustrate this if we imagine a reply to "But Melanie's never been near the manuscript" consisting of an incredulous "Never?!" with an overall falling–rising contour. A "British" analysis would classify this as a fall–rise pitch accent. AM, including IViE, would regard it as a pitch accent (H*+L in IViE) with a final H% indicating a tone "belonging" to the intonational phrase boundary. On the face of it these seem equivalent, but if we add more material to the response while keeping the pattern equivalent, and leaving the main stress on "Never," we will find that the rising part of the fall–rise is delayed to the end:

(2) NEVer?! She's NEVer seen the manuscript?!

H*+L H% H*+L * H%

Phenomena like this suggest that intonational equivalence is captured more transparently through the use of boundary tones. However, it is still useful to recognize the coherence of patterns such as H*+L H%, and the combination can be called a (nuclear) *tune* following the traditional terminology of the British school.

20.2.4 Non-Phonological Components of Intonation

Not all intonational effects lend themselves to analysis in terms of discrete categories such as pitch accents and boundary tones. Other intonational effects are communicative in the sense that the speaker has a choice, but are essentially gradient. For instance, each of the following ways of saying an utterance conveys progressively greater involvement (whether or not this is the speaker's true feeling):

(3) I'd LOVE to meet him I'd LOVE to meet him I'd LOVE to meet him

But identifying three gradations (rather than four, or seven, or more) is arbitrary; *pitch range* here behaves as a continuum. Recent work using brain imaging even suggests that gradient intonational effects are processed separately from categorical intonation (Post et al. 2015). Such use of pitch could be termed *intonational pragmatics* (cf. Ladd 2008, p. xvi), although we

should be careful not to assume that intonational phonology has no role in pragmatic signaling, or indeed that gradient pitch manipulation is excluded from core linguistic functions.

The non-categorical aspects of intonation arguably provide a link to the possible origin of intonation in very basic physical and physiological phenomena. In order to explain certain universal tendencies in the use of pitch, Gussenhoven (2004, Chapter 5), building on earlier work by Ohala (e.g., 1983, 1984), proposes three *biological codes*: the *frequency code*, the *effort code*, and the *production code* (which I will rename here the *respiratory code*). For instance, small objects or animals produce high frequencies, and so high pitch is a natural way to signal submissiveness in the animal kingdom, and by (metaphorical) extension politeness or uncertainty (among other things) in human interaction—the *frequency code*. Greater physical effort, resulting from physiological arousal, will produce more energetic movements, and more dramatic pitch change, and by extension can naturally signal involvement (as in (3)) or linguistic emphasis—the *effort code*. And as vocalization proceeds, air is used up, subglottal pressure drops, and the natural tendency is for pitch to get lower in the course of a vocalization, so it may be natural to signal newness by high pitch and older information by lower pitch—the *respiratory code*. Quite possibly, according to Gussenhoven, the categories of intonational phonology represent in some measure the *grammaticalization* of these codes; it is tempting to see the use of H% in (some) questions as arising from the frequency code, since in questioning we are submissive to the greater knowledge of another person. We shall see in Section 20.3 that the task of intonational signaling in English is shared between a discrete, clearly phonological resource and a gradient component. Relatively little attention has been paid to systematizing the description of the non-categorical part of English intonation, though a notable exception is Crystal (1969), who gives a comprehensive description of prosodic systems. The gradient use of pitch, for instance speaking in a "low voice" to indicate confidentiality or intimacy, may often be used in conjunction with specific voice qualities—in this case whisperiness or breathiness. Laver (1980) provides a comprehensive descriptive framework for voice quality which can contribute to the comprehensive description of paralinguistic signaling.

A useful prerequisite to understanding those aspects of communication involving the gradient use of pitch is a clear set of terminology. We can distinguish the following: *speaking tessitura*, a given speaker's range of comfortable speaking pitch; *pitch level*, the overall placement of an utterance within a speaker's tessitura; *pitch span*, the general distance between highs and lows in an utterance; *pitch excursion*, a local high–low distance, for example, associated with a pitch accent; and *downtrend*, the commonly found lowering of pitch over the course of an utterance. In these terms, the degrees of involvement in the examples in (3) are evident in changes in the excursion of a single pitch accent, but if the utterance were longer the changes would probably affect the pitch span of the whole utterance.

20.3 Functions and Forms of English Intonation

Section 20.2 introduced some of the general concepts required for understanding intonation. This section exemplifies how English intonation carries a number of different kinds of information, and does so by exploiting both discrete phonological categories and gradient adjustments of prosodic dimensions.

20.3.1 Grammatical Structure

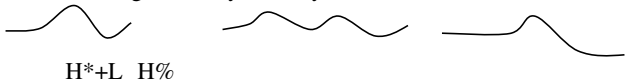
An important role of intonation is as the "punctuation" of spoken languages, marking the division between grammatical units and more generally helping the listener to follow the utterance. The function is brought sharply into focus on occasion when the words used

allow more than one grammatical parse, for instance "While eating my dog my cat and I watched television." In writing we would use a comma; after "dog" for the more *caniverous* interpretation, and after "eating" (and probably another comma separating "my dog" and "my cat") for the more seemly interpretation. An intonational equivalent of this comma in these two positions is transcribed in (4) and (5), respectively—a falling pitch accent followed, crucially, by a high boundary tone, along with a slowing down before the boundary:

(4) While EATing my D O G my CAT and I WATCHed TELevision

H*+L H%

(5) While EAT i n g my DOG my CAT and I WATCHed TELevision



H*+L H%

Note, however, that the relation between grammatical units and intonational units is not one-to-one. It is possible to phrase the following sentence intonationally in at least two ways:

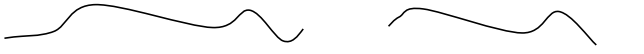
(6) If you're READy we'll G O If you're READy we'll G O

H*+L H% H*+L 0% H* H*+L 0%

without there being any corresponding change in grammatical structure and without, at least in the author's British English, there being any difference in meaning. We might regard the change as a kind of "connected speech process" like segmental assimilation, correlated with—but not directly determined by—speech rate. In general, then, we can regard grammatical structure as determining the point at which intonational phrase boundaries can occur—"licensing" them—but whether they do occur or not depends on performance factors such as speech rate. The slower and more careful the speech, the more explicitly will grammatical structure be signaled in intonational phrasing.

In some cases, intonation can guide the listener to grammatical structure which is not directly to do with phrasing. For instance, the intonation of the words "The Norwegians who are rich enjoy life to the full" can signal whether the relative clause is restrictive, meaning that, specifically, rich Norwegians enjoy life to the full:

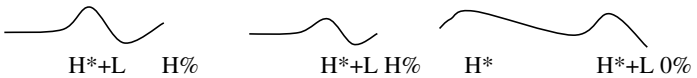
(7) The NorWEGians who are R I CH enJOY life to the F U LL



H* H*+L H% H* H*+L 0%

or whether the relative clause is non-restrictive—implying that all Norwegians are rich—and has a status more like a parenthetical remark (e.g., "…and they're rich…"):

(8) The NorWEGians who are RICH and they're RICH enJOY life to the F U LL



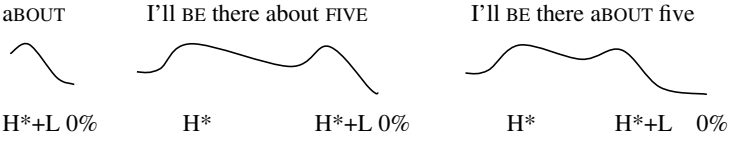
H*+L H% H*+L H% H* H*+L 0%

While cases of intonational disambiguation such as the ones provided in (7 and 8) are useful for illustrative purposes, intonation provides guidance to the grammatical structure of all speech.

20.3.2 Information Structure

Another thing which intonation does is to highlight points of high informational importance in the utterance. Each word in the lexicon has at least one stressed syllable, or, perhaps better, "stressable" syllable. This means that this syllable has the potential to be the site of prosodic prominence in an utterance.[6] The prominence is usually manifested as greater duration (relative to non-prominent syllables), greater intensity (the primary physical correlate of loudness), and in the majority of cases a pitch accent. In the word "about," it is the second syllable which is stressable. If we cite the word "about" in isolation (9), the second syllable will carry a pitch accent—often H*+L. If however we say the word as part of the utterance "I'll be at the station about five," there will be by default no prominence on the second syllable of "about" beyond what may be perceived as a result of the "full vowel" (in this case a diphthong) it contains. But if, instead, the specified time (5:00) is already present in the discourse, and the speaker wants to focus on the approximation implied by the preposition "about" ("no, don't buy tickets for the 5:02, it's too risky"), then that word can carry a pitch accent (rightmost example in (9)).

(9)



This exemplifies an important principle, that the speaker adjusts prominence according to communicational need. In the citation utterance there is no redundancy (i.e., predictability), and no word which is more important than "about." In the sentence uttered when the specified time is new information, "five" is more important, and the presence of a temporal preposition is predictable from the rest of the sentence. It would be most unnatural to speak a sentence putting a pitch accent on every word, and as a first rule of thumb we can expect content words to have a pitch accent and grammatical words to lack one.

In the third example in (9), at the same time as associating "about" with a pitch accent the speaker has robbed "five" of the prominence it had in the middle example. This kind of adjustment of prominence is a crucial feature of English intonation, often called *deaccenting*.[7] By deaccenting "five," focus has been placed on "about"; and "five"—which is *given* information—is relegated to a lower level of salience. Deaccenting happens when a word is *given* by virtue of being repeated (10) or being substituted by a hypernym (11):

(10) I OFFered her a COFFee but it TURNS out she doesn't DRINK coffee

(11) I OFFered her a BEER but it TURNS out she doesn't DRINK alcohol

In such examples, it is intonationally ill-formed in English[8]—and will give rise to a perceptual double-take on the part of the listener—if the given item carries prominence equal to that of its first occurrence. By contrast, many languages, such as Romanian and Italian (Ladd 2008, pp. 231–236), do not typically have this kind of "contextual" deaccenting of given information. Absence of deaccenting in a language, however, does not necessarily mean that givenness goes unsignaled. In Icelandic, for instance, which does not deaccent given information (Nolan and Jónsdóttir 2001), it seems that the information structure is

reflected in gradient prominence levels, and deaccenting may just be a grammaticalization of a very general reflex of the effort code.

So far, the use of intonational pitch accents in English seems rather logical; informationally rich items are made to stand out and other information is backgrounded by deaccenting. But it has long been remarked that the relation between information and accent is not always so transparent, as in cases such as the following:

(12) Look OUT! That CHAIR's broken

In the context of someone about to sit down, "chair" is contextually given, and being broken is the unexpected, crucial information. Yet, perversely at first sight, "chair" gets the main accent. But this kind of accentuation is probably the intonational equivalent of pointing; first make sure the listener looks at the chair, because then the problem will be perceived directly.

Also initially opaque is the kind of contrast between the following utterances:

(13) The DEER was shot by JOHN the BUTCHer The DEER was shot by JOHN the butcher

In the first version, "butcher" is in apposition, and explains that John is the butcher. It is rather like a reduced non-restrictive relative clause. The pitch accent on the item in apposition ("butcher") usually echoes the pitch accent on the word to which it is in apposition ("John"), but with a less extensive pitch excursion. In the second version on the other hand, "butcher" is an evaluative epithet, a metaphorical application of the word expressing (here) the speaker's disapproval of John's recreational pursuits. It carries a stress (or "rhythmic accent"—see Footnote 5), indicated here by the asterisk, but usually no pitch accent, at least in British English (Astruc-Aguilera and Nolan 2007, pp. 91–92). This deaccenting is conventional, but not easy to explain. Conceivably it is a grammaticalized form of the reduced pitch span which often accompanies parenthetical and *sotto voce* expressions, including expressions of opinion, as in "John—and I think he's a butcher because of it—is the one who shot the deer."

A comprehensive account of the relation of intonation to information structure would be too lengthy for the scope of this chapter, but as a final, very specific case, consider the following:

(14) EMma doesn't dance with ANYone EMma doesn't dance with ANYone

In reply to "why didn't she dance with Wayne?," the first version, with a low boundary tone, means that Emma will refuse all men who ask her to dance without exception. The second, with a high boundary tone, means that Emma is selective; she will not accept just *any* offer. The difference may arise from two broad categories of intonational meaning that have been associated with boundary tones. Low endings are thought of as assertive and non-continuative, for which Cruttenden (1997, p. 163) has proposed the term *closed*, and high endings as non-assertive and continuative, or *open*. Thus, the high boundary tone in the second version leaves it open for the speaker to express, or the listener to infer, a qualification, for example, "but she'll say yes if the man looks rich."

20.3.3 Discourse Function

The best-known fact about intonation is that questions arise. Like most well-known facts, it is a considerable oversimplification. Counterexamples are easy to find. English "Wh-" questions in particular, as in (15), are more often falling at the end than rising:[9]

(15) WHAT are you DOing on SATurday? How OLD is he?

H* H* H*+L 0% H*+L 0%

Nonetheless, the popular belief that the voice goes up in questions has some basis in truth. "Yes–no" (or "general") questions can rise:

(16) Have you FINished the ARTicle? OR Have you FINished the ARTicle?

H* H*+L H% H* L*+H H%

These two versions are both common; the first has a falling–rising pattern on the last word, and the second steps down to the final word but then rises to the end.[10] Ending high is in keeping with the *open–closed* distinction mentioned in Section 20.3.2 above, and Gussenhoven's *frequency code* and *respiratory code* (Section 20.2.4), the questioner perhaps metaphorically submitting to the greater knowledge of hearers, and leaving it open to them to provide completive information. However, it is still perfectly well-formed to say:

(17) Have you FINished the ARTicle?

H* H*+L 0%

One might nonetheless assume that if there is nothing in the words to indicate that an utterance is a question (i.e., a "morphosyntactically unmarked question"), then the phonological choice of a high boundary tone would be obligatory; nevertheless the second utterance in (18) will be interpreted as a question—perhaps most easily an echo question, querying something already said or implied:

(18) She's FINished the ARTicle OR She's FINished the ARTicle?

H* H*+L 0% H* H*+L 0%

The querying function is marked by gradient aspects of pitch range; the *downtrend* is less steep than that of the statement (on the left), and the *pitch excursion* of the nuclear accent is greater. In tone languages, where local pitch movements are determined lexically, intonation will rely heavily on such pitch range effects. In English, there is a rich and to some extent complementary interplay in the signaling of discourse function between morphosyntactic marking, discrete intonational marking, and gradient intonational marking.

20.3.4 Attitude and the Speaker's State

From the brief survey provided above concerning questions, it can be seen very clearly that there is no one-to-one mapping between discourse function and intonation pattern. Some of the reason for this is that intonation is also doing other, less linguistic, work, conveying information for instance about the speaker's attitude. The example (17) of a question ending in a fall is unambiguously a question (because of the syntax), but a rather less genial, more demanding one than those in (16). Furthermore, although we have tacitly assumed that statements are *closed* and are associated with low endings, not every statement ends low. Most famously, the spread through many varieties of English of "uptalk" or the "high rising terminal" (see, e.g., Warren 2016)—the trend to end intonational phrases on a high and rising pitch—has made rising intonation on non-question utterances commonplace, as for instance in examples like the following (based on Ladd 2008, p. 125; here !H* indicates a lowered or *downstepped* high accent):

(19) MY name's JOHN SMITH. I've got an apPOINTment with Dr SANDerson.

H* !H* !H* H% H* !H* H%

The speaker is not asking for information, but is more probably exploiting the *frequency code* primarily for interactional ends (Warren 2016, p. 68). These may include checking that the listener is following, and indicating that the information is being "shared" rather than handed down, thereby signaling non-assertiveness.

There is no denying the role of intonation in conveying attitude, as witness both the common observation that the problem was "not what he said but the way that he said it," and the large amount of attention devoted to the attitudinal function of intonation in books tutoring learners of English. However, with attitude we are entering particularly difficult territory. Not only is someone's attitude hard to describe (much harder, say, than the linguistic description of an utterance as a declarative consisting of two clauses and functioning as a question), but also a person's attitude shades into their psychological state. While choosing a "polite" or "informal" intonation is primarily a matter of attitude, a person whose intonation might be described as "angry" may be genuinely experiencing that emotion and expressing it unchecked, may be trying with only partial success to hide it, or may be feigning anger to signal that the matter in hand is one which deserves condemnation. There is a large body of work on how speech is affected by actual emotions and psychological states (see, e.g., Scherer 2001), but these non-linguistic determinants lie outside the scope of this chapter.

As we have seen in (16), (17), and (19), categorical choices are available in English to convey attitude. But as we would expect from the link between attitude and psychological state, the deliberate communication of attitude also employs devices which directly reflect Gussenhoven's *biological codes*. The gradations of *pitch span* in (3) on the words "I'd love to meet him" directly mimic (or indeed are) the effects of physiological arousal, and convey progressively greater involvement. It is tempting to say "greater enthusiasm," but we must beware of attributing specific meanings to intonational effects; if we impose a similar continuum of increasing pitch spans on the reply "I rather *not* meet him," the strength of feeling is mapped in a similar way, but we can no longer label it enthusiasm.

One aspect of attitude is *accommodation*, the degree to which a speaker matches the speech of an interlocutor. Undoubtedly prosodic accommodation occurs widely. For instance, if one person uses whispery phonation and a reduced pitch span, their interlocutor may well do the same. Failure to accommodate pitch span, for instance, can lead to ill-formed exchanges; if the

intention of the third utterance in (20) is genuinely to congratulate, the response is appropriate to an utterance in the manner of the first, both in terms of phonological choices and pitch span, but not the second, against which it will sound somewhat grudging, or even ironic:[11]

(20) I've JUST been proMOTed I've JUST been pro M O T ed CONGRATULATIONS

H* H*+L 0% %H L* H*+L 0% H* H*+L 0%

20.3.5 Discourse Regulation

In a successful conversation, *turn-taking* by the speakers happens smoothly. Depending on the type and degree of formality of the interaction, interruptions may be appropriate, but they will be recognizable as such by the participants, as will the point at which a speaker has finished what he or she has to say. The "traffic signals" which regulate a well-formed interaction are mainly intonational.

End-of-turn markers include low pitch, reduced loudness, rallentando (lengthening of turn-final elements), and creaky voice. The low ending and lengthening (indicated by the stretched spacing of the text) in the first utterance in (21) give it an air of finality. This does not preclude further comment on the topic (e.g., a question about it from the listener), but it does open the floor to another speaker. On the other hand, the lack of slowing (or even presence of accelerando) in the second utterance, combined with sustained final high pitch often used in listing items, indicates that more is to come and the speaker is not willing to yield the floor.

(21) …then we went to the SHOPp i n g c e n t e r …then we went to the SHOPping center

Again we can relate this intonational use of pitch to Gussenhoven's (2002) biological codes. The *respiratory code* ("production code" in his terms) links low pitch and finality by virtue of the reduction in subglottal pressure as air is used up in speaking, and this link could be extended metaphorically to a conversational turn. Conversely, attempts to wrest the floor from the speaker will be characterized by high pitch and loudness.

20.4 Intonational Variation

Varieties of languages are marked not only by their vowels and consonants but also by their prosody. The intonation of some varieties is often remarked on by outsiders using terms such as "sing-songy" or "flat." One of the most distinctive dialects of English from the intonational point of view is Northern Irish English (NIE), which "always goes up at the end." The truth is a little more complex, as shown in (22).

(22)

L*+H 0% L*+H 0% L*+H H%

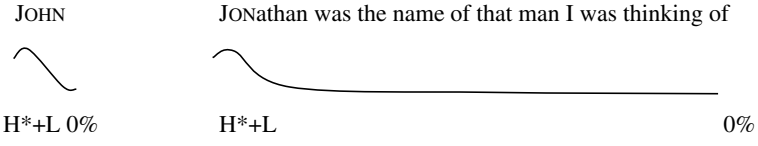
NIE SBE

The first and second patterns show the commonest nuclear "tune" of NIE. The first pattern shows what happens on short (usually monosyllabic) phonetic material, such as the answer "three" to the question "how many?" It looks and sounds pretty much like a rise; but as soon as the phonetic material becomes longer (e.g., "three of them") as in the second pattern, it becomes clear that the "underlying" pattern is a "rise-plateau." This nuclear tune can be analyzed within the IViE system as L*+H 0%. This is a pattern which seems not to occur in SBE, or most other dialects; as shown in the third schema, a nuclear rise co-occurs in SBE only with a high boundary tone (and the tune functions as a question, not a statement).

Here we have what appears to be a phonological difference between dialects, specifically a difference—similar to a segmental phonotactic difference—determining the permissible combination of phonological elements or possible *tunes*. It is also possible in NIE to drop sharply at the end of the plateau to an L% boundary, again yielding a tune which is not available in SBE or most other dialects.

There are (at least) two other ways in which dialects can manifest a difference in their intonational phonology. First, dialects can differ in terms of what intonological elements they have in their inventory, just as a dialect may lack a phoneme (SBE does not have the voiceless labial-velar which distinguishes "what" from "watt," while Scottish does, for instance). The intonational inventory will, of course, depend on analytic assumptions; one could dispose of the segmental difference just mentioned by treating the voiceless labial-velar as the combination of /h/ and /w/. Within the IViE framework, which assumes that an intonational phrase boundary tone T% will be manifested by pitch movement directly adjacent to the boundary, it seems that SBE lacks an L% boundary in its inventory. Nuclear falls are accounted for as H*+L, reflecting the fact that as material is added after the nuclear syllable, the low pitch is still attained shortly after the accented syllable and not at the boundary, as in (23). There are no cases where a fall can be associated unambiguously with the boundary and not with a prominent syllable, contrary to the NIE pattern discussed above.

(23)



Second, the association of intonational elements with functions and meanings shows considerable variation between dialects. Grabe and Post (2002) examined read statements and inversion questions in the IViE corpus and found the distribution of nuclear tunes (last pitch accent and boundary tone) shown in Figure 20.2 for SBE (Cambridge) and NIE (Belfast). It can be seen that Belfast uses predominantly the rise-plateau L*+H 0% pattern in statements, and overwhelmingly in questions, revealing that these utterance types are generally not phonologically distinct. In Cambridge, statements mostly have a falling nucleus—a straightforward difference in usage. Almost half of the inversion questions also have this pattern, but the option exists to use a rise (L*+H H%) or a fall–rise (H*+L H%). As an aside, informal polling of students in Cambridge by the author, involving presenting a polite inversion question with each of these two patterns and asking "which is more old-fashioned," has consistently shown the rise to be perceived as the "old-fashioned" alternative. The subtlety of intonational variation is underlined by Ladd (1996, p. 122), who notes that the fall–rise nuclear tune H*+L H% on a request such as "Can I have the BILL please?"—which is perfectly polite in British English—may be heard as condescending or peremptory by a speaker of American English.

So far we have looked at intonational variation that can be analyzed in terms of discrete phonological categories. There are also differences which are a matter of phonetic

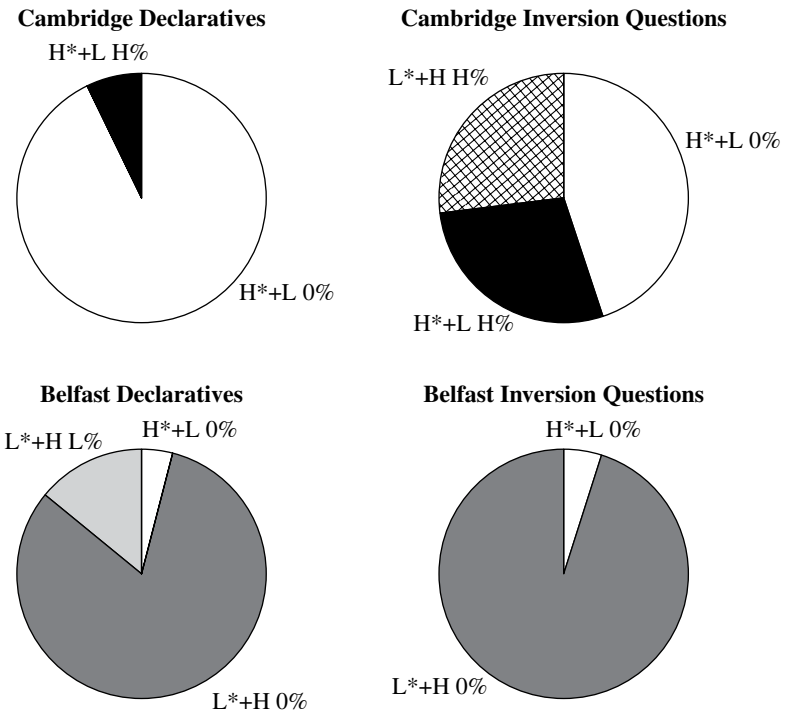
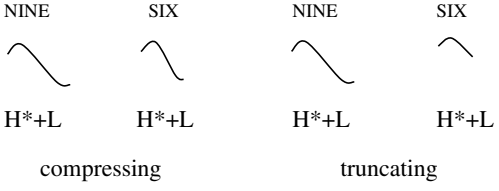


Figure 20.2 Distribution of nuclear patterns between statements and inversion questions in Cambridge and Belfast English (after Grabe and Post 2002).

realization. One such is the way a dialect behaves under "tonal crowding," that is, when there is only a very short time, because of limited phonetic material, to achieve several intonational targets (Hs and Ls). Idealizing somewhat, there are two possibilities: to "compress," and try to squeeze all the targets into the available time; or to "truncate," and give up on achieving one or more targets. These strategies are schematized in (24):

(24)



The compressing dialect on the left attempts to realize the full fall despite the very short vocalic nucleus of "six" (short because of the phonologically lax vowel, and pre-fortis clipping) by making the pitch change steeper. The truncating dialect on the right does not alter the rate of pitch change, and "runs out of road" leaving an incomplete fall.[12] Hungarian has been described as a "truncating" language (Ladd 2008, pp. 180–184), while English is thought of as "compressing." Grabe (1998) showed that German truncates falls but compresses rises.

Table 20.1 summarizes results in Grabe et al. (2000) for four dialects of English (with German added for comparison). It can be seen that SBE conforms to the stereotype of English as a compressing language, as does Newcastle. Leeds, despite being similar to SBE in terms of its

Table 20.1 Summary of truncation and compression of nuclear pitch accents in four English dialects.

	RISE	*FALL*
SBE	compresses	compresses
Newcastle	compresses	compresses
German	*compresses*	*truncates*
Leeds	truncates	truncates
Belfast	truncates	–

intonational phonology, is truncating when it comes to realization, as is Belfast (which as we have seen is phonologically unusual, and lacks the falls on which to test this parameter fully).

Another source of realizational differences is the way in which intonational targets align with segmental material. van Leyden and van Heuven (2006) report the case of the Orkney and Shetland islands off the north coast of Scotland, where Orkney English is characterized as "lilting" or "sing-song" by comparison to Shetland English. This turns out to be due to a later timing of an H target. Such cases (cf. Dalton and Ní Chasaide 2005, for similar variation among dialects of the Irish language) can be the result of drift in the alignment of an H* accent. In the case of Orkney, van Leyden and van Heuven argue provisionally for a phonological re-analysis from H*+L to L*+H, as do Dalton and Ní Chasaide for Donegal Irish, on grounds such as the stability of the low target on the accented syllable and the more variable alignment of the H. In the case of differences between other Irish dialects, however, the alignment differences do not warrant different phonological analyses; and one may speculate that historical differentiation of dialects' intonation will proceed by gradual steps of re-alignment.

Acknowledging that a substantial amount of intonational variation is realizational rather than a difference of phonological system may explain why there is relatively good between-dialect comprehension of intonation—occasional misinterpretation of affect notwithstanding. As we move from varieties of English which are historically indigenous to the British Isles to those which have emerged worldwide, however, we find cases of fundamental prosodic differences influenced by substratum languages. These may give rise to comprehension difficulties. I will focus on one, potentially interrelated, cluster of prosodic differences.

It has long been recognized that languages can differ in terms of rhythm, and this is sometimes discussed in terms of *syllable-timing* and *stress-timing* (cf. Abercrombie 1967, pp. 96–98). In the ideal syllable-timed language, each syllable would take up the same amount of time, or be *isochronous*, whereas in the ideal stress-timed language, it is the *stress-foot* which would be isochronous (the stress-foot consists of a stressed syllable plus any unstressed syllables which intervene before the next stress). According to this view, French is a good example of syllable-timing, and English is a good example of stress-timing. In reality, however, experimental phonetics has failed to support either isochrony in any strict sense or a polar division of languages into two types.

Alternatively, attempts have been made (not uncontroversially[13]) to quantify the impression which the terms *syllable-timing* and *stress-timing* sought to capture by using one of a number of *rhythm metrics*. These include the pairwise variability index (PVI), which simply expresses the average difference—in duration, intensity, or vowel quality—between successive pairs of phonetic units. It turns out, for instance, that as expected French has a lower durational PVI value for vowels and consonants than English (Grabe and Low 2002), reflecting more evenly timed syllables (well short of isochrony, of course). The units used for

rhythm metrics are typically successive vowels, consonants, or syllables, though Nolan and Asu (2009) extended the PVI to feet, and argued languages could have distinct rhythms at different levels in the prosodic hierarchy.

In fact, the first application of the PVI was not to different languages but to dialects of English, in a comparison of SBE and Singapore English—the latter of which has been described as "syllable-timed." Low (1998) and Low et al. (2000) showed that, compared to SBE, Singapore English had less pairwise variability in vowel duration,[14] vowel intensity, and vowel spectral dispersion (how peripheral a vowel is in the acoustic vowel space). To a large extent this reflects the fact that Singapore English is much more reluctant than SBE to reduce unstressed vowels to schwa. Singapore English could be said to have on average a less steep *prominence gradient* between syllables than SBE.

Separately, Low (1998) demonstrated that speakers of Singapore English do not deaccent given information (see Section 20.3.2); they are quite happy to say things like *I* OFF*ered her* COF-F*ee but she doesn't* DRINK COFF*ee*, with a full accent on the second occurrence of "coffee." The strategy of backgrounding less important parts of the utterance by intonational means seems not to be grammaticalized. It is intriguing to speculate that at the level of pitch accents, too, Singapore English has a less steep prominence gradient; there may be a scaling of pitch accents according to information, but radical reduction (to zero) is not an option. It remains to be investigated whether there really is a systematic scaling of pitch accents according to information structure (short of deaccenting), or whether this kind of intonational signaling of informational value is simply absent. What is clear is that the lack of vowel reduction and the lack of deaccenting conspire to make Singapore prosodically radically different from (for example) SBE, and create problems for speakers of SBE in lexical access and comprehension. Deterding (1994, p. 71) notes that the British model of intonation "is inappropriate for [Singapore English], because there is no clear nucleus acting as the focus of information or anchor for information within each intonational phrase," and "it is almost certain that other world varieties of English will pose a similar challenge to our ingrained assumptions about English intonation."

20.5 Conclusion

As noted in Section 20.1, one of the "design features" of speech is that speaking pitch is variable independently of the sounds being produced. As a consequence, pitch can be recruited to carry information over and above that borne by the vowels and consonants of language, functioning as lexically contrastive tone in a large subset of the world's languages, and nonlexically in all languages as intonation. In its intonational role, pitch operates in tandem with durational factors and loudness.

Intonation, as an information channel independent of the words chosen, carries a number of quite distinct strands of information. We have seen that the ways in which it does so include signals mirroring physiologically determined changes in pitch on the one hand, and abstract phonological categories on the other. The latter may originally derive from grammaticalization of biologically determined frequency effects, but the status of phonological intonational categories as members of an abstract linguistic system means that their relationship to information is potentially arbitrary.

This arbitrariness should lead us to expect variation across languages and dialects, and Section 20.4 discussed such variation between dialects. Even those intonational effects whose basis in biology is more transparent are highly conventionalized, and so can vary. Intonation, then, can be just as significant a component of a dialect as the pronunciation of its vowels and consonants.

English is generally regarded as having a complex intonation system. English, of course, is not a tone language and so intonational categories can flourish without competition for the resource of pitch variation. But even among non-tone languages, English seems to rely rather heavily on intonation for signaling. Schubiger (1965) compares English to German, which often uses pragmatic particles where English uses intonation. For instance, she cites "rejoinders with the connotation 'by the way you talk (or act) one would think you didn't know (or were ignorant of the circumstances),"' which in German naturally include the particle "doch," for instance, "Ich bin doch eben erst aufgestanden" ("I've only just got up"). "Doch" does not readily translate lexically, but the connotation is achieved in English by a low prenuclear accent:

(25) I've ONly just got U P

L* H*+L 0%

It may seem to be stretching a point to claim unusual complexity for English intonation from this one little corner of information signaling, but whether or not the claim that English is unusual in the richness of its intonation can be proved, there is no doubt that English intonation remains a highly elaborate and flexible communicative resource. This chapter has sought to give an overview of some of the ways English intonation is used to convey a wide variety of information.

NOTES

1 It would strictly be more accurate here to say "accents of English," since not all varieties to be considered differ greatly beyond pronunciation; but since in this chapter "accent" is used crucially as a prosodic term, it is convenient to use "dialect" for any variety.
2 Admittedly, with intonation the concept of phonological opposition (or contrast) is more problematic than in segmental phonetics; there is no straightforward equivalent to the "minimal pair" question, since judgments on whether two utterances are "the same" in terms of intonation are less clear-cut than a decision about whether two utterances represent the same word. Nonetheless, all systematic analyses of intonation make phonological assumptions, for instance, that there are variant events which count as the same (cf. allophones), and that events which change meaning do not count as the same.
3 Such stylized pitch curves have no theoretical status, but will be used throughout this article as a convenient way to convey the shape of the melody of utterances.
4 Their precise status is a topic of debate.
5 "English Intonation in the British Isles" funded by ESRC grant R000237145; http://www.phon.ox.ac.uk/files/apps/old_IViE/.
6 "Stress" and "accent" are tricky terms. "Stress" might best be used for an abstract phonological property of a word, showing the potential location of intonational prominence when the word is spoken, and "accent" for the realization of that potential. In speech, depending on information structure, the stressed syllable may receive no prominence, rhythmic prominence by means of the timing of syllables and loudness, or, additionally, pitch prominence (a "pitch accent"). A syllable with prominence by rhythm alone might sensibly be termed a "rhythmic accent"; but it is commonly referred to as a "stressed" syllable. Although this blurs the distinction between the lexical representation and a property of speech, I will follow this common usage here.

7 We have already seen an example of this: the word "manuscript" in Figure 20.1 is deaccented.
8 But see Section 20.4 for dialects to which this does not apply.
9 As early as the 17th century, Butler (1633/1910, p. 61) noted that a question mark "raiseth the common Tone or tenour of the voice in the last word … but if [a sentence] begin with a word interrogative; as, [who, what, how, where, why, &c;] it falleth as a Period."
10 Evidence that the nuclear accent is L*+H rather than L*, which might appear to model this utterance, would come if we extended the unaccented material after the nucleus—for instance, "…the article you were writing"—in which case the rise would be likely to plateau out after "article" followed by a final short rise at the boundary. L* H% would keep the pitch low till a final boundary rise.
11 Good ways to indicate irony include an inappropriately narrow pitch span, or an inappropriately wide one, especially when combined with greater duration.
12 Then why not regard "six" here are carrying just H* rather than H*+L? The main reason is that this would create the curious situation whereby the intonation pattern chosen was determined by the phonetic content of the word selected. Better to allow a degree of abstractness in the analysis, and treat the pattern always as H*+L underlyingly.
13 The robustness and conceptual basis of global rhythm metrics have often been questioned (e.g., Arvaniti 2012), as has any suggestion that the rhythm of a language is an intended goal rather than emergent from local temporal adjustments such as marking the edges of prosodic domains (e.g., White 2014), and even the notion that all languages "have" a rhythm (Nolan and Jeon 2014).
14 Note though that Grabe and Low (2002) show that Singapore English is still much nearer rhythmically to SBE than to a canonically syllable-timed language such as French.

FURTHER READING

For an accessible and wide-ranging all-round introduction to the forms and functions of intonation, focusing on British English, see Cruttenden (1997). Nolan (in press) reviews the history of the "British" framework for intonation analysis. Beckman et al. (2005) provides an overview of the ToBI system within the autosegmental-metrical framework and its rationale, while Ladd (2008) gives a more general discussion and critique of the autosegmental-metrical approach to intonational phonology, exploring several problematic areas in the description of intonation including the definition and use of pitch range. Pierrehumbert (1980) is pivotal in theoretical terms, marking as it does the first comprehensive application of autosegmental mechanisms to the description of English intonation. It also provides a wide overview of patterns found in American English.

Gussenhoven (2004) deals with the tonal and intonational use of pitch across languages and discusses what is universal or language specific, and Hirst and Di Cristo (1998) offers a compendium of descriptions of the intonation of a large selection of languages. Further descriptions of the intonation of the languages of the world are to be found in Jun (2005, 2014).

A classic (and highly detailed) analysis of the prosody of British English within the "British" descriptive framework, covering all aspects of non-segmental phonetics, is to be found in Crystal (1969), while classic, more pedagogically oriented descriptions of intonation within the same tradition are provided by Kingdon (1958) and by O'Connor and Arnold (1961/1973). Wells (2006) offers an updated introduction within the "British" tradition to the main intonation patterns of standard Southern British English pronunciation.

The ToBI transcription system, based on Pierrehumbert (1980), and information about its adaptation to other languages, can be accessed on the web at https://www.tobihome.org/. Information about IViE, a system which forms a bridge between autosegmental-metrical approaches and the "British" tradition, and references to work using it to describe research on intonational variation in the British Isles, can be found at http://www.phon.ox.ac.uk/files/apps/old_IViE/.

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21 Phonological Variation: A Global Perspective

PAUL FOULKES

21.1 Introduction

Interest in linguistic variation is probably as old as interest in language itself. Comments on variation trace back as far as the Sanskrit grammarian Pāṇini (ca. 600 BC) (Chambers 2002, p. 6). One of the earliest pronouncements on phonological variation in English comes from John of Trevisa (ca. 1385), who describes an antipathy to northern British accents which is preserved in some quarters even today:

> *Al the longage of the Norþumbres, and specialych at York, ys so scharp, slyttyng and frotyng, and unschape, þat we Souþeron men may þat longage unneþe undurstonde.*
>
> [All the language of the Northumbrians, and especially at York, is so sharp, piercing and grinding, and unformed, that we Southern men can that language hardly understand. (Freeborn et al. 1993, p. 23)]

My aim in this chapter is to outline the various causes and effects of phonological variability. I draw on the methods and findings of several academic traditions, especially phonetics, phonology, dialectology, sociolinguistics, psycholinguistics, pragmatics, language acquisition, and a range of applied disciplines. The integration of different strands of work serves to highlight areas of overlap and tension between disciplines, and to identify areas in which our understanding of variation remains limited.

A few caveats are in order before we begin. First, while my focus is on variation in English, the discussion is presented in a more general framework. English examples are used to illustrate general principles and problems in the study of phonological variation. Since the turn of the millennium, there has been a pleasing increase in attention paid to varieties of English across the world, and to variation in other languages (e.g., Stanford and Preston 2009; Stanford 2016, and work in journals such as *World Englishes*). Yet our understanding of variation has traditionally been dominated by work on North American and British English varieties. It is thus vital to ensure our ideas and theories are put to the test by diverse data sets. Second, my focus is mainly on speech production, as we know rather more about how variation is manifested in production than about its effects on speech perception. However, research is now beginning to shed light on the latter, and theoretical accounts of variation are coming to integrate findings from production and perception. Third, I have interpreted *phonological* in the broad sense of "pertaining to speech sounds," in order to include work that deals both with the physical medium of speech and also the cognitive representation of speech "sounds." The

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issue of whether particular variable features are the result of physical (phonetic) or cognitive (phonological) factors is one of the most interesting and important questions to emerge from the study of variation. Fourth, I only discuss language using the vocal medium, although systematic variation is also found in the phonological elements of sign languages (Sutton-Spence et al. 1990; Bayley et al. 2002, Schembri et al. 2009). Finally, given the range of different approaches to variation, the discussion is structured around sources of variation rather than academic tradition. Five broad categories are covered: physical and biological factors, structural–contextual factors, grammatical factors, geographical and social factors, and individual factors. It will, however, become apparent that the factors interact with each other, and that phonological variation must be understood with reference to them all simultaneously.

The sources of variation are discussed in Sections 21.2 to 21.6. Section 21.7 outlines the general contributions made by work on phonological variation to current theoretical debate in linguistics, while Section 21.8 similarly summarizes the relevance of phonological variation for applied fields. The final section offers concluding comments and a speculative outlook for future work.

21.2 Physical and Biological Constraints on Phonological Variation

The first set of factors to consider in understanding phonological variation are not particular to any one language. Rather, they are the direct consequence of differences in the structures of the vocal tract and auditory system. The phonetic form of any utterance is governed to a large extent by the biological and physical components of the *speech chain* (Denes and Pinson 1993), which represents the discrete stages in production and perception of speech. Any spoken event begins with cognitive processes: the speaker intends to convey a message, and plans the utterance in terms of the linguistic units and structures of the relevant language(s). This plan is then translated into neural motor commands which in turn drive muscular action. The vocal organs are moved into positions to generate the appropriate sounds by channeling airflow through the vocal tract. The acoustic signal thereby creates travels to the listener's auditory system, from where it is transmitted by neural response to the cognitive perceptual system. The perceptual system then converts the neural information into linguistic terms to complete the transmission of the message. Note that the chain need not be considered fully linear, however: speakers also attune their speech in line with constantly updated observations about interactants in conversation, such that phonetic forms of words may be mutually negotiated (e.g., Couper-Kuhlen and Selting 1996).

The speech chain model is clearly universal, applying to all utterances in all languages. Moreover, the model largely defines the study of phonetics, which has developed through investigation of the various "links" in the chain. Theoretical models have been developed to account for events that occur in particular stages of the chain, or in the transition from one stage to the next. Thorough reviews of particular links are provided by Hardcastle et al. (2010), Goldrick et al. (2014, production), Stevens (2000, acoustics), and Pisoni and Remez (2008, perception).

As far as speech production is concerned, there has been abundant work on the effects of structural context (Section 21.3). Until recently, however, the study of most types of variation has played a relatively peripheral role in phonetic theory. In fact, variation has traditionally been treated by phoneticians as an unwelcome obstacle. Research on speech perception and production has been plagued by the "lack of invariance problem," and much effort has been directed at constructing theoretical models to explain it. The "problem" is the fact that all acts of speaking, and thus all acoustic signals, are unique; yet listeners can

understand the same linguistic message—at some level at least—even when it is represented in varying acoustic forms. Theoretical models have therefore sought to explain the mapping between highly variable production strategies and acoustic forms on the one hand, and, on the other, linguistic units that are assumed to be invariant. No universally accepted solution has been reached, but influential models include the motor theory of speech perception (Liberman and Mattingly 1985) and the direct realism model (Fowler 1986). For critical discussion, see Mattingly and Studdert-Kennedy (1991) and volume 14(1) of the *Journal of Phonetics* (1986), respectively. More recent perceptual models, however, have approached the issue of variation from a fresh perspective, taking account of the structured variability in the acoustic signal which results from phonotactic and sociolinguistic factors (see further, Section 21.7).

The speech chain model predicts certain types of variability and provides a partial explanation for why no two utterances are identical. Speech is largely dependent on the physical properties of the vocal–auditory channel, and, of course, no two human beings share exactly the same physical characteristics. Differences in spoken forms may therefore emanate from physical differences in each link in the chain. Furthermore, these physical differences are not only to be found across speakers: individuals are also subject to long- or short-term physical changes in the vocal tract and auditory system, which in turn may yield long- or short-term effects on speech or hearing.

Mackenzie Beck (1997) surveys the available research on variation in anatomy and physiology of the vocal tract. She notes that differences between individuals may be relatively minor, for example, slight variation in dentition which may lead to subtle effects on the acoustic properties of fricatives such as [s]. There may also be much greater physical (and thus phonetic) differences, for example, caused by disease or malformation. A detailed consideration of the phonetic effects of speech and language pathologies is beyond the scope of this chapter, but see Weismer (1997) and Ball et al. (2008). The vocal tract of an individual also undergoes substantial physical changes during the life course, with marked developments occurring through childhood and adolescence into adulthood, and further changes emerging as a result of old age. For example, fundamental frequency (f_0, which is perceived as the pitch of the voice) lowers from childhood to adulthood, and may undergo particularly dramatic short-term change in the case of adolescent males (the "breaking" of the voice). In old age, the atrophy of muscles and calcification of bones and cartilages may introduce marked phonetic changes (Mackenzie Beck 1997, p. 258ff.), including whispery phonation and further changes in average f_0. Smoking may also affect parameters such as f_0, and in turn may affect listeners' ability to estimate a speaker's age (Braun 1996).

Everyone is affected by short-term physical changes, occurring, for example, as a result of the common cold or tooth loss. The phonetic effects of such physical changes range from the subtle to the obvious, but all remain under-researched. Mackenzie Beck (1997, p. 278) points out that this is in part because of methodological difficulties: it is often hard to distinguish the effects of physical change from those which stem from social and cultural influences such as regional accent (see further, Section 21.5). It is also often impractical to track individuals longitudinally. Phonetic changes reflecting elective physical change, for example, for transgender individuals, are addressed by Gorham-Rowan and Morris (2006) and Papp (2011), among others.

Although the study of variation has traditionally been peripheral to phonetic theory, models of production, acoustics, and perception do enable us to understand the parameters of variability in speech. For example, it has been shown that (all things being equal) vowels differ in intrinsic f_0, with close vowels having higher f_0 than open vowels (Whalen and Levitt 1995). Similarly, voice onset time (VOT) in stop consonants varies in relation to several factors including place of articulation. This has been explained with reference to the variable aerodynamic demands of different vocal tract configurations (Westbury 1983).

21.3 Structural–Contextual Constraints on Phonological Variation

In addition to the gross effects of the physical vocal system, phonological variation also results from the linguistic context in which a sound appears. Contextual constraints include the effect of sequential articulations upon one another, the effect of position within words or syllables, and larger-scale effects reflecting predictability of sounds.

21.3.1 Coarticulation

The direct phonetic effect of one sound on another is termed *coarticulation* or *assimilation* (Hardcastle and Hewlett 1999). Well-known examples in English are the addition of lip-rounding to consonants in anticipation of a following rounded vowel (thus, the second /s/ of *seesaw* is likely to be rounded, whereas the first /s/ is more likely to have spread lips due to coarticulation with [i]), and the abrupt consonantal changes that may occur across word-boundaries (e.g., *dress shop* [dɹɛʃ ʃɒp]). A subtler effect is described by Moreton (2004), who demonstrates that vowel formants vary in relation to whether a following consonant is voiced or voiceless. Cruttenden (2001b, p. 278ff.) discusses many more types of variation caused by syntagmatic context. Anticipatory effects are stronger than perseverative effects, thus sounds are more likely to be influenced by their following neighbours than their preceding ones (Gay 1978).

The variation in the acoustic signal which results from articulatory movement between neighbours is important for speech perception. In consonant+vowel sequences, the formants of the vowel take systematically different routes toward the final target position, depending on the place of articulation of the consonant as well as the quality of the vowel itself (see, e.g., Ladefoged 2001, p. 180). These formant *transitions* are an important cue to the identity of the consonant (Harris 1958; Mann and Repp 1980), and may also help listeners to identify the vowel (Verbrugge and Rakerd 1986). Most perceptual work, however, has concentrated on syntagmatic variation between sounds in stressed syllables, while relatively little work has been devoted to perception of unstressed syllables or domains longer than individual segments (but see, e.g., Fowler 1981; West 1999).

Assimilatory effects have often been described as resulting from economy of articulatory effort (e.g., Abercrombie 1967, p. 87). In the course of fluent speech, speakers may take "short cuts" as they move from the production of one sound to another. Support for this explanation comes from studies which have examined the effect of speaking rate on articulation (e.g., Gay 1968; Crystal and House 1988a, b; Perkell et al. 2002; but see Harris 1978, for contrary evidence). In general, faster speaking rate is characterized by articulations of shorter duration, increased overlap, and greater articulatory undershoot (that is, the articulators do not fully reach their targets). Not all sounds are equally affected by changes in speaking rate, because the various articulators differ in degrees of inertia, and in the basic speed with which they can be moved (Ohala 1983, p. 207). However, economy of effort does not tell the full story behind coarticulation. Ohala (1983) argues that some examples are better explained by aerodynamic principles. For example, stops develop into affricates most commonly in the context of close vowels or /j/ (for instance, the pronunciation of *tune* as [tʃʉn] in some varieties of British English). The generation of fricative energy results initially not from articulatory change, but via the aerodynamic consequences of the vocal tract configuration. In [ti] or [tj], a narrow constriction is created behind the alveolar closure for [t], which in turn causes high velocity airflow to last longer when the stop is released. The long period of high velocity airflow may be perceptible as a fricative (Ohala 1983, p. 204).

Moreover, it is clear that coarticulatory effects are not universal. They differ across languages, dialects, individuals, and situations (Lindblom 1963; Byrd 1994; Laver 1994). For example, Received Pronunciation (RP) is said not to show anticipatory voicing assimilation, unlike some Scottish accents where the medial consonant cluster in *birthday* may be [-ðd-] (Laver 1994, p. 384). Similarly, vowels before voiceless consonants are generally shorter than before voiced consonants (Peterson and Lehiste 1960). Thus, *brute* has a shorter vowel than *brood* and *bruise*. However, the effect of the following consonant varies across dialects. In Scottish English and some north-eastern accents in England, vowels display a pattern known as the Scottish vowel length rule (SVLR; see, e.g., Scobbie et al. 1999; Milroy 1995). In SVLR accents, vowels preceding voiced stops are short, and thus pattern with vowels preceding voiceless consonants. Thus, *brood* and *brute* are short, while *bruise* is long. Further contextual differences across English dialects are discussed by Fourakis and Port (1986) and Kerswill (1987), while Nolan and Kerswill (1990) demonstrate similar differences across socioeconomic groups. The overall degree of articulatory precision (i.e., citation-like production, as opposed to reduction) is also shaped in part by the demands of situational context related to interaction, and to sociolinguistic factors such as attitude, stance, and identity. Hawkins (2003) provides a neat anecdote to illustrate both, reporting a production of the phrase *I don't know* as [ə̤ə̤ə̤]. The heavily reduced form signals the informality of the situation and the speaker's attitude to the question she was answering. Local and Walker (2012) document a wider range of interactional functions, for example, noting that that reduction is used to signal talk projection (holding the floor).

These differences show that coarticulation is not simply the automatic consequence of "mechanical necessity" (Laver 1994, p. 379), but is to some extent planned and controlled by speakers. Knowledge of coarticulation can therefore be argued to form part of phonological competence (Whalen 1990; Kingston and Diehl 1994).

21.3.2 Prosody

The examples discussed in Section 21.3.1 concern the sequential effects of sounds upon each other. Sounds also vary in response to their prosodic context, that is, their context with respect to higher level units of organization such as sentences and intonational phrases. Generally speaking, articulations are longer and "stronger" in initial contexts, and when in stressed rather than unstressed positions. Final contexts and unstressed positions present greater freedom for sounds to reduce or lenite, and it is also common to find increased duration of segments before major prosodic boundaries (for a review, see, e.g., Shattuck-Hufnagel and Turk 1996; Turk and Shattuck-Hufnagel 2007). Lavoie (2001), for instance, analyzed acoustic and electropalatographic (EPG) data from American English. She found consonantal features such as VOT to be longer when preceding stressed vowels and when syllable-initial. Byrd (1996) used EPG to show that there is less overlap between articulatory gestures in syllable onsets than codas, and that onsets are in general less variable than codas.

21.3.3 Syllable and Word Position

With respect to syllable context, Byrd (1996) found that in coda positions plosives reduced in duration more than fricatives, and coronals were overlapped more by following velar gestures than vice versa. Pierrehumbert (1995) discusses variable effects of context on syllable-final glottalization of /t/. She hypothesizes that glottalization is less likely in the context of a following voiceless fricative (e.g., *hat shop*) than other following sounds. This is because the aerodynamic consequences of glottalization are in conflict with the aerodynamic needs of fricatives. Glottalization involves a constriction or closure of the glottis, which therefore

restricts airflow passing into the oral tract. Fricatives, however, demand high airflow in order to create turbulence. The data shown in Figure 21.1 lend support to Pierrehumbert's hypothesis. This figure displays glottalization patterns produced by 32 speakers from Newcastle upon Tyne. The *y*-axis shows the proportion of glottalized tokens produced for word-final /t/ in pre-consonantal contexts. The data combine glottal stop realizations with those displaying laryngealization (see Docherty and Foulkes 1999, 2004). Data from older (45–67) and younger (15–27) speakers are shown separately. We can see that glottalization is lowest in the voiceless fricative contexts, particularly /f, s, ʃ, h/. Stops trigger higher rates of glottalization, but substantially less than approximants and nasals. This pattern is also predicted by Pierrehumbert: stops require sufficient airflow to create plosion, while approximants and nasals can be produced with relatively low airflow rates. Note, however, that Figure 21.1 also reveals other factors to be at work in accounting for the variation in the data. In the case of /h, θ, ð, l, r, j/, the younger speakers have significantly higher glottalization rates than the older generation, suggesting change in apparent time. Indeed, that is precisely what was found with glottalization in other contexts (Docherty et al. 1997).

As with coarticulation, there is some debate on the extent to which contextual effects are universal. While many effects seem to be found to similar degrees across languages, there are also clear differences between dialects in contextual realization of sounds; hence, these differences must form part of speakers' phonological knowledge. For example, in American English, it has been suggested that nasal consonants in coda positions are in fact typically realized via nasality on the preceding vowel. This is especially true where the nasal occurs in a cluster with a final voiceless obstruent. As a result, the duration of a nasal consonant in a word such as *tent* may be shorter than that in *ten* or *tend* (Fujimura and Erickson 1997, p. 105).

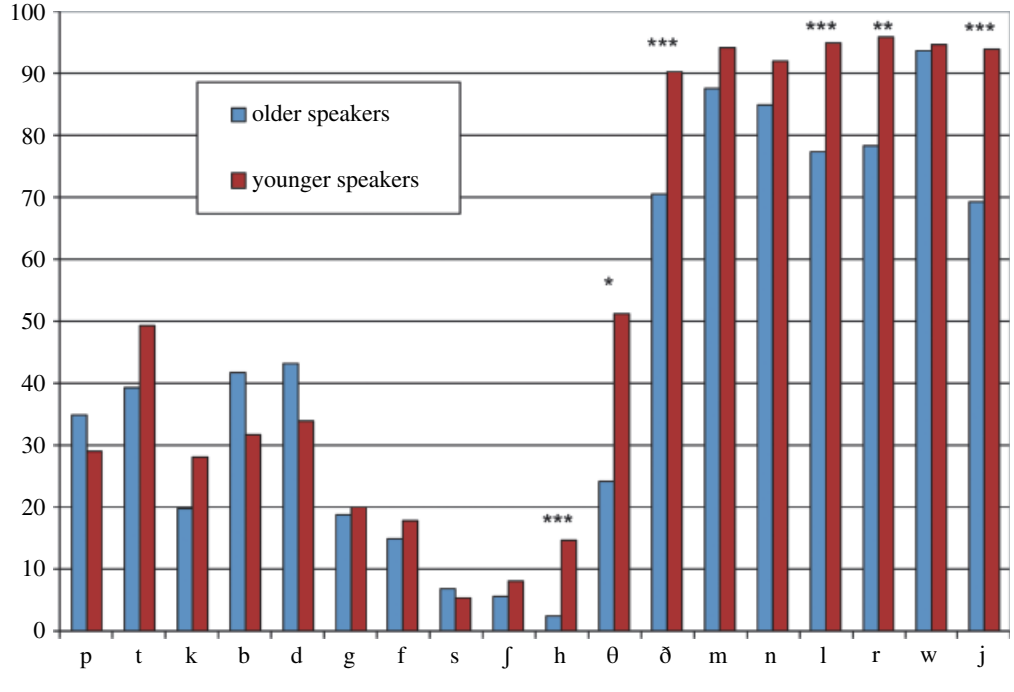

Figure 21.1 Glottalization rates for pre-consonantal /t/ in Newcastle English. (* indicates $p < .05$, ** $p < .01$, *** $p < .001$; N tokens = 4883; data for /v, tʃ, dʒ/ are not shown due to small number of tokens.)

The significant age effects in glottalization shown in Figure 21.1 also testify that universal explanations for variable patterns (in this case based on aerodynamic principles) cannot be wholly satisfactory. Instead, aspects of contextually conditioned variability may differ across individuals or may correlate with social factors. Further evidence is provided by Docherty and Foulkes (1999, 2004). In an acoustic study of Newcastle English, systematic variation was found in the realization of word-final pre-pausal /t/. In addition to the expected voiceless oral stop variants, variants were also found which contained a continuation of voicing from the previous vowel, and pre-aspirated variants which contained a period of high-frequency fricative energy before the stop closure. The voiced variants were significantly more common in the speech of older males than any other group, while the pre-aspirated type was strongly associated with young women.

21.4 Grammatical Constraints on Phonological Variation

It was noted in Section 21.3 that aspects of contextual variation vary across languages and dialects, and are thus arguably represented cognitively in the phonological component of the grammatical system. This section addresses further sources of variation which are unequivocally the result of grammatical factors. Some of these involve the interaction of the phonology with other levels of the grammar (Section 21.4.1), while others occur as a result of speakers having access to grammars of more than one language or dialect (Section 21.4.2).

21.4.1 Interactions Between Phonology and Other Levels of the Grammar

Several phonetic and phonological studies have discussed the deletion of /t/ and /d/ in English coda consonant clusters. For example, in a phrase such as *perfect memory*, it is common for the /t/ of *perfect* to be deleted, particularly in casual speech (e.g., Cruttenden 2001b, p. 287; see also Browman and Goldstein 1990, who show via X-ray evidence that the apparent deletion may be a perceptual effect, with the alveolar closing gesture for the /t/ still present but masked by labial closure for the /m/). The deletion of final /t/ and /d/ has also been a common topic in sociolinguistic work (e.g., Guy 1980; Guy and Boyd 1990). It has been shown that the rate of deletion is influenced by several contextual factors, including the phonetic quality of adjacent sounds and the morphological status of the target word. Deletion is more likely in monomorphemes (*mist*) than in irregular past-tense forms (*kept*), and least likely in regular past-tense forms (*missed*). This pattern is largely consistent across dialects, although differences have been found in a study in York (Tagliamonte and Temple 2005). Similarly, Labov (1989) shows that the use of alveolar [n] for /ŋ/ (e.g., in *jumping*) is influenced by grammatical category. It is least frequent for nouns, but increasingly more frequent for gerunds, adjectives, and progressives/participles. Labov claims there is a historical explanation for the patterning, as the modern *-ing* forms derive from two different historical roots, *-inge* and *-inde*.

The differential rate of cluster reduction in pairs like *mist* and *missed* shows that morphological structure may make itself apparent in phonetic form even where the phonological structure of words appears to be identical. Hawkins and Smith (2001) and Hawkins (2003) cite examples where similar differences are found even in canonical speech and without the influence of connected speech processes. In some dialects, the pair *mistake* and *mistime* share a similar phonological structure, with a syllable break after /mɪs/. However, for some speakers, syllabification of the /t/ differs: it is affiliated with the second syllable in *mistime*

but ambisyllabic in *mistake*. As a result of the different syllabic structure, the relative durations of acoustic segments may differ. *Mistime* has a more aspirated /t/, for example, because it is in syllable-initial position. The explanation for the difference is that *mistime* contains a morpheme boundary whereas *mistake* does not. Similar differences are found in SVLR accents (see Section 21.3.1): while *brood* has a short vowel in these accents, *brewed* has a long vowel because of its morphological complexity. Hawkins and Smith (2001) predict that listeners should be able to perceive such subtle distinctions and exploit them in speech perception tasks to facilitate lexical access (cf. findings on coarticulatory variation referred to in Section 21.3.2).

A word's grammatical category can also constrain the degree of variability that speakers exercise in producing it. Function words and auxiliaries undergo quite different reduction processes from content words (Ogden 1999; Turk and Shattuck-Hufnagel 2000; Bell et al. 2003). Usually, this means a greater range of reduced forms are found for function words. In English, for example, forms of the auxiliary *have* include [hav, həv, əv, v], but a similar range of reductions is not possible for minimally different phonological forms, such as *ham*, *heave*, *Gav*.

21.4.2 Predictability

In addition to variation shaped by syntagmatic and prosodic factors, a number of recent studies report significant effects on phonetic form as a function of predictability (Shaw and Kawahara 2018). This term encompasses both phonological and lexical predictability (e.g., the relative frequency of sounds in phonotactic context or words in the lexicon) and also message predictability or *informativity* (information content). The latter term refers to the average predictability of segments in the language as a whole. For example, in English, /ŋ/ is rare across the entire lexicon, but highly predictable if the preceding context is /standɪ-/ (Cohen Priva 2015). Segmental properties including duration, VOT, formant frequencies, and deletion rates vary in line with both local and overall informativity. Segments that are less predictable tend to be realized in a more citation-like form, for example, with longer duration and with a lower tendency to delete. These effects interact with those influenced by sociolinguistic factors such as social class and age. Hay and Foulkes (2016), for example, document a complex set of effects that have shaped the development of intervocalic /t/ from [t] to [d/ɾ] in New Zealand English. These include effects of lexical frequency (more frequent words attract more [d/ɾ]), and predictability effects in discourse context, for example, through repetition (repeated words are more likely to attract [d/ɾ], whereas the same words have [t] on first mention). Overall predictability has also been argued to shape change in phonological systems over time (e.g., Sóskuthy and Hay 2017; Currie Hall et al. 2018). Discussion of predictability effects has often been couched within exemplar models (discussed further in Section 21.7 below).

Findings such as these are largely the product of research based on data drawn from large corpora of speech recordings, but there is also evidence that such effects are attuned to in speech perception and comprehension (see further the papers collected in Shaw and Kawahara 2018).

21.4.3 Interactions Between Grammatical Systems

The anglocentric world of linguistics has tended to treat monolingualism as the norm. It is often neglected that the majority of the world's population is multilingual. Research on the phonology of bilinguals, however, shows that the grammatical systems of languages may interact and influence a person's speech production and perception (see, e.g., Flege 2007; Flege et al. 2003).

In the case of adult learners of a new language, it is of course usual for the new language to conform largely to the phonological patterns of the base language. This is why

we tend to display a non-native accent when speaking a language learned in adulthood. Where a large population learns the same language, as is often the case with English around the world, there may be a long-term effect which comes to define the regional accent. For instance, features of South African English such as unaspirated stops and tapped /r/ have been attributed to the influence of Afrikaans phonology (Melchers and Shaw 2003, p. 117). Jibril (1986) notes regional differences within Nigerian English which appear to be the result of the differing influences of Hausa and Yoruba. Several varieties of North American English are characterized by influence from other languages, including Cajun (French, see, e.g., Dubois and Horvath 1998) and Chicano (Spanish, e.g., Fought 2003). Interaction between two languages has also been shown in perceptual experiments. Elman et al. (1977), for example, found that bilinguals categorized synthetic stimuli differently depending on which of their languages they believed they were listening to (see also, e.g., Pallier et al. 1998).

Phonological studies of bilingual children also show that interference may take place between phonological systems (e.g., Leopold 1947). However, Khattab (2002a, b, 2007, 2009, 2011) shows that such interference is not automatic but may in fact testify to very sophisticated sociolinguistic learning on the part of bilingual children. As the following example shows, when searching for an Arabic word, the children often code-switched to English, but used L2 features such as tapped /r/.

Mother:	[miːn ˈhaɪda]	(“*who’s that?*”)
Child:	[ˈweɪtə]	
Mother:	[laʔ bɪlˈʕaɾabe]	(“*no, in Arabic*”)
Child:	[ˈweɪt**aɾ**]	

Thus, the “interference” is situation-dependent and serves to achieve goals in communication, both in terms of constructing a suitable Arabic-like word form on the fly, and also attempting to be cooperative. In such cases, the phonetic influence of one language on the other is not due to lack of competence, but instead indicates that the child tailors speech to the needs of the interlocutor or exigencies of the communication (see further, Section 21.5.6).

21.5 Geographical and Social Constraints on Phonological Variation

One of the most obvious sources of phonological variability is the geographical and social background of the speaker. Speakers learn the dialect(s) of the community in which they are raised. In the case of a global language like English, this may result in phonological differences between speakers that are so large as to make communication difficult or even impossible. Furthermore, work carried out in the Labovian sociolinguistic paradigm since the 1960s has revealed differences between speakers of any given dialect as a function of social factors such as gender, social class, ethnicity, age, and speaking style (Chambers 2003; Tagliamonte 2011).

The following sections (Sections 21.5.1 to 21.5.6) outline geographical and social factors in turn, explaining the influence of each factor on phonological variation with reference to key findings from dialectological, sociolinguistic, and phonetic research. However, many published sources contribute to our understanding of several of these factors simultaneously. Sociolinguistic studies, for example, usually investigate the effects of various social factors within a geographical location. In addition to the works referred to in the specific sections

provided below, other sources which provide valuable information about geographical and/or social differences across varieties include:

General Overviews of Regional Varieties

Bailey and Görlach (1982), Wells (1982), Cheshire (1991), Burchfield (1994), MacMahon (1998), Melchers and Shaw (2003), Kortmann and Schneider (2004), Kachru et al. (2006), and Trudgill and Hannah (2017). See also studies reported in the journals *American Speech*, *English World-Wide*, *Journal of English Linguistics*, *Language Variation and Change*, and *World Englishes*.

United Kingdom and Ireland

Surveys are provided by Hughes et al. (2012), Corbett et al. (2003, Scots), and Foulkes and Docherty (2007, England). Several other studies are collected in Trudgill (1978), Foulkes and Docherty (1999), and Hickey (2015). Studies of particular regional dialects include Trudgill (1974, 1988, Norwich), Macaulay (1977, Glasgow), Bauer (1985, RP), Petyt (1985, West Yorkshire), Milroy (1987b, Belfast), Ramisch (1988, Channel Islands), Deterding (1997, RP), Kerswill and Williams (2000, Milton Keynes), McClure (2002, Doric), Marshall (2004, Huntly), Beal et al. (2012, North East England), Clark and Asprey (2013, West Midlands), Kallen (2013, Ireland), Schützler (2015, standard Scottish), Braber and Robinson (2018, East Midlands), and Paulasto et al. (2018, Wales).

United States

Fischer (1958), Labov et al. (1972), Pederson (1977), Feagin (1979), di Paolo and Faber (1990), Schneider (1996), Fridland (1999), Thomas (2001), Clopper and Pisoni (2004), Newman (2014), and Johnstone et al. (2015). Surveys are provided by Wolfram and Ward (2005) and Wolfram and Schilling (2015).

Canada

Chambers (1991), Clarke (1991, 1993, 2010), Esling (1991), Woods (1991), Boberg (2008), and Walker (2015).

Australia

Mitchell and Delbridge (1965), Horvath (1985), Collins and Blair (1989), Burridge and Mulder (1998), and Blair and Collins (2001).

New Zealand

Bauer (1986), Holmes (1997), Burridge and Mulder (1998), Bell and Kuiper (2000), Trudgill et al. (2000), Watson et al. (2000), and Hay et al. (2008).

Asia

Bansal (1990), Khan (1991), Pingali (2009, India), Deterding (2007, Singapore), and Setter et al. (2010, Hong Kong).

Africa

Simo Bobda (2003, several varieties); Mesthrie (2002, 2006, 2017, South Africa).

The Americas

Holm (1983, Central American creoles), Patrick (1996, Jamaican Creole), and Aceto and Williams (2003, Caribbean).

Lesser Known Varieties

Sudbury (2001, Falkland Islands), Tent (2001, Fiji), Schreier (2003, Tristan da Cunha), Schreier (2008, St Helena), Schreier et al. (2010), Williams et al. (2015), and Britain et al. (2019, Micronesia).

Information on the pronunciation of consonants and vowels is considerably richer than that on suprasegmental features, particularly in sociolinguistic studies. However, works referring to intonational patterns include Bilton (1982), Guy et al. (1986), Britain (1992), Douglas-Cowie et al. (1995), Rahilly (1997), Warren and Britain (2000), Daly and Warren (2001), Cruttenden (2001a), Fletcher et al. (2002), Sutcliffe (1982), Walters (2003), and Nance et al. (2018). Grabe (2002, 2004) and Fletcher et al. (2004) compare patterns across dialects, while Cruttenden (1997, p. 128ff.) summarizes dialect-specific intonation work. Warren (2016) discusses uptalk in English across the world, as well as providing excellent methodological advice for intonation research.

Esling (1978, 1991), Henton and Bladon (1988), and Stuart-Smith (1999) show that social factors correlate with variation in *vocal setting*. Vocal setting is defined by Laver (1994, p. 396) as the "tendency underlying the production of the chain of segments in speech toward maintaining a particular configuration or state of the vocal apparatus." Examples of vocal settings include the use of breathy or creaky phonation. Further comments on regional or social variation in vocal setting and voice quality can be found in Honikman (1964), Trudgill (1974), Catford (1977, p. 103), Knowles (1978), Laver (1980, p. 4), and Podesva and Callier (2015). Other suprasegmental aspects to have been analyzed across dialects include pitch accent realization (Grabe et al. 2000) and rhythm (Low et al. 2000; Deterding 2001; Thomas and Carter 2006; Nokes and Hay 2012; Torgersen and Szakay 2012).

21.5.1 Geographical Variation

There is a long tradition of interest in geographical differences across English dialects, with systematic studies of regional varieties beginning at least as early as the eighteenth century. For example, Pegge's survey of the dialect of Whittington, Derbyshire, began in 1751 (published posthumously as Pegge 1896). Specific phonological interest is exemplified by Ellis (1889) and the editorial additions made by Hallam to Pegge (1896). The study of geographical variation was formalized in national dialect surveys in the mid-twentieth century (Chambers and Trudgill 1998). Major national projects include surveys of the USA and Canada (Kurath and McDavid 1961, Kretzschmar et al. 1994), England (Orton et al. 1962), Scotland (McIntosh 1952), and Ireland (Barry 1981). These surveys yielded detailed descriptive data in the form of local lexical items and pronunciations, often presented as linguistic atlases (e.g., for the USA, Kurath et al. 1939–1943; Allen 1973–1976; Pederson et al. 1986–1992; for Scotland, Mather and Speitel 1975; Labov et al. 2005; for England, Orton et al. 1978; Upton and Widdowson 1996). Older surveys were criticized for the lack of representativeness in their fieldwork, with the focus usually on accessing the speech of *NORMs* (non-mobile older rural males) (see, e.g., Pickford 1956; Milroy and Gordon 2003, p. 11ff.). Nonetheless, the wealth of descriptive data produced during national surveys remains an extremely valuable resource for research in historical phonology (e.g., Jones 2002). Modern surveys are more inclusive in design, involving urban as well as rural speakers and in some cases offering insights into variation within communities or within the repertoire of individuals. Advances in technology further facilitate data collection and analysis. Labov et al. (2005), for instance, collected much of their data via

telephone (although telephone speech may itself be problematic—see Section 21.5.6). Leemann et al. (2018) have developed mobile phone apps to collect data via crowdsourcing, and which produce results rapidly in the form of maps. An ongoing project in the United Kingdom has already collected data form over 47 000 respondents in the form of quiz responses, with over 3500 providing audio recordings.

The effects of geographical space on linguistic variation are discussed by Britain (2002). Britain argues that sociolinguists have overemphasized the effects of Euclidean (physical) space, while neglecting *social* and *perceived* space. Maintenance and change in linguistic forms may be constrained not only by physical distance but by the social distance between speakers, viewed in socioeconomic or political terms. The political division between England and Scotland, for example, explains why the Scottish–English border remains an abrupt division between dialects (Watt et al. 2013). Variation may also be linked to speakers' attitudes, and their perceptions of geographical or social distances (e.g., Britain 2002; Dyer 2002). Britain (2002) shows, for example, that the English city of Peterborough is much more influenced by London speech patterns than the adjacent rural areas of the Fens. The geographical distance from London is similar, but the social link is much closer with Peterborough than the Fens thanks to good road and rail links. Attitudinal factors further enhance the distance between Peterborough and the Fens, with urban dwellers often holding negative perceptions of their rural neighbours, and vice versa. This in turn means there is relatively little interaction between the urban and rural communities, thus further distancing the Fenlanders from London influences.

A number of perceptual studies have tested listeners' abilities to recognize and categorize regional dialects, including Wolfram et al. (1999), Thomas (2002a), Clopper and Pisoni (2004), and Montgomery (2012). It has also been shown that a listener's regional background affects perceptual processes (reviewed by Drager 2010). For example, Niedzielski (1999) conducted experiments with listeners from Detroit. Some subjects were played voice samples and told that they were hearing Michigan English, while others were told they were hearing a Canadian variety. The subjects were then asked to listen to a set of synthesized vowels, and from them choose the best match to the vowels they had heard in the original samples. Listeners made different choices depending on which variety they believed they had heard. Hay et al. (2018) found that New Zealand listeners displayed different degrees of sensitivity to /r/ in a phoneme-monitoring experiment, with greater sensitivity for those who had greater experience of hearing /r/ in the relevant contexts. These studies therefore suggest that knowledge of dialect-specific variation is drawn upon in a range of perceptual tasks, and speech perception is not accomplished purely through interpretation of the acoustic signal.

21.5.2 Social Class and Social Network

Socioeconomic status, often abbreviated as "class," is usually found to have a very strong influence on linguistic behavior. Typically, the class continuum correlates with a linguistic continuum from standard to vernacular, with vernacular forms most prevalent for members of lower social classes. Although many sociolinguistic studies investigate class differences, class itself is a difficult concept to quantify and interpret, particularly where female and child subjects are concerned (Rickford 1986; Ash 2002; Milroy and Gordon 2003), and few current studies use complex metrics for class. Instead, "class" is often used as a general label for the type of neighbourhood being investigated. Current studies, however, are beginning to explore class through the lens of contemporary models of class structure (Kerswill 2018).

Our understanding of within-community differences has been enhanced by sociometrics and social network analysis (e.g., Eckert 2000; Milroy 2002). This is especially true where social class is relatively homogeneous, as in Belfast, for example (Milroy 1987b). Networks

describe the type of regular contact a person has with other individuals. A dense network is a tight-knit one in which all individuals know each other. The ties between network members are strong if the individuals have regular contact with each other. The polar opposite is a loose network with weak ties between members. Network studies show that dense networks are often characteristic of broadly working-class communities, and that these networks exert strong influences on group members to adhere to the norms of group behavior. One result of this influence is the maintenance of local linguistic patterns. By contrast, looser networks are found in situations where group members are more physically and socially mobile, as is typical of communities higher up the social hierarchy. Such networks exert less influence on group members to conform to in-group norms, in turn rendering group members more susceptible to influence from outside the group. Britain (1997) elaborates on the role of network types and their effect on language use with reference to the effect of routines. Routine activities (e.g., regular patterns of work and leisure) promote the maintenance of patterns of behavior. Typical "middle class" communities are characterized by weaker cycles of routine, since they tend to enjoy greater mobility, which in turn disrupts routine activities.

Milroy and Milroy (1985) argue that loose networks and weak ties act as a conduit for linguistic change, since they increase the chances of exposure to external linguistic patterns (for a critique of the network model, see Marshall 2004).

21.5.3 Sex and Gender

Sex-based phonetic differences between adult speakers are very striking, and result to an extent from marked differences in vocal tract anatomy and physiology (Section 21.2). The larger size of the average male vocal folds explains why male voices typically have lower f_0 than women, for example. However, biology is not the only source of variation between males and females. Children are not differentiated by the obvious variation in anatomy and physiology that adults are, and yet it seems that gender-correlated patterns of phonological variation are learned relatively early in childhood. Perceptual studies show that listeners can distinguish boys and girls in speech samples taken from children as young as 3 years old (Lee et al. 1995). Production studies confirm that children start to manifest the same gender-differentiated phonological patterns as the adults of their community at around 3 years (Roberts and Labov 1995; Roberts 1997a, b; Docherty et al. 2006).

Sex- or gender-correlated differences emerge in almost all sociolinguistic studies. Generally, women are found to adhere more closely than men to norms associated with standard language varieties (see the review by Cheshire 2002). There are, however, exceptions (e.g., Milroy 1987b), and the general correlation between sex and standardness has been shown to be an oversimplification. Milroy and Milroy (1985) redefine the effect of sex in terms of orientation to *non-local* versus *local* forms rather than a standard/non-standard continuum. Their conclusion is based on observations that women and men typically operate in different social network structures: men's networks are usually denser than women's, which explains why men orient more to vernacular norms (see Section 21.5.2 above). The local/non-local dimension is better able to capture observed patterns where standard forms appear to play little role. One such finding is described by Watt and Milroy (1999), in their study of vowels in Tyneside English. Their results show that women prefer variants which have a relatively wide currency over Northern England, while men show a much higher use of more localized pronunciations.

The distinction between speakers' socially defined gender and the binary distinction of biological sex is often merely an issue of terminology (Cheshire 2002, p. 423): results tend to be presented and interpreted in binary terms in any case. Eckert (1989, 2000) and Stuart-Smith (2007), however, show that analysis of informants' gender identity offers a much more refined

understanding of their linguistic differences. In both Eckert's study of vowel variables used by Detroit teenagers and Stuart-Smith's research in Glasgow, some of the largest differences emerged not between male and female groups but between different groups of girls. Eckert (2000, pp. 122–123) explains this finding in the following terms:

> "the primary importance of gender lies not in differences between male and female across the board, but in differences within gender groups … a general constraint against competition across gender lines leads people to compete, hence evaluate themselves, within their gender group"

Recent years have seen a rapid rise in interest in gender and sexuality, and phonetic variation associated with a wide range of gender identities (for a review, see Podesva and Kajino 2017).

In the perceptual domain rather little attention has been paid to gender-based differences, although a series of experiments have shown that perceptual boundaries between sounds may be adjusted in line with the assumed gender of the talker. Strand (1999) presented listeners with a continuum of synthetic stimuli ranging from a clear [s] at one pole to a clear [ʃ] at the other, with intermediate stimuli gradually decreasing in the low frequency boundary of fricative energy. The listeners' task was to label the stimuli as either /s/ or /ʃ/. While hearing the stimuli, some listeners were presented with a female face but others saw a male face. The category boundary differed for the two listener groups, in line with typical differences in speech production. Those who saw a female face, placed the boundary at a higher frequency, since female voices produce fricatives with higher frequencies than male voices. A similar pattern was found in vowel categorization by Johnson et al. (1999). These experiments demonstrate that sociolinguistic knowledge, and accrued experience of physical differences in speech, may influence basic speech perception tasks (cf. also Niedzielski 1999, on regional dialect differences; Section 21.4.2).

21.5.4 Race and Ethnicity

The relationship between linguistic variation and ethnicity has been a prominent focus for North American sociolinguistics since the 1960s. Labov's early works included investigations of the phonological patterns of the Portuguese and Wampanoag Native American minorities in Martha's Vineyard (Labov 1963), and Puerto Ricans and African-Americans in New York City (Labov et al. 1968). Since then a wealth of work has been produced on African-American vernacular English (AAVE) in particular, both describing features of contemporary AAVE and also tracing its development from the early settlement of Africans in North America (for recent accounts, see, e.g., Mufwene et al. 1998; Wolfram et al. 2000; Green 2002; Wolfram and Thomas 2002; Thomas 2007; Wolfram and Schilling 2015). Phonological features, however, have been less studied than other aspects of the grammar, and suprasegmentals fare worse still (but see Tarone 1973; Hudson and Holbrook 1982, Thomas and Carter 2006, and brief reviews by Green 2002; Wolfram and Thomas 2002). Furthermore, most work has concentrated on differences between AAVE and other varieties, with relatively little attention being paid to variation within AAVE itself. Overall, however, it appears that AAVE varies relatively little geographically, and AAVE speakers collectively resist participation in major sound changes such as the northern cities shift (Wolfram and Schilling-Estes 2015, p. 236).

Other ethnic communities to have been studied in North America include Franco-Americans in New Hampshire (Ryback-Soucy and Nagy 2000), Lumbee Native Americans (Schilling-Estes 2000), Cherokees (Anderson 1999), Irish, Italian, and Jewish groups in Boston (Lafarriere 1979), Pennsylvania Germans (Huffines 1984), Orthodox Jews (Benor 2001), and several rural enclaves in Canada (see Chambers 1991). Chicano speakers are perhaps the most

extensively studied (Peñalosa 1980; Penfield and Ornstein-Galicia 1985; Fought 1999, 2003; Thomas 2000).

Ethnic differences in phonology have not been so extensively studied elsewhere in the English-speaking world, although there is a growing body of work on differences between Māori and Pākehā (European) English in New Zealand (e.g., Britain 1992; Holmes 1997, 2005). In Australia, there has been little work on the phonological properties of ethnic minority groups, but see Butcher (2008) on Aboriginal English, Shnukal (2001) on Torres Strait English, and Clyne et al. (2001) on German and Greek communities.

Work in Northern Ireland has investigated ethnic differences drawn along religious divisions (Milroy 1987b; McCafferty 1999, 2001). Wells's (1973) study of London Jamaican English is an isolated early example of research on ethnic varieties in the rest of the United Kingdom, although systematic phonological studies of ethnic varieties have increased in recent years as researchers have come to recognize the importance of language in a rapidly changing ethnic context. There has been a huge rise in immigration since the mid-twentieth century, resulting in very large ethnic minority populations in cities such as Bradford and Leicester. Kirkham (e.g., 2017) and Wormald (2016) present detailed work on the English of British Asian groups, including comparative work on Punjabi-speaking communities. The Polish community in Manchester has been studied extensively by Drummond (2011, 2012, 2013). In contexts of interaction between ethnic groups, there is evidence of major change in local varieties through admixture of features originally from different ethnic origins. A particularly clear case is provided by work on Multicultural London English (e.g., Cheshire et al. 2011).

Heselwood and McChrystal (2000) present a preliminary study of the accent features of Punjabi-English bilinguals in Bradford. Intriguingly, their results suggest that differentiation from local Yorkshire patterns is much more marked in the speech of young males than females. For example, the males used more noticeable retroflexion in /t/ and /d/ articulations, a feature characteristic of Punjabi itself. It seems that the males may be adapting phonological features of one language for use as markers of ethnicity in the other. This "recycling" of sociolinguistic features is also reported by Dyer (2002) in her study of the English steel town, Corby. The town saw a large influx of Scottish steel workers in the 1960s. Subsequent generations have abandoned many of the Scottish phonological features which characterized the immigrant community. However, certain features are being maintained with redefined social-indexical values. The use of monophthongs in words such as *boat*, *know*, for example, is emblematic of Scottish ethnicity for older speakers, but is now being used by younger speakers as a marker of local Corby identity. In this way, young Corby speakers differentiate themselves from inhabitants of neighbouring areas.

21.5.5 Age

The effect of age on phonological differences is very obvious when comparing the speech of adults with that of children. Of course, differences in anatomy and physiology are largely responsible, as we saw in Section 21.2. However, socially oriented variation also occurs across the course of life. In discussing such variation, Eckert (1997) shows that culturally determined life stages are of greater relevance than biological age. She identifies three key *life stages*—childhood, adolescence, and adulthood. Each of these stages exerts quite different influences on linguistic patterns.

Childhood is obviously characterized by relatively immature speech patterns due to incomplete language learning and the ongoing development of the child's anatomy and motor control. Relatively little work has been carried out on the acquisition of socially structured variation by children, despite the obvious variation which is a hallmark of child speech. This lack of study results in large measure from the dominance in child-language work of

structuralist and generative frameworks, and the emphasis on searching for the acquisition of language-specific contrasts (Ferguson 1986, p. 44). It is clear, though, that local forms of pronunciation, including quite complex patterns of allophonic distribution, emerge from the very start of the acquisition process (Roberts and Labov 1995; Roberts 1997a, b, 2002; Docherty et al. 2006). Typically, patterns characteristic of adult women's speech have the greatest chance of being acquired by children, as in most societies children will gain the majority of their linguistic input from female caregivers (Labov 1990).

In adolescence, the role of the peer group becomes very important, and may overtake the influence of the home. Conformity to peer group norms becomes increasingly important, and one reflex of this may be the rapid increase in usage of vernacular features in speech. Individuals may therefore undergo marked changes in phonological patterns, as the influence of the home model wanes. A very clear example is provided in the context of the English new town, Milton Keynes (Kerswill 1996; Williams and Kerswill 1999; Kerswill and Williams 2000). Being a new town, Milton Keynes is characterized by a large number of in-migrants from various quarters of the British Isles and beyond. Children growing up in Milton Keynes are therefore exposed to an unusually wide array of dialects as their initial linguistic input. The variety of input dialects is clearly apparent in the speech of 4-year-olds, who constitute as heterogeneous a linguistic group as their parents. However, by age 12, the pressure to conform to peer norms is such that most of the initial differences have been eradicated, and a strikingly homogeneous local accent has emerged. Eckert (2000) also reveals the important linguistic influence of the peer group on adolescents.

Adulthood, by contrast, is often assumed to be a stable period, with the phonological structure of the language having become fixed. Some studies reveal evidence for ongoing change in adulthood, however, depending on the personal circumstances of the speaker. Obvious situations which induce ongoing change include the learning of a new dialect or language after geographical relocation (e.g., Chambers 1992). Coupland (1980) and Mees and Collins (1999) also show that individual deployment of sociolinguistic variants may change markedly during adulthood, depending on factors such as the social ambition of the speaker. An even more striking example illustrating ongoing change is reported by Harrington et al. (2000), who identify various changes in Queen Elizabeth II's vowel production over several decades. Her pronunciation has gradually shifted from a stereotyped upper-class RP toward a more mainstream RP variety. Rhodes (2012) provides a thorough review of both acoustic and sociophonetic research on the effects of ageing.

21.5.6 Communicative Context

Variation in speech may result from many different types of influence emanating from the specific context in which communication takes place. Phonetic forms may be controlled in line with the style or register of speech; they may be tailored according to the relationship between the speaker and listener; they may be designed to provide coherence to a discourse or to negotiate interaction; they may be linked to changes in the ambient physical conditions of the context; and they may be affected by temporary external influences such as alcohol or consciously adopted disguise.

Speaking style has been a long-standing focus in sociolinguistics (see Schilling-Estes 2002, for a review). Many studies have shown that speakers (particularly women) move closer to the standard in more formal styles of speech. Examples include the increased production in formal styles of post-vocalic [ɹ] in New York (Labov 1966), and [h] in British English (Trudgill 1974). Phonological variation may even be linked to quite particular registers, such as pop songs (where features of American accents are often adopted, Trudgill 1983) and horse racing

commentary, which is notable for its particular rhythm, rate, and intonational features (Horvath 1997).

In early sociolinguistic work, speaking style was conceived as a linear continuum from vernacular to standard, with speakers shifting toward the standard pole of the continuum as a reflex of increasing self-consciousness (e.g., Labov 1972, p. 208). Subsequent work has refined this view somewhat, with researchers recognizing that phonological choices are also affected by the interlocutor, communicative task, and discourse function.

Bell (1984) notes that interlocutors often accommodate to each other's linguistic patterns as a means of establishing solidarity. Trudgill (1986, p. 8), for instance, found that in the sociolinguistic interviews he carried out in Norwich his own use of glottal forms of (t) correlated with that of the interviewees. Alternatively, linguistic differences may be enhanced to create distance between speakers. In both cases, phonological variation results not simply from the speaker's self-consciousness but from the relationship between the interlocutors in the communicative context. As such, speech is therefore subject to what Bell terms *audience design*. A similar conclusion is reached in phonetic work by Lindblom (1990), who claims that the structure of spoken discourse varies along a continuum from *hyper-speech* to *hypo-speech*. The former is characterized by relatively canonical pronunciation, and is generated when the listener's needs in the communicative setting demand clear speech from the speaker (for example, when conditions are noisy, or detailed new information is being given). Hypo-speech is characterized by increased rapidity and greater degrees of underarticulation. It is produced when the communicative context permits the speaker to be more egocentric, such as in narratives. Variation according to addressee was demonstrated very clearly in a study of the speech of one individual, Carol Meyers, in a range of situations (Labov 2001, p. 438ff.). Meyers's vowels differed quite radically depending on whether she was in a work or social context. Differences in phonological variant patterns have also been found in studies comparing speech between adults to that between adults and children, also showing that adults tailor their speech differently to boys and girls (Foulkes et al. 2005). Degrees of hyper- and hypo-articulation have furthermore been shown to depend on a word's relative frequency, and on the number of close phonological neighbours it has (e.g., Luce and Pisoni 1998; Wright 2003; Hay and Foulkes 2016, and see further Section 21.3.3).

Research with bilinguals supports the view that situational context has an important influence on phonological choice, in that patterns of interference between languages depend upon the type of *language mode* being used (Grosjean 1998). In some circumstances, a bilingual is likely to use just one language, such as speaking to a monolingual. In a monolingual mode, any interference between the speaker's two languages is minimal. However, in interaction with other bilinguals code-switching often emerges. That is, speakers engage in a bilingual mode where both languages are used and structures from one language may well be transposed onto the other. Khattab (2002a, b, 2007, 2009, 2011) provides evidence for mode-related phonological differences in Arabic-English bilingual children (Section 21.4.2).

In addition to variation according to addressee, speakers exploit phonological choices for pragmatic and conversational purposes. For example, in Tyneside English, fully released nonglottalized voiceless stops seem to play a role in signaling transitions in speaking turns (Local et al. 1986). Turn transitions may also be controlled by intonational patterns that vary markedly across dialects. Local et al. (1985) describe patterns of pitch movement as a cue to turn-endings in London Jamaican English, while the use of high rising tone has been identified as a turn-holding mechanism, among many other functions (Warren 2016). Other studies reveal very fine control of phonetic parameters to give coherence to discourse, including timing, overlap between interlocutors, speech rate, and f_0 level (e.g., Couper-Kuhlen and Selting 1996; Curl 2003; Local 2003; Walker 2003; Local and Walker 2013).

Given communicative contexts may generate short-term effects on phonological patterns. Some of these result from the speaker's attitude to the addressee, topic of discourse, or physical situation. Speakers usually indicate attitude or paralinguistic intent via suprasegmental features such as voice quality or intonation (reviewed by Ní Chasaide and Gobl 1997). Boredom, for instance, is typically conveyed by a narrow intonational range and low overall f_0. Some such features are clearly voluntary, although the phonetic effect of others such as anger and fear appear to be largely beyond the speaker's control. Individuals nevertheless vary in the effects they manifest. Perceptual experiments show that listeners can detect attitudinal factors, and also that variation in paralinguistic voice qualities may affect speech perception and voice recognition (Mullennix et al. 2002). Topic has been shown to exert subtle statistical effects on phonetic variant usage, for example, by Love and Walker (2013, pronunciation of /r/ in context of football) and Hay and Foulkes (2016, variants of /t/ related to time depth of narrative).

Other short-term effects may result from temporary changes in ambient conditions, or through the presence of external influences such as intoxicating substances (e.g., Chin and Pisoni 1997).

Speech in noisy conditions, meanwhile, is often modified to counteract the effects of background noise. The *Lombard reflex* typically leads to louder speech, which results in various side effects including higher f_0 and complex modifications to vowel formants (Lane and Tranel 1971). A similar response also typifies speech via telephones where the limitations of the transmission medium lead speakers to increase loudness. This has consequences for vowel formant patterning as well as f_0, in particular leading to a major upshift in the first formant (F1) (Künzel 2001; Byrne and Foulkes 2004).

Variation resulting from factors such as telephone speech, alcohol, and emotional states is a particular problem in forensic phonetics (Jessen 2008). A frequent task in the application of forensic phonetics is to compare a speech sample with criminal content (e.g., a threatening message) with a sample from a known suspect, to assess the likelihood that the two samples were produced by the same person. However, the majority of criminal samples in real cases involve telephone calls, often made in emotional circumstances, and not infrequently by people who have had a few drinks. The phonological effects of these factors must all be catered for in the comparison with the suspect's sample, which is likely to have been recorded in quite different conditions (usually an interview in police custody).

What is perhaps most striking about the effect of communicative context is the sheer range of different influences on speech that can be found. In view of that, our understanding of how such factors are handled in phonological knowledge remains relatively poor. Work in experimental phonetics and theoretical phonology has largely ignored the sorts of factors outlined in this section, focusing instead on canonical materials collected in laboratory settings or "neutral" interactional styles.

21.6 Individual Constraints on Phonological Variation

Phonological differences between individuals have been alluded to throughout the previous sections. We have seen, for example, that differences may result from idiosyncrasies in vocal tract anatomy, or, in the case of Carol Meyers and others, the effects of personal interactions. It is probably true, in fact, that individual differences are demonstrated in every empirical study of speech production or perception, even if these differences are rarely the focus of discussion. An obvious counterexample is the field of forensic phonetics, where there is a prime concern in identifying features particular to an individual (Jessen 2008). By contrast, the number of laboratory phonetic or phonological studies which draw attention to inter-speaker differences is small but growing (e.g., Johnson et al. 1993; Allen et al. 2003;

Yu et al. 2013). Sociolinguistic studies likewise tend to focus on group patterns in favour of descriptions of general or average patterns within the group under investigation (but see, e.g., Forrest 2015).

While the lack of explicit interest in individual patterns is understandable, it does mean that we have only limited understanding of the parameters of variation across individuals. Johnstone and Bean (1997, p. 236) acknowledge that factors such as region, class, and gender all have an important influence on speech, but make the important point that such factors "do not *determine* how people sound." Instead, the array of structured variation available to an individual, coupled with other factors such as ideology, can be seen as a rich resource from which the individual can choose elements in order to project their own identity. Studies of the role of phonological variables in the construction of identity include Bucholtz (1998, focusing on [t] production by female nerds), Benor (2001, [t] production by Orthodox Jews), and Podesva et al. (2002, phonetic patterns in camp gay male speech).

21.7 Theoretical Implications of Phonological Variation

As we have seen, different traditions in linguistic research have focused on different aspects of variability, while in some traditions variability has generally been factored out of research designs or marginalized in interpreting results. This section aims to summarize the contribution of phonological variation to aspects of linguistic theory. It also highlights areas in which a better understanding of variation may prove both challenging and profitable.

The role of variation in shaping theory is most evident in sociolinguistics. The recognition that much variability is structured rather than random has enabled great strides to be made in understanding how linguistic change originates, and how it spreads through communities and grammars (e.g., Milroy 1992; Trudgill et al. 2000; Kerswill and Williams 2000; Chambers 2003; Tagliamonte 2011). Labov's work has been particularly influential in this sphere (see, e.g., Labov 1994, 2001, 2010, and for critiques Gordon 2001; Thomas 2002b). Experimental phonetic work has further contributed to explaining the origins of regular sound changes (Ohala 1983). Dialect geography, too, although sometimes uncharitably depicted as a theory-free zone, has often had an eye on understanding change. The Survey of English Dialects, for instance, was largely geared to tracing the development of the Middle English vowel system (Orton et al. 1978).

Sociolinguistic studies have, however, made only limited impact on mainstream linguistic theory. This is unsurprising in view of the general aims of twentieth-century linguistic theory to describe synchronic grammars of particular languages, and the universal parameters of possible grammars. Few phonologists have therefore accorded a central place to issues of variation in the development of theory. Various phonological models have been applied to variationist data at some time or other, though, including optimality theory (e.g., Nagy and Reynolds 1997). That said, it is equally true that sociolinguistics has been slow to profit from advances within theoretical phonology (cf. Honeybone 2002, p. 414). Much sociolinguistic work refers to organization at the level of the phoneme, an approach which has been superseded by many alternatives in phonological theory, some of which have radically different conceptions of what the basic phonological units are and how they are organized into lexical representations.

Like phonology, phonetic theory has also advanced with relatively little interest in variation beyond the contextual types discussed in Section 21.3. Furthermore, phonetic research has been dominated by analysis of carefully controlled materials, usually canonical forms in standard dialects of American or British English, and gathered from few speakers under laboratory conditions. However, the somewhat eclectic field of sociophonetics has grown rapidly in recent years (Foulkes et al. 2010; Thomas 2011). Studies under this banner generally

involve the use of large and heterogeneous data sets, representing multiple speakers and/or styles of speech. Such work has been facilitated by collaborative work between researchers with complementary expertise, and also by technological advances such as the development of large corpora. Sociophonetic studies have generally employed auditory or acoustic methods, though newer techniques are now being applied to issues of variation. For example, Stuart-Smith et al. (2014) and Turton (2017) use ultrasound to analyze /r/ and /l/, respectively.

Recent trends, though, have started to show that speech production, and particularly speech perception, are intimately affected by detailed knowledge of structured variability (see, e.g., Drager 2010; Nygaard et al. 1994). New theoretical accounts of such observations are therefore being developed, along with new methods designed to test those theories further. Exemplar models of lexical representation have in particular gained ground in recent years as an alternative to traditional models (Lachs et al. 2002; Pierrehumbert 2002; Bod et al. 2003; Foulkes and Docherty 2006; Foulkes and Hay 2015; Hay and Foulkes 2016). In exemplar models, lexical representations are hypothesized to contain speaker-specific details, rather than being stored solely in abstract, invariant, symbolic forms. Instead, the cognitive representation of a word is a richly detailed store of exemplars, constantly updated through experience. Note that this hypothesis is commonly misrepresented or misunderstood to suggest that every instance of every encountered word is memorized in full detail, like a library of extracts from a high-definition movie of the speaker's life. Exemplars are *memorized* forms of encountered tokens, mediated by both the perceptual system and the speaker's prior expectations, and subject to the constraints of attention and memory. The store of exemplars is nevertheless based on experience, and thus the cognitive representation of words reflects the detailed acoustic and phonological properties of tokens that a speaker has heard, and the articulatory properties of tokens the speaker has uttered.

Support for exemplar models comes from disparate sources. Studies of second language learners support the view that experience of multiple talkers improves lexical recognition (Lively et al. 1993). Studies of child language have also stated support for exemplar models, both via perception experiments (Nathan et al. 1998) and production analyses (Docherty et al. 2006). In speech production, many of the studies discussed in Section 21.3.3 on predictability are also couched within exemplar models.

Exemplar models entail several important implications, many of which are themselves compatible with the various strands of work dealing with phonological variation that have been outlined throughout this chapter. Exemplar models may therefore potentially be the best candidates for a unitary account of the disparate sources of variation we have discussed. If so, one implication is that individuals possess their own unique lexical store (cf. Hawkins 2003). Another is that lexical representations need not be stored (solely anyway) in canonical form, as is usually assumed in phonological models. Furthermore, lexical and indexical information may not be stored as two separate knowledge bases, but as a single composite store of knowledge about sound in general (Docherty et al. 2006). Thus, phonological knowledge is not only a source of information about lexical contrast, it also contains information about specific voices, encompassing details of age, gender, dialect, contextual allophony, and so on. Note that the "lack of invariance problem" (Section 21.2) is largely solved, since there is no cognitive stage at which invariant and abstract symbolic representations need to be mapped onto variable and continuous speech signals (Foulkes and Docherty 2006).

Exemplar models remain, however, problematic in various respects (Foulkes and Docherty 2006; Docherty and Foulkes 2014; Hay and Foulkes 2016). The bulk of evidence in support of the models comes from speech perception: it is less clear how a vast store of exemplars is manipulated in the course of speech production. Pierrehumbert (2002) suggests that

production goals are driven by exemplars that are most heavily weighted in perception, although no formal model of how weighting takes place has yet been proposed beyond simple statistical observations. Presumably there must also be weighting in respect of factors such as sociolinguistic preferences, stylistic choices, attitude, and attention (Pierrehumbert 2002, p. 135). It is not clear either to what extent the store of exemplars is subject to abstraction, what form that abstraction takes, or what role (if any) the abstract representation plays in speech production or perception. What is clear, though, is that exemplar models reignite the cognitive storage/computation debate of the 1970s (see, e.g., Ladefoged 1972; Linell 1979). In generative models and their derivatives, one aspect of the evaluation metric for grammars is that simpler and better grammars minimize storage at the expense of complex processes of derivation or manipulation. Exemplar models appear diametrically opposed, with major demands on cognitive storage but little online computation. Much work therefore remains to be done to test and refine exemplar models, but they are at least to be welcomed for their fresh perspective on established issues.

21.8 Wider Significance of Phonological Variation

Understanding phonological variation is not only important for linguistic theory but for a range of interests beyond linguistics. Speech technology, for example, must cater for social, regional, and contextual variability to generate natural-sounding synthesized speech and to ensure speech recognition systems that can tolerate natural variability (Hoequist and Nolan 1991; Laver 1995). Speech therapists benefit from informed views of language variation, enabling them to distinguish genuine pathology from natural non-standard variability (Milroy 1987a, p. 208ff.; Ball 2004).

Information on variability is critical for practical casework in forensic phonetics. Comparison of criminal recordings with a suspect's speech involves making allowances for the effects of factors such as accent, style shifts, disguise, stress, emotion, and telephone speech (Jessen 2008). In other cases, for example, the receipt of a call or tape from a kidnapper, there may only be a criminal recording. The analyst's task is therefore to create a *speaker profile* to help narrow the field of suspects (Foulkes et al. 2019). The strength of conclusions that can be reached is largely dependent on the state of descriptive reference material, including the likely geographical origins of particular features and the frequency of speech disorders and other idiosyncrasies throughout the population. A similar technique is applied to assess the claims of asylum seekers, by analyzing their speech to verify their region of origin (Wilson and Foulkes 2014).

Pedagogical issues are clearly informed by debate on phonological variation, most famously perhaps in the case of the Ebonics debate in the USA (see Wolfram and Schilling 2015, p. 217ff., and volume 26(2) of the *Journal of English Linguistics*, 1998). On a wider platform, models of English for teaching as a foreign language are constantly being revised in line with changes in British and American standard varieties, as well as in respect of the development of influential new standards such as Australian English in East Asia (Melchers and Shaw 2003, p. 101).

More widely still, it has been shown that people often develop strong attitudes, negative and positive, to features of linguistic variation (see Honey 1989, and Milroy and Milroy 1998, for a stimulating debate). Indeed, it has been claimed that language variation is "the last acceptable public prejudice" (Edwards 2015). Examples abound, such as the online abuse leveled at the Manchester-born MP Angela Rayner because of her accent (BBC 2017).

Attitudes to linguistic variation may affect communication between groups of people (Lambert et al. 1960; Gumperz 1982), job prospects (Lippi-Green 2012), and may be

consciously tapped into for purposes of advertising and marketing (Bell 1991, p. 135ff.). Lippi-Green (2012) also highlights the subliminal effects of linguistic stereotyping with reference to the use of accents for characterization in films. She shows, for example, that in Disney films "good" characters usually have standard accents, with AAVE and foreign accents largely reserved for negatively portrayed characters. Similar examples of language stereotyping abound in film and television, as witnessed, for instance, by the Cockney-sounding Orcs in the film versions of *The Lord of the Rings*.

21.9 Conclusion and Outlook

We have seen that phonological variation results from many sources. The physical form of any utterance is governed simultaneously by the speaker's anatomy and physiology, the nature of airflow through the vocal tract, linguistic context, the social and regional background of the speaker, communicative context, and a range of psychological factors. We have seen also that a full range of effects are rarely countenanced together within academic pursuits. Phonetics, phonology, and sociolinguistics have tended to focus on particular aspects of variability to the exclusion of others, or in some cases to peripheralize the study of variability.

Developments in recent years have started to recognize the importance of variability for our understanding of the structure and functioning of linguistic systems as well as for issues outside linguistic theory. There is a growing awareness that systematically controlled variation is something that must be learned in the course of language acquisition, and thus that it represents an aspect of knowledge about sounds and sound structure. Phonological models of varied hues are making progress in addressing issues in social and geographical variability, while new models are emerging which place some types of variability in center stage. Sociolinguistic data are being more widely exploited as a testing ground for theoretical claims. The expanding field of sociophonetics testifies to the growing interest in the interrelationship between linguistic theory and variable data. This field is likely to continue to grow, thanks to a large extent to rapid changes in technology. Acoustic analysis of large data samples is now cheap and speedy, while newer articulatory techniques such as ultrasound will provide new perspectives on variability in speech. Computational modeling (e.g., Fagyal et al. 2010; Stanford and Kenny 2013) and exploitation of ever larger corpora will further add to our understanding of variation and change.

The most intriguing challenge remains how to weave together the various strands of knowledge about lexical forms and variability of all kinds into a unified theoretical framework. But the best chance of achieving this is by viewing variability not as a nuisance but as a universal and functional design feature of language.

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Section 4: Lexis and Morphology

22 English Words

DONKA MINKOVA AND ROBERT STOCKWELL

"English words" is an umbrella topic; it can be addressed from the point of view of sound structure, morphological composition, syntactic type and function, meaning, collocational possibilities, regional, social, and stylistic variation, and many other angles. The goal in taking up this topic is to describe the vocabulary of English in terms of size, type and token frequencies, and historical sources. The last section offers an overview of some recent patterns of vocabulary enrichment.[1]

22.1 Estimating the Size of the English Vocabulary

It is often remarked that English has an impressively large lexicon. This is undoubtedly true, but it is difficult to offer objective counts and comparisons regarding the size of the lexicon. On the one hand, the vocabulary reflects the political, economic, cultural, and social events in the histories of its speakers. Extensive contacts with other languages have contributed to the buildup of a very large and etymologically diverse word-stock. On the other hand, constant fluctuation makes measuring the size of the lexicon of any language problematic. No single dictionary can record both archaic words and recent neologisms, all strictly regional, local, and slang words, or all the words used in specialized fields such as biochemistry, computer science, law, medicine, religion. The potential of deriving transparent new words from existing roots and affixes is practically unlimited; words such as *Calexit*, *emeritude*, *Putinness*, *moronize*, *tennisracketology*, *schmooseaholic*, and *selfiebility* are easily produced and understood, but their chances of inclusion into an "institutionalized" dictionary are unclear. Moreover, it is difficult to decide when a word has become "naturalized"; dictionaries commonly record borrowed words, even when they continue to be perceived as phonologically or morphologically foreign. Therefore, it is the lexicographers' decision whether words like *Blitzkrieg* (German), *divan* (Arabic), *nabob* (Urdu), *tsunami* (Japanese), *glasnost* (Russian), and *kukumakranka* (Afrikaans < Khoikhoin) should be included in the counts of the English word-stock or not, though they may certainly be familiar to many speakers of English, and all of them are entries in the *Oxford English Dictionary* (OED).[2]

With these disclaimers in mind, it is still possible to offer some idea of what the inventory of the English lexicon looks like. The number of entries in the so-called "unabridged" dictionaries of English ranges between 300 000 and 450 000 entries; the latter figure is based on the approximate count in *Webster's Third New International Dictionary of the English Language*, 2002 edition. The most widely used historical record of the English lexicon, the OED *Online*,

The Handbook of English Linguistics, Second Edition. Edited by Bas Aarts, April McMahon, and Lars Hinrichs.

estimates "600 000 words … 3.5 million quotations … over 1000 years of English" (https://public.oed.com/about/). The number of entries and the citation databases are continually expanding; the OED publishes between 1000 and 2000 new and revised entries each quarter.

The definition of what counts as a single dictionary entry allows for very wide margins; any attempt at further precision is impossible because of the unlimited potential for compounding and derivation. The OED policy on compounds and derivatives is indicative of how blurred the line between a "headword" and a compound or a derivative can be:

> Compounds are frequently collected together in a section or group of sections at or near the end of an entry. They are followed by a quotation paragraph in which examples of each compound are presented in alphabetical order of the compound. *Some major compounds are entered as headwords in their own right*.
>
> Derivatives … are typically entered as the final section of an entry. *Many derivatives are included as headwords in their own right*. They are followed by a quotation paragraph illustrating examples of usage.
>
> (https://public.oed.com/the-oed-today/guide-to-the-third-edition-of-the-oed/ emphases authorial)

Clearly, the size of the dictionary records exceeds by far the vocabulary of an individual speaker. The vocabulary used by Shakespeare in his plays and sonnets, a countable set, amounts to just over 29 000 different words, out of a total of 884 647 words of running text. This is somewhat misleading, because inflectional forms (*work*, *working*, *worked*) are counted as separate words. A more narrowly defined count will bring that number down to about 20 000.[3]

Counting the words used and known by an average speaker of English is beset with the same obstacles that prevent us from calibrating the vocabulary of the language as a whole. In addition, age, gender, education, occupation, ethnic and geographic factors, personal history, and so on are variables that make the picture extremely unstable. Still, estimates of the word-command of an adult educated speaker exist, placing the counts in the 10 000–60 000 words range. The passive vocabulary exceeds the active vocabulary by about 25%, raising the number of lexemes recognized by a user to approximately 75 000.[4] The words we use or recognize are not all of the same order of structural importance or frequency; the following section addresses the layering of the English lexicon.

22.2 Core and Periphery

Among the parameters that characterize the lexicon are word frequency, grammatical type, meaning, etymology, and phonological structure. The interaction of these parameters results in the commonly made distinction between *core* and *periphery*. In terms of linguistic corpora, *core* vocabulary can be measured by frequency; words shared by all adult speakers top the frequency lists. Semantically and pragmatically, the core lexicon comprises the most useful words familiar to all speakers. Diachronically, the core is typically stable and resistant to borrowing.[5]

The core includes items which form the structural backbone of syntax: articles, conjunctions, prepositions, auxiliaries, pronouns, quantifiers, and determiners. Invariably, such items rank highest in frequency studies: all but five of the top 50 items in the rank list in Francis and Kučera (1982, p. 465) are function words. A frequency analysis based on a million-word corpus of British English texts, *The Lancaster-Oslo/Bergen Corpus* (*LOB*), makes the point even more dramatically: *all* of the 50 most frequent words in the *LOB* Corpus are function words (Johansson and Hofland 1989, pp. 19–20). This is confirmed in the *Corpus of*

Table 22.1 Frequency bands in the OED (based on https://public.oed.com/how-to-use-the-oed/key-to-frequency/).

Band	*Frequency per million words*	*% of entries in OED*	*Examples*
8	>1000	0.02%	*and*, *I*, *on*, *do*, *of*, *one*, *time*
7	100–999	0.18%	*person*, *head*, *day*, *thing*, *two*
6	10–99	1%	*dog*, *stress*, *vain*, *grey*, *happy*
5	1–9.9	4%	*tumult*, *subsist*, *markedly*
4	0.1–0.99	11%	*rodeo*, *rewrite*, *intern*, *pee*
3	0.01–0.099	20%	*merengue*, *emote*, *teensy*
2	<0.0099	45%	*decanate*, *geogenic*, *lawnly*
1	–	18%	*abaxile*, *grithbreach*, *zarnich*

Contemporary American English (*COCA*, https://corpus.byu.edu/coca/) database. Similarly, Van Heuven et al. (2014) use a Zipf scale word-frequency range from 1 (very low frequency) to 6 (very high frequency content words), but add a separate frequency ranking of 7 for function words, using *and*, *for*, *have*, *I*, *on*, *the*, *this*, *that*, and *you* as examples; see also Lei and Liu (2014). Outward from the core lie layers of words of decreasing frequency, generality, and familiarity. One of the innovations in the online-only OED is the information on frequency. Table 22.1 shows the frequency range for each band, and the percentage of non-obsolete OED entries assigned to each band.

The OED logarithmic frequency score, based primarily on the *Google Books Ngrams* data, generated in July 2012 (Version 2), covers non-obsolete words in all of their inflected forms attested in post-1970 books. Each word is assigned to a frequency band, 8 to 1, based on decreasing overall frequency score. The core words in band 8 are around ten times more frequent than words in band 7, which in turn are around ten times more frequent than words in band 6 and so on. Each non-obsolete headword has an indicator of frequency in the form of red dots of increasing size: ●●●●●●●● for *and*, *I*, *on*, *do*; ●●●●●○○○ for *tumult*, *subsist*; ●●●○○○○○ for *merengue*, *emote*. Frequency scores are recalculated as the OED is revised.

Like estimates of overall vocabulary size, the estimate of a word's frequency will vary depending on the size of the corpus, the types of material included (spoken or written), the range of text types (informative vs. imaginative), and further subcategories within those groups. The decisions involving grammatical tagging, a refinement which was initiated by the compilers of the *LOB Corpus*, are an important component of lexical studies today and can also affect the word frequency ranking. Such sub-distinctions are taken into consideration in *British National Corpus* (*BNC*) by Leech et al. (2001), which is a hundred times larger than the Brown and the *LOB* corpora, and draws on material dating mainly from 1985–1994. A sample of their listings illustrating the differences between spoken and written English is given in Table 22.2; frequencies are rounded per million word tokens.

The separation of registers and genres is a key aspect of the design of the 400-million-word COCA, whose database is divided almost equally between spoken language, fiction, popular magazines, newspapers, and academic journals—20% in each genre (Davies 2010). The dominance of web-exchanges in this century is reflected in the new 1.9-billion-word *Corpus of Global Web-based English* (*GloWbE*): approximately 60% of the corpus comes from informal blogs, and the rest from a wide range of other genres and text types. The material is collected from 20 different English-speaking countries (Davis and Fuchs 2015).

Table 22.2 Rank and frequency in the *BNC* (Leech et al. 2001, pp. 144–145).

Rank	*Word*	*Frequency in speech*	*Frequency in writing*
1.	the	39 605	64 420
2.	I	29 448	6494
3.	you	25 957	4755
⋮	⋮	⋮	⋮
31.	know	5550	734
32.	well	5310	634
⋮	⋮	⋮	⋮
51.	then	3474	1378
52.	get	3464	709
⋮	⋮	⋮	⋮
715.	education	115	277
716.	social	115	458

The explosion of available quantifiable data enriches the picture of frequency-layering across the lexicon, yet the red flags remain: generalizations about frequency are only approximations. There can be no fixed and absolute ranking because even within the very center of the metaphorical core, roughly bands 8 and 7 in Table 22.1, the range of variation may be significant. Nevertheless, what we know intuitively about "basic" words is confirmed statistically again and again: the broad association between the notion of core and the frequency of the items residing there remains valid.

A focus on meaning is another way of distinguishing between vocabulary layers. Examining patterns of borrowing, cross-linguistic semantic approach by Haspelmath and Tadmor (2009) uses criteria of communicative need and usefulness. In addition to function words, their Leipzig-Jakarta list categorizes the meanings of the vocabulary into 24 semantic fields, including kinship, human body parts, animal and plant parts, natural phenomena, motion, time, cultural items, properties, and actions. The concept behind that study is that what we consider "core" vocabulary does not coincide semantically with the most central or most frequent items in other languages, nor is the stability of that core equal across languages. Some kinship terms, typologically expected to be deeply entrenched, such as *āþum* (son/brother-in-law), *tācor* (husband's brother), and *swehor* (father-in-law), are examples of how English abandoned some specific words and adopted the more general system used in French. This does not invalidate the assumption that much of the core vocabulary is made up of basic communicative items. Grant (2009) reports that the most stable words in English are from the semantic fields of quantity, time, and miscellaneous, and indeed the OED assigns the highest frequency band 8 to words such as *one*, *much*, and *time*.

Etymologically, the core vocabulary tends to be more homogeneous and morphologically simpler than the periphery. Only four of the top-ranked 100 words in the Brown Corpus are of non-Germanic origin, and as the first recorded dates in the OED show, they are very early loans. These are (64) *state*, n. (c. 1225); (81) *use*, v. (1240); (93) *people* (1292); and (100) *just*, adv. (1382). In the LOB Corpus, only *very* (c. 1250) and *people* make it into the first 100 words, ranked (81) and (99), respectively. For comparison, among the top-ranked items in the spoken English portion of the BNC, there are only three non-Germanic items: (74) *very*, (85) *people*, and (98) *really* (c. 1430). For the written portion of the BNC, the first loanword is (86) *people*, followed by (91) *very*, and (94) *just*.[6] It is a commonplace observation that, in everyday conversation, the basic *bread-water-food-kitchen-eat-sleep-dream-wake-run* type of discourse

covered by the 1000 most frequent words in the language, up to 83% of the items are descendants of Old English (OE) words. The situation is not static, however. Hughes (2000, pp. 392–394) points out that the composition of the core vocabulary has been changing in favor of borrowings. In his estimate of the "kernel" of 600 words, taken from a body of 5000 words, about half are of non-Anglo-Saxon origin, including, for example, *society*, *class*, *company*, *energy*, *machine*, *system*, *program*, and *science*. The universal tendency for basic vocabulary to resist borrowing is confirmed by the 100 shared basic meanings list in Tadmor et al. (2010): within the set of English words for these meanings, only *soil*, n. and *carry*, v. are single entries of non-Germanic origin.

The concentration of Germanic words decreases dramatically outside the innermost frequency band. Table 22.3 shows the results of one such study, based on more than 15 million running words, over half of which were recorded in business and personal correspondence reflecting ordinary everyday activities.[7]

A very significant drop of the native component occurs in the second row: only 34% of those words have survived directly from Old English. In that same frequency range, the 1000–2000 range, the proportion of combined French and Latin words jumps from 13% in the first 1000 to an impressive 57%. A spot-check of the items in the frequency range 1490–1500 shows that half of the words in the spoken portion of the *BNC* (*responsible*, *catch*, *population*, *property*, *huge*) and half of the words in its written section (*treated*, *legislation*, *previously*, *ministers*, *materials*) are non-Germanic.

The proportion of native words decreases again in the 3000-word layer and then tends toward stability. Function words and common words—*water* and *food*, *sleep*, *wake*, *sister* and *brother*, *green* and *yellow*—are predominantly native in origin. Words from the realm of ideas, art, science and technology, and specialized discourse—*autonomy*, *capitalism*, *cognition*, *delight*, *discretion*, *molecule*, *supreme*, *reverberate*, *telethon*—tend to be loanwords and reside in the more peripheral layers. The share of French and Latin is greatest in the outer layers. Starting with the 2000 band, the proportion of other sources is on the rise. The largest contributors to that group are Dutch and Greek, but it also includes Italian, Spanish, German, and many other sources, including words of uncertain and unknown etymologies. Thus, although frequency counts are multiply variable, the English lexicon composition fits within the framework of cross-linguistic studies showing the correlation between basic vocabulary and borrowability (Haspelmath and Tadmor 2009).

Syllable structure is another possible diagnostic for items belonging to the core or the periphery. Ninety-three of the first 100 words in the Brown Corpus are monosyllabic words,

Table 22.3 Sources of the most frequent 10 000 words of English.

Frequency	*English*	*French*	*Latin*	*Norse*	*Other*
1000	83%	11%	2%	2%	2%
2000	34%	46%	11%	2%	7%
3000	29%	46%	14%	1%	10%
4000	27%	45%	17%	1%	10%
5000	27%	47%	17%	1%	8%
6000	27%	42%	19%	2%	10%
7000	23%	45%	17%	2%	13%
8000	26%	41%	18%	2%	13%
9000	25%	41%	17%	2%	15%
10 000	25%	42%	18%	1%	14%

and the remaining seven have two syllables: *only*, *about*, *other*, *also*, *many*, *even*, and *people*. At the other end of the frequency range where function words which are typically monosyllabic or disyllabic disappear completely, the items are major class words and the majority of them are polysyllabic. Some examples from the same corpus are: *hierarchy* (5943), *thoroughly* (5955), *subordinate n.* (5962), *attachment* (5977), *interpreter* (5980), *inclination* (5981), and *paramount* (5994). The proportion of monosyllabic words in the peripheral layers is low; this corresponds to the commonly made association between "learned" vocabulary and morphological and phonological complexity. Polysyllabic items are likely to be derived words, and the proliferation of borrowed affixes contributes to the innovative stress-placement patterns in English. The inherited root-initial stress in the native vocabulary is now challenged by weight-controlled final stress in loanwords—*design*, *collect*, *secure*, and stress-shifting—driven by some borrowed affixes—*sendee*, *Icelandic*, *dramatic*, *majority* (Minkova 2014, Chapter 9).

22.3 The Paths and Perils of Borrowing Words

The data in Table 22.3 allow us to average the frequencies for the various etymological categories. On the basis of that source, but see Note 7, the origin of the 10 000 most frequent words in the language breaks down roughly as shown in Figure 22.1.

Again, the way the etymological information is treated can produce different statistics, thus Durkin (2014, p. 24) identifies approximately 32% of loanwords in the OED3's alphabetical range revised up to 2012: M-R and A-ALZ. The basic message remains, however: the vocabulary of English is a blend of indigenous words and loanwords; the formation of new words is also of mixed origin. This section looks closer into the ways in which new and borrowed words intersect and interact with the pre-existing word-stock.

The most straightforward case of borrowing brings in a completely new form and meaning, for example, *panther* (1220), *athlete* (1528), *giraffe* (1594), *kumquat* (1699), *kiwi* (1835), *tobacco* (1588), *mahogany* (1660), *maraschino* (1791), *yoga* (1820), *tsunami* (1897), *harissa* (1906), *bolshevik* (1917), *mah-jong* (1922), *abacost* (1974), and *sudoku* (2000). Such words enter the language as monomorphemic items, irrespective of their compositionality in the source language. Once adopted, they may be open to metaphoric extension of the literal meanings (*giraffe*-necked, *kiwi* music, *bolshi*ness, etc.), and thus may interact with the native lexicon. When such borrowings violate some native phonotactic constraint, they tend to fall in line with the native phonology: vowel shift in *athlete* and *tobacco*, cluster simplification in *psycho* [ˈsʌɪkəʊ], *maraschino* [ˌmarəˈʃiːnəʊ ~ -ˈskiːnəʊ], *tsunami* (AmE) [sʊˈnɑ·mi ~ tsʊ-], vowel

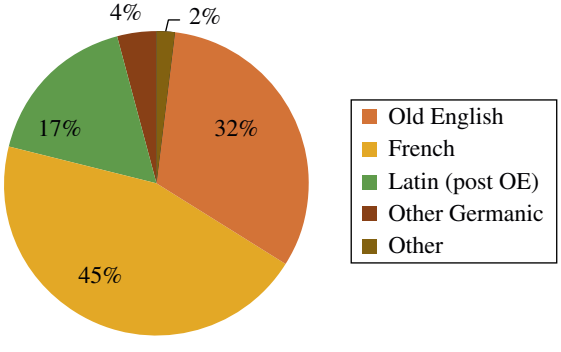

Figure 22.1 Vocabulary distribution in Present-Day English (PDE) according to etymology.

insertion in *athlete*, affrication in *giraffe*, and stress shift and loss of palatal [l] in *bolshevik*. Apart from phonological assimilation, however, such borrowings tend to preserve their formal and semantic identity and independence.

A somewhat different mode of borrowing duplicates the native lexicon at least partially. The duplicate can correspond to the pre-existing word etymologically, semantically, or quite commonly, both etymologically and semantically. The degree of overlap between the earliest known form and meaning, the *etymon*, and the current form and meaning is largely unpredictable: *work* and *erg* < Greek "work" have the same meaning, but derivatives from their shared root, reconstructed (*) Indo-European (IE) **werg* "to do," undergo semantic shifts as in *allergy*, *bulwark*, *energy*, *metallurgy*, *playwright*, *organ*, etc. IE **wed-* surfaces as *water*, *wet*, *wash*, *winter*, *otter*, all going back to Old English, but the same root gives us *hydro-* (Greek), *inundate*, *undulate* (Latin), *whisk(e)y* (Gaelic), and *vodka* (Russian). The fact that all of these items are cognates is an etymological curiosity; the naïve speaker may be unaware of their common origin. Recognition of the *formal* relationship of words going back to the same IE root rests most commonly on the set of consonantal correspondences in items in two phonological shapes: Germanic versus non-Germanic, the latter primarily Latin, French, or Greek. The most frequent correspondences are summarized in Table 22.4.

The historical depth of the correspondences renders the semantic relationships obscure, but the regularity of the consonantal pairings has led scholars to the formulation of the notions "sound law"; the correspondences in Table 22.4 are also known as "Grimm's law." The borrowed versions of the shared original etymon can appear in phonological forms which correlate both with the constraints in the donor language (penultimate stress in *December*, *virile* (Lat. *virīlis*), *plethora*, < Lat. *plethora*, Greek *πληθώρα*) and with native processes (vowel shift in *labor*, *decade*, *thesis,* stress shift in *category*).

Phonological and semantic variability is not restricted to pairs of Germanic and Greek or Latin/Romance words. It can arise also when two Germanic languages come in contact, as was the case with Old English and Old Norse after the ninth century. Pairs such as *kirk–church*, *dike–ditch*, *skirt–shirt* are instances of such borrowing, often with attendant change in meaning and usage. The closeness of the donor language to English preserved the Germanic prosodic contour of the items duplicated in this way: such pairs share root-initial stress. Some phonotactic sequences allowed only in Old Norse were borrowed and are now part of the overall set of phonotactic constraints in PDE. Figure 22.2 shows some examples of the phonological and semantic divergence of lexemes derived from the same etymon in two different Germanic languages.

Table 22.4 Recognition of cognates based on the first consonant shift.[8]

Consonant class	*IE*	*Germanic*	*Latin*	*Greek*	*Examples*
Voiceless	p	f	p	p	**f**ull, **pl**enty, **p**lethora
stops	t	θ	t	t	**th**in, **t**ender, hypo**t**enuse
	k	h	c	k	be**h**est, ex**c**ite, **k**inetic
Voiced	b	p	b	b	la**p**, la**b**ile, la**b**or
stops	d	t	d	d	**t**en, **D**ecember, **d**ecade
	g	k	g	g	**c**ram, a**g**ora, cate**g**ory
Voiced aspirated stops	b^h	b	f	ph	**b**alk, **f**ulcrum, **ph**alanx
	d^h	d	f	th	**d**eed, **f**act, **th**esis
	g^h	g	h	kh	**g**irdle, co**h**ort, **ch**orus

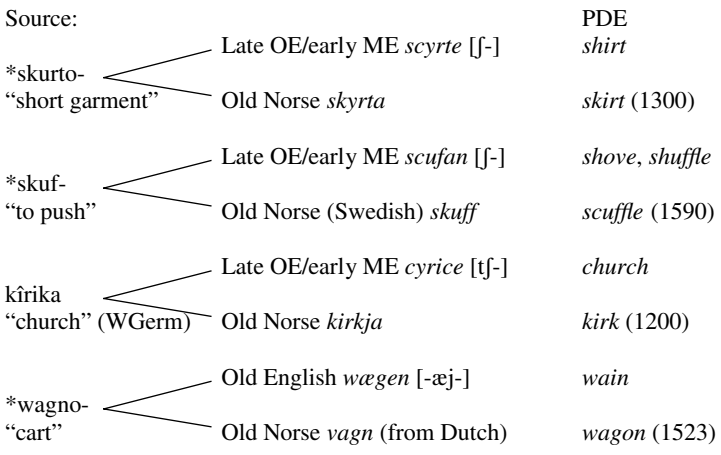

Figure 22.2 Cognates based on early contact with other Germanic languages.

Table 22.5 Re-borrowing of the same lexical item from French and Latin.

ME loanword	*EModE loanword*	*Source*
count (1325)	*compute* (1634)	L. *computare*, OFr. *cunter*
cross, v. (1391)	*cruise* (1651)	L. *cruc-em*, OFr. *croiz*
debt (1225)	*debit* (1682)	Lat. *debitum*, OFr *dete, dette*
frail (1382)	*fragile* (1513)	L. *fragilis*, OFr *fraile, frele*
number (c.1300)	*numeral*, n. (1530)	L. *numerus, -ālis,* OF *noumbre*
ray (13–)	*radius* (1597)	L. *radius*, OFr. *rai, ray*

Different phonological shapes of the same etymological input can be due entirely to differences within the non-Germanic donor languages, as in *debt–debit*, *frail–fragile*, *numeral*, n.-*number*. Almost always, the members of such pairs were borrowed at different dates, in different contexts, triggering sematic shifts, and rendering their etymological connection non-intuitive. Thus, words that had already been borrowed from French in Middle English (ME) were commonly re-borrowed from Latin, resulting in duplication of the original meaning with additional semantic and pragmatic scope. In the examples in Table 22.5, the dates in parentheses are the first attestations of the words in the OED.

More examples of that type are the pairs *garner–granary*; *poor–pauper*; *purvey–provide*; *sever–separate*; *spice–species*; *strait–strict*; *sure–secure*, see also Serjeantson (1961, p. 262). The Latin adjectives for "kingly" and "lawful" have even given rise to triplets; in the forms *real*, *royal*, and *regal* and *leal*, *loyal*, *and legal*, they were imported either from Anglo-Norman, or from Old French, or from Latin direct.

Another mode of vocabulary change is the replication of an existing meaning with a loanword of a different etymological pathway and shape. The resulting pair or set of words are only partial synonyms. Such initial duplicates can come from different daughters of Germanic, as is the case with *heaven–sky* (OE *heofon* "heaven, the clouds, atmosphere" and ON *sky* "cloud, firmament"), *field–veld* (1785) (OE *feld* "earth, open land" and Dutch *veldt*, Afrikaans *veld* "the unenclosed country or open pasture land"); similarly *shrub–scrub*, *ditch–dike*, *draw–drawl*. The most typical case, however, is the expansion of a semantic set by the

historical addition of Romance loanwords which duplicate meanings already covered by existing Germanic lexemes. This is what happened in the case of *swine–pork, freedom–liberty*, and hundreds of other pairs or clusters of words, for example, *feed–nourish* (c. 1290), *white–blank* (c. 1325), *manly–virile* (1490)–*macho* (1928), *red–rouge* (1485)–*rubid* (1656), *climb–ascend* (1382), *top–summit* (1470)–*apex* (1603). In these sets, the first word goes back to Old English. The later borrowings have the same meaning as the English word in the source languages, but they have developed new shades of meanings and belong to different stylistic registers.

22.4 The History of Vocabulary Expansion in English

The size and the etymological composition of the English lexicon have changed in harmony with the demographic and cultural history of its speakers. When we turn to the very early history of the English vocabulary, the problem of counting entries is compounded by the nature of the records. The extant body of texts gives us access only to a very limited portion of the language spoken outside the scriptoria where the texts were created. Moreover, the survival of texts is often a matter of historical accident—the records we draw on may be a small portion of what was actually written, but got randomly destroyed. Considering that the great literary figures of Anglo-Saxon England, people such as Ælfric (c. 955–c. 1010) and Wulfstan (d. 1023), were fluent in Latin, and wrote in both languages, it is most likely that their total individual lexicons were as large as those of highly educated PDE speakers. With that preamble in mind, it is still logical to assume that language contact and the historical progress in every sphere of human activity has indeed resulted in vocabulary "growth" from OE to PDE.

The Dictionary of Old English, in preparation at the Centre for Medieval Studies at the University of Toronto,[9] is based on a corpus of 3037 texts.[10] They represent a complete record of surviving Old English except for some variant manuscripts of individual texts. The number of words attested in Old English is estimated, conservatively, and prior to the completion of the *Dictionary*, at roughly 34 000 items.[11] Direct Latin borrowings account for around 1.75% of the OE vocabulary, but if derivatives are included, the share of Latin may reach 4.5% (Durkin 2014, p. 100). The OE lexicon can therefore be described as etymologically homogeneous. The nature of the surviving materials—religious, didactic, legal, or stylized poetic compositions—probably limits our access to many everyday words that must have been used in the various dialects, but never went on record. Manuscript production was a specialized activity in closed monastic circles within a pre-literate society. Nevertheless, the monolingual OE texts are overwhelmingly Germanic. This uniformity of lineage is in sharp contrast with the heterogeneous character of the PDE lexicon as shown in Table 22.3 and Figure 22.1.

The evolution of the lexicon involves both expansion and shrinkage: 65%–85% of the Old English vocabulary has been "lost"—some words became obsolete (*fain* "with pleasure," *hight* "is called," *lorg* "weaver's beam," *shaw* "a thicket, a small grove"), or restricted to dialectal use (*atter* "poison," *emmet* "ant," *mere* "marsh, fen," *losel* "worthless person, a profligate, rake, scoundrel"). Sometimes the notions these words cover are no longer needed outside specialized historical texts: *hidegild* "a fine paid in lieu of a flogging," *fleam* "a surgical instrument for letting blood," *thane* "a military attendant, follower, or retainer," *heriot* "feudal service/military equipment." Lexical loss can be induced also by borrowing; Table 22.6 shows a sample of words which did not compete successfully with the corresponding loanword and fell into disuse.

Later borrowing could lead to the loss of only some, but not all of the meanings of the original OE word, as in *craft*, originally also "art," *cynn* "kin," originally also "species," *haven*,

Table 22.6 The replacement of Old English lexemes by loan synonyms.

Old English	*Latest OED quote*	*Replacement*	*Earliest OED quote*
bede "prayer"	1554	prayer (OF. preiere)	1300
blee "color"	1460[12]	color (OF. color)	1290
dight "to ordain"	1558	ordain (AN. ordeiner)	1300
ferd "army"	1350	army (F. armée)	1386
galder "charm"	c. 1275	charm (F. charme)	1330
glad "to rejoice"	1622	rejoice (OF. rejoiss-)	1303

originally also "harbor," *gast* "ghost," originally also "spirit." All of these "losses" were obviously offset by the adoption of the loanwords with overlapping meaning.

The next section surveys the etymological composition of the English lexicon in chronological sequence, starting with the words borrowed by Germanic speakers from Latin before Germanic was "exported" to the British Isles.

22.4.1 Latin Influence on Continental Germanic

Proto-Germanic was spoken from around 500–200 BC to the beginning of the Christian era or later. The Germanic tribes of that period are believed to have formed a generally unified linguistic community, distributed over a broad geographic area in Northwestern and Central Europe. Variation must have existed, of course, but the dialects were probably mutually intelligible. Sometime after the beginning of the Christian era, perhaps around the second century or third century AD, the first major split of Germanic occurred: between East Germanic, with the Goths migrating to Southeast Europe, and Northwest Germanic. The split between North and West Germanic is dated roughly between c. 300 and 600 AD.

The early borrowing of Latin words into the widening stream that became Old English has traditionally been divided into three chronological layers: the Continental period, the settlement period (450–650), and after 650 (Serjeantson 1961). Later scholarship (Durkin 2014, pp. 104–105) shows that a broader layering, before and after the middle of the seventh century, is less problematic. He provides a comprehensive list of the early borrowings and a generous sample of the later ones (2014, pp. 108–119). In this approach, the Latin words that came into Old English between the Germanic settlement and c. 650 could have been from contacts made with the continent after the Germanic settlement of Britain, or from newly arriving settlers over a considerable span of time, or from Celtic speakers of Latin, at least in the early settlement years. Words of this sort include *ancor* "anchorite," *scrin* "chest, shrine," *fic* "fig tree, fig," *trefet* "trivet," *portic* "porch." The early Latin loanwords fall into some well-defined sematic categories: religion and scholarship (*abbot*, *bishop*, *nun*, *priest*), flora and fauna (*beet*, *fennel*, *mule*, *oyster*), food (*cheese*, *wine*, *mustard*), tools, clothing, buildings, warfare, general trade terms (*cheap*, *inch*, *toll*). The segmental shape of these words in OE may be a good diagnostic for the date of entry, see Durkin (2014, pp. 144–154) for an exhaustive list of relevant changes and items illustrating these changes. Prosodically, these borrowings tend to follow the Germanic pattern of initial stress, trisyllabic items tend to drop their final syllable (L. *monacus* > OE *munuc* "monk," *acetum* > OE *eced* "vinegar," L. *asellus* > OE *eosol* "ass"). Their foreignness is of interest only to etymologists.

22.4.2 Celtic and Roman Britain

Prior to the arrival of Germanic-speaking settlers in Britain early in the fifth century, the British Isles were inhabited by Celtic-speaking people. The Celts may have settled in Britain as early as c. 2000 BC but not later than the sixth to the first century BC. From 43 AD to 410 AD, Britain was a province of the Roman Empire. The Roman occupation of Britain has left a great deal of archeological evidence; however, the contacts between the indigenous Celts and the Romans in Britain have left only limited traces on the vocabulary of the language which subsequently became the dominant language of the British Isles, namely, Old English.

During the 350 years prior to the departure of the Romans, the superstrate language, at least in the southern part of the country, was Latin. The local substrate language(s) continued to be spoken, but at least part of the Celtic population were speakers of both Celtic and Latin. After the middle of the fifth century, Old English became the new superstrate language.

Given the long contact between the Celts and the settlers from Germania, and given that Old English had become the superstrate and local Celtic languages the substrate, the linguistic situation was extremely complex. In essence, Celtic was two substrate layers down (Old English the superstrate, some sort of Latin the upper substrate, Celtic the lower substrate), so it is not surprising that very few Celtic words made their way into early English. The only common Celtic elements are in place names; place names have the advantage and the prestige of having been there first, and their transfer into the invading language is predictable. Examples of such names, many with Latin pieces inside them, are *Thames*, *Severn*, *Kent*, *Canterbury*, *Dover*, *Yorkshire*, *Devonshire*, *Davenport*, *Lancaster*, *Exeter*, *Gloucester*, *London*. Among the place-name elements borrowed from the Celts are *-combe* "valley" and *-torr* "rock, peak." There are also some Celtic borrowings into English. Among the common nouns that have survived into PDE are: *brock* "badger," *bin*, *brat* "cloth, cloak," *cradle*, *dun*, *crag*, *curse*, *gull*, *loch*.

The adoption and spread of Christianity at the end of the sixth century promoted the learning of Latin and the translation of many religious and scholastic texts from Latin into Old English. As noted above, religion brought a significant number of Latin words into the language. Many of these words go back to Greek prototypes: *apostle*, *cleric*, *bishop*, *candle*, *anthem*, *devil*, *monastery*, *monk*, though their exact pathways of entry into Old English are still being researched (Durkin 2014, pp. 158–162). It was in Old English that the first loan translations, or *calques*, appear on record: Lat. *Lunæ dies* "day of the moon"—> OE *Monan-dæg*, "Monday"; Lat. *Martis dies* "day of Mars," O.E. *Tiwes-dæg* "Tuesday" (*Tiw* was the Anglo-Saxon of the Norse god of war corresponding to the Roman god of war *Mars*), Lat. *evangelicum* "good news," O.E. *godspell* "good tidings," ME *evangely* "gospel."

22.4.3 Early North Germanic Additions

The most profound and lasting influence on the vocabulary of English that can be traced back to another branch of Germanic is associated with the continuous presence of the Vikings, speakers of Old Norse, in Anglo-Saxon England from the middle of the ninth century onward. The Viking Age in Europe is dated c. 750–1050. During that time, Old Norse/early Scandinavian was spoken not just in present-day Scandinavia, but also in Iceland, Greenland, the Faroe Islands, the islands off the coast of Scotland, and in parts of Ireland, Scotland, England, Northern France (Normandy), and Russia.[13]

The Viking incursions and their permanent settlements into large parts of eastern and northern England became a source of lexicon diversification. The ninth century establishment of a territory northeast of the Thames which came to be called the Danelaw legitimized the presence of the northern strand of Germanic in the country and created conditions for permanence, and possibly peaceful integration of the two "cousin" languages. Once the

attacks and the warring had subsided, the two vernaculars, Old English and Scandinavian, were on an equal linguistic footing. The conditions for linguistic integration peaked in the first half of the eleventh century when the country was under Danish rule (1017–1042).

It is estimated that about 1000 words were adopted from Old Norse between the end of the eighth century and the middle of the eleventh century. Most of these items are common everyday words: *bank*, *bull*, *call*, *fellow*, *guess*, *leg*, *loan*, *score*, *skill*, *sister*, *skin*, *sky*. Very significantly, Scandinavian is the source of some important function words: *they*, *them*, *their*, possibly also *she* and *are*, *till* and *though*. Old Norse also contributed extensively to the formation of place-names in England: there are about 600 of them today ending in *-by*, "settlement, town," *-thwaite* "a plot of land," *-thorp*(*e*) "village," etc. Phonologically, the addition of a number of words with root-initial /sk-/ from Old Norse enriched the range of possible root-initial clusters in English. The influence of Scandinavian is attested also in the pronunciation of words such as *get* (*OE gietan*), *give* (*OE giefan*), in which the boldfaced sounds would have been pronounced [j-], had it not been for the ON [g-] pronunciation.[14]

22.4.4 *The Norman Conquest and Its Effect on the Composition of the Lexicon*

Although register-specific borrowings came into the language before the eleventh century, the historic event which put the vocabulary of English onto a fast non-Germanic track was the Norman Conquest of 1066. The cultural and linguistic consequences of the occupation of Britain by speakers of Norman French were far-reaching. The new demographic minority spoke little or no English and maintained strong cultural and linguistic ties to Normandy for at least a century and a half. Political and cultural ties to France continued throughout Middle English. Although after the beginning of the thirteenth century the Anglo-Norman nobility gradually became more and more "English," the relationship between English and the two other languages used in administrative and legal contexts, Latin and Anglo-Norman/Old French, continued to be that of a universally spoken substrate (English) to two culturally dominant languages (Latin and French).

The existence of trilingualism in England after the Conquest was an essential condition for vocabulary expansion. The process was not a simple superstrate-to-substrate transfer because there were never many native speakers of French in England, especially after the thirteenth century. Few English speakers would have been fluent in Anglo-Norman between 1066 and 1250, and the largest portion of the new lexicon came at a later time. Also, although the French influence on English was through social and cultural superiority, it was the prestige language in coastal Northwestern Europe, so English was not exceptional among the languages of Europe in this regard. Words were borrowed from all spheres of contact: literature, religion, government, law, warfare, architecture, art, science, medicine. Legal, administrative, military, and political terms replaced or duplicated existing English words: *liberty*, *assembly*, *council*, *guard(ian)*, *parliament*, *record*, *tax*, *army*, *defense*, *navy*, *soldier*. In the areas of literature, art, science, medicine, English borrowed words such as *beauty*, *color*, *romance*, *music*, *poet*, *physician*, *surgeon*, *grammar*, *logic*, *study*, etc. Along with that, many core words were also borrowed: *air*, *beast*, *city*, *close*, *dangerous*, *diet*, *feast*, *flower*, *glue*, *haste*, *jealous*, *journey*, *judge*, *liquor*, *mountain*, *noble*, *oil*, *part*, *peace*, *pork*, *river*, *servant*, *soil*, *story*, *tender*, *very*, etc. All in all, approximately 10 000 words were borrowed from Anglo-Norman and continental French into ME (1066–1476).[15] About 75% of these borrowings are still in use.

Among the long-term consequences of the increased presence of Romance vocabulary in the Middle English lexicon were changes of the phonemic inventory, greater frequency of individual phonemes, and the introduction of new prosodic patterns. Borrowed /v/-initial words, for example, *virgin* (c. 1220), *visit* (a. 1250), *very* (c. 1250), *vacant* (c. 1290), *vapor* (1390),

and /z/-initial words (e.g., *zephyr* (c. 1386), *zodiac* (c. 1392), *zone* (1394)) were instrumental in the phonemicization of the voiced labiodental and alveolar fricatives /v/ and /z/ (Minkova 2011). A later, seventeenth-century change affecting the phonemic inventory, the palatalization of <-s + *-ion*, *-ure*> to [-ʒ], in, for example, *derision*, *occasion*, *measure*, and the identification of this new consonant with the French [ʒ] as in, for example, *beige*, *rouge*, led to the addition of the voiced palatal fricative /ʒ/ to the phonemic inventory of English. The Romance vocabulary also contributed to the higher frequency of the palatal fricative /ʃ/ and the reanalysis of the bisegmental sequences /tʃ/ and /dʒ/ to contour affricates /t͡ʃ/, /d͡ʒ/ (Minkova 2019). Words borrowed with palatal consonants, or phonological sequences that later developed naturally into palatals, include (before 1200) *chancellor*, *chapel*, *passion*, *catch*, *cheer*, *gentle*, *charity*, *large*, *chasten*, *ginger*, *fresh*. In the thirteenth century, the borrowings of palatals or incipient palatals are even more common: *burgess*, *physician*, *preacher*, *judge*, *chasten*, *creche*, *scourge*, *dangerous*, *devotion*, *jealous*, *patience*, *adventure*, *special*, *change*. In the fourteenth century, the numbers are overwhelming and can only be minimally sampled: *merchant*, *official*, *page*, *nation*, *archer*, *kerchief*, *rage*, *stature*, *touch*, *precious*. All of these loans were early enough to feel completely "naturalized" today.

The effect of the newly adopted Romance lexicon on the prosodic structure of Middle English is of special interest. For disyllabic words borrowed early, stress on the initial syllable of the word became the default: *fortune*, *language*, *mammon*, *minus*, *mercy*, *moral*, *mountain*, *novel*, *pagan*, *palate*, *primer*, *sentence*, *sermon*, *solid*. This is fully in line with the Germanic pattern of root-initial stress. Words which were borrowed as trisyllabic followed the Latin stress rule: if the penultimate syllable was light (or "short" in the philological literature), the antepenultimate was stressed: *article*, *melody*, *mystery*, *regimen*, *patient*, *Samuel*, *violent*. Such words also fit the native model of word-initial main stress. These two types did not affect the native prosodic system. However, the nativization of French borrowings with heavy suffixes such as *-ance/-ence*, *-esse*, *-(i)er*, *-io(u)n*, *-ité(e)*, *-y(e)*, *-ment*, *-ous* was a more complex process. Initially, within English, they developed a second stress two syllables back from the main stress: *àrgumént*, *èloquénce*, *iàlousíe*, *pàrlemént*, etc. Such loans provided important evidence against root-initial stress in English, a prosodic innovation which was bolstered by the influx of Latinate vocabulary during the Renaissance. Word-types providing a model for a competing, weight-based pattern of stress in English were trisyllabic words with a heavy penultimate syllable—*aroma* (c. 1220), *placebo* (c. 1225), *asylum* (1430), though the Germanic stem-initial stress can surface even in such words—*calendar* (1205), *discipline, n.* (a.1225), *sinister* (1411). Variation continues in many items to this day: Latin *adversārius* > *adversary* [ˈadvəs(ə)ri ~ ədˈvəːs(ə)ri ~ ˈædvərˌsɛri], Latin *vagārī* > *vagary* (1566) [ˈveɪgəri ~ vəˈgɛːri].

22.4.5 The Renaissance and After

The two centuries following the introduction of the printing press in England in 1476 stand out as the period of most rapid vocabulary growth in the history of the language. Even as the nationalistic spirit was rising and with it the respect for the vernacular, Latin and Greek continued to dominate the classrooms as obligatory components of good education. 4500 new words were recorded in English during each decade between 1500 and 1700. Over 20 000 words borrowed from the classical languages between 1500 and 1700 have survived to this day.[16] Unlike the earlier wave of influence from the classical languages, mostly mediated by French, the Renaissance borrowings entered the language largely in their original form. Some words borrowed from Latin during that period are *alumnus, contend, curriculum, exclusive*, *investigate*, *relate*, *sporadic*, *transcendental*. From the fields of mathematics and geometry, botany, biology, geography, medicine are: *abdomen*, *antenna*, *calculus*, *cerebellum*, *codex*, *commensurable*, *compute*, *evaporate*, *lacuna*, *larva*, *radius*, *recipe*, *species*. A substantial number of

everyday words were also adopted; they probably started out as specialized words, but quickly became part of the common vocabulary: *frequency*, *parental*, *plus*, *invitation*, *offensive*, and *virus*. Affixes were also borrowed from Latin, for example, the suffixes *-ence*, *-ancy*, *-ency*, *-y*, and the prefixes *ante-*, *post-*, *sub-*, *super-*. Greek words which came through Latin, and possibly through French, are words such as *atheism*, *atmosphere*, *chaos*, *dogma*, *economy*, *ecstasy*, *drama*, *irony*, *pneumonia*, *scheme*, and *syllable*. Direct borrowings from Greek are *asterisk*, *catastrophe*, *crypt*, *criterion*, *dialysis*, *lexicon*, *polyglot*, and *rhythm*.

It was this second wave of classical lexicon that produced a new set of weight- and affix-sensitive constraints on stress placement in PDE. A phonotactic innovation, mostly ignored until Minkova (2015), entirely driven by borrowing, was the reversal of the loss of word-final [-ə] in English. Figure 22.3 shows the trajectory of this process: by the end of c. 1400 there were less than two dozen [-ə] nouns, while the addition of loans of the shape *lacuna*, *larva*, *drama*, *santa*, *plasma*, *stamina* make this segment's present phonotactics similar to the Old English status of [-ə].

The U-turn illustrated in Figure 22.3 is also of interest because of its strong association with the class of nouns; while [-ə] does not have the derivational potential of *-ance/-ence*, *-ity*, *-ment*, it is still a deterrent to conversion: **to stamina*, **to larva* are blocked. It also complicates gender marking in animate nouns, especially personal names: *Alexandra*, *Antonia*, *Georgia*, *Martina*. Also, in addition to the introduction of new phonological templates, Renaissance borrowings brought new minor morphological patterns into the system, as in the plurals *larvae*, *calculi*, *cornua*, and *hiatus*.

The non-classical portion of the loan vocabulary recorded in early Modern English and after is quite diverse in origin. Some examples of borrowings from Italian include: *artichoke* (1531), *bazaar* (1599), *gondola* (1549), *vermicelli* (1669), *squadron*, (1562), *balcony* (1619), *fresco* (1598), *opera* (1644), *rotunda* (1687), *stanza* (1588), seventeenth- and eighteenth-century musical loanwords, for example, *duet*, *maestro*, *tempo*, *soprano*, etc. Early loans from Dutch are *drill*, v. (1622); *foist*, v. (1545); *knapsack* (1603); *pickle*, v. (1552); *smuggle*, v. (1687); *rant*, v. (1598); *trigger* (1621); *yacht* (1557); *bully* (1710). Among the Renaissance borrowings from Spanish are: *buoy* (1596), *cargo* (1602), *guava* (1555), *hammock* (1555), *masquerade* (1654), *mestizo* (1588), *negro* (1555), *potato* (1565), *siesta* (1655).

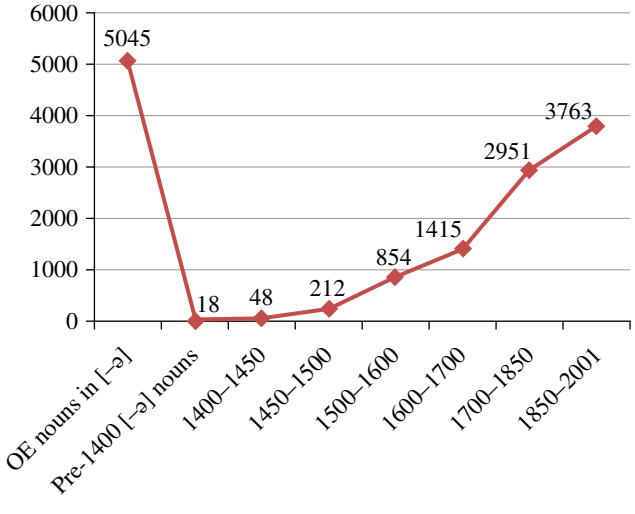

Figure 22.3 Final [-ə] in English nouns from OE to PDE (from Minkova 2015).

Table 22.7 The 10 most frequent sources of loanwords (data from Durkin 2006, p. 29).

1775–1799 (305)	*1875–1899 (816)*	*1975–1999 (84)*
French (33%)	Latin (40.5%)	Latin (20%)
Latin (30%)	German (18%)	French (16.5%)
German (5%)	French (15.5%)	Japanese (8.5%)
Sanskrit (5%)	Italian (4%)	Spanish (8.5%)
Italian (3%)	Japanese (3%)	German (7%)
Malay (2.5%)	Spanish (3%)	Russian (3.5%)
Urdu (2.5%)	Greek (2%)	Hindi (3.5%)
Hindi (2%)	Yiddish (1.5%)	Italian (3.5%)
SAfr. Dutch (1.5%)	Hawaiian (1%)	Zulu (3.5%)
Spanish (1.5%)	Swedish (1%)	Greek (2.5%)

The last three centuries have been a time of further diversification of loanword sources. Documenting these trends for the final quarters of the eighteenth to twentieth centuries, Durkin (2006) shows a rich mixture of newer and older donor languages.

French and Latin vocabulary has continued to be borrowed and created through the flourishing of scientific inquiry and the opening of new fields of knowledge: *electromotive* (1806), *invertebrate* (1826), *agglomerate* (1830), *pterodactyl* (1830), *endorphin* (1976), *exaptation* (1981), and *lorem ipsum* (1995). There are also important new sources: the contribution of Spanish is more than doubled in each column, and in the last two centuries Japanese has become a major donor, its share up from 3% to 8. 5%. In the twentieth century, Russian loans exceed the 1% threshold in Table 22.7. Arabic, Chinese, Hebrew, and Maori have also increased their contribution to English in the last two centuries. Although English replaced French as the most prominent European donor language in the course of the twentieth century, globalization has continued to bring new words into English through wide-spread bilingualism and increased international exchanges on every level. Once again, gauging the size and growth of the lexicon is a difficult task because of the incompleteness of the documentation, the proliferation of differently organized corpora, and the application of different criteria in compiling the statistics.

22.5 Recent Acquisitions: Looking to the Future

Borrowing is not our only source of new words. The inherited word formation patterns of compounding and derivation are still strong: *binge-watch* (2007), *douchebaggery* (2000), *clickjacking* (2008), and *defriend* (2004). New forms based on more recent models of blending, clipping, abbreviation, and eponymy are also growing in number—*acquihire* (2005), *glam-ma* (2001), *Brexit* (2012), *e-cig* (2007), *CRISPR* (2002), *livermorium* (2012)—and continue to enrich the word-stock. OED3 lists 186 headwords first recorded between 2000 and 2012, all of them still low-frequency words (band 1 on Table 22.1). 154 of them are categorized as English in origin, that is, formed within English, as *ace* "asexual" *alt-right*, *geocache*, *photobomb*. The bulk of the entries, 147 of them, are nouns, some also used as adjectives: *Anthropocene*, *blue state*, *cissexual*, or as verbs: *Facebook*, *hashtag*, *sext*.

The creation of new words is often inspired by new technologies: *Blu-ray*, *Captcha*, *Skype*, *podcast*, *clickjacking*, *crowdfunding* are some of the "digital age" OED3 entries in the decade

2002–2012. In the 7-year period between the first and second editions of *The Cambridge Encyclopedia of the English Language*, Crystal (2003) had to add an entire chapter to accommodate the growth of Internet-based words such as *flaming*, *offline*, *firmware*, *freeware*, *groupware*, *wetware, webonomics*, *webzine*, *netiquette*, *geekification*. The Internet has generated an ever-growing list of new abbreviations such as *URL* "Uniform Resource Locator," *DDS* "Digital Data Storage," *HTML* "HyperText Markup Language," *IAP* "Internet Access Provider," *PDF* "Portable Document Format." Acronyms and abbreviations are the fastest growing and most volatile part of the vocabulary: the 5000-page *Acronyms, Initialisms, and Abbreviations Dictionary*, now in its 48th edition (Gale/Cengage Learning), is advertised as offering more than 900 000 definitions.

Social media communication is a major new channel for the creation and spread of innovative word-forms. Some like *e-skin*, *tarzy*, *Greksit*, *lactivism*, *clicktivism*, *slacktivism* are now headwords in OED3, but whether *Calexit*, *blacktivism*, *accuse-tivism*, *unpresidented*, and *-gate* words such as *blabbergate*, *Kremlingate*, *pee-gate/pissgate*, *Russiagate* will be similarly institutionalized remains to be seen.[17]

A much rarer type of innovation with a long history, see Section 22.4.2, is calquing, or translating the components of a compound or phrase. A recent example of calquing is the expression "*that goes without saying*," a loan translation of the French expression *cela va sans dire*, or the twentieth-century introduction of power politics, from German *Machtpolitik*, *metaphony*, based on German *Umlaut*, via French, *ivory tower* from the French *tour d'ivoire*.

One may conclude from this survey, somewhat sweepingly, if not rashly, that English has turned inward to its own resources for new words and new readings. As it is the Latin of the twenty-first century, required in all fields of science, required worldwide in travel, politics, and global communication, perhaps this inner-directed expansion is to be expected.

NOTES

1 Robert Stockwell passed away in 2012. The second edition version of this chapter preserves the plan and a substantial portion of the material included in the original publication.

2 All references in this chapter are to the OED *Online* (http://dictionary.oed.com/), third edition. Since March 2000, the OED has been an exclusively online publication, with entries from M to R fully revised and updates across the lexicon on a quarterly basis. See Ogilvie (2013) on the changing attitudes and practices regarding borrowed words in OED's 150-year history.

3 This estimate is found in Craig (2011) who surveys the history of the myth surrounding the capaciousness of Shakespeare's vocabulary and shows that his achievements are not a matter of word innovation or word numbers, but of thematic breadth and extraordinary artistic talent.

4 These estimates are based on a small sample in Crystal (2003, p. 123). The upper ranges of the estimate are unrealistic.

5 For a more extended discussion of the history of the core–periphery distinction, its recent applications, and its problematic nature, see McCarthy (1999), Grant (2009), Tadmor et al. (2010), Borin (2012), and Durkin (2014).

6 See Leech et al. (2001, p. 144, 180).

7 The original results of the investigation were published in *A Statistical Linguistic Analysis of American English* by A. Hood Roberts, The Hague: Mouton 1965, pp. 35–38. The

tabulation of the results used here is from Williams (1975, p. 67). Using the *BNC* and a different counting procedure, which eliminates numerals and nationalities and includes "indirect" borrowing, that is, items formed by conversion, derivation, compounding, and derivation, Durkin (2014, pp. 36–38) shows a very different picture for the 1000 most frequent items, with the proportion of loanwords slightly exceeding the native element.

8 Watkins (2011) offers an excellent introduction to the methodology of establishing such cognates and tracks the history of over 13 000 words from IE to PDE.

9 *The Dictionary of Old English* (DOE), http://www.doe.utoronto.ca/, is currently (November 2018) complete for the entries A to I online.

10 For comparison, the first edition of the OED (1884–1928) used citations from 2700 authors; the number of works represented in quotations in it was 4500 (http://dictionary.oed.com/about/facts.html). There is no comparable data on OED 2 (1989), but for that edition the number of quotations is given as 2 436 600.

11 This is the estimate endorsed in Durkin (2014, p. 100). An earlier estimate, cited in Kastovsky (1992, p. 293), is more conservative, putting the range at 23 000–24 000 items.

12 Two further isolated entries, 1623 and 1850, are obvious and deliberate archaisms.

13 On the term "early Scandinavian" as an umbrella term for West or East Norse, see Durkin (2014, p. 175).

14 For more details on the phonological effect of Scandinavian borrowings, see Dance (2003, pp. 74–86), Durkin (2014, pp. 191–198).

15 The estimate is based on a word's first appearance as recorded by the *Oxford English Dictionary*, see Baugh and Cable (2013, pp. 173–174). Though the immediate source for many of those words was Old French or Anglo-Norman, they are etymological descendants of Latin, so "Romance" can be used as a cover term. On the difficulty of distinguishing between borrowing and code-switching in attested new Romance words in the post-Conquest period, see Durkin and Schad (2017).

16 For these figures, see Minkova and Stockwell (2009, pp. 47–53). For an excellent survey of the lexical changes in early Modern English, see Nevalainen (1999), especially at pp. 336–376.

17 All of the *-gate* words and *unpresidented* are documented in the rubric "Among the New Words" in *American Speech* Vol. 92, No. 2, May 2017, doi 10.1215/00031283-4202031. For an attempt to model the emergence of new lexical items based on current social media sources, see Grieve et al. (2016).

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23 Compounds and Minor Word-Formation Types

LAURIE BAUER

23.1 Introduction

Most word-formation in English (independent of whether "word-formation" is taken to include or exclude inflectional morphology) is done through the three processes of prefixation, suffixation, and compounding. Some internal modification (umlaut, ablaut) is generally seen as supporting inflectional affixation, while other sub-types (stress-shift, consonantal change) are seen as supporting derivational morphology. Two other types, back-formation and conversion (also known as zero-derivation, functional shift) are seen as closely related to derivational affixation, and are best dealt with as extensions to that category. This chapter deals first with the compounds, and then with other minor-types of word-formation which are not clearly morphological in nature.

The processes dealt with here may thus be united as non-affixal instances of word-formation in English. These are all extremely frequently used methods of forming new lexical items in modern English. Interestingly, it is often difficult to draw a firm line between the different types, the borders tending to be fuzzy rather than clear-cut. At the same time, there are differences between compounds and these minor word-formation types. The most obvious one is the regularity which is usually attributed to compounding, as opposed to the formal irregularity which is often seen as characterizing the minor word-formation types. This is sometimes characterized as a distinction between the productivity of compounding (implying rule-governed behavior; see Bauer 2001) as opposed to the creativity of other types (implying the predominance of analogy and other processes which are not rule-governed).

The central question in this chapter will be one of definition. Just what is a compound, and how much does the category cover? How reliable a criterion is stress? Where does compounding stop and blending begin?

23.1.1 Productivity and Lexicalization

One problem which recurs in any discussion of word-formation is the matter of productivity. Although the term PRODUCTIVE is used in various ways in morphology (see Bauer 2001), we can fundamentally say that a process is productive while and to the extent it is used in the coinage of new forms. Purely syntactic processes are usually assumed to be totally productive: they are assumed not to have lexical exceptions, not to be restricted by factors related to etymology, the word-classes involved, or demands for euphony. Any of these may have an

The Handbook of English Linguistics, Second Edition. Edited by Bas Aarts, April McMahon, and Lars Hinrichs.

effect in word-formation. On the other hand, the lexicon of English contains many words whose precise form or meaning could not be predicted on the basis of the current state of the language. In some instances, the process has simply ceased being productive. We have a word like *dreadnought*, but cannot create a new parallel like **fearterrorist*. In other cases, an existing word has acquired particular connotations or meanings which make it non-compositional or idiomatic. For example, a frogman is not a person who happens to have bulging eyes or a long tongue, nor yet a man who collects, eats, or sells frogs. The meaning of *frogman* is fixed. Such patterns or examples are said to be LEXICALIZED.

23.1.2 Words

If you were learning English, and you learnt *protrude*, *protrudes*, *protruding*, *protruded*, how many words would you have learned? If you answer "four," you are taking *word* in the sense WORD-FORM, and if you answer "one" you are taking *word* in the sense of LEXEME. The lexeme subsumes the different inflected forms illustrated for *protrude*. In this particular example, the BASE is *protrude*, and the other word-forms are produced from that base (on inflection, see further, Chapter 20, this volume). Word-formation is about the formation of lexemes rather than about the formation of word-forms (although in some cases, such as the suffix *-ing*, it can be difficult to draw firm lines, even here).

There is another, related term which must be distinguished from lexeme, and that is lexical item (sometimes called "listeme"). A LEXICAL ITEM is anything which must be listed in a speaker's mental dictionary. This includes lexemes, may include smaller items such as suffixes, but also includes items made up of more than one lexeme such as *red herring*, *bark up the wrong tree*, *put up with*, and so on.

23.2 Compounds

23.2.1 Preliminaries

Compounds are frequently given a slightly paradoxical definition as words which are made up of two words. We can be slightly more precise than that, even if the delimitation of compounds will be a question to which we shall have reason to return. First, we must understand that *word* in the loose definition given above is to be understood in the sense of "lexeme." Compounds are lexemes in the sense that they have—in appropriate word-classes—the ability and requirement to inflect just like lexemes that do not have a complex internal structure. Compounds are distinguished from other lexemes in that their internal structure shows two or more lexemic bases (which we will call the ELEMENTS of the compound)—forms which in other places in the language inflect independently and can on their own act as the heads of relevant phrases. In compounds, it is typically the case (though we shall come back to whether this is always the case) that only one of these lexemic bases, in English typically the right-hand one, can show overt inflection. Moreover, we generally restrict the term "compound" to those multi-lexemic lexical items which do not arise through the lexicalization of syntactic structure. *Love-in-a-mist* and *forget-me-not*, while they are undoubtedly lexical items of English, are, by this criterion, not compounds. *Namby-pamby* and *shilly-shally* are equally not compounds, because they fail to meet the part of the definition which states that a compound must contain bases of two independent lexemes.

Not only is it the case that only the final element in an English compound can usually inflect, it is also the case that in a very large number of cases the final element in isolation denotes a hypernym or superordinate term for what is denoted by the compound as a whole. *Windmill* denotes a type of mill, *dive* is a superordinate of *sky-dive*, *sky-blue* is a

hyponym of *blue*. In such instances, the final element determines not only an important part of the meaning of the compound, it determines the word-class of the compound and, in most cases, the inflectional class of the compound (*flittermouse* makes its plural in the same way that *mouse* does; *understand* makes its past tense in the same way that *stand* does). Inflection is typically marked on the final element of the compound, whether it is regular or irregular. In such cases, we may talk of this final element as being the HEAD of the compound. We shall return below to extensions to this notion of headedness, and to some problems and exceptions.

In calling a compound a lexeme, I made specific reference to the notion of an item which takes a global inflection. But there is a common perception that a "word" of English (of whatever type) corresponds in some way to an ORTHOGRAPHIC WORD, the word as delimited by spaces on the page. We must, therefore, state at the outset that any such definition of the compound in English is totally impracticable. First, large numbers of English compounds can be found with different spellings in different dictionaries. We might, for instance, find *coffee pot*, *coffee-pot*, or *coffeepot*, depending on the dictionary we care to consult. When even dictionaries fail to agree, we can be sure that actual usage provides a bewildering amount of variation. Second, we must note that there is a principle of English spelling whereby any item consisting of more than one orthographic word is hyphenated (and thus presumably turned into "one word" orthographically) when it occurs in attributive position. Thus, the phrasal *false advertising* appears to become a single orthographic word in *false-advertising laws*. It is not clear that such examples are meaningfully analyzed as compounds rather than as rank-shifted syntax. Worse, in actual usage this gives us such attested examples as *to fill AB social class-type jobs* and the *ex-vice queen of Hollywood* (Bauer and Renouf 2001), which create orthographic units which appear to run counter to fundamental constituent analysis. Even greater nonsense is generated by examples such as *the New York-Los Angeles flight*, which appears to contain *York-Los* as a single orthographic word. For reasons such as this, the compound needs to be defined independently of the orthographic word.[1]

Compounds are classified and cross-classified in a number of different ways. We have traces of a classification designed for Sanskrit compounds remaining in terms like *bahuvrihi* and *dvandva* (see below); we have structuralist analyses of various types, traces of which remain in terms like *endocentric* and *exocentric*; we have transformationally based analyses which see sentential relations persisting in the relationships between elements in compounds. Perhaps the classification which makes the fewest assumptions and which is easiest to apply is a fundamental division between compounds functioning as different word-classes in a sentence. Using this system, we talk about COMPOUND NOUNS (e.g., *windmill*), ADJECTIVES (e.g., *sky-blue*), VERB (e.g., *baby-sit*), PREPOSITIONS (e.g., *into*), etc. While other classifications will be required, this is the one we shall take as basic here.

With compounding, as with other instances of word-formation (in particular conversion), we need to distinguish in principle between the final result of the word-formation process and the process by which a particular form was coined. Take *baby-sit* as an example. On the surface, this is a compound verb: it is used as a verb in sentences such as *I have been asked to baby-sit for the Smiths*, and it contains two lexemic bases, and is inflected according to the pattern of the word-final element (*My aunt baby-sat for us last night*). But it did not come into being by taking *baby* and *sit* and putting them together into a new compound verb. The verb *baby-sit* is formed from the earlier form *babysitter*. *Baby-sitter* is formed in much the same way as other compounds such as *train-driver*. But while *baby-sit* has become a verb, we do not say **He train-drives for SNCF in Paris*. In terms of the final form (which the Germans neatly call *Wortgebildetheit*), *baby-sit* is a compound; in terms of the process by which it was formed (in German, *Wortbildung*), it is an instance of back-formation. This distinction has led to some confusion in the past.

In what has been said above, a compound has been defined as a form. There is another definition of compound current in the literature, according to which a compound is defined less by its form (although it must still contain two lexemic bases) as by its status as a lexical item. *Windmill* is accepted as a compound because it is well established in the community, but if we were to read that a particular author "has become a veritable book-mill, churning out two novels a year every year," *book-mill* would not count as a compound because it is a new and ad hoc formation. In contradistinction to that position, it is here argued that the process of becoming well-known and semantically specialized is independent of any structural properties. Sentences such as *How do you do?* become fixed and specialized in meaning, but they are still examples of the same structures they were before they became fixed in meaning. The same is true of compounds. They are always compounds, but some of them are well-known and specialized in meaning, others are less well-known. The label "compound" has nothing to do with how often a particular expression is used, so that both *windmill* and *book-mill* are compounds.

Precisely, where the border between compounding as a lexical process and premodification as a syntactic process might run is currently a matter of some controversy, and cannot be solved here. The discussion above tends to favor viewing compounding as lexical rather than syntactic, but for wider discussion, see, for example, Bauer (1998); Giegerich (2004, 2015); Levi (1978); Munat (2003); and Olsen (2000).

23.2.2 The Phonology of Compounds

Whereas the phrase *black bird* takes its major stress on the right-hand element, *blackbird* is stressed on the left-hand element. This stress difference is often taken to be a defining one in terms of English compounds (see, e.g., Chomsky and Halle 1968). The argument is rarely made explicitly (though see Bauer 2004), but presumably depends on the orthographic unity of *blackbird* and the fact that words typically have a single stress while *black bird* has the possibility of two stresses if it does not carry the intonational nucleus.[2] This stress-based division has been challenged in the literature, so we need to consider it carefully here.

There is a semantic difference between *black bird* and *blackbird* which appears to be an important part of the distinction: while *black birds* provides a description of a set of birds, *blackbirds* provides a classification of birds. We can see the difference in that *a brown black bird* is nonsensical, while *a brown blackbird* is not; *a very black bird* makes sense, while *a very blackbird* is probably not even grammatical. In *black bird*, then, *black* is a gradable adjective (an EPITHET in one terminology), while in *blackbird*, *black* is non-gradable (a CLASSIFIER). In every instance where we get an adjective–noun construction with COMPOUND STRESS (forestress, left-hand stress), we find this classificatory meaning. But the reverse is not true. Where we get the classificatory meaning, we do not necessarily get compound stress. Contrast *'blackbird*, *'blue-tit*, and *'whitefly* on the one hand with *black 'fly*, *black 'robin*, *blue 'fox*, *red 'cardinal*, *red 'mullet*, *red 'squirrel*, *white 'ant*, and *white 'gold* on the other. The differences appear to be purely in terms of stress pattern, not in terms of the semantics (or, following from the semantics, the syntactic patterns in which each can occur). If we say *I saw a very black robin*, we are no longer talking about the species of robin which is the black robin, and *a brown red squirrel* is not necessarily a contradiction in terms. That being the case, it is not clear why stress should be taken to be criterial for compounding: the construction type appears to be independent of stress; the stress seems to be an extra marker which is not necessarily present, possibly a marker of degree of lexicalization rather than anything else.[3] This notion is developed in Bauer (2004), where it is shown that on average items displaying compound stress are more frequent than those without it.

When we consider noun–noun compounds, the role of stress becomes even more difficult to distinguish. First, although we can find some examples where the stress does seem to be predictable, there are many others where it is not. Lees (1963) seems to have been the first to point out that *'apple cake* contrasts with *apple 'pie* and that *'Madison Street* contrasts with *Madison 'Avenue* in terms of stress. This observation appears to be robust, and indicates that stress is not (or is not always) a correlate of semantic structure. On the other hand, a distinction between a *'toy factory* ("a factory in which toys are made") and a *toy 'factory* ("a factory which is itself a toy"), between a *'concrete factory* ("a factory in which concrete is produced") and a *concrete 'factory* ("a factory built of concrete"), seems to imply that stress is not only contrastive in noun–noun constructions, but does correlate (or does sometimes correlate) with meaning. When we look away from these series of compounds, we find less agreement. Not only do dictionaries and pronunciation guides often give conflicting patterns for individual collocations, individual speakers do not seem to be able to assign a consistent stress pattern to known lexical items, and speakers vary in the assignation of stress patterns in actual speech (Bauer 1983a). We seem a long way from the received phonological wisdom of two discrete classes.

When we look beyond nouns, the pattern does not get clearer. Compound adjectives like *sky-blue* take phrasal stress in predicative position, but compound stress in attributive position, thus behaving according to the rules of iambic reversal (sometimes termed stress-shift). The same is true of other compound adjectives like *lead-free* or *machine-readable*. Here stress appears to be determined by principles which are separate from the status of the relevant construction.

Compound verbs derived by back-formation (like *baby-sit*) or by conversion (like *to carbon-copy*) retain the stress of the words from which they are derived. Adjective–verb constructions (which may also be formed by back-formation or conversion), where the adjective is usually interpreted with adverbial force, seem to show final stress: *fine-tune*, *soft-land*. Particle–verb constructions like *over-achieve* again show final-element stress. While some compound verbs like *freeze-dry* do, or do sometimes, show compound stress, compound stress does not seem to be a feature of compound verbs.

All things considered, although we often find first-element stress in things we wish to call compounds, there is little evidence that first-element stress is a necessary or even consistent correlate of compound structure. We still lack a good theory of how stress is assigned to compound items, although some mixture of lexical conditioning (including here lexicalization) and semantic patterning seems likely, with a large admixture of influence from the immediately surrounding context. In our present state of ignorance, it seems dangerous to equate first-element stress with compound structure. See Olsen (2000) and Giegerich (2004) for further contrasting views on the subject.

23.2.3 The Lexical Structure of Compounds

There is no known lexical restriction on the words which can be compounded. Indeed, many scholars have commented that any sequence of noun and noun, for instance, can be given an interpretation as a compound. While such a statement may be a little overenthusiastic (*tree-oak* is difficult to assign a meaning to, and we should recall Jespersen's (1942, p. 140) claim that Carlyle's *mischief-joy*—a translation of *Schadenfreude*—is foreign to the genius of the language), nonetheless it shows the generally accepted position. The claim in Bauer (1983b, p. 206) that only an etymologically defined subset of adjectives (primarily Germanic ones) enters into adjective–noun compounds is falsified by examples such as *dra'matic society*, *'musical box*, *'primary school*, *'solar system*, and many others. It is sometimes claimed that nominalizations do not compound easily with each other. This seems to be the result of the fact

that only in very restricted situations are compounds such as *knowledge expansion* required, rather than a genuine restriction on the compounding process.

23.2.4 The Grammatical Structure of Compounds

In the default cases, compounds in English have the structure lexemic-base + lexemic-base (+ inflection). Specifically, this excludes inflections from positions which are compound-internal. This is related by many to the principles of lexicalism, principles which seem rather more threatened by the fact that phrases can apparently be used in the first element of compounds, as in *He … gave … me a don't-mess-with-me look*,[4] *give-me-the-money-or-I'll-blow-your-brains-out scenarios*,[5] and so on. There are a number of places where this view of what comprises a compound is challenged by apparently parallel and synonymous constructions which break with this expected structure in a number of ways. Some of these will be considered below.

Briefly, though, it should first be pointed out that although compounds with more than two elements have been admitted in the definitions given here, no such examples have been provided. It seems that longer compounds such as *railway timetable* can virtually always be broken down into nested compounds, each of which shows binary branching. Incidentally, where orthography shows apparent structure in these instances, as in *[railway] [timetable]*, it appears to provide accurate information. The exceptions to binary branching are COORDINATIVE compounds such as *Rank-Hovis-McDougal* where the ability to assign a binary structure to the tree can arise only through knowledge of history (the rather specialized history of business mergers) rather than linguistic knowledge.

23.2.4.1 Internal Plurals

The general rule with English compounds is that the modifying (left-hand) element occurs in the stem form. However, some things which otherwise look like compounds have the modifying element marked as plural. The term *teethridge*, for example, is a standard part of linguistic terminology, and *teeth* is a plural form. It is often claimed that this kind of structure arises only when the plural form is irregular, as is the case with *teeth*, and thus presumably independently listed in the lexicon. *Mice-infested*, we are told, is acceptable English, *rats-infested* is not.

Acceptability is rather slippery in this area. While *mice-infested* is undoubtedly accepted and used by some speakers,[6] it seems that most speakers still prefer to stick to the stem-form modifier and say *mouse-infested*. At the same time, there are sufficient examples like *suggestions box* for it to be clear that there is no simple ban on plurals (regular or not) in modifying position. Rastall (1993) suggests that plurals are used where the sense demands them, but this seems too strong a claim. Consider examples such as *a two-man boat* where even the numeral *two* fails to call forth a plural marker—compare also *all-party talks*. The general preference for singulars (or, perhaps more accurately, unmarked forms) is not the only way in which the modifying noun in such constructions is constrained.

It is not usual for the modifying noun to be submodified by an adjective. Given a compound like *library book*, a *white library book* is usually interpreted as a white book from a library rather than as a book from a white library.[7] There are exceptions, such as *blue-sky research*, *hot-air balloon*, *red letter day* (but note that *air balloon*, etc., are not established as compounds), and *black market prices*, but a reading where any adjective modifies the head of a N + N construction (or the construction as a whole) is clearly the default. It is hard to tell how far this is a matter of grammar and how far it is a matter of pragmatics, but further constraints suggest that it may be grammar.

If a single adjective modifying the first noun is rare, conjoined adjectives modifying the first noun seem to be virtually impossible. *Green and yellow bruise treatment*, for instance, is odd, perhaps because of the rarity of appropriate opportunities for such constructions.

Post-modification of the modifying noun also seems to be awkward though real examples are found such as *the health and safety in employment act*; but relative clauses appear not to occur (perhaps because a plural noun would frequently be required, as in **a students who attend this university demonstration*).

In the continental Germanic languages such as Dutch, German, and Swedish there is a tendency to use an *-s* (which in German and Swedish might sometimes be interpreted as a genitive rather than a plural) to mark constituent structure in an [[A B] C] construction, separating the B element from the C element (Josefsson 1997, p. 60; Krott et al. 2004). It is not clear that any such tendency can be found in English.

Both Rastall (1993) and Pinker (1999) suggest that the difference between *suggestion box* and *suggestions box* is that in the former an N is used in the modifying position while in the latter it is an entire noun phrase (NP), introduced in much the same way as the much longer phrases illustrated earlier. If this were the case, we might expect to find that any complex NP could be found as a compound modifier. That appears not to be true, though a detailed corpus study would be useful in this area.

23.2.4.2 Internal Possessives

Alongside internal plurals we also find things that look like compounds except that they have internal possessives: *cat's-cradle*, *cat's-eye*, *cat's-paw*, *cat's-tail* alongside compounds like *cat door*, *cat-gut*, *catnap*, *cat-walk*, etc. We should note that while these things are written as possessives, all we can strictly say about them is that they contain a linking *-s-*, which in some cases could also be interpreted as plural. Alternatively, we could accept these as lexicalized syntactic structures like the *love-in-a-mist* examples cited earlier, and thus not as genuine compounds at all.

There is some evidence that these should be taken as genuine possessives (at least in origin). First, we find things like *wolf's-bane* (not **wolves-bane*). Second, we should note that possessives marked by *-'s* are more usual with humans and animates than with inanimates. If we look at a number of first elements and the number of possessives which are found in constructions where they would be feasible (a *witch-hunt* could not be a *witch's hunt* because the meaning would be different), we find the figures given in Table 23.1 (based on the entries in *The Chambers Dictionary*—Schwartz 1994). It is quite clear that possessive forms are most common with humans and then with higher animals and least so with inanimates.

Table 23.1 Comparative numbers of possessive first elements.

First element	*Number with -'s*	*Number with nonpossessive form*
Dog	16	47
Frog	3	4
Hand	2	45
Lion	3	2
Table	0	29
Widow	7	1
Witch	7	2
Wolf	3	6

Source: Schwartz 1994.

If we accept these things as genuine possessives, it is still not clear how they should be dealt with grammatically. They are usually just seen as syntactic structures, not lexical ones, and if we can add that they have become idiomatized or lexicalized, that seems appropriate. In terms of defining compounds, though, we are again in the situation where things that are lexicalized seem to be very like compounds.

23.2.4.3 Non-Predicate Adjectives

There is a series of adjectives in English which Levi (1978) calls NON-PREDICATE ADJECTIVES, since they do not normally occur in predicative position. These adjectives are often derived from nouns and are not gradable. Giegerich (2015) terms these ASSOCIATIVE ADJECTIVES, and this label seems to be more suitable. When these occur in attributive position, they sometimes have a function equivalent to that of the related noun. So, for example, *atomic bomb* and *atom bomb* denote the same thing, as do *language instruction* and *linguistic instruction*, *tooth decay* and *dental decay*, and so on. Levi (1978) argues that these two constructions are equivalent constructions, to be dealt with in the grammar in the same way. In most instances, if there is an attributive adjective, it is used and a noun is used in those cases where no attributive adjective can be found. While things are not quite that simple (*bovine lick* and *bovine parsley* would not be good replacements for *cow-lick* and *cow-parsley*), there is enough here to raise interesting possibilities, especially since some of the mismatches can be explained in terms of style, connotations, lexicalization, and the like. The lack of a compound like *operation mismanagement* can be explained by the possibility of *operational mismanagement*, and the fact that *theater management* does not mean the same as *theatrical management* can be explained by the fact that *theatrical* has gained certain overtones (of the excessively dramatic, for example, which has made it become a gradable adjective) in the course of its history. *Library book* and *book-shop* are fine because there are no established adjectives corresponding precisely to *library* and to *book*, but *electricity power* and *cranium damage* are odd because we have the possibility of *electric power* and *cranial damage*. Although there is much to be worked out in the detail here, the idea is appealing in part because it explains how our learned Romance and neo-Latinate vocabulary interacts with our native Germanic vocabulary, with compounding being predominantly a Germanic phenomenon.

23.2.4.4 Headedness

For most compound nouns and verbs, the notion of headedness in compounds is uncontroversial. A *money belt* refers to a type of belt not a type of money, *freeze-dry* denotes a type of drying. Such compounds are clearly right-headed. However, there are a set of compounds where these rules do not apply so easily.

The first of these types carries the Sanskrit name of BAHUVRIHI. These are compounds like *red-head* and *hatchback* which denote neither a type of head nor a type of back, respectively. Rather they denote a person who has a red head (in that it is covered with red hair) and a car which has a back which opens upward like a hatch. Because they denote something which has the named feature, these are sometimes termed POSSESSIVE compounds. In Bloomfield's terminology, these are termed EXOCENTRIC compounds: that is, their head is missing and is external to the compound itself. This is misleading. In *red-head*, it is quite clear that whatever the compound as a whole denotes, the element *red* still modifies the element *head*. So these compounds do have a grammatical head, although it does not always determine the inflection class of the compound as a whole (for example, *The Oxford English Dictionary* gives *arsefeet* "bird sp." but *pussyfoots* "stealthy person"; Bauer 2003). These heads show only some of the typical features of heads. We might call them SEMI-HEADS.

Next, consider the series of nouns like *shoot-out*, *put-down*, etc. The final form of these words is a compound noun made up of a verb and a particle. But unlike most compound

nouns they have no heads (except possibly in that the second element carries the inflection: *put-downs*, **puts-down*). This is probably due to the method of formation, which is a nominalization of a phrasal verb with a typical verb-to-noun stress-shift (compare $[\text{im}'\text{port}]_V \rightarrow [\text{}'\text{import}]_N$). Other lexemes which might appear to be compound in form but which were not historically formed by a compounding process may also lack the typical right-hand head of the English compound: *attorneys general*, *mothers-in-law*. Even things like *passers-by* may be seen as a nominalization from a phrasal verb (albeit a different type of nominalization).

The Romance type illustrated by *pick-pocket* (now probably no longer productive) is not regularly right-headed either. It does not denote a type of pocket.

There are a few constructions which might appear parallel but which are left-headed. Forms such as *whomever* (inflected on the left-hand element), *Model T* (a type of model, not a type of T) are left-headed, but the question arises as to whether this indicates that they are not compounds. *Endgame* is one of the few examples of an English nominal compound that seems to be left-headed: it is a kind of end, not a kind of game (Renner 2013).

When we come to compound adjectives, it is difficult to discuss their headedness at all. There are, to be sure, forms like *sky-blue* which appear right-headed, and which are clearly adjectival. But there are large numbers of items, apparently compound in form, used as premodifiers to nouns for which word-class appears to be irrelevant. Consider, for example, *pass-fail test*, *kick-ass attitude*, *before-tax profits*, *throwaway item*, *quick-change artist*, *no-drug behaviors*, *estrogen-only pill* (Bauer and Renouf 2001). Rather than setting up a whole series of different types of exocentric compound adjectives, it is probably better to see items like these as complex compounds. We know that compound nouns with two elements allow a range of word-classes in modifying position: adjective in *blackbird*, noun in *computer screen*, verb in *call-girl*, preposition (possibly an adverb) in *downtime*, whole phrase/clause/sentence in *a don't-mess-with-me look*. In the three-term items cited above, it is probably best to say that this flexibility is being exploited by the use of constituents of any type and from any level of analysis being taken up to fill the slot. That being the case, we can keep the label of compound adjective for those formations which clearly have an independent existence outside the longer compound construction. *Sky-blue* can occur in many constructions as an adjectival head, but *pass-fail* is restricted to a premodifier above.

There is an alternative approach to the whole question of exocentricity. It is to deny that the distinction is one of construction-type at all: rather so-called exocentric compounds are endocentric, they are just interpreted in terms of some figure of speech, most often synecdoche or metonymy, sometimes metaphor (Bauer 2016). Such a solution not only resolves the problem implicit in saying that *I saw the hand working in the fields* contains an instance of synecdoche, but *I saw the farm hand working in the fields* contains an exocentric compound (that is, having two solutions for what is fundamentally the same problem), it also means that we need not worry about whether *greenhouse* or *monkey puzzle* are endocentric or exocentric. In the first instance, the question comes down to one of whether *house* fundamentally means "building" or "building intended for (human) habitation." In the second, there are multiple questions, such as whether *monkey* is a direct object and *puzzle* a verb, or whether, if *puzzle* is a noun, *monkey puzzle* is an abbreviated form of *monkey puzzle tree* (a label which is also used) and if so, whether the assumed ellipsis of *tree* automatically makes the construction exocentric.

23.2.4.5 Neoclassical Compounding

Neoclassical compounding is the formation of words like *coprolith*, *genocide*, *psychology*, which are created in modern times using elements from the classical languages Latin and Greek. There are a number of questions about neoclassical compounds in English (and other

modern European languages) none of which has received a thoroughly satisfactory answer at this stage.

First, although they are termed compounds, and there is some justification for this in their headedness and the variable semantic relationship between the elements (see Section 23.2.5.1 below), it is not altogether clear that they should be treated alongside compounds rather than as a separate type of word-formation. Nevertheless, they appear to mirror some of the relationships we find in native compound traditions. So alongside native compounds like *redfish* we find neoclassical compounds like *rhododendron*, alongside those like *wolf-spider* we find *lycanthrope*, alongside *headache* we find *cephalgia*, alongside *cheese-lover* we find *philosopher*, and alongside *saber-tooth* we find *mastodon*. This parallelism is itself suggestive, if no more.

Next, the boundaries of the type are not clear. Do words such as *psycholinguistics* and *Kremlinology* count as neoclassical compounds or as derivatives? The implications of a decision have not been fully worked out.

Next, are there rules for the formations in English, and if so are they different from the rules in the classical languages? In Greek, for instance, it seems clear that the medial *-o-* is a linking element which belongs to neither element; in English that is less clear. Moreover, it is not clear whether there is a fixed set of morphophonemic adjustments that must today be made when these elements are juxtaposed, or whether the morphophonemics simply reflect those in the classical languages. For some discussion, see Bauer (2017).

23.2.5 The Semantics of Compounding

23.2.5.1 Endocentric Compound Nouns

Where compounds contain an element whose base is verbal, there is increasing evidence that this verb plays a large part in determining the semantics of the compound as a whole. For example, in *deer hunting*, where *hunting* is a word containing a verbal base, *deer* is an argument of the verb. In *deer hunter*, not only is *deer* an argument of the verb, but the subject of the verb is also present in the *-er* suffix. In *nose-bleed*[8] and *call-girl*, the nominal element which co-occurs with the verb is an argument of the verb. In *alcohol-dependent*, *alcohol* is again an argument of the verb *depend*. So the interpretation of the compound is determined, to some extent, by the grammatical pattern available for the verb.

However, this is not always true. In *town crier*, *sky-diving*, *color-code*, *free-associate*, the interpretation of the noun does not appear to be constrained by the syntactic possibilities of the verb. Rather, the relationship between the elements appears to be much freer. For instance, a *city surveyor* could be a person who surveys cities (meaning determined by the verb) or a surveyor who works for a city (meaning independent of the verb). The relationship is seen to be freest when no verb is found in the compound, so that noun–noun compounds have been discussed particularly in terms of the meaning relationships that may hold between the elements.

For some scholars, there is a finite list of relationships which may hold in those instances where there is no verb constraining the relationship. For example, Levi (1978) lists 12, illustrated in Table 23.2. Others suggest that no such list can capture all the possible relationships between the elements of compounds. For example, it is not clear where *spaghetti western* or *wisdom tooth* would fit into Table 23.2. We might also object that it is often not clear which meaning a particular compound illustrates: is *horse blanket* an instance of HAVE or an instance of FOR, for example.

Table 23.2 Levi's 12 possible meanings of compounds.

Relationship	*Examples*
CAUSE (first element subject of *cause*)	*drug death*; *viral infection*
CAUSE (first element object of *cause*)	*tear gas*; *mortal blow*
HAVE (first element subject of *have*)	*lemon peel*; *feminine intuition*
HAVE (first element object of *have*)	*picture book*; *industrial area*
MAKE (first element subject of *make*)	*daisy chain*; *consonantal pattern*
MAKE (first element object of *make*)	*honeybee*; *sebaceous glands*
USE (instrumental)	*steam iron*; *solar generator*
BE	*soldier ant*; *consonantal segment*
IN	*field mouse*; *marital sex*
FOR	*horse doctor*; *avian sanctuary*
FROM	*olive oil*; *solar energy*
ABOUT	*abortion vote*; *criminal policy*

Source: Based on Levi 1978, pp. 76–77.

If an exhaustive listing of meanings is possible, as Levi suggests, then we have to account for the fact that apparently contrastive elements (or meanings) are deleted between the deep structure formulation of the compound and its surface structure. Levi was writing in a period and within a model where this seemed less objectionable than it seems today. If we have no exhaustive list of meanings, we have to account for the fact that at least the range of meanings established by Levi may be read into the relationships between the elements of noun–noun compounds. I would suggest that this can be achieved by understanding the relationship between the elements to be "a type of element-2 efficiently brought to mind by mention of element-1." The relationship between the two elements is usually treated in compounds as positive, non-modal, and inherent or permanent. (*Picture book* from Table 23.2 could not mean "a book without pictures," "a book which may contain pictures," or "a book which contains pictures just today.") While such a meaning relationship is considerably more abstract than any envisaged by Levi, it has the advantage of being applicable to all compounds of this type, and thus of being assignable to the construction. Such a solution cuts across much of the dispute there has been about the semantics of compounding for the last century or more, and provides a unified solution which we may term the MNEMONIC THEORY of compounding.

23.2.5.2 Coordinative Compounds

The class of dvandva compounds in Sanskrit is made up of compounds which denote the unity made up of the two distinct items named in the elements of the compound. English has very few compounds which fit this model precisely: a couple of geographic names (*Alsace-Lorraine*, *Schleswig-Holstein*) and rather more names of businesses formed by mergers (*Time-Warner*, *Goodman-Fielder*, *Hewlett-Packard*, etc.). Frequently, however, the label has been misleadingly applied to any compound which can be glossed by inserting the word *and* between the elements of the compound. If there is any unity here it is much better captured by the label COORDINATIVE COMPOUND. Several types of coordinative compound can be found in English, including the true dvandvas. The types and their suggested labels (some of them well-established, some of them novel) are given in Table 23.3.

Table 23.3 Subtypes of coordinative compound.

DVANDVA:	*Alsace-Lorraine*, *Hewlett-Packard*.
APPOSITIONAL:	*poet-playwright*, *secretary-treasurer*, *fighter-bomber*, *washer-drier*.
TRANSLATIVE:	*a* ***Greek-English*** *dictionary*, *the* ***London-Paris*** *flight*.
PARTICIPATIVE:	***German-American*** *cooperation*, *the* ***Australia-New Zealand*** *trade deal*.

23.2.6 The Pragmatics of Compounding

Compounds are compact. This is what makes them suitable in headlines, and what makes them appear semantically incomplete. It is what makes them useful for showing subcategorization, and it also makes them useful as a mechanism for referring back to some past discussion by providing a neat summary of it.

… the one with the woman in the orange coat …
[22 lines]
The **orange-coat lady**, now in grey with pearls, was the driver.[9]
I saw a woman standing in the lighted kitchen, leaning back against a counter. In her left hand was a bottle of tequila …
[101 pages]
The **tequila woman** almost certainly lived in the house.[10]

While it seems unlikely that this is a major function of compounds, it is one of the uses to which compounds are well suited by virtue of their structure.

23.2.7 The Word-Classes of Compounds

As we have seen, compound nouns are common, in many guises, and there are at least some clear examples of compound adjectives. Compound prepositions are usually ignored in discussions of compounding, but *into*, *onto* are certainly treated as orthographic compounds, and *because of*, *off of*, *owing to* could be treated as compounds despite the fact that their historical origin in syntax is clear. Compound verbs are of interest in that some authorities deny there are any (Marchand 1969, p. 100). This represents a failure to distinguish between process of formation and final form. But it seems likely that even in terms of process of formation, there are instances of verbal compounding in English, although it is often impossible to show that the past participle has not been used before the infinitive. At least the type in Hamlet's *out-Herod Herod* seems productive today, especially with proper-names in the base (Bauer and Renouf 2001).

23.2.8 Conclusion

More questions have been raised in this section than have been answered. We can finish the section with yet another: How far is compounding a part of lexis? It is assumed by most people that since compounds are lexemes, their formation must be lexical. Yet they have been seen as syntactic formations at least since Lees (1963), and Kuiper (1999) argues that they should still be seen in that way. This may take us back to the question of definition with which we began. Can we create lexemes by syntax? Or is lexeme creation the lexicalization of syntactic output? But whether compounds are fundamentally syntactic or morphological structures, their fascination remains. They are lexical items with obvious structure whose ultimate status and unity are still not entirely clear.

23.3 Minor Word-Formation Types

23.3.1 Introduction

Taxonomists are always seeking a classification and terminology which will allow them to distinguish the various types of structure that are found in a language like English. While we can do this, once we start looking at minor word-formation types there are many formations which do not fit neatly into any predetermined category. Accordingly, any classification does no more than label some (perhaps rather vague) prototypical categories, and we can find examples which appear to straddle the boundaries of the categories. Here, fairly traditional categories are provided, and some of the borderlines are explored. The fuzziness may not have any theoretical implications beyond the suggestion that we may not be operating with the best possible categories. It is not clear that any major predictions depend upon which of these categories a particular example belongs to.

23.3.2 Word-Manufacture

The term WORD-MANUFACTURE is used to refer to the creation of words as nothing more than a sequence of letters or phonemes. The letters or phonemes must (with a certain amount of freedom which is hard to quantify) form patterns which are permitted within English, but otherwise there is no requirement of internal structure, and indeed, we would expect internal morphological structure to be absent. Word-manufacture is used most obvious in the formation of new trade names like *Kodak* and *Exxon*,[11] but also occurs in the rest of the vocabulary. Words such as *barf* "vomit," *blurb*, *boff* "have sexual intercourse with," *quark*,[12] *scag* are probably (it is often difficult to tell with certainty) instances of word-manufacture.

It seems that word-manufacture is not as easy as it might appear. People are probably reluctant simply to generate random strings of letters/phonemes which match English patterns to the requisite degree. Partly this is because unmotivated formation is such an unnatural thing to do. Partly it is because randomly generated strings may nevertheless have resonances with existing English words which may be distracting or undesirable. Examples such as *nylon* illustrate the problem. Consider the formation of the word *nylon*, often quoted as an instance of word-manufacture. By the time *nylon* was first used in 1938, *rayon* had been in use for 14 years, and both of them seem also to resonate with *cotton* (1300) and *chiffon* (1765). Although it seems unlikely that any resonance with words like *arson*, *bison*, *lemon*, *moron* was intended, there may nevertheless have been some from what were, at the time, relatively new scientific terms like *ergon* (1873), *proton* (1893), *argon* (1898), and *photon* (1916). Certainly, by the time we get to *Orlon* (1948), *Dacron* (1951), and *Dralon* (1955), we must suspect that the final *-on* is no longer a random set of letters/phonemes, but a semi-meaningful element, somewhere between a phonestheme and a morph.

While it may be difficult to discern an instance of word-manufacture, in principle it is clear that word-manufacture is the creation of words without any influence from meaningful sub-parts of the word. In practice, a total lack of such influence is often hard to find.

23.3.3 Clipping

Clipping refers to the shortening of some word while the original meaning is retained. Clipping does not create lexemes with new meanings, but lexemes with a new stylistic value. Examples are *coon* (< *racoon*), *deb* (< *debutante*), *flu* (< *influenza*), *jumbo* (< *jumbo jet*), *mic* (< *microphone*), *phone* (< *telephone*), *perm* (< *permanent wave*), *shrink* (< *head shrinker*), *stash* (< *moustache*), which show that (1) the material which is removed may come from the beginning of the word, the end, or both, (2) that it is not always the semantic head of the word which is

retained, (3) that it is not always the stressed syllable in the word which is retained, and (4) that a compound or phrase may be clipped to provide a single clipping. In the instances dealt with under (1), we may distinguish terminologically between FORECLIPPINGS, BACK-CLIPPINGS, and AMBICLIPPINGS.

While clippings seem to arise through a desire to have more compact lexemes (and we might postulate a preferred length of one or two syllables, based on the few examples given above), clippings are frequently given additional suffixal material, which has the effect of lengthening them again. These EMBELLISHED CLIPPINGS (Bauer and Huddleston 2002) are regionally variable in their productivity, Australian English being perhaps particularly open to their use. Examples are *barbie* (< *barbecue*), *garbo* (< *garbage collector*), *preggers* (< *pregnant*), *rellie* (< *relative* = "family member"). In instances like *cardie* (< *cardigan*) or *pollie* (< *politician*), it may not be clear whether the clipping is embellished or not.

These embellished clippings are reminiscent of HYPOCORISTICS or pet names. *Liz* might be a clipping from *Elizabeth*, and then *Lizzy* an embellished clipping, and similarly with *Fred* and *Freddie* from *Frederick*. Hypocoristics, though, show a bewildering array of variation, no doubt because of the persistence of hypocoristics as independent names, the persistence of nursery pronunciations, and the vagaries of historical change. *Nell* from *Helen* and *Ned* from *Edward* may seem perverse, and *Harry* and *Hal* from *Henry* are inexplicable in modern terms, as is *Chuck* from *Charles*. The sheer range of hypocoristics from *Elizabeth* and *Margaret* is in itself astonishing (for some explanations, see Hanks et al. 2006). Surprisingly, speakers of English keep inventing new ways to make up hypocoristics. A relatively recent one gives us *Bazza* (< *Barry*) and *Shazza* (< *Sharon*) (incidentally showing a relationship between /r/ and /z/ not seen in English since the time when the relationship between *was* and *were* was transparent in a way it no longer is). It seems likely that hypocoristics form something of an elephant's graveyard of cast-off clippings and embellished clippings.

Clippings may be compounded with each other to give CLIPPING COMPOUNDS (sometimes called "complex clippings") such as *hazchem* (< *hazardous chemical*), *humint* (< *human intelligence*), *kidvid* (< *kid's video*), *nicad* (< *nickel cadmium*), *psyops* (< *psychological operations*), *spagbol* (< *spaghetti bolognese*). The term may also be taken to include compounds which have just one of the elements clipped, such as *autochanger* (< *automatic record changer*), *op art*, *slomo* (< *slow motion*), *teletext*. Note that some of these examples may look just like instances of affixation or neoclassical compounding: some etymology is necessary to distinguish between *teletext* (< *television text*) and *telephone* (a neoclassical compound).

23.3.4 Alphabet Soup

There is a whole range of letter-based word-formation patterns, many of which merge imperceptibly into one another. Unfortunately, the terminology in this area is not altogether stable. I shall use the term ALPHABETISM as a superordinate term for this set of formations.

An INITIALISM is one type of alphabetism. In an initialism, the initial letters of the words in a phrase are taken to replace the phrase. These letters are pronounced as a sequence of letters. Thus, we find examples such as *CPI* (< *Consumer Price Index*), *DUI* (< *driving under the influence* [of alcohol]), *mia* (< *missing in action*, pronounced /ɛm aɪ eɪ/), *fob* (< *free on board*), *FBI* (< *Federal Bureau of Investigation*), *LGM* (< *Little Green Men*), *MIT* (< *Massachusetts Institute of Technology*), *PC* (< *politically correct* or *personal computer* or *police constable*), *UN* (< *United Nations*), and so on. Let us call the phrase which underlies the initialism the ORIGINAL. It can be seen from the examples provided above that not every word of the original has to be represented in the initialism; letters representing grammatical words being easily dropped.

In some cases, the initialism has the same distribution as the original, so that *mia* can occur predicatively but not attributively, just as is the case with the original. In other

cases, the distribution is subtly different. Thus, it is not clear why we talk about *the FBI* but not about **the MIT*.

Where the initial letters of an original are such as to provide something which can be pronounced as a word, and this option is taken, we have an acronym. An ACRONYM is an initialism which is pronounced according to ordinary grapheme–phoneme conversion rules. *AIDS* (< *acquired immune deficiency syndrome*, pronounced /eɪdz/), *BASIC* (< *Basic All-purpose Symbolic Instruction Code*), *laser* (< *light amplification by stimulated emission of radiation*), *RAM* (< *Random Access Memory*), *SALT* (< *Strategic Arms Limitation Talks*), *scuba* (< *self-contained underwater breathing apparatus*), *TESOL* /'tiːsɒl/ (< *Teaching of English to Speakers of Other Languages*), *UNESCO* (< *United Nations Educational, Scientific, and Cultural Organization*) are acronyms. As with initialisms, it can be seen that not all the initial letters of the original are inevitably used in the acronym. It can also be seen that the orthography of acronyms is inconsistent, with the most familiar terms which are not names of organizations tending toward the use of lower case.

While it might seem clear that *FBI* could not be an acronym, because English syllable structure does not allow an initial /fb/ cluster, the choice between an initialism and an acronym is on occasions an open one. *MIT* could have been pronounced as an acronym /mɪt/ but happens to be pronounced as an initialism. There are many such examples. Given the pressure for an acronym, which leads to the creation of potential originals from suitable letter-sequences—occasionally referred to as a backronym (as in *ASH* (< *Action on Smoking and Health*))—why acronyms should be avoided in some cases is a mystery.

It will be noted that initialisms and acronyms function as nouns and adjectives. They do not appear to be used as verbs (although subsequent conversion of an initialism cannot be ruled out, such as *to emcee a TV show*), and they are not used as prepositions.

Although these definitions of initialism and acronym are clear-cut, the reality of alphabetic formations is far less so. There are several ways in which actual forms can diverge from these prototypes.

First of all, the letters that appear in the alphabetism may not (all) be initial letters. For example, *TB* comes from *TuBerculosis*, where the <B> is not initial to anything. In *ddI* (< *DiDeoxyInosine*), the letters are, if anything, morpheme-initial. In *mifepristone* (< *aMInoPHenol-PRopyne-oeSTradIol-one*), the letters are not only not initial, they are in the wrong order: at this point we have to ask whether this is an alphabetism or just word-manufacture—at least up to the point where the recognizable suffix *-one* is added. The argument against such a reclassification is that there is some motivation for the letters that make up the new form. In *ID*, the letters are contiguous in the original *IDentity*, so that we might want to see this as a clipping rather than an initialism. The boundaries start to become vague.

We find examples where only one element in the word is reduced to an alphabetism, which is thus likely to be a single letter: (*e-mail*, *e-commerce*). At this point, it may not be clear whether we should analyze such items as clipping compounds or as alphabetisms.

We find examples which look like initialisms but where the initial letter does not stand for any meaningful original (*the A-list*, *OK*[13]). If an alphabetism is defined in terms of its process of derivation from an original, such examples are problematic.

We find examples which are pronounced as acronyms, but where the pronunciation is not derivable from the set of letters in the original. An FBI agent may be called a *fibbie*, where the origin of the first <i> or /ɪ/ is unclear (why is it not *febbie* or an *effbie*?). *SCSI* (< *Small Computer System Interface*) is pronounced /skʌzi/, as if an acronym, but it might equally well, or better, have been /skɒzi/. Note, moreover, that if *SCSI* can be pronounced as a well-formed word, there is no reason why *DUI* should not become /d(j)uːi/ (contrast *GUI* [< *Graphical User Interface*], which is pronounced /guːi/).

In the face of so much variation, the ordinary language term ABBREVIATION is often as much use as anything else.

23.3.5 Blending

BLENDS, or "portmanteau words" as Humpty Dumpty called them, are lexemes made out of phonological parts of two (occasionally more) other words, with the parts which remain from the originals being determined purely phonologically without any reference to morphs. Examples are *motel* (< *motor+hotel*), *sexploitation* (*sex+exploitation*), *smog* (< *smoke+fog*). In some cases, there may be some part of the blend which is common to the two words of the original (as in *sexploitation*), but this is not a requirement for a blend.

In some ways, blends look like clipping compounds, and, indeed, the two are often treated as a single phenomenon. However, we can make a distinction by definition. In a clipping compound, the first part of both words in the original is represented in the new form; in a blend, the first part of the first word in the original and the last part of the second word in the original are represented in the new form. Thus, *sitcom* (< *situational comedy*) is a clipping compound, while *monergy* (< *money+energy*) is a blend. While this distinction has been based here purely on definition, it turns out that there are formal differences between the two sets (Beliaeva 2014).

Semantically or in terms of origin, we can distinguish two fundamental types of blend. There are those like *smog* where the words in the original, *smoke* and *fog*, are in paradigmatic relationship with each other, and those like *motel*, where the two words in the original, *motor* and *hotel*, are in a syntagmatic relationship to each other (see Dressler 2000). We may term these, respectively, PARADIGMATIC ORIGIN BLENDS and SYNTAGMATIC ORIGIN BLENDS. In some instances, such as *monergy*, it may not be clear at first glance which category a particular blend fits into, but a little etymological research may be sufficient to make matters clear (according to Tulloch 1991, this—now outdated—term meant money spent on energy, not something which was simultaneously money and energy, and so it is syntagmatic).

Various attempts have been made to try to explain the structure of blends. None has yet been totally successful. It is not clear whether the description would be easier if syntagmatic and paradigmatic origin blends were distinguished, or whether precisely the same rules of formation affect both. It seems likely that in at least one respect, they do not.

In syntagmatic origin blends, the order of the elements is determined by the original. A *motor hotel* cannot be a *hotel motor* (because of the headedness rules determining the structure of compounds), and so **hotor* is an impossible blend with this meaning. With *smoke* and *fog*, on the other hand, the ordering of elements in the blend appears to be governed by some independent set of constraints. Given *ballute* from *balloon* and *parachute*, why is it not *paraloon*? We might postulate that *foke* is blocked as the outcome of *fog+smoke* because of homonymy with *folk*, but even if that is true, there are many instances where either order might seem possible in principle.

Kelly (1998) argues that in paradigmatic origin blends (which he terms CONJUNCTIVE), the first element is (a) higher in frequency than the second, (b) shorter than the second (in terms of number of syllables), and (c) a more prototypical member of its set than the second. Where these constraints are not obviously met (as in *brunch* < *breakfast+lunch*), it may be the case that there are one-off extraneous factors which overrule the constraints (such as the temporal ordering of breakfast and lunch in this particular example).

Tendencies can also be found in the point in the blend at which the switch from the first word of the original to the second takes place. For example, where there is phonological overlap between the two words, that overlap defines the switch point (and accordingly, it becomes difficult to determine whether the /eks/ which remains in *sexploitation* comes from the *sex(ual)* or from the *exploitation*). But where there is no shared material, Kelly (1998) suggests that speakers prefer to retain consonant clusters, and will keep syllable rimes together more often than onset + peak sequences. While we might expect this area to be one of interest for writers within optimality theory, I am not aware of any postulated

constraint tableau to account for all of English blend structure, though it must be assumed that some such constraint ranking is involved (see Bat-El 2000, on blends in Hebrew, Bat-El and Cohen 2012, and Gries 2004, 2012, on English for studies which show how this kind of approach might work). It should be noted, however, that it sometimes appears that the overlap between words is orthographic rather than phonological, and that blends have some kind of basis in the written language, despite the fact that most speakers are relatively unfazed about forming blends without reference to the orthography. This orthographic link seems to tie blends in with alphabetisms as formations parasitic upon the written structure of the language, despite the fact that phonological rules may be so useful in describing the structure of so many of them.

Occasionally, repeated blends with a particular word can give rise to a recurrent SPLINTER, which may later be accepted as a full-blown word-forming unit. For instance, the element *-scape* in *starscape* is a splinter arising originally from a blend of *sea* and *landscape* and then more following the same pattern. Other splinters are *-(et)eria*, *-(a)nomics*.

23.3.6 Echo Words

As was pointed out in Section 23.2.1, words like *namby-pamby* and *shilly-shally* do not meet the definition of compounds, though they are frequently called RHYME-MOTIVATED and ABLAUT-MOTIVATED COMPOUNDS, respectively, with the term ECHO WORD being a less technical label. There are some complete reduplicates like *booboo* "mistake," *gee-gee* "horse." Minkova (2002) deals with the ablaut cases in an optimality theoretic framework. Such cases are interesting because of the degree to which the onset consonant in the rhyming cases and the vowel alternation in the ablaut cases are predictable from general principles, and why the attested alternations should be preferred. Minkova points out that these formations are less productive now than they once were, but we do still find a lot of compounds whose creations are partly motivated by rhyme: things like *dead-head*, *dream machine*, *fag hag*, *gang-bang*.

23.3.7 Conclusion

Although these minor types of word-formation may not be linguistically very important, arising as they do, at the point where system gives way to random creativity, they are nonetheless of increasing importance in the lexicon of modern English in terms of the sheer number of new forms created by them. Many of these new forms are ephemeral, extremely localized, or rather slangy in tone; but so are many words formed by more established word-formation processes. These should not be reasons for dismissing them.

23.4 Future Study

Although we know a lot about compounds and minor word-formation types, it can be seen that even the taxonomy is not particularly robust. Optimality theory and cognitively based models of linguistics are providing new ways of looking at the minor word-formation types, and may create new classes if it can be shown that the old categories are simply different superficial results of the same underlying processes, which does not seem unlikely. An application of optimality theory to neoclassical compounds might also prove rewarding. Where compounds are concerned, the major problem is still a definitional one: can any lexical process of compounding be distinguished from apparently similar syntactic processes? Such a problem is not necessarily confined to English, though it is a vital one for English. In going

forward, we probably need to take care to deal with productive processes separately from lexicalized ones, and to look more carefully at corpus data.

NOTES

1 In corpus linguistics, where "words" have to be derived from the printed text without any preliminary grammatical analysis, there is often no alternative to an orthographic criterion for wordhood. This does not make such a definition desirable or valid; it just makes it the best possible definition. Many corpus linguists forced to adopt such a criterion are well aware of the problems that this gives rise to. Since even spoken corpora are usually transcribed for analysis, the problem may even arise there.
2 If it does carry the intonational nucleus, the stress will fall on the right-hand element in non-contrastive environments, which is not what we find with *blackbird*. However, we must not confuse stress phenomena with intonational phenomena.
3 We occasionally observe items passing from one class to another. *Cold drink* has started to get first-element stress within my lifetime.
4 Lawrence Sanders, *McNally's Puzzle* (London: Hodder and Stoughton 1996, p. 9).
5 Stephen Solomita, *Force of Nature* (New York: Putnam 1989, p. 24).
6 *Mice manure* occurs in Tony Hillerman, *The First Eagle* (London: HarperCollins 1999, p. 61).
7 Consider, for example, Robert Campbell, *The Lion's Share* (New York: The Mysterious Press, 1996, p. 79): "Then his little wife ran off with a foreign motor mechanic … that is, a mechanic who repaired foreign cars." The preferred reading is deliberately overridden, showing that either reading can be found, but that in some instances we have to work to get the marked reading.
8 *Nose-bleed* is an unusual compound for a number of reasons, one of which is that it does not seem to be headed. *Bleed* is not a synchronically available nominal form (in the way that, for instance, *desire* is, corresponding to the verb *desire*). There is nothing in the etymology of the word to explain its rather odd form. The pattern appears not to be productive, perhaps because in words like *nosedive* the *dive* is interpreted as a noun rather than as a verbal stem.
9 Dick Francis, *Comeback* (London: Michael Joseph 1991, p. 103).
10 Richard Laymon, *Night in the Lonesome October* (London: Headline 2001, p. 51, 152).
11 Note the <xx> spelling which is not found elsewhere in English, though the pronunciation /ɛksɒn/ is consistent with English structures.
12 Although *quark* comes from a line by James Joyce, and so is not strictly word-manufacture when applied to a sub-atomic particle, it was presumably invented *de novo* by Joyce.
13 Although various etymologies of this expression have been suggested, there still seems to be some doubt as to what the origin really was, and in any case it is hard in the current state of the language to reconstruct anything meaningful here.

FURTHER READING

General introductions to English word-formation (often including minor types) are provided by Adams (1973, 2001), Bauer (1983), Marchand (1969), Plag (2003), and Bauer et al. (2013). Of these, Marchand's is the classic work, Adams tends to be taxonomic and has a lot of good examples, Bauer and especially Plag are rather more theoretical, with Bauer now theoretically rather old-fashioned. The fullest, and

most recent, survey is provided by Bauer et al. (2013). For a wider view of compounds, looking beyond English, see Bauer (2001, 2017). For an innovative approach to forms involving deletion, see Lappe (2007).

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24 Productivity

INGO PLAG

24.1 Introduction

Speakers of English (and of course also of other languages) can coin new words on the basis of other words or word-forming elements. For example, we can turn the adjective *cute* into a noun *cuteness* by adding the suffix *-ness*, or we can form a new compound by joining two existing words, as in *train connection*. A closer analysis of such word-formation processes reveals that much of what happens in this domain is rule-governed, in the sense that there are predictable form-meaning relationships among similar morphologically complex words. For example, we can say that adjectives regularly can take the suffix *-ness* and that *-ness* derivatives regularly express a meaning that can be paraphrased as "the property of being X," with "X" standing for the meaning of the base.

Assuming the existence of such morphological rules, patterns, or processes according to which complex words are formed, one can easily observe that some rules (or affixes) are quite often used to create new words, whereas others are less often used, or not used at all for this purpose. For example, it seems that no new verb can be formed in Modern English with the help of the prefix *en-* (as in *enlist*, *enroll*, *enshrine*, etc.), while the verbal suffix *-ize* happily adjoins to adjectives or nouns to make up new verbs (as in *peripheralize*, first attested in 1987 and *Clintonize*, first attested in 1992, both according to the *OED*).

In this sense, some morphological rules can be called productive and other rules unproductive or less productive. A number of interesting questions arise from this fact. What makes a given rule productive or unproductive? How we can measure the productivity of a given rule and which mechanisms are responsible for the variability in the productivity of morphological processes?

Another important theoretical problem is whether productivity should be regarded as a theoretical primitive, that is, a non-derivable property of word formation rules, or an epiphenomenon, that is, a property that results from other properties of the rule in question or some yet-to-be-detected mechanisms. It is clear, for example, that the productivity of a rule is never unrestricted in the sense that any given word may serve as its base. In particular, there can be phonological, morphological, syntactic, and semantic conditions on possible bases, or on the derivatives themselves, which may limit the productivity of the process.

The notion of productivity is relevant also for the common distinction between inflection and derivation. It is commonly assumed (e.g., Haspelmath 2002, p. 75) that inflectional processes are fully productive, whereas derivational processes are characterized by varying degrees of productivity, with the majority not being fully productive. In other words,

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inflectional processes apply to all words of a given word class, which is not the case for derivational processes. For example, all verbs in English can take the past tense morpheme, but not all verbs take the adjectivizing suffix *-ive* (*invent–invented–inventive*, *associate–associated–associative*, but *call–called–*callive*, *cite–cited–*citive*). Though intuitively appealing, there are some problems with the idea that inflection is fully productive. For example, one could argue that though fully productive as a category, the *regular* past-tense affix {*-ed*} (with its three allomorphs [d], [t], and [ɪd]) is not fully productive, since there are quite a number of verbs which do not take one of these allomorphs, but use ablaut (e.g., *sang*, *dug*), change their stems (e.g., *brought*), take no overt suffix (e.g., *put*), or use a combination of different coding strategies (e.g., *kept*). Such ill-behaved verbs are of course well known as "irregular verbs," and, in order to save productivity as a distinguishing criterion between inflection and derivation, we could simply say that all *regular* inflection is fully productive while derivational morphology is not. This would, however, create the problem that regular derivational processes could also be said to be fully productive. Hence, productivity is an issue that seems not only relevant in word-formation but also in inflection. For reasons of space, we will confine our discussion of productivity in this chapter to derivational morphology.

Large parts of the more recent discussion on the nature of productivity have focused on English, partly due to the early and easy availability of modern analytical tools for this language, such as large electronic text corpora, lexical data bases, and electronic dictionaries. The findings and concepts developed using English as the sample language have been extended and applied to other languages (cf., e.g., Evert and Lüdeling 2001; Pustylnikov and Schneider-Wiejowski 2010, on German; Gaeta and Ricca 2003, 2006, on Italian; Nishimoto 2003, on Chinese).

24.2 Qualitative and Quantitative Aspects of Productivity

One important theoretical question concerning the nature of productivity is whether productivity is a quantitative or a qualitative notion. If productivity is of a qualitative nature, a process or affix could be said to either have this property or not. Alternatively, it has frequently been argued that productivity is a gradual phenomenon, which means that morphological processes are either more or less productive than others, and that completely unproductive or fully productive processes only mark the endpoints of a scale. In the following subsection, I will lay out the qualitative concept of productivity, which will be followed in Section 24.2.2 by a discussion of approaches that have attempted to devise quantitative measures of productivity.

24.2.1 Qualitative Approaches

Definitions of productivity can be found in any standard morphology textbook. Adams (1973, p. 197), for example, uses "the epithet 'productive' to describe a pattern, meaning that when occasion demands, the pattern may be used as a model for new items." Bauer (1983, p. 18) says that a word formation process is productive "if it can be used synchronically in the production of new forms," Spencer (1991, p. 49) considers a rule productive if it is "regularly and actively used in the creation of totally new words," Bauer et al. (2013, p. 32) call productive those processes "which can still be exploited in the speech community for the creation of new words," and Plag (2018, p. 44) defines productivity as "[t]he property of an affix to be used to coin new complex words." These definitions may suggest that productivity is an all-or-nothing property of morphological processes. Bauer (2001) explicitly advocates the all-or-nothing view, when, drawing on earlier work by Corbin (1987), he divides

productivity into two distinct phenomena, one of them qualitative, the other quantitative in nature: availability and profitability. A morphological process is defined as available if it can be used to produce new words. "Availability is a yes/no question: either a process is available or it is not" (Bauer 2001, p. 205). Profitability, on the other hand, is the extent to which a morphological process may be employed to create new pertinent forms. This is a quantitative notion, and we will postpone the discussion of profitability until later.

The most problematic point concerning availability is the notion of "morphological process" (or often called "word-formation rule") itself. Given a set of seemingly related words, on which grounds can one assume the existence of a word-formation rule as being responsible for the creation of these words? In general, one would say that we can speak of a rule if there is a sufficient number of regular form–meaning correspondences of individual items, that is, a recognizable pattern. The theoretical status of such patterns is however controversial. Some scholars believe that what has been traditionally called "rule" or "process" is just a larger set of words that are related to one another by the very general mechanism of analogy (e.g., Becker 1990, or, more recently, Skousen et al. 2002). And this analogical mechanism can also be used to coin words on an individual, idiosyncratic basis, which is what earlier, or more traditional, accounts of analogy are more concerned with. The problem now is that in a purely qualitative approach to productivity, an unproductive process would not be able to give rise to new formations at all. Empirically, however, we find that supposedly unproductive processes sometimes do yield new formations, because speakers use existing derivatives to form new words by way of proportional analogy (e.g., single:singleton::triple:**tripleton**). If this only happens once or twice, we might still say this is an unproductive rule, but where would we draw the line between productive and unproductive processes, if more words are coined? Would we say a process is productive after we have found two, three, five, ten, or twenty new analogical forms?

These considerations lead to the conclusion that even in a qualitative approach to productivity one has to assume the existence of three types of processes: Those that are clearly unproductive (with not even occasional analogical coinages), those that are clearly productive, and those processes that are not easily classified as either productive or unproductive. This is also acknowledged by Bauer, when he writes that "there might be cases of uncertainty" (2001, p. 205) with regard to the availability of a word-formation process.

In view of these problems, many researchers have abandoned the idea of a qualitative notion of productivity and have turned to the exact determination of what was introduced above as "profitability." These researchers have sought measures by which the productivity (here: profitability) of processes can be assessed, to the effect that totally unproductive and fully productive processes are conceptualized as end-points on a scale.

24.2.2 Quantitative Approaches

A good starting point for quantitative measures of productivity is the definition by Bolinger (1948), which is based on the idea that productivity can be seen as a kind of probability. In his words, productivity is "the statistical readiness with which an element enters into new combinations" (p. 18). Since the formulation of this definition more than half a century ago, a number of productivity measures have been proposed that try to model the insight behind this definition.

One prominent definition says that the productivity of an affix can be measured by counting the number of attested types (i.e., different words) with that affix at a given point in time, for example, by counting the number of pertinent forms in an unabridged dictionary. The problem with this measure is that there can be many words with a given affix, but nevertheless speakers will not use the suffix very often to make up new words. In other

words, the fact that the language has already many words with a given affix indicates that the suffix must have been productive at some period in the past. For example, many words with the nominalizing suffix *-ment* (*entertainment*, *punishment*, etc.) can be found, but the suffix was mainly productive between the mid-sixteenth and the mid-nineteenth centuries (e.g., Bauer 2001, p. 181). Similarly, the verbalizing suffix *-en* (as in *blacken*) is attested in numerous words, but hardly any of them were coined after 1900 (e.g., Plag 1999, p. 98).

Aronoff (1976) suggests a different productivity measure, the ratio of actual to possible words. "Actual word" refers to existing established words with a given affix, while "possible word" (or "potential word") refers to words which could in principle be formed with that affix. The higher this ratio, the higher the productivity of a given rule. Largely ignored by later authors, this measure had already been proposed earlier by Berschin, who labeled it "Besetzungsgrad" ("degree of exhaustion," 1971, pp. 44–45). Anshen and Aronoff (1981, p. 64) point out the main weakness of this proposal: for extremely productive and for completely unproductive processes, it makes wrong predictions. Thus, with highly productive affixes like *–ness*, the number of potential words is, in principle, infinite, which necessarily leads to a comparatively low productivity index. With unproductive rules like *-th* nominalization, it is unclear how the ratio of actual to possible words should be calculated. If one considers all actual words with this suffix as possible words, the ratio equals 1, which is the highest possible score and therefore counterintuitive. If, however, the number of possible words with this suffix is considered zero, the index cannot be computed at all.

Another, more general problem of Berschin's and Aronoff's proposals is how to actually count the number of possible words, since the number of possible formations on the basis of a productive rule is, in principle, uncountable, because new potential base words (e.g., new adjectives as bases for *-ness*) may enter the language any time. How can one quantify something that is, in principle, uncountable?

Coming back to the idea of counting the number of derivatives, one can say that this may still be a fruitful way of determining the productivity of an affix, namely, if one does not count all derivatives with a certain affix in use at a given point in time, but only those derivatives that were newly coined in a given period, the so-called neologisms. In doing this, one can show that, for instance, an affix may have given rise to many neologisms in the eighteenth century but not in the twentieth century. The number of neologisms in a given period is usually determined with the help of historical dictionaries like the *OED*, which aims at giving thorough and complete information on all words of the language, independent of how often a word may be (or may have been) used. For example, for the period from 1900 through 1985, we find 284 new verbs in *-ize* (Plag 1999, chapter 5) in the *OED*, which shows that this is a productive suffix. The power of the *OED* as a tool for measuring productivity should however not be overestimated because quite a number of new words escape the eyes of the *OED* lexicographers. For instance, the number of *-ness* neologisms listed in the *OED* for the twentieth century ($N = 279$, Plag 1999, p. 98) roughly equals the number of *-ize* neologisms, although it is clear from many studies that *-ness* is much more productive than *-ize* (e.g., Plag et al. 1999; Hay and Baayen 2002).

Thus, in those cases where the *OED* does not list many neologisms it may be true that the affix is unproductive, but it is also possible that the pertinent neologisms simply have been overlooked (or not included for some other, unknown reason). Only in those cases where the *OED* lists many neologisms can we be sure that the affix in question must be productive. Given these problems involved with dictionary-based measures (even if a superb dictionary like the *OED* is available), one should also look for other, and perhaps more reliable measures of productivity.

Harald Baayen and his collaborators (1993 et seq.) have developed some corpus-based productivity measures, which all rely on the availability of very large electronic text corpora. Such corpora are, for example, the British National Corpus (BNC) or the COBUILD Corpus,

the former containing ca. 100 million word tokens, the latter originally containing ca. 18 million words, now having been turned into the ever-increasing Bank of English. The word lists that can be extracted from such corpora are the basis for corpus-based productivity research.

The first corpus-based measure to be mentioned here is the number of types, that is, different words with a given affix. This measure, also known as the type-frequency V, has been discussed above, only that it is calculated here not on the basis of a dictionary, but on the basis of a representative language sample.

Two other measures proposed by Baayen rely heavily on the notion of hapax legomenon. Hapax legomena (or "hapaxes" for short) are words that occur only once in a corpus. Such words are crucial for the determination of the productivity of a morphological process because in very large corpora hapaxes tend to be words that are unlikely to be familiar to the hearer or reader. Complex unknown words can be understood at least in those cases where an available word-formation rule allows the decomposition of the newly encountered word into its constituent morphemes and thus the computation of the meaning on the basis of the meaning of the parts. The word-formation rule in the mental lexicon guarantees that even complex words with extremely low frequency can be understood. Thus, with regard to productive processes, we expect large numbers of low frequency words and small numbers of high frequency words, with the former keeping the rule alive. For instance, Dalton-Puffer and Plag (2000, p. 236) showed that derivatives with viewpoint adverb-forming *-wise* (as in *They make no special demands food-wise, and tolerate a wide pH range*) are attested 205 times in the BNC, and these 205 tokens represent 137 types, 111 of them being hapaxes. In other words, the proportion of rare words is very high in this category.

By contrast, less productive or unproductive morphological categories will be characterized by a preponderance of words with rather high frequencies and by a small number of words with low frequencies. Consider the manner/dimension adverb-forming *-wise* (such as in *crosswise*) in contrast to the viewpoint adverb-forming *-wise* just mentioned. The manner/dimension adverb-forming *-wise* has many more attestations in the BNC (N = 591), but only 21 of these words are hapaxes.

The crucial point now is that, even if not all of the hapaxes with a given affix may be neologisms, we can be confident that it is among the hapaxes (as against words that have a higher frequency) that we find the highest proportion of neologisms (see, for example, Baayen and Renouf 1996; Plag 2018, for discussion). Given that the number of hapaxes of a given morphological category should correlate with the number of neologisms of that category, the number of hapaxes can be seen as an indicator of productivity. Note that it is not claimed that a hapax legomenon *is* a neologism. A hapax legomenon is defined with respect to a given corpus, and could therefore simply be a rare word of the language (instead of a newly coined derivative) or some weird ad-hoc invention by an imaginative speaker, as sometimes found in poetry or advertisement. The latter kinds of coinages are, however, extremely rare and can be easily weeded out.

The size of the corpus plays an important role in determining the nature of hapaxes. When the corpus is small, most hapax legomena will indeed be well-known words of the language. However, as the corpus size increases, the proportion of neologisms among the hapax legomena increases, and it is precisely among the hapax legomena that the greatest number of neologisms appear. The number of hapaxes is therefore an important measure for estimating the productivity of a morphological process.

There are, of course, methodological problems that need to be considered. First, as already mentioned, there is the question of corpus size. Small corpora like the 1-million-word Wellington Corpus of Written New Zealand English are certainly too small for this kind of approach (cf. Bauer 2001, p. 150f). Furthermore, there may be some rare cases of morphological categories where the proportion of neologisms among the hapaxes is unexpectedly low.

For instance, in Plag's (1999, p. 112f) random sample of 10 hapaxes with verbal suffix *-ate*, where this seems to be the case.

Other methodological problems concern the determination of pertinent word forms, involving sometimes empirically and theoretically problematic decisions. For example, it is not so easy to develop consistent criteria for or against the inclusion of words such as *entity, quantity, celebrity* as *-ity* derivatives. Such forms occur in abundance in English especially because this language has borrowed a large stock of its vocabulary from other languages (e.g., French, Latin, Greek, etc.). Often such words were morphologically complex in the donor languages but were not necessarily decomposed in the borrowing process. If many words with the same affix are borrowed, however, this may have eventually led to the reanalysis of most words of the category and even to a more or less productive derivational process in English, but with a residue of words, whose status as complex words remained questionable (see Dalton-Puffer 1996, for some discussion). In general, the so-called Latinate affixes seem less productive than native affixes (e.g., Plag 2018, chapters 4 and 7). Apart from borrowing, problems of classification can also arise through lexicalization, a process in which a complex word can adopt new and idiosyncratic senses which are no longer identical with the general meaning of the morphological category. For example, *curiosity* has the predictable meaning of "property of being curious," but it has also lexicalized the rather idiosyncratic meaning "curious thing."

In general, the abovementioned problems of classification are inherent in all work on derivational morphology and not restricted to a particular language or to corpus-based investigations (see Plag 1999, chapter 5, or Bauer 2001, section 5.3 for more discussion).

Coming back to the idea of estimating the probability with which new words are coined, we turn to Baayen's "productivity in the narrow sense." This measure calculates the ratio of the number of hapaxes with a given affix and the number of all tokens containing that affix. Metaphorically speaking, when calculating this measure, we are going through all attested tokens with a given affix and picking out all words that we encounter only once. If we then divide the number of these words (i.e., the number of hapaxes) by the number of all tokens with that affix, we arrive at the probability of finding a hitherto unattested word (i.e., "new" in terms of the corpus) among all the words of that category. This probability can be expressed by the following formula, where P stands for "productivity in the narrow sense," n_1^{aff} for the number of hapaxes with a given affix and N^{aff} stands for the number of all tokens with that affix:

$$(1) \quad P = \frac{n_1^{aff}}{N^{aff}}$$

P can be interpreted in such a way that a large number of hapaxes lead to a high value of P, thus indicating a productive morphological process. Conversely, large numbers of high frequency items lead to a high value of N^{aff}, hence to a decrease of P, indicating low productivity.

To address some of the methodological concerns with the quantitative measures developed by Baayen, some scholars have developed other corpus-based measures. Gaeta and Ricca (2006) point out that P is not well suited for the comparison of affixes with very different token numbers N in the same corpus. Computing P after having sampled through a corpus, one will always overestimate the values of P for the less frequent suffixes. They therefore propose to evaluate the number of hapaxes for different affixes at equal values of N, that is, of tokens sampled. Baayen (2009, p. 905) argues that the productivity measure of Gaeta and Ricca is mathematically and empirically very similar to P and that both measures lead to plausible productivity rankings of derivational affixes.

Nishimoto (2004) develops a type-based measure using the deleted estimation method. The measure is called P_{DE} (subscript "DE" stands for "deleted estimation method"), derived on the basis of the differences in the distribution of types across subcorpora of a corpus. The idea behind his measure is that those types that are not shared between subcorpora are more likely to be new words than types that are shared. His measure, based on two subcorpora A and B, is computed as in (2):

$$(2) \quad P_{DE} = \frac{V_0^{AB} + V_0^{BA}}{V^A + V^B} = \frac{\left(V_0^{AB} + V_0^{BA}\right)/2}{V^A + V^B/2} = \frac{V_N}{V}$$

V^A is the number of types with a given affix in subcorpus A, V^B is the number of types with a given affix in subcorpus B. V_0^{AB} is the number of types with that affix which occur in subcorpus A but not in subcorpus B, while V_0^{BA} is the number of types with that affix which occur in subcorpus B but not in subcorpus ^{B}. V_N (subscript N stands for "new") is the averaged number of types that do not occur in the other subcorpus, hence the number of words that are potentially new. V in (2) is the sum of the number of types in each subcorpus. The quotient of V_N and V can be interpreted as the estimated proportion of potentially new words among all types. The method can be further refined by using more than two subcorpora at a time ("usage-commonality measure," see Nishimoto 2004, chapter 3, for technical details and discussion). As we will see below, the results obtained using the deleted estimation method are quite similar to those using hapaxes.

To summarize our review of different productivity measures, we can distinguish between the following methods:

- Using a text corpus or a large dictionary, productivity can be measured by counting the number of attested different words with a particular affix (i.e., the type-frequency V). The greater the type-frequency, the higher the productivity of the affix. This measure is, however, indicative of past, rather than present productivity.
- Productivity can be measured by counting the number of neologisms in a given period, using, for instance, a large historical dictionary. The greater the number of neologisms in that period, the higher the productivity of a given affix in that period.
- Productivity can be measured by counting the number of hapaxes with a given affix (n_1) in a large corpus. The higher the number of hapaxes, the greater the productivity.
- By dividing the number of hapaxes with a given affix by the number of tokens with that affix, we arrive at P, which indicates the probability of finding new words among all the tokens of a particular morphological category.
- A measure similar to P, even if fully type-based, is P_{DE}, which estimates the probability of potentially new words among the types of a given morphological category, using subcorpora.

For illustration of the different productivity measures in action, let us look at Table 24.1. It gives productivity measures for a number of suffixes investigated in the literature: *-ion*,[1] *-ist*, *-ity*, *-ish*, *-less*, *-ness*, and *-wise*. The PD_{DE} values are taken from Nishimoto (2004, p. 142, based on the BNC), all other values come from Plag et al. (1999) and Plag (2002), based on data from BNC and *OED*.

The table raises the question of which suffix is most productive. Let us first regroup the table according to each measure in the descending order of their values.

Table 24.2 reveals that each measure establishes a different productivity ranking, such that certain measures seem to contradict each other. However, as we will shortly see, this is not the case, since the different measures highlight different aspects of productivity.

Table 24.1 Productivity measures and token frequencies of some affixes in the BNC and *OED*.

	V	N^{aff}	n_1^{aff}	*P*	P_{DE}	*OED neologisms*
-ion	2392	1 369 116	524	0.00038	0.162	625
-ish	491	7745	262	0.0338	0.347	101
-ist	1207	98 823	354	0.0036	Not available	552
-ity	1372	371 747	341	0.00092	0.232	487
-less	681	28 340	272	0.0096	Not available	103
-ness	2466	106 957	943	0.0088	0.318	279
-wise	183	2091	128	0.061	Not available	12

The adverb-forming suffix *-wise* seems to be the most extreme case. While of highest productivity according to *P*, it is of extremely low productivity according to the other measures. How can this paradox be solved? The low rank of *-wise* in terms of *V* and n_1 is an indication of the fact that it is a suffix that is used comparatively rarely. Not very many derivatives are used nor are very many newly coined. However, the high value of *P* shows that among all types with the suffix *-wise* the number of new coinages is quite high, such that the proportion of unknown words among all the *-wise* derivatives is high, indicating the suffix's potential to be easily used for the coinage of new forms, if need be. A look at some forms attested in the BNC supports this impression (cited from Dalton-Puffer and Plag 2000, p. 237):

(3) a. Bridhe lifted the baby, slipped a magic coral and rowan-berry necklace over his head and walked **sun-wise** round the bed three times for good fortune.
b. They make no special demands **food-wise**, and tolerate a wide pH range.

The *OED* ranking reflects the fact that *-wise* words are, though easily derivable, not often used. The suffix *-ish* is very similar to *-wise* in this respect.

Turning to *-ion*, *-ity*, *-ist*, and *-less*, we can state that according to type-frequency, number of hapaxes, and number of neologisms, the suffixes *-ion*, *-ity*, and *-ist* must be regarded as quite productive, whereas the suffix *-less* is less productive. However, according to the *P* measure, the situation is exactly the opposite: *-less* must be regarded as more productive, and the suffixes *-ion*, *-ity*, and *-ist* as ranking very low on the scale. This apparent contradiction can be solved in the following way. The suffix *-less* does not occur in very many different words, and these words are also not so frequently used, hence the lower *V* and *N* figures, and the comparatively small number of hapaxes and *OED* neologisms. If we, however, only consider the words within this morphological category, we find that the proportion of hapaxes among all tokens is very high, which means that there is a high probability of finding new forms among all the words with *-less*. And this high probability is expressed by a high *P* measure. In less technical terms, the apparent contradiction can be explained by saying that we obviously do not use *-less* words a lot, but it is very easy to coin new ones. The opposite is the case for the categories of *-ion*, *-ity*, and *-ist* words. Each of these categories contains many different words, but these are on average of comparatively high frequency, and the chance of finding a newly coined word among all tokens of one of these categories is comparatively low. In other words, these suffixes are very often used with existing words, but in comparison to the many words we use, we do not so often coin new ones.

The suffix *-ness* scores high in terms of type-frequency and neologisms, but due to the high number of tokens (many *-ness* words are quite frequent, e.g., *happiness*) *P* is lower than that of *-wise* and *-less*. Taking all the different aspects together, *-ness* is the most productive

Table 24.2 Ranking of suffixes according to different measures of productivity ("na" = not available).

Rank	*V*		*N*		n_1		*P*		P_{DE}		*OED neologisms*	
1	*-ness*	2466	*-ion*	1 369 116	*-ness*	943	*-wise*	0.061	*-ish*	0.347	*-ion*	625
2	*-ion*	2392	*-ity*	371 747	*-ion*	524	*-ish*	0.0338	*-ness*	0.318	*-ist*	552
3	*-ity*	1372	*-ness*	106 957	*-ist*	354	*-ness*	0.0096	*-ity*	0.232	*-ity*	487
4	*-ist*	1207	*-ist*	98 823	*-ity*	341	*-less*	0.0088	*-ion*	0.162	*-ness*	279
5	*-less*	681	*-less*	28 340	*-less*	272	*-ist*	0.0036	*-ist*	na	*-less*	103
6	*-ish*	491	*-ish*	7745	*-ish*	262	*-ity*	0.00092	*-less*	na	*-ish*	101
7	*-wise*	183	*-wise*	2091	*-wise*	128	*-ion*	0.00038	*-wise*	na	*-wise*	12

suffix of all. It has a relatively high productivity in the narrow sense and is at the same time also used in a great number of derivatives. The comparatively low number of *OED* neologisms is indicative of the problematic data collection method mentioned already above.

Finally, let us compare the P_{DE} measure to the other measures. Interestingly, this measure yields the same productivity ranking as P. This supports the idea that it is a good measure of the probability of finding new words, only that it is type-based, and not token-based.

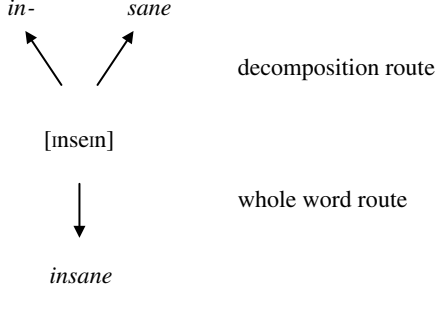
In sum, we can say that researchers have a number of different measures at their disposal to assess the productivity of word-formation processes. Each measure highlights different aspects of productivity and brings with it special methodological problems of data sampling and data analysis. In order to make sound statements about "the" productivity of a given affix, different measures should be taken into account and be interpreted carefully in the light of the methodological problems involved in their computation.

Having clarified the notion of productivity and how productivity can be measured, we may now turn to the problem of how speakers know whether they can use a given affix for the creation of new words. As we will shortly see, this has to do with the question mentioned above whether the productivity of a rule is an inherent, primitive part of that rule or a property derivable on the basis of other properties. We will deal with these issues in the next section.

24.3 Psycholinguistic Aspects: Productivity and the Mental Lexicon

How can speakers know that a given affix can be used to coin new words? What do productive processes have in common that unproductive processes do not have? Which properties of affixes give rise to different degrees of productivity? In this (and also in the next) section, we will try to answer these questions, making reference to recent psycholinguistic research. In the previous section, we introduced productivity measures that make crucial reference to the frequency of lexical items. The basic reasoning behind the use of frequency in computing productivity is that the frequency of complex words significantly influences the way in which we process and store them. In most current models of morphological processing, access to morphologically complex words in the mental lexicon works in two ways: by direct access to the whole word representation (the so-called "**whole word route**") and by access to the decomposed elements (the so-called "**decomposition route**") (see McQueen and Cutler 1998, for an overview). This means that each incoming complex word is simultaneously processed in two ways, with one way of access finally succeeding. On the decomposition route, it is decomposed in its parts and the parts are being looked up individually, on the whole word route the word is looked up as a whole in the mental lexicon. The two routes are schematically shown in (4):

(4)



How does frequency come in here? According to Hay (2000, 2001), the degree of decomposability of a given word depends crucially on the relative frequency of the derived word and its base. Relative frequency is defined as the ratio of the frequency of the derived word to the frequency of the base and measures how frequent the derivative is with respect to its base:

$$(5) \quad f_{\text{relative}} = \frac{f_{\text{derivative}}}{f_{\text{base}}}$$

With most complex words, the base is more frequent than the derived word, so that the relative frequency is smaller than one. In psycholinguistic terms, the base has a stronger representation, or higher "resting activation," in the mental lexicon than the derived word. This leads to a preponderance of the decomposed route, since due to its high resting activation, the base will be accessed each time the derivative enters the system. In the opposite case, when the derived word is more frequent than the base, there is a whole word bias in parsing, because the resting activation of the base is lower than the resting activation of the derivative. For example, *business* is much more frequent than its base *busy* (35 141 vs. 4879 occurrences in the BNC), so that *business* will have a whole word bias in access. Note that *business* (in the sense of "company," "economic transactions," and related meanings) is also semantically and phonologically opaque, which is often the case with derivatives that have strong, that is, lexicalized, whole word representations. Conversely, *blueness* has a base that is much more frequent than the derived form (10 059 vs. 39 in the BNC), so that there will be a strong advantage for the decomposed route. In general, the higher the frequency of the derived word in relation to the base word, the less likely is decomposition. Alternatively, the lower the frequency of the derived word in relation to the base word, the more likely is decomposition.

Hay shows that relative frequency also patterns with other properties of morphological categories: low relative frequency correlates with high productivity and low relative frequency correlates with high semantic transparency. These correlations do not come as a surprise. As already discussed in the previous section, productive morphological processes are characterized by a high number of low frequency words (i.e., many hapaxes, if we speak in terms of corpora). The lower the frequencies of derived words, the lower their relative frequencies (holding the frequency of the base constant). Thus, productive processes have a preponderance of words with low relative frequencies, whereas less productive morphological categories are characterized by a preponderance of words with higher relative frequencies. In a detailed study of the relation between parsing and productivity involving 80 affixes of English, Hay and Baayen (2002) demonstrate that the more morphologically decomposable forms containing a given affix are in the lexicon, the more productive that affix will be. Thus, there is a strong relationship between relative frequency, parsing in perception, and morphological productivity. Increased rates of parsing lead straightforwardly to increased productivity.

The fact that productive morphological categories are characterized by a high proportion of decomposable words is also responsible for the fact that productive processes exhibit a preponderance of semantically and phonologically transparent formations. This correlation between transparency and productivity has been established in many earlier publications (e.g., Aronoff and Schvaneveldt 1978; Anshen and Aronoff 1981; Cutler 1981).

We can now see that productive categories are semantically transparent as a consequence of processing, since productive processes favor the decomposed route, and decomposed storage strengthens the individual semantic representations of the constituent morphemes. Decomposition and individual storage of the constituent morphemes thus leave little room

for semantic drift and opacity, which arise easily under whole word access and storage, where the meanings of the parts are less likely to be activated. Hence, semantic opacity and low productivity go hand in hand with high relative frequencies.

The relationship between phonological transparency and productivity is further substantiated in Hay and Baayen (2003), who investigate the role of junctural phonotactics with the 80 affixes from the earlier study. The term "junctural phonotactics" refers to the possible combination of sounds that straddle a morphological boundary or juncture, as for example /n-a/ in the word *combi**n-a**tion*. Hay and Baayen (2003) start out from the assumption that speakers rely on phonotactics for the (pre)processing of morphologically complex words. In prelexical processing, speakers posit morphological boundaries inside phoneme transitions that are unlikely to occur inside monomorphemic words (see, e.g., Saffran et al. 1996a, b; McQueen 1998). For example, the phoneme transition /pf/ (as in *cu**p-f**ul*) never occurs inside monomorphemic English words and will therefore strongly facilitate decomposition in speech perception, while the transition /tɪ/ (as in *produc**t-i**ve*) has a much higher probability of occurring morpheme-internally and will therefore not facilitate decomposition. Hay and Baayen now argue that decomposition in speech perception leads to decomposed forms in the lexicon. And, if, as stated above, decomposed forms in the lexicon lead to productivity, it can be predicted that there is a relationship between the junctural phonotactics associated with an affix, and that affix's productivity. This prediction is borne out by the facts. Hay and Baayen find a significant correlation between the kind of junctural phonotactics of an affix and that affix's productivity. Roughly speaking, the more illegal the phonemic transitions created by an affix, the more productive that affix tends to be. Thus, phonotactics contributes probabilistically to the likelihood of decomposition and therefore to the degree of productivity.

To summarize, we can say that, psycholinguistically, productivity can be explained as a syndrome of properties, with parsability, relative frequency, semantic and phonological transparency as important factors. With regard to the question whether productivity is a derived notion or a theoretical primitive, we have seen that the productivity of an affix results in a complex fashion from the abovementioned processing factors. Among these factors, semantic and phonological transparency are not only psycholinguistically but also structurally determined in that it is the semantic and phonological structure of affixes and their derivatives that codetermine processing and storage of these forms. In the following text, we will see that there are many more structural factors that play a significant role in influencing—and constraining—productivity. It is these factors that are responsible for the fact that the findings of Hay and Baayen are not exceptionless principles but strong probabilistic tendencies, which are sometimes overruled by structural restrictions (see Plag 2002, for discussion).

24.4 Productivity Restrictions

One important factor restricting the productivity is of course the usefulness of a newly coined word for the speakers of the language. No matter which function a particular derivative serves in a particular situation, intended usefulness is a necessary prerequisite for the emergence of productively formed derivatives. But not all potentially useful words are actually created and used, which means that there must be certain restrictions at work. We must distinguish between, on the one hand, the general possibility to apply a word-formation rule to form a new word and, on the other hand, the opportunity to use such newly coined derivatives in speech. Both aspects are subject to different kinds of restrictions, namely, those restrictions that originate in problems of language use (so-called pragmatic restrictions) and those restrictions that originate in problems of language structure (so-called structural restrictions). We will discuss each type of restriction in turn.

24.4.1 Pragmatic Restrictions

One of the most obvious usage-based factors influencing productivity is fashion. The rise and fall of affixes like *mega-*, *giga-*, *mini-*, or *-nik* are examples of the result of extralinguistic developments in society which make certain words or morphological elements desirable to use and therefore productive.

Another pragmatic requirement new lexemes must meet is that they denote something nameable. Although the nameability requirement is rather ill-defined, it captures a significant insight: the concepts encoded by derivational categories tend to be rather simple and general (e.g., adjectival *un-* "not X," verbal *-en* "make X," etc.) and may not be highly specific or complex. This point is illustrated in the putative example of an extremely specific and overly complex, and therefore unlikely, denominal verb-forming category given by Rose (1973, p. 516): "grasp NOUN in the left hand and shake vigorously while standing on the right foot in a 2.5 gallon galvanized pail of corn-meal-mush." This does not mean, however, that more complex notions cannot be encoded by affixes, but that this requirement seems to be language-specific and is a mere tendency.

The problem with pragmatic restrictions is that, given a seemingly impossible new formation, it is not clear whether it is ruled out on structural grounds or on the basis of pragmatic considerations. Before claiming that a certain form is impossible due to pragmatic restrictions, it is therefore necessary to take a closer look at the structural restrictions involved, which often reveal that a form is impossible because it violates pertinent phonological, morphological, syntactic, or semantic restrictions.

24.4.2 Structural Restrictions

Structural restrictions (or constraints) in word-formation may concern the traditional levels of linguistic analysis, that is, phonology, morphology, syntax, and semantics. A general question that arises from the study of such restrictions is which of these should be considered peculiar to the particular word-formation rule in question and which restrictions are of a more general kind that operate on all (or at least some classes of) morphological processes (see Plag 1999, chapter 3, or Bauer 2001, p. 126–143 for a detailed discussion of both kinds of restrictions).

Rule-specific constraints may concern the properties of the base or of the derived word. Let us start with phonological constraints, which can make reference to individual sounds or to prosodic phenomena such as syllable structure or stress. For example, suffixation of verbal *-en* (as in *blacken*) is subject to the segmental restriction that it only attaches to base-final obstruents (cf., e.g., *blacken* vs. **finen*) and to the prosodic restriction that it does not take bases that have more than one syllable.

Apart from being sensitive to phonological constraints, affixation may depend on the morphological structure of the pertinent base words. An example of such a morphological constraint is the suffix combination *-ize-ation*. Virtually every word ending in the suffix *-ize* can be turned into a noun only by adding *-ation*. Other conceivable deverbal nominal suffixes, such as *-ment*, *-al*, *-age*, etc., are systematically ruled out by this morphological restriction imposed on *-ize* derivatives (cf., e.g., *colonization* vs. **colonizement*, **colonizal*, or **colonizage*).

The suffix *-ee* (as in *employee*) illustrates a semantic restriction. Derivatives with that suffix must denote sentient entities, as shown, for example, by the impossibility to use *amputee* to refer to an amputated limb (see Barker 1998, for detailed discussion).

Finally, productivity restrictions can make reference to syntactic properties. One of the most commonly mentioned ones is the restriction of word-formation rules to members of a certain syntactic category. An example would be the adjectival suffix *-able* which normally attaches to verbs (as in *readable*), or the adjectival suffix *-al*, which attaches to nouns (as in *parental*).

Let us now look at one productivity restriction that is of a more principled kind, blocking. The term "blocking" has been used in various senses in the literature. Our discussion will be restricted to two kinds of synonymy blocking, token-blocking and type-blocking (Rainer 1988). Token-blocking involves the blocking of a potential regular form by an already existing synonymous word, an example of which is the blocking of **arrivement* by *arrival* or **stealer* by *thief*. In contrast, type-blocking concerns the blocking of the application of one rule (e.g., *-ness* suffixation) by another rival rule (e.g., *-ity* suffixation). We will discuss each in turn.

Token-blocking is a relatively uncontroversial notion and will therefore not be discussed in great detail. One important aspect of token-blocking deserves mentioning, however, namely, that it crucially depends on frequency. Contrary to earlier assumptions, Rainer (1988) shows that not only idiosyncratic or simplex words (like *thief*) can block productive formations (such as **stealer*), but that stored words in general can do so. As already discussed above, the storage of words is largely dependent on their frequency. Now, in order to be able to block a potential synonymous formation, the blocking word must be sufficiently frequent. In Rainer's experiment, the higher the frequency of a given word, the more likely it was that the word blocked a rival formation. Both idiosyncratic words and regular complex words are able to block other forms, provided that the blocking word is stored.

That such an account of blocking is on the right track is corroborated by the fact that occasionally really synonymous doublets do occur (which may later develop different meanings, e.g., *passivate/passivize*). Plank (1981, pp. 181–182) already notes that blocking of a newly derived form does not occur in those cases where the speaker fails to activate the already existing alternative form. The likelihood of failing to activate a stored form is negatively correlated to the frequency of the form to be accessed. In other words, the less frequent the stored word is, the more likely it is that the speaker will fail to access it (and apply the regular rule instead), and the more frequent the stored word is, the more likely it is that the speaker will successfully retrieve it, and the more likely it is, therefore, that it will block the formation of a rival word. With frequency and storage being the decisive factors for token-blocking, the theory can naturally account for the occasional occurrence even of synonymous doublets.

We may now move on to the notion of type-blocking, which has been said to occur when a certain affix blocks the application of another affix (e.g., Aronoff 1976). The example *decency* versus *decentness* would be a case in point. The crucial idea underlying the notion of type-blocking is that rival suffixes (such as *-ness*, *-ity*, and *-cy*) are organized in such a way that each suffix can be applied to a certain domain. In many cases, one can distinguish between affixes with an unrestricted domain, the so-called general case (e.g., *-ness* suffixation, which may apply to practically any adjective), and affixes with restricted domains, the so-called special cases (e.g., *-ity* or *-cy* suffixation). The latter are characterized by the fact that certain constraints limit the applicability of the suffixes to a lexically, phonologically, morphologically, semantically, or otherwise governed set of bases. Type-blocking would occur when the more special affix precludes the application of the more general affix.

The problem with this idea of type-blocking is that it cannot account for the patterning of the data. For example, Aronoff (1976, p. 53) regards formations involving nominal *-ness* as ill-formed in all those cases where the base adjective ends in *-ate*, *-ent*, or *-ant*, hence, the contrast between *decency* and what he considers an illegal form **decentness*. In his view, the systematic special case *-cy* (*decency*) precludes the general case *-ness*. There are, however, a number of problems with this kind of analysis. The first one is that, on closer inspection, *-ness* and its putative rivals *-ity* or *-cy* are not always synonymous, so that blocking could—if at all—only occur in those cases where the meaning differences would be neutralized. Riddle (1985) shows that there is in fact a slight but consistent meaning difference observable between rival *-ness* and *-ity* derivatives. Consider, for example, the pair in (6) (from Riddle 1985, p. 438):

(6) a. The lanterns demonstrated the *ethnicity* of the restaurant.
b. The lanterns demonstrated the *ethnicness* of the restaurant.

In (6)a, the lanterns show to which ethnic group the restaurant belongs, whereas in (6)b, the lanterns show that the restaurant has an ethnic appeal (as opposed to a non-ethnic appeal). In general, *-ness* formations tend to denote an embodied attribute, property, or trait, whereas *-ity* formations tend to refer to an abstract or concrete entity. Hence, *-ity* and *-ness* may not be completely synonymous, which would be a prerequisite for type-blocking. The second problem of the notion of type-blocking concerns the status of forms like *decentness*, which are in fact often attested. A search for *decentness* in the very large Corpus of Global Web-based English yields five occurrences from Britain, Ireland, and the United States. The word is even listed in dictionaries (e.g., https://www.merriam-webster.com/dictionary/decentness, accessed February 25, 2019), hence not at all morphologically ill-formed. Furthermore, the occurrence of many attested doublets with no clear difference in interpretation rather indicates that the domain of the general case *-ness* is not systematically curtailed by *-ity*: *destructiveness–destructivity, discoursiveness–discoursivity, exclusiveness–exclusivity, impracticalness–impracticality, inventibleness–inventability, naiveness–naivity, ovalness–ovality, prescriptiveness–prescriptivity* (all from the *OED*). Bauer et al. (2013) provide numerous examples of doublets (most often without any discernible meaning difference) from various morphological categories and come to the conclusion that they "have found too many examples of the failure of any such principle [i.e., blocking, IP] for us to be able to give it much credence" (p. 577).

The final problem with alleged cases of type-blocking is to distinguish them from token-blocking. Thus, putative avoidance of *decentness* could equally well be a case of token-blocking, since one can assume that, for many speakers, the word *decency* is part of their lexicon, and is therefore capable of token-blocking (for a detailed discussion of affixal rivalry, see Plag 1999, chapter 8; Bauer et al. 2013, chapter 26).

To summarize our discussion of blocking, we have seen that type-blocking as a general factor constraining productivity is highly problematic, while token-blocking only weakly restricts the productivity of affixes by sometimes preventing the formation of complex rival synonymous forms.

24.5 Conclusion

In this chapter, we have looked at what it means when we say that a word-formation process is productive. The productivity of a given affix can be seen as its general potential to be used to create new words and as the degree to which this potential is exploited by the speakers. This degree can be assessed by various measures, both corpus-based and dictionary-based. We then discussed how complex words are stored and accessed in the mental lexicon, which is crucial for an understanding of the notion of productivity in word-formation. Productivity has been shown to be a derived notion. It emerges from the mental lexicon as the result of different properties, such as parsability, relative frequency, semantic and phonological transparency. Differences in productivity between affixes also raise the question of productivity restrictions. We have seen that apart from constraints on processing and usage, structural constraints also play an important role in restricting productivity. Possible words of a given morphological category need to conform to very specific phonological, morphological, semantic, and syntactic requirements. These requirements restrict the set of potential complex words, thus limiting productivity. Finally, token-blocking was discussed, which is a general psycholinguistic mechanism which may prevent complex forms from being formed if a synonymous word is already available in the speaker's mental lexicon.

NOTE

1 The letter sequence <-ion> is used here to cover the different allomorphs of this suffix (*-ation*, *-cation*, *-ion*, *-ition*, *-iation*, *-sion*, *-ution*, *-tion*, Bauer et al. 2013, p. 201).

FURTHER READING

An accessible introduction to morphological productivity and the mental lexicon can be found in Plag (2018, chapter 3). Storage of and access to complex words in the lexicon are explained in more detail in Baayen (2014). For seminal corpus-based studies of the productivity of English affixes, see Baayen and Lieber (1991), Baayen and Renouf (1996), Plag (1999, chapter 5), or Plag et al. (1999). More recently, some studies on the productivity of compounding in English have become available, for example, Fernández-Domínguez (2009) and Tarasova (2019). The methodological problems involved in corpus-based analyses of derivational morphology are discussed in considerable detail in Plag (1999, chapter 5) and, more generally, in Baayen (2009). Book-length studies of mainly structural aspects of productivity are Plag (1999) and Bauer (2001).

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25 Lexical Semantics

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25.1 Introduction

Lexical semantics is the study of word meaning and its relationship to a word's grammatical properties. An important assumption that scholars in this field of inquiry share is that word meanings are highly structured and their internal structure determines their syntactic behavior. More specifically, it is claimed that the fact that certain meaning components constitute full verb meanings and members of other lexical categories has direct consequences with respect to the elements that appear in the syntactic environment of these words and their morphosyntactic realization. A central goal in lexical semantics is thus to provide a theory of word meaning that allows us to make predictions about all possible and impossible structures with which words within and across languages are compatible. The following three questions have received a lot of attention in lexical semantic research: (i) What is the most plausible representation of word meaning? (ii) What is the nature of the mapping between a word's lexical semantics and its syntactic realization? and (iii) How do languages differ when it comes to the linguistic expression of various facets of real-world situations?[1]

In this chapter, I will explore some answers that have been provided to these questions in the past 50 or so years. I will focus on verb meaning as it is verbs that have generated the most amount of interest for lexical semanticists, at least in the generative tradition. In Section 25.2, I look into the internal structure of verb meanings and discuss theories of word meaning representation and the linking between lexical semantics and syntax. In Section 25.3, I focus on constraints on the lexicalization of events across languages, whereas in Section 25.4, I further discuss how verb meaning is structured by briefly addressing two argument alternations: the causative–inchoative alternation and the locative alternation. The discussion in this section is meant to serve as a case study to explore what kind of challenges arise when it comes to the linking at the syntax–semantics interface. In Section 25.5, I conclude with some remarks on future directions for lexical semantics.

25.2 The Internal Structure of Verb Meanings

In this section, I discuss two strands of research into the representation of verb meaning: I begin by giving a brief overview of theories of thematic roles and problems with these theories. Then I discuss more recent theories of predicate decompositions, which have become largely popular not only in lexical semantics but also in syntactic analyses of various argument structural phenomena (see Harley 2005; Ramchand 2008; Acedo-Matellán and Mateu 2014; Alexiadou et al. 2015).

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25.2.1 Theories of Thematic Roles

It is Fillmore's (1968) case grammar that is the best-known early example of a theory of word meaning based on thematic roles. A basic tenet of this work is that the role participants play in the events described by verbs has direct implications as to the syntactic realization of the arguments denoting these participants. Take, for example, the verb *break*. It is assumed that a grammatically relevant facet of meaning encoded in this verb is that it assigns an agent role to the argument that denotes the initiator of the breaking event and a patient role to the argument denoting the participant whose referent undergoes a change of state. Verbs differ with respect to the type of roles they assign to their arguments. Some examples of thematic roles, taken from Fillmore (1971), are given below.

(1) a. Agent (A), the instigator of the event.
b. Counter-agent (C), the force or resistance against which the action is carried out.
c. Object (O), the entity that moves or changes or whose position or existence is in consideration.
d. Result (R), the entity that comes into existence as a result of the action.
e. Instrument (I), the stimulus or immediate physical cause of an event.
f. Source (S), the place from which something moves.
g. Goal (G), the place to which something moves.
h. Experiencer (E), the entity which receives or accepts or experiences or undergoes the effect of an action …

(Fillmore 1971, p. 376)

The role "counter-agent" is lesser-known than the roles "agent," "instrument," "source," "goal," and "experiencer," whereas the role "object," which for many scholars in more recent works subsumes the result role, is often referred to as "theme" or "patient" (Levin and Rappaport Hovav 2005, p. 36). Some scholars use the labels "theme" and "patient" interchangeably, but when they are taken to name different entities, the former is meant to refer to participants undergoing a change of location or possession, whereas the latter refers to affected or created entities, or entities that undergo a change of state (Cruse 2011, pp. 289–290; Wechsler 2015, p. 58).

The idea is that semantic role lists like the one above allow us to provide descriptions of verb meanings based on a specific set of unanalyzable semantic labels and to make predictions as to what kind of argument realization patterns verbs are associated with. These descriptions, illustrated below, have been referred to as case frames by Fillmore (1968) or theta-grids by Stowell (1981).

(2) a. break <agent, patient>
b. close <agent, patient>
c. fear <experiencer, theme>
d. put <agent, theme, location>

In order to derive various structural properties of the nominal arguments that name event participants, a variety of theories of linking focusing on subject and object selection have been proposed. Many of these theories share the conjecture that semantic roles are arranged in universal grammar according to their semantic prominence and thus they form hierarchies (Fillmore 1968; Jackendoff 1972, 1990; Baker 1989; Van Valin 1990; Grimshaw 1990). Illustrative examples are provided in (3) from Baker (1989) and Jackendoff (1990).

(3) a. Agent > Instrument > Patient/Theme > Goal/Location
(Baker 1989, p. 544, (64))
b. Actor > Patient/Beneficiary > Theme > Location/Source/Goal
(Jackendoff 1990, p. 258, (30))

Thematic hierarchies like those in (3) are also often accompanied by a hierarchy of grammatical relations along the lines of (4).

(4) Subject > Object
(Wechsler 2015, p. 141, (8b))

The mapping mechanism between hierarchies like those in (3) and (4) is the following: If there is an agent selected by the verb, it is linked to the subject position in the sentence. In the absence of an agent, it is the argument carrying the role that comes after the agent in the hierarchy (i.e., the instrument in (3)a and the patient or beneficiary in (3)b) that is predicted to occupy the subject position. If the verb is transitive, the second argument is linked to the object, the second most prominent grammatical relation according to (4).

Theories of thematic roles have appealed to scholars for their allowing us to account for data like those in (5).

(5) a. Kate closed the door.
b. The door closed.

In (5)a, the agent of the verb *close* is mapped to the subject and the theme is mapped to the object, as expected on the assumption that these two roles constitute part of the inventory of thematic roles available in universal grammar and semantic prominence between these roles is preserved at the syntax–semantics interface. In (5)b, the theme, which is the only argument of intransitive *close*, becomes the subject.

In addition to these results, researchers have also identified a number of problems with thematic roles: For example, data like those in (6) pose a challenge for theories of thematic roles. The verbs in the examples in (6) select the same kind of arguments, and yet they can appear in different argument realization patterns, which is unexpected under the assumptions discussed above.

(6) a. The public liked John.
b. John appealed to the public.

To overcome this and other problems that arise with the traditional notion of semantic roles (for a detailed critical discussion, see Rappaport Hovav and Levin 1988; Levin and Rappaport Hovav 2005; and Riemer 2010), an alternative approach is taken to semantic roles by researchers like Dowty (1989, 1991) and Van Valin (1990), who no longer treat semantic roles as unanalyzable chunks of lexical meaning, but as a collection of lexical entailments or generalizations with respect to the arguments of verbs. This is a significant step toward a thematic-role-based theory of word meaning that has a greater explanatory power in comparison to previous analyses, since thematic roles are no longer used only for the purpose of word meaning representation but they become testable. Furthermore, lexical entailment-based theories also open up the possibility of accounting for various argument realization phenomena based on purely semantic grounds. This is, for example, achieved in Beavers's (2006, 2010) work on argument/oblique alternations, where the author's main goal is to show that the morphosyntactic realization of arguments is directly determined by the

implicational structure between the lexical entailments associated with the alternants in an alternation.

Beavers's (2006, 2010) theory is based primarily on Dowty's work, where two semantic proto-roles are proposed, the proto-agent and the proto-patient, and they are associated with the following lexical entailments.

Proto-agent entailments

(7) a. Volitional involvement in the event or state.
b. Sentience (and/or perception).
c. Causing an event or change of state in another participant.
d. Movement (relative to the position of another participant).
e. (Exists independently of the event named by the verb.)

Proto-patient entailments

(8) a. Undergoes change of state.
b. Incremental theme.
c. Causally affected by another participant.
d. Stationary relative to movement of another participant.
e. (Does not exist independently of the event, or not at all.)

(Dowty 1991, p. 572, (27) and (28))

On Dowty's view, semantic roles are thus clusters of lexical entailments; the goal of this theory is to characterize event participants as more or less prototypical agents or patients. The principle necessary for argument selection is formulated as follows.

(9) **Argument selection principle**: In predicates with grammatical subject and object, the argument for which the predicate entails the greatest number of proto-agent properties will be lexicalized as the subject of the predicate; the argument having the greatest number of proto-patient entailments will be lexicalized as the direct object.

(Dowty 1991, p. 576, (31))

In light of the two clusters of proto-role entailments and the argument selection principle in (9), we can predict the argument realization behavior of verbs like *murder* in (10).

(10) John murdered Mary.

The argument *John* in the example above is associated with proto-agent entailments and is thus expressed as the subject, whereas *Mary* is a prototypical patient and hence the object of the sentence. To account for the argument structural behavior of verbs having arguments associated with the same set of lexical entailments and for three-argument verbs, Dowty also proposes the following corollaries to his theory:

(11) **Corollary 1**: If two arguments of a relation have (approximately) equal number of entailed proto-agent and proto-patient properties, then either or both may be lexicalized as the subject (and similarly to objects).

(12) **Corollary 2**: With a three-place predicate, the nonsubject argument having the greater number of entailed proto-patient properties will be lexicalized as the direct object and the nonsubject argument having fewer entailed proto-patient properties will be lexicalized as an oblique or prepositional object (and if two nonsubject arguments have approximately equal numbers of entailed p-patient properties, either or both may be lexicalized as direct object).

(Dowty 1991, p. 576, (32) and (33))

An important consequence of (11) is that stative predicates like *resemble* as in *John resembles Mary* or *Mary resembles John* can appear with two arguments, each occupying either the subject position or the object position without a difference in the truth-conditions of the sentences containing these arguments (*ibid*. 556). Furthermore, (12) allows us to predict that verbs like *put* will co-occur with the participant having the greatest number of proto-agent properties in subject position, the prototypical patient in the direct object position, and a location, the least prototypical patient, expressed as a prepositional phrase, as in *John put the book on the desk*.

Crucially, Dowty's influential theory contrasts with earlier theories in that the former does not aim to determine necessary and sufficient conditions for semantic role membership (Levin and Rappaport Hovav 2005, p. 53; Beavers 2006, p. 15).[2] Instead, a proto-role is a prototypical characterization of the role event participants have in a situation. As Beavers (2006, p. 15) notes, a proto-role is "a yardstick against which the properties of different participants in the same event can be compared when determining argument realization." Furthermore, as Levin and Rappaport Hovav (2005, p. 64) point out, citing Van Valin (1999), among others, Dowty's proto-roles do not appear in the representation of a sentence; they are involved in argument selection but they are not assumed to be linked to grammatical functions at the level of syntax (Dowty 1991, p. 576). However, the way argument realization is envisaged on this analysis leaves some problems unaddressed. For example, it has been suggested that proto-role entailments may have to be ranked differently in the description of argument selection (*ibid*. 574). This is consonant with the assumption that there seems to be a greater amount of structure with which verbs are associated. This idea is taken more seriously in theories of predicate decompositions, which I will address in the next section.

25.2.2 *Theories of Predicate Decompositions*

An alternative approach to theories of thematic roles is pursued starting in the 1970s when scholars start classifying verb meanings based on the type of events that verbs describe instead of the event participants with which they are associated. Verb meanings on this view are analyzed in terms of a small set of primitive components in a predicate decomposition, which reflects the structure of the events described by verbs. Numerous proposals have been put forward in the literature as to the number and type of primitive predicates and the internal structure of the decompositions (Jackendoff 1983, 1990; Dowty 1979; Rappaport Hovav and Levin 1988, 1998; Van Valin and LaPolla 1997). Here, I discuss facets of two highly influential proposals: Dowty (1979) and Rappaport Hovav and Levin (1998).

Dowty (1979) proposes that various combinations of primitive units like DO, CAUSE, and BECOME give rise to the meanings that verbs express. An important goal in this research program is to derive the properties of verbs that fall into the four aspectual classes (i.e., states, activities, achievements, and accomplishments) originally identified by Vendler (1957).[3] In addition, central to this type of analysis is the observation that sentences like *The soup is cool*, *The soup cooled*, and *John cooled the soup* seem to correspond to basic event types

being embedded in other event types. Consider (13), which contains a simplified version of Dowty's decompositions associated with these sentences from Wechsler (2015).

(13) a. The soup is cool: **cool'**(*the.soup*)
b. The soup cooled: BECOME [**cool'**(*the.soup*)]
c. John cooled the soup: ∃P[P(*John*) CAUSE [BECOME [**cool'**(*the.soup*)]]]
(Wechsler 2015, p. 154, (32))

The representations above allow us to capture that both (13)b and (13)c entail (13)a as a result of each containing the predicate **cool'**. In addition, the decompositions also reflect the fact that verbs like intransitive *cool* and transitive *cool* share selectional restrictions with respect to the subject of the former and the object of the latter (Levin and Rappaport Hovav 2005, p. 69).

Another advantage of lexical decompositions is that they allow us to give a principled analysis of the scope effects observable with adverbials like *again*, *almost*, and durative adverbials like *for four years*. Dowty (1979) illustrates these effects with examples (14) and (15), among others, where (14) is attributed to Robert I. Binnick in the literature.

(14) The Sheriff of Nottingham jailed Robin Hood for four years.
(Dowty 1979, p. 250, (30))

The sentence above has multiple interpretations: The temporal adverbial *for four years* is either meant to describe the length of the jailing activity or it refers to the amount of time that Robin Hood spent in jail. This ambiguity can be nicely captured if a decomposition is proposed where the adverbial has scope over either the entire causative event and thus a durative reading arises, or only the final result, which gives rise to the second reading, also referred to as the internal reading.

A similar effect is observable in the example in (15).

(15) John closed the door again.
(Dowty 1979, p. 252, (31))

The sentence above has a repetitive and a restitutive reading. On the repetitive reading, the adverbial *again* has scope over the entire closing activity and thus the sentence is interpreted to describe multiple closing events, whereas on the restitutive reading, where the adverbial has scope over the result state, the sentence expresses that John caused the door to become closed again; in this latter case no earlier closing event needed to happen for the truth of the sentence.

Dowty's decompositions provide the basis for the event structure templates of Rappaport Hovav and Levin (1998), which also derive Vendler's (1957) lexical aspectual classes of verbs. Two basic ingredients constitute these templates: Recurring meanings in verbs are represented in the form of the primitive predicates ACT, CAUSE, and BECOME, whereas idiosyncratic meaning is encoded in the root component. Roots can be of two types: Manner roots serve as modifiers to an event templatic ACT operator, whereas result roots fill the argument position of an event templatic BECOME operator in the decompositions. Specific verbs are instantiated through canonical realization rules, which associate roots with the event templates based on the former's ontological type (e.g., state, place, manner), the most important property of roots (Levin and Rappaport Hovav 2005, p. 71). Consider (16)–(19).

(16) a. *sweep*
b. [x ACT $_{\langle SWEEP \rangle}$]

(17) a. *shovel*
b. [x ACT $_{\langle SHOVEL \rangle}$]
(18) a. transitive *break*
b. [[x ACT] CAUSE [y BECOME $_{\langle BROKEN \rangle}$]]
(19) a. transitive *cool*
b. [[x ACT] CAUSE [y BECOME $_{\langle COOL \rangle}$]]

The representations above allow us to capture (i) that both (16) and (17) express simple activities by virtue of encoding only a single primitive predicate (ACT), and (ii) that these verbs are also different in that (16a) specifies the manner of activity, whereas (17a) lexicalizes the instrument with which the activity is carried out. As for *break* and *cool* in (18) and (19), they are represented as causative verbs expressing a causing activity event and a result state. An important consequence of the distinction between activity verbs like *sweep* and *shovel* and causative transitive verbs like *break* and *cool* is that the former show a more flexible argument structural behavior, whereas the latter are stricter regarding the expression of their arguments. For example, manner verbs like *sweep* allow object omission, as in (20)a, whereas verbs like *break* must appear with an explicit object, illustrated in (20)b. For more on this distinction, see Section 25.3.2.

(20) a. John swept all day.
b. *John broke all day.

Complex-event denoting expressions can also come about via template augmentation, as in the case of the resultative expression in (21), where an activity is combined with a result state through the causative operator CAUSE.

(21) a. Peter ran his shoes ragged.
b. [[*x* ACT$_{\langle RUN \rangle}$]] CAUSE [*y* BECOME $_{\langle RAGGED \rangle}$]]

Rappaport Hovav and Levin (2001) also propose an argument structural restriction on the event structures illustrated above in an effort to explain why verbs like *sweep* are more flexible than verbs like *break* when it comes to the expression of their arguments. They argue that it is the complexity of events that figures in argument realization in the following way.

(22) **Argument-per-subevent condition**: There must be at least one argument XP in the syntax per subevent in the event structure.[4]
(Rappaport Hovav and Levin 2001, p. 779, (44))

As discussed by Kardos and Pethő (2019, p. 124), the condition in (22) does indeed allow us to predict that verbs of complex events like *break* are obligatorily transitive, whereas verbs expressing simple events are either (i) obligatorily transitive, (ii) optionally transitive, or (iii) intransitive. However, the authors also point out some problems. They provide examples from English and Hungarian, which pose a challenge for the theory:

(23) a. The boy grew tall.
b. The eggs boiled hard.
(24) a. A ház por-ig égett.
the house.NOM dust-to burned
"The house burned to the ground."

b. A modell csontsovány-ra fogyott.
the model.NOM skinny.to.the.bone-on lost.weight
"The model got skinny to the bone as a result of losing weight."
(Kardos and Pethő 2019, p. 125, (22a), and p. 126, (22d))

An important property of the predicates in (23) and (24) is that they all express two subevents, that is, an activity and a result state, and yet they occur with a single argument, contra (22). These and other data also discussed in the work of Kardos and Pethő can lead us to conclude that, although it is highly plausible that argument structure is at least partially derived from event structure, the nature of this derivation needs further investigation for better explanatory adequacy. In recent years, part of this investigation has concerned the nature of lexical roots and, more specifically, their contribution to argument realization. In the next section, I will review some findings of this research.

25.3 Lexicalization Constraints

In this section, I illustrate what kind of meanings a single surface verb can or cannot have and how this varies across languages. I begin by discussing a typological classification regarding the lexicalization of events, which is not linked to any theory of word meaning, and I also review more recent work on the plausibility of this classification. Finally, I address the debate on a universal constraint concerning how much meaning verbal roots can lexicalize across languages. Unlike the typological proposal discussed in the first half of this section, the latter topic on verbal roots is tied to specific frameworks where a predicate decomposition analysis of word meanings is assumed.

25.3.1 Verb-Framed versus Satellite-Framed Languages

One of the most significant typological discoveries of lexical semantic research concerns the different ways in which languages express various components of situations in the world. In the case of situations expressing an entity's change of location, which have generated the most amount of interest in recent decades, some of these components are the motion itself, the path of motion and the manner of motion. An influential early proposal regarding the encoding of these components is put forward by Talmy (1985, 2000), who suggests a two-way classification of languages into verb-framed and satellite-framed based on how they encode the path of motion in directed motion events.[5] In verb-framed languages such as Spanish and Romanian, it is verbs that encode the path of motion and the motion itself, whereas the manner of motion is expressed by a constituent—also referred to as a satellite—outside the verb. The examples in (25) and (26), where in each case the satellite is a subordinate clause headed by a participial verb, illustrate this encoding pattern.

(25) La botella entró a la cueva (flotando). Spanish
the bottle moved.in to the cave (floating)
"The bottle floated into the cave."

(Talmy 1985, p. 69, (15a))

(26) Sticla a ajuns în peşteră (plutind). Romanian
bottle.the AUX.3SG get.PRF in cave (floating)
"The bottle got into the cave (floating)."

(Farkas 2013, p. 187, (4))

By contrast, in satellite-framed languages like English and Hungarian, verbs encode both motion and the manner of motion, whereas the path of motion is expressed outside the verb. Consider the examples in (27)–(29).

(27) The bottle floated into the cave. English
(28) János a barlang-ba úszott. Hungarian
János the cave-into swam
"János swam into the cave."
(29) Péter ki-sétált. Hungarian
Péter PRT-walked
"Péter walked out (from some place)."

In both the English and the Hungarian examples, the verbs express motion events in which the referent of the theme undergoes a change of location by floating, swimming, or walking, while the satellites express the path of motion. In English, the satellite to the verb is the prepositional phrase (PP), whereas in Hungarian it is the case-marked determiner phrase (DP) in (28) and the verbal particle *ki* "out" in (29).[6]

An important question that arises regarding Talmy's typology is what kind of consequences the distinct encoding mechanisms have with respect to the grammar of different languages. It has been argued that one such consequence concerns an argument structural property of verbs: whereas in satellite-framed languages manner verbs can appear in resultative constructions (see (30) and (31)), such complex predicates are generally not available in verb-framed languages, illustrated in (32).[7]

(30) John hammered the metal flat. English
(31) János lapos-ra kalapálta a vas-at. Hungarian
János flat-to hammered the iron-ACC
"János hammered the metal flat."
(32) *Ion a bătut metalul plat Romanian
John AUX.3SG pound.PRF metal.the flat.SG.M
"John hammered the metal flat."

(adapted from Farkas 2013, p. 259, (136a))

As discussed by Levin and Rappaport Hovav (2019), a variety of other grammatical properties have been correlated with whether a language is associated with one encoding strategy or another. These include the availability of constructions like the double object construction and the encoding of various aspectual meanings. In this chapter, I will not provide a more specific characterization of the nature of these correlations, but I wish to point out an important idea that two-way or three-way typologies suggest: The encoding strategy used in one language should not be available in languages associated with another strategy. In other words, the strategy whereby a single verb encodes the path of motion in a clause is expected to be unavailable in satellite-framed languages and the strategy whereby the path is expressed in a satellite outside the verb should not be used in verb-framed languages. However, this generalization, and thus two-way (or three-way) typologies, does not stand up to empirical scrutiny. Data from numerous typologically diverse languages have been

identified in the literature (for references, see Levin and Rappaport Hovav 2019), which pose a challenge for Talmy's proposal. For example, Beavers et al. (2010) provide the example in (33) to show the encoding of the path of motion in a PP outside the verb in Spanish, which is a strategy primarily used in satellite-framed languages.

(33) La botella flotó hasta la cueva. Spanish
the bottle floated until the cave
"The bottle floated to the cave."
(adapted from Beavers et al. 2010, p. 347, (26))

It is clear from (33) that path-encoding *hasta*-PPs can in fact occur with manner-of-motion verbs. The co-occurrence of the goal-denoting PP and the manner verb in this example gives rise to a delimited event,[8] as in English and many other satellite-framed languages, as evidenced by the entailment test below.[9]

(34) #La botella flotó hasta la cueva, pero no llegó (a la cueva).
the bottle floated until the cave, but not arrived at the cave
#"The bottle floated to the cave, but never arrived." Spanish
(Beavers et al. 2010, p. 347, (27))

Furthermore, Beavers and his colleagues also cite the following examples from Iacobini and Masini (2006) to show that there are in fact verb-framed languages in which some manner-of-motion verbs can appear with path-encoding particles, which is again a strategy typically found in satellite-framed languages.

(35) Luigi è saltato fuori all'improvviso. Italian
Luigi be.3SG jump.PART.PAST out suddenly
"Luigi suddenly popped up."
(Iacobini and Masini 2006, p. 160)

Finally, it is also problematic that in some satellite-framed languages it is possible for verbs to encode the path of motion, as in the case of the English verbs *enter*, *exit*, *ascend*, and *descend*.[10]

Overall, then, in light of these data and some other considerations, Beavers et al. (2010) conclude that, although there seems to be a tendency for languages to favor verb-framed, satellite-framed, or equipollently framed options, it is best to attribute the divergent encoding strategies in different languages to (i) their lexical, morphological, and syntactic resources, (ii) pragmatic factors, and (iii) a lexicalization constraint on how much meaning verbal roots can express. Space limitations do not allow me to discuss (i) and (ii) any further, but, in the next section, I turn to a more detailed examination of (iii), which has sparked an interesting debate among scholars, both lexical semanticists and syntacticians.

25.3.2 The Lexicalization of Manner and Result in Verbal Roots

I have so far reviewed theories seeking answers to (i) what kind of linguistically relevant meaning components make up words, (ii) how these components are to be represented, and (iii) how languages differ when it comes to the encoding of different facets of situations as construed by native speakers. An additional question related to (i)–(iii) is whether there is a constraint limiting the amount of information a word can lexicalize and, if so, what is the nature of this constraint. In some of their most recent works, Malka Rappaport

Hovav and Beth Levin propose that verbal roots within an event structural theory may lexically encode either a manner component or a result component, but not both (Rappaport Hovav and Levin 2010). Manner/result complementarity receives support from the different argument structural behavior with which manner verbs and result verbs are associated. Manner verbs like *dance*, *sweep*, *wipe*, *play*, and *hit* appear in a variety of argument realization patterns, whereas result verbs like *break*, *cool*, *arrive*, and *enter* exhibit a stricter grammatical behavior.

(36) a. All last night, Kim scrubbed.
b. Cinderella scrubbed the table clean/shiny/bare.
(Beavers and Koontz-Garboden 2012, p. 339, (14a), and p. 340, (22a))

(37) a. *All last night, Kim broke.
b. *Kim broke the stick purple.
(Beavers and Koontz-Garboden 2012, p. 339, (16b), and p. 341, (24d))

As shown in (36)a, the two-place manner verb *scrub* allows the omission of the patient and it can also appear with a variety of resultative XPs, as in (36)b. By contrast, the result verb *break* requires the syntactic instantiation of the object (37)a and it is not found with resultative XPs unrelated to the result state encoded in the verb (37)b.

Rappaport Hovav and Levin derive manner/result complementarity from a more general constraint on event structures, formulated as follows:

(38) **The lexicalization constraint**: A root can only be associated with one primitive predicate in an event schema, as either an argument or a modifier.
(Rappaport Hovav and Levin 2010, p. 25, (12))

As noted by Rappaport Hovav and Levin (2010, p. 26), in morphologically poor languages like English, manner/result complementarity characterizes words which contain a single verb stem, whereas in morphologically rich languages like Lakota and Washo, it is different pieces of words, that is, verb stems and affixes, that can encode either manner or result, but not both. Here, I illustrate this contrast with examples from English and Hungarian.

(39) John entered the stadium. English
(40) János be-ment a stadion-ba. Hungarian
János PRT-went the stadium-into
"János entered the stadium."

Whereas in the English example, it is the verb stem *enter* that encodes the goal point that is associated with the event description, in the Hungarian example, the verb stem *ment* "went" lexicalizes the manner of motion and the verbal particle *be* "(in)to" encodes the goal point along with the case-marked DP.

Rappaport Hovav and Levin justify their complementarity idea further by finding a semantic property of events which is associated with result verbs, but not with manner verbs. They argue that result verbs express simple, scalar changes, whereas manner verbs describe complex, non-scalar changes. A scalar change is characterized as follows.

(41) A scalar change is one which involves an ordered set of changes in a particular direction of the values of a single attribute and so can be characterized as movement in a particular direction along the scale.
(Rappaport Hovav 2008, p. 17)

Various grammatical properties of scalar/result verbs are attributed to the properties of the scales that they lexically encode. For example, verbal predicates like *enter* and *exit*, which encode scales having two degree values, are associated with a telic reading, whereas predicates like *cool* and *warm*, which encode scales constituting multiple degree values, are atelic by default. With these verbs, a telic reading can arise due to contextual cues or some sentential material.

(42) a. John cooled the soup for/in 10 minutes.
b. John cooled the soup to room temperature in/*for 10 minutes.

As pointed out by Hay et al. (1999), Kennedy and Levin (2008), and Rappaport Hovav and Levin (2010), among others, degree achievements like *cool* and *warm* are characterized by variable telicity. For example, the predicate *cool the soup* in (42)a is interpreted atelically without any contextual support and is thus compatible with the temporal adverbial *for 10 minutes*, but context may also allow the hearer to assign a telic reading to this example such that the soup reached some contextually specified temperature in the course of the cooling event. By contrast, (42)b illustrates strict telicity due to the lexical semantics of the verb and that of the adpositional expression *to room temperature*. Yet another class of verbs encoding multipoint scales are again associated with strict telicity given that these scales are associated with maximal endpoints (Wechsler 2005, p. 263). Consider (43).

(43) a. John straightened the rope in 10 minutes/*for 10 minutes.
b. Helen emptied the fridge in 10 minutes/*for 10 minutes.

In addition to figuring into the calculation of various aspectual properties,[11] scalar properties have also been used to explain the difference between manner verbs and result verbs regarding their compatibility with various result XPs. For more on this, see Wechsler (2005).

Despite these and various other predictions, the manner/result complementarity hypothesis by Rappaport Hovav and Levin has been called into question by multiple scholars (see, for example, Goldberg 2010; Husband 2011; Beavers and Koontz-Garboden 2012, 2020; Acedo-Matellán and Mateu 2014). Goldberg (2010), for instance, argues that this constraint is too strong as there seem to be verbs that simultaneously encode manner and result. She illustrates this point with various verb classes including verbs of creation like *scribble* and verbs of cooking like *sauté*, *roast*, and *fry*. As for the former, Goldberg argues that in addition to manner, verbs like *scribble* also encode some kind of result by virtue of the fact that a new entity comes about in the course of the events described by these verbs. Verbs of cooking, on the other hand, describe the manner of cooking and a scalar change. She uses the gradability test for scalarity to support her claim (Hay et al. 1999). It is possible to fry food more or less, which shows that the verb *fry* must be scalar.[12] Therefore, as an alternative to the hypothesis of Rappaport Hovav and Levin, Goldberg proposes another constraint on word meaning: She claims that verbs "may encode both manner and result as long as there exists a semantic frame that unites both meaning components" (Goldberg 2010, p. 57). For more on the notion of "semantic frame," see Fillmore (1982).

Beavers and Koontz-Garboden (2012, 2020) also offer an insightful critique of the manner/result complementarity hypothesis. They argue that manner/result complementarity is false as a truth-conditional claim about verb meaning, but it does receive empirical support as a claim about event structure. They distinguish between three classes of verbs regarding how much information verbal roots may lexically entail. Verbs like *run* and *walk* are associated with manner roots, whereas verbs like *break* and *destroy* lexicalize result roots. In addition, there is a third class, including the subclasses of verbs

of cooking like *sauté* and *braise*, verbs of manner of killing like *crucify*, *drown*, and *hang* and ditransitive ballistic motion verbs like *throw* and *toss*, which lexicalize roots encoding manner and result simultaneously. They apply several manner and result diagnostics to provide evidence for these three classes. Here, I only discuss some of these diagnostics to show that verbs encoding both manner and result can be found in English (and possibly other languages). First, when appearing in a result-entailing context, verbs like *drown* give rise to a contradiction, as shown in (44)a. Second, such verbs do not allow object omission, which is what (44)b illustrates. Thus, the verb *drown* patterns with canonical result verbs.

(44) a. #Jane just drowned Joe, but nothing is different about him.
b. *All last night, Shane drowned.
(Beavers and Koontz-Garboden 2012, p. 338, (13a), and p. 339, (14b))

By contrast, verbs of manner of killing also exhibit a manner behavior. This is illustrated below.

(45) #The governor drowned/hanged the prisoner, but didn't move a muscle – rather, during the execution she just sat there, tacitly refusing to order a halt!
(46) It took me five minutes to drown/hang/crucify Jim … ("during/after five minutes")
a. AFTER: because I lacked the courage.
b. DURING: because this is how long it takes to kill someone by holding them under water/cutting off their air/nailing them down to a cross, hoisting them up, and waiting.
(Beavers and Koontz-Garboden 2012, p. 347, (39b), and p. 348, (43))

That it is not possible in (45) to both assert that the subject drowned/hanged the patient and deny that the drowning/hanging activity was performed is a hallmark of manner verb behavior. Furthermore, (46) serves as evidence for the availability of a durative reading with verbs like *drown*, *hang*, and *crucify*, which again shows that these verbs encode a manner component. Durativity can only be due to this component, since the result state of death, also encoded in these verbs, is a non-gradable property.

In light of these and some other truth-conditional diagnostics, Beavers and Koontz-Garboden conclude that the complementarity idea cannot be upheld contra the proposal of Rappaport Hovav and Levin. Verbal roots can in fact package manner and result at the same time. However, they also discuss manner/result complementarity as a claim about event structures. They show that it is indeed the case that there must be a single root object in an event structure associated with verbs showing a single overt morphological root. This root object can serve as an adjunct modifying v_{ACT} or v_{CAUSE} or as a complement to v_{BECOME} (see the syntactified event structures in Chapter 4 of Beavers and Koontz-Garboden 2020). They rely on scopal modification facts to support this claim.

(47) John drowned the zombie again.
MEANS "John caused the zombie to be dead by drowning again."
CANNOT MEAN "John caused the zombie to become dead again by drowning, but the last time the zombie was killed it was with a chainsaw."
(Beavers and Koontz-Garboden 2012, p. 358, (68))

We have already seen in Section 25.2.2 that sentences containing canonical result verbs like *close* are ambiguous in the presence of the adverbial *again*. This ambiguity arises since *again*

can either scope over the entire event, in which case a repetitive reading becomes available, or only the result state giving rise to a restitutive reading. That *drown the zombie again* in (47) can only receive a repetitive meaning shows that the root in the verb must encode both the result state of death and the manner of drowning. It is not the case that there are two root objects in the surface verb *drown*, one responsible for result and another one for manner; that is, manner/result complementarity viewed as a constraint as to how many root components event structures may contain proves to be adequate.

25.4 Argument Alternations

In this section, I discuss in some more detail how verb meaning is structured. I aim to provide a case study of some of the challenges that arise when it comes to the linking at the syntax–semantics interface in the context of the causative–inchoative alternation and the locative alternation. There are at least four questions that need answers regarding these (and other) alternations: First, we need to understand what kind of properties allow verbs to participate in argument alternations. Second, we would also like to explore how the verbs in each alternation are related to each other. In particular, a crucial question is whether there is a derivational relationship between the alternants and, if so, what is the nature of this derivation? Third, we also have to provide an explanation for the differences between the alternants regarding the morphosyntactic realization of the arguments. And, finally, the fourth question concerns the semantic relationship that holds between members of the sentence-pairs containing alternating verbs. In what follows I will focus on the first two questions in the discussion of the causative–inchoative alternation, whereas in the subsection on the locative alternation I address the third and the fourth questions.

25.4.1 The Causative–Inchoative Alternation

The causative alternation is illustrated by the following pairs of sentences:

(48) a. John broke the vase. English
b. The vase broke.

(49) a. János be-törte az ablak-ot. Hungarian
János PRT-broke.DEF the window-ACC
"János broke the window."
b. Az ablak be-tört.
The window PRT-broke.INDEF
"The window broke."

All the examples above describe breaking events but it is clear that the (a) and (b) sentences in each pair are characterized by different truth conditions: In each case the sentence in (a) supplies specific information as to the instigator of the event expressed by the verbal predicate, whereas in (b) this event participant is left unspecified. It is also important to note that there is an entailment relationship between the two sentences in (48) and (49) such that the (a) sentence entails the (b) sentence in each pair.

As for the type of verbs that can participate in this alternation, several proposals have been put forward as to what kind of semantic properties distinguish alternating verbs from non-alternating verbs (Smith 1970; Levin and Rappaport Hovav 1995). For instance, Levin and Rappaport Hovav (1995, p. 91) suggest that non-alternating verbs such as *play*, *speak*, *glitter*, *roar*, and *bubble* express internally caused eventualities, which means that in the case

of these verbs "some property inherent to the argument of the verb is 'responsible' for bringing about the eventuality." Conversely, verbs like *break*, *close*, *cool*, *dry*, *freeze*, *bounce*, and *roll* "by their very nature imply the existence of an external cause with immediate control over bringing about the eventuality described by the verb: an agent, an instrument, a natural force, or a circumstance" (*ibid*. 92). Levin and Rappaport Hovav further argue that, unlike internally caused verbs, externally caused verbs are associated with a complex event structure. That is, their lexical semantics reflects the fact that they are inherently two-argument verbs: the external cause occupies the argument position in the causing event and the argument whose referent undergoes some change occupies the argument position in the caused state. This is illustrated in (50).

(50) [[*x* ACT] CAUSE [*y* BECOME *STATE*]]
(adapted from Levin and Rappaport Hovav 1995, p. 94, (27a))

An important consequence of this analysis is that externally caused verbs must have a transitive variant, though not all of them appear as intransitive verbs. Consider (51)–(52).

(51) a. The baker cut the bread.
b. *The bread cut.
(52) a. The nurse sterilized the instruments.
b. *The instruments sterilized.
(Levin and Rappaport Hovav 1995, p. 95, (28)–(29))

Despite its initial appeal, however, the internal versus external causation idea has also generated skepticism among scholars as there are no independently verifiable criteria according to which externally caused and internally caused verbs can be reliably isolated.[13]

In response to the second question mentioned at the outset of this section, various derivational and non-derivational analyses have been proposed in prior literature and, within the derivational approaches, both transitivization and detransitivization analyses have been pursued. According to theories advocating a transitivization analysis, the basic idea is that the transitive causative variant comes about as a result of a causative operation, whereby a CAUSE operator is added to the event structure of the intransitive variant (Dowty 1979; Pesetsky 1995). By contrast, proponents of the detransitivization view have argued that the transitive variant is basic and the intransitive variant is derived from it via reflexivization (Chierchia 2004; Koontz-Garboden 2009; Beavers and Koontz-Garboden 2013a, b), lexical binding (Levin and Rappaport Hovav 1995) or deletion (Reinhart 2003; Reinhart and Siloni 2005). On non-derivational analyses, the transitive causative and intransitive variants are not derived from each other but from a common morphological root (Piñón 2001). On yet another non-derivational approach, alternating verbs are associated with the internal argument and transitive structures come about with the introduction of an external argument in the syntax (Alexiadou 2010; Alexiadou et al. 2015).

In this review, I briefly discuss the reflexivization analysis, as it has sparked an interesting debate in the literature in recent years. As mentioned above, an important assumption that advocates of the reflexivization analysis share is that the causative–inchoative alternation comes about as a result of a detransitivization process whereby the inchoative variant is derived from the causative variant (Chierchia 2004; Koontz-Garboden 2007, 2009; Beavers and Koontz-Garboden 2013a, b). This claim is taken to be supported in languages like Spanish by the fact that it is the inchoative/anticausative variant that is the morphologically marked form and the marking element *se* (as in *romperse* "intransitive break," which alternates with *romper* "transitive break") also happens to be a reflexive marker in this language. On this view, derivation occurs through reflexivization, which,

according to Koontz-Garboden (2007, 2009), is an advantageous assumption, as it allows us to adhere to the monotonicity hypothesis in (53), originally proposed in Kiparsky (1982).

(53) **Monotonicity hypothesis**: Word formation operations do not remove operators from lexical semantic representations.

(Koontz-Garboden 2007, p. 25, (12))

An important consequence of the detransitivization operation via reflexivization is that the inchoative variant retains the CAUSE operator available in the causative variant and the external argument that comes with CAUSE becomes identical with the patient. Researchers have used multiple diagnostics to identify a CAUSE component in the intransitive variant of the alternation. Here, I only discuss the *by itself*-test, which was proposed by Chierchia (2004).

It has been shown that modifiers like Italian *da sé* "by itself" and Spanish *por sí solo* "by itself" are anaphors that need to be locally bound by a causer subject; they can appear with verbs that lexically encode such a subject. Thus, for example, sentences containing *da sé* "by itself" in Italian or *por sí solo* "by itself" in Spanish and a reflexive verb are grammatical, whereas sentences with these modifiers and passive verbs are ungrammatical. That inchoative verbs like Spanish *romperse* "intransitive break" can also appear with the modifier *por sí solo* "by itself" has been taken as evidence by proponents of the reflexivization analysis for this verb's lexicalizing CAUSE.

This view has also been challenged by Horvath and Siloni (2011, pp. 2177–2179), who show that in Hebrew there are two possible counterparts of English *by itself*, namely, *be-acmo* "in itself" and *me-acmo* "from itself." The former can appear with agentive and reflexive verbs but rejects inchoative verbs regardless of the morphological shape of the verb, whereas the latter is licensed with inchoatives. That is, agentive verbs and reflexive verbs pattern differently from inchoatives, which is unexpected on Koontz-Garboden's analysis.[14] Beavers and Koontz-Garboden (2013a, pp. 204–205) respond to this critique by showing that the Hebrew counterparts of *by itself* contribute different animacity constraints to the sentences they appear in, and this is why they differ in their distribution. Other tests involving, for example, negation and adjunction facts have also been proposed and challenged in the debate on the reflexivization analysis of the causative–inchoative alternation. For more on these tests, see Horvath and Siloni (2011, 2013) and Beavers and Koontz-Garboden (2013a, b).

25.4.2 The Locative Alternation

Examples illustrating the locative alternation are given in (54).

(54) a. John loaded the hay onto the wagon.
b. John loaded the wagon with the hay.

The data above represent a widely researched phenomenon: The sentences in (54)a and (54) b are exact opposites of each other in terms of the morphosyntactic realization of the locatum argument, that is, *the hay*, and the location argument, *the wagon*. In (54)a, the locatum is the object and the location appears as an oblique, whereas in (54)b, the location appears as the object and the locatum is realized as an oblique. As for the semantics, (54)a and (54)b are similar in that they both describe caused motion events in which the hay undergoes a change of location and ends up on the wagon. However, an important respect in which the two variants are different is that, due to the holistic reading that is associated with the participant in the object position, the interpretation that one can assign to (54)a is that all of the hay ended up on the wagon (without necessarily filling it up completely), whereas the reading assigned to (54)b is that the wagon was completely filled up by some (but not necessarily all of the) hay. These phenomena have been given a variety of analyses in the past few decades

(Fillmore 1968; Rappaport Hovav and Levin 1988; Dowty 1991; Tenny 1994, among many others). Here, I briefly review an event-structural analysis and a lexical-aspectual analysis.

The most influential event-structure-based account of the locative alternation is provided by Rappaport Hovav and Levin (1988). On this view, the two variants are associated with different event structures, as in (55).

(55) a. [*x* CAUSE [*y* to come to be at *z*]/LOAD]
b. [[*x* CAUSE [*z* to come to be in STATE]
BY MEANS OF [*x* CAUSE [*y* to come to be at *z*]/LOAD]]
(Rappaport Hovav and Levin 1988, p. 26, (25))

That the two variants in this alternation are related to each other in a way that the *with* variant entails the locative variant is captured by the BY MEANS OF relation. As pointed out by Beavers (2017, p. 4015), an important merit of this analysis is that it can provide independent support for the differences that arise between the two variants regarding the morphosyntactic realization of the internal arguments. As opposed to thematic-role approaches, which often stipulate argument expression in the case of this alternation, the reverse realization of the locatum and the location participants is explained in a way that the relative prominence of arguments is linked to embeddedness in the event structures: the more embedded an argument is in the event structure, the less prominent role it will receive in the morphosyntax. However, representations like (55) fall short of accounting for the semantics associated with the alternation. It is not clear how the holistic reading associated with the direct object and the partial or holistic reading which arises due to the prepositional expression in each variant can be predicted on this view.

One particular analysis which offers a solution to the latter problem is Tenny's (1987, 1994) work on the syntax–semantics interface. She proposes that it is only the aspectual properties of verbs that figure into argument realization. This is formulated in the aspectual interface hypothesis (AIH) in (56).

(56) **Aspectual interface hypothesis:** The universal principles of mapping between thematic structure and syntactic argument structure are governed by aspectual properties relating to measuring-out. Constraints on the aspectual properties associated with direct internal arguments, indirect internal arguments, and external arguments in syntactic structure constrain the kinds of event participants that can occupy these positions. Only the aspectual part of thematic structure is visible to the universal linking principles.
(Tenny 1994, p. 2)

One of the constraints referred to in the AIH is the measuring-out constraint on direct internal objects, according to which it is only direct objects that measure out events (Tenny 1994, p. 11, (9)). Therefore, in (54)a, the loading event is measured out by the specific locatum object and thus a telic reading arises, whereas in (54)b, it is the location that has the measuring role.

As pointed out by Levin and Rappaport Hovav (2005, p. 101), this theory can correctly predict that, in the case of canonical transitive verbs like *destroy* and *cut*, it is the non-agent argument that is directly responsible for measuring-out, whereas verbs like *reign*, which do not have measuring-out themes, appear in intransitive structures, where the non-agent participant is expressed in the form of a prepositional expression (e.g., *over some country*). However, the theory also has serious shortcomings. For instance, it has been shown by Dowty (1991, p. 570) that it is not only direct objects that can measure out events; arguments which appear as subjects can also be directly responsible for the aspectual make-up of events as expressed by verbal predicates. This characterizes Dowty's (1991, p. 570, (25a) and (25b)) examples *John entered the icy water (very slowly)* and *The*

crowd exited the auditorium (in 21 minutes), where it is *John* and *the crowd* that serve as incremental themes, respectively. A similar problem also arises with verbs appearing both with a locatum and a location participant. As originally observed by Jackendoff (1996), it is both of these arguments that serve a measuring role in the events expressed by their verbal predicates (cf. *fill* and *cover*) no matter what position they occupy in the sentence. Another problem, as noted by Beavers (2017, pp. 4017–4018), is that on Tenny's view we must stipulate that measuring is linked to objects as "nothing about measuring out *a priori* makes an argument more prominent than others." This and other problems have prompted researchers to part with the AIH and look for notions other than measuring out which can be more successfully invoked in accounts of argument realization.

25.5 Conclusion

I hope to have shown that the derivation of important grammatical properties of verbs from their lexical semantics has proved to be a popular and, in many ways, successful research enterprise in the past few decades both in terms of its empirical coverage and its impact on linguistic theorizing. However, there are still several questions to be answered. For instance, researchers have most recently focused on the question whether verbal roots contain grammatically relevant facets of meaning (in addition to their ontological category), or they are irrelevant for the grammar, as has generally been assumed. Levin (2017), for example, shows that the class of manner verbs like *hit* and *wipe* is heterogeneous based on differences in their argument expression and she also argues that this heterogeneity follows from the divergent properties of their roots. Whereas "hitting roots—and events—involve impact at a point—or what is conceptualized as a point," "wiping roots involve contact over a necessarily extended area" (*ibid*. 586). Also, Beavers and Koontz-Garboden (2020) provide multiple pieces of evidence for some roots encoding templatic information such as causation. This is a finding that seriously challenges the assumption that a given component of meaning cannot appear both as information introduced by a functional head (in a syntactically instantiated event structure) and as information encoded in the verbal root (cf. Embick's (2009) Bifurcation Thesis for Roots). Future research will have to provide further evidence for such claims both with respect to English and other languages.

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NOTES

1 As noted by Levin and Rappaport Hovav (2005, p. 19), situations as described by various linguistic units are construals of real-world situations and not the real-world situations themselves.
2 That Dowty's work on proto-roles has had a profound impact on lexical semantic research is evidenced by the fact that the theory has been adopted and extended by a number of researchers including Primus (1999), Ackerman and Moore (2001), and Beavers (2006, 2010).
3 In order to properly derive the temporal properties characterizing members of different aspectual classes, Dowty's (1979) analysis also relies on interval semantics, which, however, I refrain from discussing in this chapter.

4 Similar principles have been proposed by Grimshaw and Vikner (1993), Pustejovsky (1991, 1995), and van Hout (1996).
5 There are other linguistically relevant components in motion events such as the moving entity, which Talmy calls the figure, and the reference object with respect to which the figure moves. The latter is also referred to as the ground. For more on the grammatical role of these components, see, for example, Jackendoff (1983, 1996) and a more recent paper by Beavers (2012).
6 More recently, a third strategy has also been posited with respect to how languages express motion events: equipollently framed languages like Thai employ multiple verbs in a single clause to encode the manner and the path of motion events. For more on this strategy, see Slobin (2004) and Zlatev and Yangklang (2004).
7 For more on the absence and availability of resultative constructions of the English type across languages, see, for example, Snyder (2001).
8 For more on *hasta*-markers, see Bassa-Vanrell (2017).
9 This is a simplification of the facts. Event delimitedness also depends on the reference properties of the theme DP, the referent of which undergoes a change of state or a change of location. For more on this, see Beavers (2012) and Kardos (2012, 2016, 2019).
10 In strong satellite-framed languages (Acedo-Matellán 2016) like Hungarian, this is not possible. Endpoints encoded in particles or locative/resultative XPs do not incorporate into the verb (Hegedűs 2017).
11 Durativity, which is another lexical aspectual property of verbal predicates, has also been linked to scalar complexity. For more on this, see Beavers (2012, pp. 47–52).
12 Goldberg (2010, p. 50), however, also points out that gradability is not necessary for scalarity. Verbs encoding two-point scales are not gradable.
13 For a critical discussion of the analysis of the causative-inchoative alternation by Levin and Rappaport Hovav (1995), see Rappaport Hovav & Levin (2012), Rappaport Hovav (2014), and Pethő and Kardos (2014).
14 As shown by Rákosi (2012, p. 193) and Pethő and Kardos (2014, pp. 514–516), a similar problem arises in Hungarian.

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26 English Lexicography: A Global Perspective

STEFAN DOLLINGER

26.1 English Lexicography and English Linguistics

Since the 1970s, the sister disciplines of English linguistics and English lexicography have developed in somewhat different directions. While prior to World War II, the disciplines had close connections, with the latter usually seen as a key constituent of the former, the relationship has since changed. Some reasons lie in the distinct needs of lexicographical projects, their profound upfront financial investments, their long timelines to completion, and their more practical and applied viewpoints rather than theoretical ones. The status of lexicography within English linguistics has consequently—with the notable exception of learner lexicography in applied linguistics—somewhat diminished since its heyday (e.g., McDavid and Duckert 1973). Linguistics is big on methods, while lexicography is a "tradition", in which "as far as methods are concerned, it is very seldom that they are discussed or explained; sometimes, they are not even described" (Zgusta 1971: 19).

On account of the field's unprecedented diversification, linguists have taken on fewer English lexicographical projects, while these projects have partnered more and more with the commercial book-publishing sector. With the demise of paper publishing and the heavy costs of moving print dictionaries to digital environments, many publishers (e.g., Houghton Mifflin, Random House, Merriam-Webster, Nelson Gage, etc.) have since cut back on lexicographical staff or closed operations entirely. Today, English lexicography, unlike English linguistics, is in a difficult situation. There are some exceptions to this scenario, such as the distinct role of Oxford University Press or Merriam-Webster in their markets, yet even these large dictionary-making enterprises have not been unaffected by the big structural changes (see, e.g. Ferrett and Dollinger in press). The lexicographical projects that still have an academic home are more often housed in philological than linguistic contexts (e.g., *Dictionary of American Regional English*, *Dictionary of Old English*, and the *Anglo-Norman Dictionary*).

It is today no easy task to find lexicographical texts that appeal to linguists. There are strong subfields that look at English lexicography from a philological angle (e.g., Durkin 2009; Liberman 2007; Ogilvie 2008) and from corpus-linguistic and applied angles (e.g., Hanks 2013; Kilgarriff et al. 2014; Rundell 2018). The largest swath of literature today, however, is decidedly lexicographical and of less immediate linguistic interest, whether as articles (e.g., Adams 2019; Hargraves 2015; Hartmann 2011), handbooks (e.g., Durkin 2015; Fuertes Olivera 2017; Mugglestone 2000; Lambert 2020), or monographs (e.g., Brewer 2007; Gilliver 2016; Dollinger 2019). In the context of World Englishes, Görlach (1990) is a study that is—still—outstanding for its linguistic as well as lexicographical appeal.

The Handbook of English Linguistics, Second Edition. Edited by Bas Aarts, April McMahon, and Lars Hinrichs.

This study serves as a starting point for the present paper, which aims to survey the state of lexicography in the context of varieties around the world—native, nativizing, lingua franca, or learner-wise.

26.2 English Lexicography: A Rough Model

The present article will be dealing with desk dictionaries (general language dictionaries), historical dictionaries, as well as English learner dictionaries. For reasons of space alone, slang dictionaries will be excluded (for the latter, see, e.g., Coleman 2014). There are also areas of specialized lexicography beyond the scope of this chapter, which can be found in, for example, Ogilvie (2020), of which place name dictionaries are perhaps closest and most relevant to English linguistics (see Wright 2020 for a rationale).

A minimum of terminology is required. We distinguish after Görlach (1990) on the one hand between "inclusive" dictionaries, meaning all potential words in a variety, and "exclusive" dictionaries, that is, those only capturing words that are distinct in a given variety; on the other hand, we discriminate between "synchronic" and "historical" (diachronic) dictionaries, with the former further divided by primary user groups, that is, L1 user or L2 learner. Learner lexicography for L2 speakers, both ESL and EFL, is an area in which linguistic concerns, often via corpus linguistics, have remained central (e.g., Sinclair 1991; Atkins et al. 2003). Table 26.1 schematizes these basic distinctions, exemplified with examples.

While lexicographers today generally consider themselves as advocates of linguistic descriptivism, lexicography is operating at what might be called the interface between description (linguistic facts), prescription (socially preferred forms), and attitudes (what is considered as appropriate). As Curzan (2014) shows, the two areas are more intermingled and more difficult to separate than meets the eye. L1 user-oriented, inclusive lexicography is where conflict becomes most apparent. Linguistic and popular concepts of what (written) language is and should be, for instance, came to a head in 1961, with the publication of

Table 26.1 Basic terminological grid.

	Synchronic			Historical
	Monolingual		Bilingual	
	L1 user	L2 learner		
Inclusive	*American Heritage Dictionary* (2018) *Collins Canadian Dictionary* (2016)	*Oxford Advanced Learner's Dictionary* (2015) *Longman Dictionary of Contemporary English* (2014)	*Merriam-Webster's Spanish–English Dictionary* (2016) [E–Sp, Sp–E] *Oxford Chinese Dictionary* (2010) [E–Ch, Ch–E]	*Oxford English Dictionary,* 3rd edition *Chambers Dictionary of Etymology* (1999)
Exclusive	Relatively rare; Casselman (1995), Dolan (2006), Share (2008)	–	Rare, for example, word lists of local terminology	*Dictionary of Americanisms on Historical Principles* (1951) *Dictionary of Canadianisms on Historical Principles* www.dchp.ca/dchp2 (2017)

Webster's Third New International (1961), which was a thorough revision of *Webster New International*, *Second Edition* (1934). The inclusion of *ain't* as a term that was not condemned aroused great resistance and led the *New York Times* to reject this dictionary and continue to use the outdated, prescriptive 1934 edition.

26.3 Period Dictionaries

A special kind of dictionary is the period dictionary, that is, a dictionary that covers the language of a given historical time period, such as Old English or Early Modern English. With the *Dictionary of Old English* (now complete in letters A–I) and the (originally) *Middle English Dictionary* (now completed under the title *Middle English Compendium*), two such dictionaries exist, while the *Early Modern English Dictionary* folded in the 1980s. Its citation file, however, is now accessible through the University of Michigan library (https://quod.lib.umich.edu/m/mememl/simple.html).

26.3.1 Old and Middle English

Devised in the 1970s by Angus Cameron, the *Dictionary of Old English* (DOE) has been one of the first digital humanities projects, long before the term existed. Building on computation from the start (e.g., Cameron et al. 1981), DOE uses the complete extant corpus of Old English materials in the editing, from about 600 to 1150 AD and has published nine fascicles, from A and Æ to I. Figure 26.1 shows the current online version, which is now newly accessible to everyone for a number of times a year, for the lexeme *hlaf* "loaf".

Since the mid-1990s, the DOE has been available in web versions with full-text links to the sources (e.g., ÆGram, for Ælfric's grammar, in the first attestation of the meaning "bread, loaf"). Figure 26.1 shows just one part of the first of the 27 meanings and submeanings of *half* > *loaf* in the DOE (https://www.doe.utoronto.ca/pages/index.html).

The *Middle English Dictionary* (MED) documents the years 1100–1500. It was edited from 1925 to 2001 and is available in open access at https://quod.lib.umich.edu/m/middle-english-dictionary/dictionary. A revised edition of MED has been created in 2016–2018, with a focus on correction and improvement rather than full-scale revision. The MED is by far the most complete dictionary of Middle English, but, unlike the DOE, it is not based on a complete corpus of Middle English, as such corpus is more elusive than the relatively confined extant material of Old English. An MED spin-off project is the *Barnhart Dictionary of Etymology* (Barnhart 1998), reprinted as of 1999 as the *Chambers Dictionary of Etymology* (Barnhart and Steinmetz 1999).

26.3.2 Oxford English Dictionary (OED)

The OED is no period dictionary in the strict sense of the word, as it spans a number of periods: Middle English, Early Modern English, Late Modern English, twentieth-century English and present-day English. It is listed here because it focuses on the historical developments of terms and only in a more limited way on other kinds of variation. First envisaged in 1857, the OED was edited from 1879 to 1928 in 12 volumes, for the longest stretch by James A. H. Murray. Together with a 1933 supplement, the OED came in 13 volumes, which are termed OED-1. Its history is well-researched (see Gilliver 2016, and references therein).

The OED has been instrumental in the context of English lexicography, which was lacking in quality compared to other philologies in the first half of the nineteenth century. OED represented this catching up and, in some ways, the surpassing of continental lexicography. As

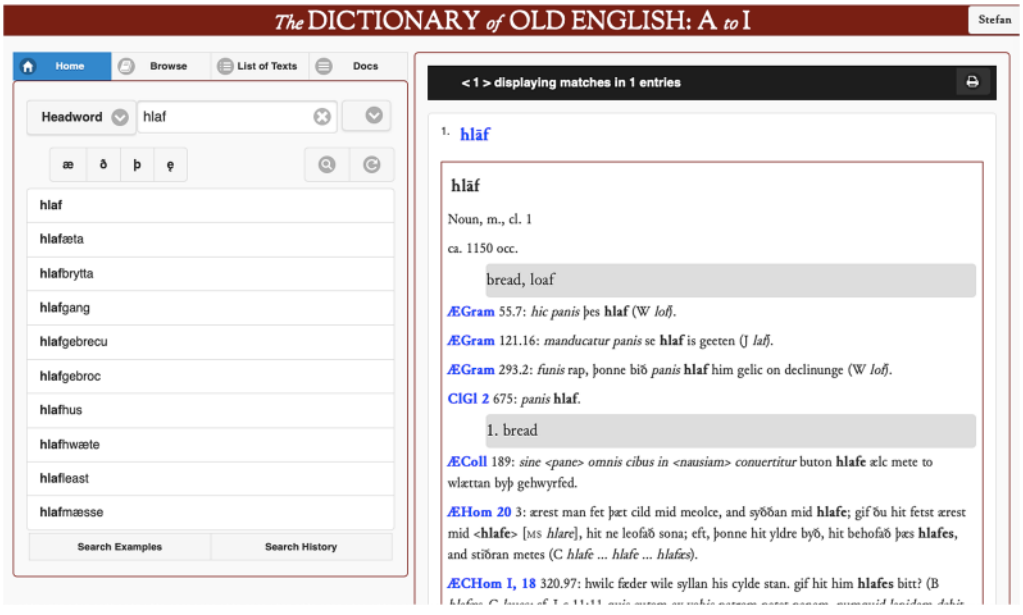

Figure 26.1 Beginning of *hlaf*, modern reflex *loaf*, in the DOE (May 17, 2019). Dictionary of Old English Project.

OED-1 has been fully financed by Oxford University Press, the press needed to devise ways to derive revenue from a historical dictionary project that would not return a profit despite good sales. The solution was the formation of a dictionary unit that would base its prestige in the OED, yet would garner revenue from the sales of its smaller, more affordable dictionaries.

With the advent of digital delivery methods, however, the delivery format was changing. Prior to the technological change, Oxford University Press (OUP) was reinvesting into *OED Supplements* and *Additions* volumes, which appeared in paper from 1972 to 1997. In 1989, a print re-issue of OED-1, the extra volumes, and a very modest update of 5000 terms was published in 20 volumes and sold as OED-2, 2nd edition. OED-2 was put on CD-ROM in 1992 and, as of 1995, on Internet beta versions (Simpson 2016, p. 285). In 2000, a complete revision of the OED-2 text, starting in letter M, was begun. OED-3 has since been available as a work-in-progress for purchase online. OED-3 is an apt improvement over the fin-de-siècle OED-1 that forms the bulk of OED-2. The four supplements by Robert Burchfield (1972–1986), together with the addition volumes, represented the continuation of the tried-and-tested approach, focusing on written sources alone, with a focus on technical vocabulary and, to a degree, on "inner circle" varieties of English (settler Englishes). This approach is, by and large, still carried on in OED-3, while some "outer circle" varieties also find consideration; see, for example, *mahoe* "type of South Pacific, NZ, tree," *oolong* "type of Chinese tea," *sulu* "type of sarong, used in Fiji." For a dictionary aiming to be the "definitive record of the English language," scope of what to include and what not remains a perennial problem (e.g., Dollinger 2013).

26.4 English Lexicography around the Globe

With the expansion of English beyond its confined sphere of influence in early modern times, numerous varieties of English have been developed. Since World War II (e.g., Partridge and Clarke 1951 [1968]), a pluricentric approach has become part of the DNA of English linguistics. The idea that English is a language that is structured on the standard level in multiple

centers, hence pluricentric, is uncontested today: English English (London), Scottish English (Edinburgh), and American or Australian English are part of Kachru's inner circle, which is vastly outnumbered in terms of speakers by both the outer circle (e.g., India, Philippines, Nigeria) and the "expanding circle" (e.g., Austria, Russia, China). With the concomitant rise of English as a lingua franca (see next section), variation is a "design feature" of how we conceptualize English today.

But not all varieties of the world's languages are treated or studied equally, and here English lexicography is no exception. Görlach identifies historical biases in the field as relating to the British (English) lexicographical tradition:

> The historical development of the lexicography of English, with its strong London/Oxford bias, the user-oriented decisions of publishing houses, and the lack of international lexicological research in the field of English variation mean that the information that can be drawn from the British-based dictionaries […] is limited. (Görlach 1990, p. 1478)

A similar verdict would need to be offered for American English lexicography, the other dominant school, as Avis (1966) makes clear. In that context, Zgusta's (1971), UNESO-commissioned volume offers global perspective that is still pertinent for English lexicography today.

One way to categorize World Englishes is via its "crossings," as suggested by Mesthrie and Bhatt (2008). English can periodically and conceptually be divided into four crossings, by which we usually mean crossings of water. The first is the crossing of the North Sea in the fifth century, when Germanic speakers occupied Britain; the second is represented by the first colonies, for which Mesthrie and Bhatt take the twelfth-century crossing into Ireland as a key point. The third crossing began in the sixteenth century, with the Atlantic crossing of English and further on worldwide, while the fourth crossing is a more figurative crossing via IT technologies, starting with the telegraph. Görlach highlights the special role of American English as "the starting point" (1990, p. 1479) for the description of non-English English varieties, a role that has since been formalized in Schneider's (2007) dynamic model, featuring American English as the first variety that has run the complete course to a new national variety trough five phases that are to occur in successive order.

26.4.1 1st Crossing Englishes: England, Wales, and Scotland

Covered to the greatest extent in OED, MED, and DOE, the lexis of the English Englishes are further documented in the *English Dialect Dictionary* (Wright 1898–1905), which is a most important resource for non-standard English between 1700 and 1900 and Green's *Dictionary of Slang* (Green 2010) with its UK focus. Complementary to the MED is the *Anglo-Norman Dictionary* (http://www.anglo-norman.net).

Further north, Scots and Scottish English are today characterized by a complex relationship. Scots, the Germanic language that was in the seventeenth century en route to standardization as an independent language (Millar 2005, pp. 73–93), was arrested in its development by the merger of crowns in 1603. John Jamieson's (1808) *Etymological Dictionary of the Scottish Language* (see Rennie 2019, accessible at https://jamiesondictionary.com) is the starting point to Scots and Scottish English lexicography. Since then, Scottish lexicography has been developing quickly. Initiated by William Craigie, one of the OED editors of the early 1900s and one of Murray's successors, the *Dictionary of the Older Scottish Tongue* (DOST) documents the height of the Scots language from its earliest beginnings to 1700 in a project begun in 1921 and completed in 2002. The *Scottish National Dictionary* (SND) covers the later period, from 1700 to the present, its fascicles appearing between 1931 and 1976. Both DOST and SND are today available within the *Dictionary of the Scots Leid* (Scots language) in open access at https://dsl.ac.uk. The publication of the second edition of the *Concise Scots Dictionary* (CSD) (2017, 1st ed.

1985) attests to active language monitoring and documentation. CSD includes Ulster Scots terms and shows the shared legacy and connections between Scots and Ulster Scots.

26.4.2 2nd Crossing Englishes: Northern Ireland and the Republic of Ireland

While Scottish English represents "a case of a superabundance of dictionaries." (Richard W. Bailey, qtd. in Aitken 1989: 235), Ulster Scots—of central relevance in the Scottish diaspora in North America and spoken in the six Northern Irish counties and three counties in the Republic—is characterized by the opposite. Macafee's (1996) *Concise Ulster Dictionary* is more comprehensive than the title suggests and perhaps the best place to start. The Ulster-Scots Academy has been claiming to prepare a *Complete Ulster-Scots Dictionary*, drawing from all sources, synchronic and historical, for a bilingual and bidirectional (English–Ulster Scots and Ulster-Scots English) dictionary (http://ulsterscotsacademy.com/words/dictionary/introduction.php). No fascicle has been published to date. Linguistically, work by the late Robert J. Gregg is to this day instrumental for Ulster Scots (he was also a pioneer in the study of Canadian English); Michael M. Montgomery offers important jump-off points for any Ulster dictionary project (see Corrigan 2010); Montgomery (2006) is important to gauge the Scots influence on US English.

Irish English is, paradoxically, one of the under-documented varieties in terms of lexis. While research from grammatical and linguistic identity angles is strong, including historical work (e.g., Hickey 2007; McCafferty and Amador-Moreno 2014), there exists to date no reasonably comprehensive dictionary. Dolan (2006) *Dictionary of Hiberno-English* (Hiberno = Irish) is a first step, as is an exclusive dictionary of Irish Gaelic terms and loanwords in Irish English (Ó Muirithe 1999). Share (2008) is documenting a wide range of Irish English terms in present-day use and is the most comprehensive title today, while Green (2010) includes also Irish English slang terms. On mere dictionary count, Lambert (2020: 426) considers Irish English as "One of the better recorded varieties", an assessment that is at least debatable. Kallen (2013) features a substantial section on lexis. Generally, it seems that in Irish English—southern and northern political entities alike—what is needed is someone to compile the plethora of material into one (or two) stand-alone comprehensive dictionaries.

26.4.3 USA and Canada

In 2013, the landmark *Dictionary of American Regional English* (DARE, Cassidy and Hall 1985–2013) was completed. Taking over 120 years from first plans to completion, DARE can be considered as paradigm-setting in its uncompromisingly empirical approach and execution. DARE does not guess, as authoritative data stand behind all labels, so when "esp." is used, as in "esp. Northwest," it says much more than the use of such qualifier in any other dictionary. Complete historical coverage of extant material, nationwide fieldwork, and computational innovations mark DARE as a uniquely precise resource among the large family of English dictionaries. With about 60 000 lexemes DARE is about a tenth the size of the OED, though its entries are much more detailed. Figure 26.2 (left) shows the example of *pail* "bucket."

As a fully digital approach that allows the download of the results from the field survey (see Figure 26.2, right), DARE is a unique tool for American English.

That DARE is more specialized in scope, which is reflected by "regional" in the title, is because DARE is not the first historical dictionary of American English. The first such work was the *Dictionary of American English on Historical Principles* (DAE), which was begun in 1924 at the University of Chicago by William Craigie, who was also one of the chief editors

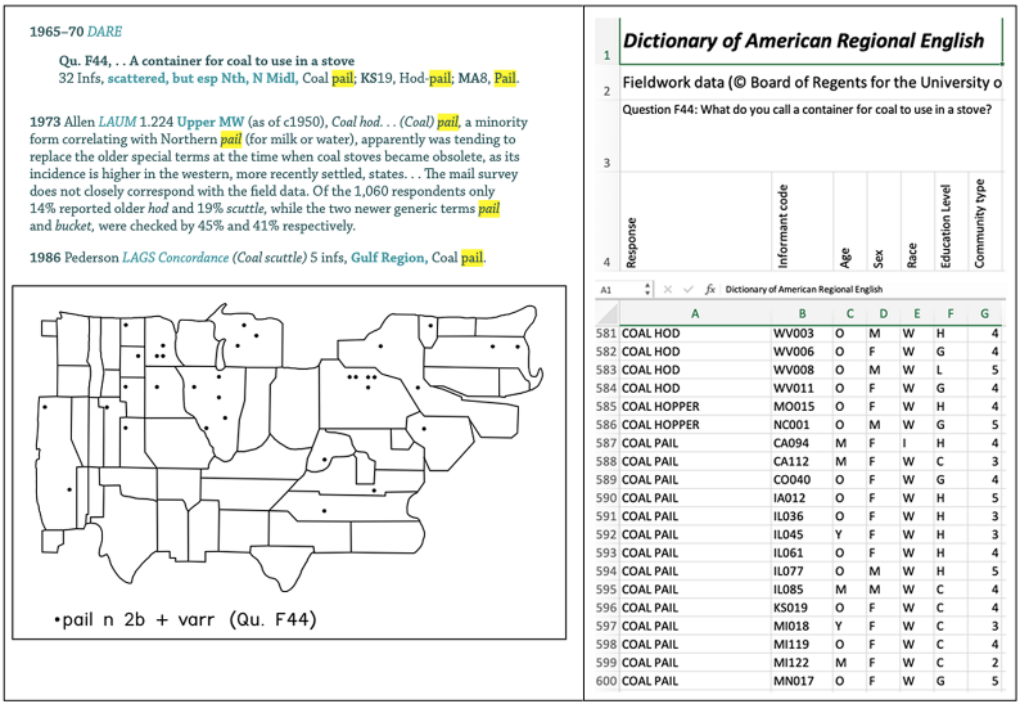

Figure 26.2 Instances of *pail* on map, meaning 2b, from DARE (left); excerpt of data download for *pail* (right). Dictionary of American Regional English.

of the OED. Published as Craigie and Hulbert (1938–1944), this four-volume work was documenting the more obvious Americanisms, such as *campus* "university grounds" or *store* "shop." An editor with the DAE, Mitford Mathews, went on to publish a hefty one-volume supplement under the name of *Dictionary of Americanisms on Historical Principles* (DA), assisted by Charles Lovell (Mathews 1951). Regional dictionaries of American English are plentiful, while some stand out for quality. Among the latter is the *Dictionary of Smoky Mountain English* (Montgomery and Hall 2004).

The orphaned, high-school-only Lovell who was instrumental for DA started to notice Canadian evidence while editing American English and began to collect terms that might have a claim to Canadian-ness in his own files (Dollinger 2019, p. 40). This file amounted to half the collection of quotations behind what would be developed over the next 20 years into a historical dictionary of Canadianisms. The lexicography of Canadian English had a first stand-alone publication in Sandilands (1912), harnessed for nation building (Doherty 2020). The publication of the "Dictionary of Canadian English" series in the form of three graded school dictionaries (Gregg et al. 1962; Avis et al. 1963, 1967a) and *A Dictionary of Canadianisms on Historical Principles* (DCHP-1, Avis et al. 1967b), however, was instrumental for awareness building about the variety. These dictionaries offered the groundwork for the identification of Canadian English that has given rise to a drawn-out process of linguistic identity creation and acceptance of the variety. DCHP-1 is now available in open access (www.dchp.ca/dchp1). A second, updated and reconceptualized edition was published in 2017 at www.dchp.ca/dchp2 (Dollinger and Fee 2017).

Beyond DCHP-2, lexicography in Canada can also boast three scholarly historical dictionaries. There is the ground-breaking *Dictionary of Newfoundland English* (DNE 1982,

1990, 1999, online https://www.heritage.nf.ca/dictionary/). The DNE is half the size (ca. 5000 lexemes) of the national DCHP-2 (ca. 11 000 lexemes), thus a powerful testament to the linguistic distinction of the province of Newfoundland and Labrador. In the 1980s, another Atlantic province was bestowed with the nicely made *Dictionary of Prince Edward Island English* (DPEIE, Pratt 1988), which lists some 900 lexemes, combining both historical material with fieldwork interview data, much like DARE. Recently, the historical variety of a part of the province of Nova Scotia was documented in the *Dictionary of Cape Breton English* (Davey and MacKinnon 2016), which is about the size of DPEIE.

The 1990s saw an unprecedented fight for market-share among three dictionary publishers in Canada. Termed the Great Canadian Dictionary War (Dollinger 2019, pp. 177–178), it reflected increased market demand yet in the end knew only losers, as by 2008, the *Canadian Oxford Dictionary* was shut down after two editions. As the school market leaders *Gage Canadian Dictionary* (1997) and the undervalued *ITP Nelson Dictionary* (1997) have not been maintained, for the first time since 1967 Canadian English is left without a full-sized (100 000 lexemes or more) dictionary. Today, the *Collins Canadian Dictionary* (2019) is the only current title of about half the size of a full-size desk dictionary.

26.4.4 Caribbean

Lexicographical knowledge of Caribbean English is generally the outcome of older projects. The *Dictionary of Jamaican English on Historical Principles* (Cassidy and Le Page 1967, 1980) was begun in the 1950s and compiled in both Jamaica and the United States, as Fred Cassidy was based at the University of Wisconsin-Madison. It is not the case, however, that any big Caribbean island with substantial populations is served with a dictionary of English and/or Creole. There is, for instance, no dictionary of the English/Creole of Barbados (Bajan and Barbadian English), though there is a dictionary of Bahamian English (Bahamas) (Holm 1982). Trinidad and Tobago is the third Caribbean state that is today well-served with Winer's (2009) most comprehensive historical dictionary of Trinidad and Tobago English and Creole. Occasionally, small islands, such as (Dutch) Saba, measuring a mere six square miles and counting just above 2000 inhabitants, can boast lexical documentation of considerable quality (Johnson 2016), including *outer* "eraser/rubber," *zamba* "locally made bed, stuffed with banana leaves as a mattress," and pronoun variants such as *you all* and *all you*, the latter two including regional variation information.

Overall though, the varieties of the Caribbean, with their Creole/English continuum, are spottily documented. While the cross-linguistic *Dictionary of Caribbean English Usage* (DCEU, R. Allsopp 1996) with about 6500 lexemes is an important resource, it can only be a first step toward a more complete coverage of English varieties in the Caribbean. Examples show an interesting range, such as *folly* (Turks and Caicos) "road/path between salt ponds," *foodin* (Guyana) "a child who eats heartily," or *foodist* "adult glutton" in Barbados and Guyana. The quadrilingual domain dictionary by J. Allsopp (2003) documents flora, fauna, and foods in English, French, French Creole, and Spanish for 3000 words.

Large social sections of the linguistically complex, multilingual Caribbean, with its long pedigree of English since the early 1600s, remain obscure. For instance, Williams (2010, pp. 139–140) lists more than 20 L1 varieties alone of what he calls "Euro-Caribbean English varieties," many of which spoken in communities of fewer than 100 members today (p. 136), including the locations in the Bahamas (island of Abaco), Anguilla, Barbados, Bequia, Bermuda, Montserrat, Saba, St. Kitts, St. Lucia, or Sint Maarten, in which non-creolized and/or creolized varieties of English are spoken. Studies of these Euro-based communities tend to focus on phonology and grammar and not on lexicology/lexicography (e.g., Schreier et al. 2010; Williams et al. 2015).

26.4.5 Latin America

English in Latin America has seen rapid spread in the past 20 years. Among the older English settlements in the region, few have developed sustainable communities. Places such as Costa Rica, Panama, Honduras, Nicaragua, and Colombia have English-speaking communities of various sorts, though neither of them is much described.

An example of a settlement that did not achieve their original, English-dominant plans is New Australia in the hinterland of Paraguay. Perez-Inofuentes (2015, pp. 232–233) reports of lexical items in Anglo-Paraguayan English spoken by the descendants of Australian immigrants to New Australia, a settlement that, as of the 1890s, was meant to remain ethnically non-mixed, English-speaking, and "white." After having failed as a settlement, 600 workers shifted over time from English to Guarani (not Spanish), making the settlement "stand [] out as the first known case where a well-organized English-speaking immigrant community [that] shifted from English to an indigenous language" (ibid. 227–228). Accordingly, the English of those maintaining the language is spiked with loan phenomena, such as *montie* "bush, scrub" < Sp. *monte*, *camp* "settlement" (as in Falkland Island English) < Sp. *campo* "field," or *mate cocido* "morning tea" < Guarani (ibid. 232–233). For these small varieties no dictionaries exist.

26.4.6 Isolated Atlantic Locales

There are a handful of inhabited islands in the Atlantic, of which Tristan da Cunha's 250 residents live some 2500 km from any continent in what is called the "most remote" settlement on earth. Tristan was linguistically studied (Schreier 2003), as was St. Helena (Schreier 2008), which is a 1000 km to the northeast of Tristan, and as a UK military base with 4500 inhabitants much bigger. In both studies, though, the lexical element is largely ignored for the benefit of phonology and morphosyntax. English in Latin America has seen rapid spread in the past 20 years. Among the older English settlements in the region, few have developed sustainable communities. The Falkland Islands off the coast of Argentina have remained an English-speaking foothold since the early nineteenth century, renewed in commitment by the 1982 war between the United Kingdom and Argentina. Falkland Island English has British military support, literally, in the sense of Max Weinreich's purported bon mot that a language—here in the sense of language variety—is "a dialect with an army and a navy" (Bright 1997). Dictionaries for these varieties are missing and even word lists and glossaries are a desideratum.

26.4.7 South Pacific

With Tok Pisin, one of the three official languages of Papua New Guinea, we have a former pidgin that has achieved accepted status as a national language. A full dictionary of Tok Pisin, considered an "urgent desideratum" an academic lifetime ago (Görlach 1990, p. 1495), is still missing. However, a bilingual learner dictionary was published (Baing et al. 2008), and crowd-sourced lexicography has filled the void to a degree, as with https://www.tokpisin.info and https://www.tok-pisin.com two dictionaries of Tok Pisin are available. While not following lexicographic standards, as with many less-widely used languages, these dictionaries seem to work in practical terms.

Solomon Pidgin English, also called Pijin, is an English-based creole language that is spoken by about 25 000 native speakers and 300 000 L2 speakers on the Solomon Islands; it is related to Tok Pisin. Jourdan (2001) is a dictionary offering usage information and, fitting with the multilingual tradition, translations into both English and French. Similarly, Bislama—an English-based creole language spoken in the islands state of Vanuatu—is today

an official language. Crowley (1995) is a dictionary of the variety, yet there does not seem to be a full-size print dictionary. There is a bilingual English–Bislama and Bislama–English online dictionary with 6500 lexemes (http://www.bislama.org/bislama-dictionary). It lists words such as *antap* "above," *gato* "cake," or *switblad* "diabetes," and covers quite a range, yet could be lexicographically improved. The kingdom of Tonga does not have dictionaries of Tongan English, yet Besnier (2003) identifies isolated Tongan loanwords and semantic changes in English words in Tongan transsexuals (e.g., *respect*, with a wider semantic range than in the inner circle), who play an important role in the small island nation in regard to English, with English taking on the indexical meanings of "urban," "modern," and also "feminine." In small island contexts, dictionaries are unobtainable, of which Pitcairn, with a declining population of 50 descendants of the 1789 mutineers of the Bounty and their Tahitian mates, is no exception.

By contrast, exciting developments can be seen in the study of Fiji English, which since the 1930s has been used as a language of school instruction and in the 1990s acquired official status in the new constitution (Zipp 2014, p. 115). Since 2006, an 18 000-lexeme *Macquarie Dictionary of English for the Fiji Islands* (Geraghty et al. 2006), which is an inclusive dictionary of medium size, gives lexicographic recognition to the variety, but leaves the number of items marked as "Fiji English" undefined (Schneider 2013, p. 359). Beyond the Fiji context, Biewer (2015) suggests based on comparative data from Samoan English and Cook Island Englishes that New Zealand might have acquired a sphere of linguistic influence in the formation of these standard varieties, though lexical developments remain to be considered.

26.4.8 Australia and New Zealand

A true lexicographical pioneer, Edward Morris wrote the first non-dominant (non-British and non-American) dictionary of English. Morris (1898) was half a century ahead of the trend, beginning with a dictionary of Australian slang Baker (1941) and Baker (1945), which uses in analogy to Mencken (1936) not the word variety in the title, but *language*, in this case, the Australian *language*. The success of the *Macquarie Dictionary* (2017), an inclusive synchronic desk dictionary, which once and for all solidified the concept of Australian English as a standard variety, did therefore not come overnight. The *Australian National Dictionary* (1988) is a historical dictionary in one volume, which was expanded into two volumes recently (Moore et al. 2016). Australian English has its own language history account (Moore 2008) and has started to look into inner-Australian variation. Malcolm (2018) is on Aboriginal English, with titles focusing on the indigenous lexical contributions to Australian English are considerably older (see, e.g., Dixon et al. 1990).

Quite uncharacteristically for a smaller variety next to a bigger one (Australian English), New Zealand English is well-documented. The *Dictionary of New Zealand English* (Orsman 1997) is a one-volume historical dictionary going back to 1951. The first synchronic dictionary of New Zealand English appeared in 1979 and was a mid-sized 400-page title that has over the years been expanded to 1300 pages (Wattie and Orsman 2001). By that time, the variety saw publishing competition on the desk dictionary market (Deverson and Kennedy 2005).

26.4.9 Asia

English in Asia is a highly dynamic field, with considerable differences depending on the region, for example, Singapore versus North Korea (e.g., Hickey 2004). There is India, whose English lexis shows "substantial creativity" (Sailaja 2009, p. 66). The most populous country in the world, China, is a developing English-using country and is expected to influence the functions and uses of Englishes in decisive ways once its population has been sufficiently exposed to the variety. At least 400 million or more Chinese are reported as active learners of

English (e.g., Jenkins 2015, p. 170), which are as many learners in that country alone than there are native speakers of English globally.

A long time ago, Görlach summarized that "As regards to South Asia, no exclusive dictionary appears to be in the planning phase" (Görlach 1990, p. 1490). The situation for India and Pakistan has not improved. This is baffling, as in most outer and expanding circle societies, especially in those that are multilingually diverse, English plays many roles in the daily lives of some of its speakers. With research activity increasing since the 1960s, Indian English has become increasingly viewed not just as external, but as something Indian. Krishnaswamy and Krishnaswamy (2006, p. 168) speak of the "complex multiverse" that India is, a multiverse in which English "has to be used in certain areas" (Krishnaswamy and Krishnaswamy 2006, p. 169).

However, no standard-size dictionary of the variety of some 300 million speakers of Indian English is available today. There are, often outdated, exclusive glossaries of Indian English, for example, the "quite unsatisfactory word-list[s]" (Görlach 1990, p. 1490). Rao (1954) is a monograph-length study of Indian words in English, with a focus on cultural influences. This leaves *Hobson-Jobson*, first edition 1886, by Yule and Burnell (1903), which was written from a colonial-British perspective (Nagle 2010) and smaller 300–400-page titles based on it (e.g., Kurian et al. 2006). The *Hobson-Jobson* is on the English of British soldiers in India and is available in open access at https://dsal.uchicago.edu/dictionaries/hobsonjobson/; reprints are confusingly referred to as a *Dictionary of Indian English*.

Online dictionaries can fill that void to a degree with interesting items, such as, for example, *half ticket* "children's ticket," *miscreant* "troublemaker, petty criminal," *regional aspirations* "local political demands" (see http://www.vsubhash.com/dictionary-of-indian-english.html). Corpus-based studies show clear register tendencies for given features, for example, the use of "Indian words" is highest in conversational English, where "Indian English is a vehicle for Indian culture" (Balasubramanian 2009, p. 126). Similar effects can be expected in Pakistan. In fact, Baumgardner et al. (1993) point to semantic and lexical processes from Urdu, for example, *chamcha* "literally spoon," but used for "sycophant" or *chittar* "literally worn-out footwear" but used to as different entities, from "whip to punish criminals" (pp. 123–124) to "hashish" (p. 126) in Pakistani English.

Southeast Asia is a growth area for English. In the Singaporean English lexicon, the substrate influences of Malay, Hokkien, and other languages are easily noticeable, leading to terms such as *makan* "food, to eat," *bodoh* "stupid," or *ang moh* "Westerner < lit. red hair" (Leimgruber 2013, p. 67). Today it is widely accepted that Singapore Colloquial English (SCE), often referred to as Singlish, and Standard Singapore English (SSE) "are the two main varieties of English spoken in Singapore" (Cavallaro and Ng, quoted in Wong 2014, p. 8). An online dictionary of "Singlish" and Singaporean English is available with some 1900 lexemes in Lee (2004). The example below shows that "can, can" is used for a more emphatic positive response ("thanks"), using reduplication for a wide range of functions (Wee 2003, pp. 106–113):

A: Do you want root beer?
B: Can, can.
(A brings B a root beer.)
B: Thanks, thanks. (Wong 2014, p. 178)

The concept is that Singlish speakers (A) see themselves as collaboratively solving the "problem" of providing the B with a drink. It is clear that such pragmatic phenomena would need to be entered into SCE and SSE dictionaries, respectively.

For some linguists, the Philippines counts as a country that was on the cusp of codifying its variety of English just two generations ago; the OED lists a number of Filipino English terms, for example, *batchmate* "member of the same cohort." There are to date bilingual

Tagalog–English dictionaries, but no dictionary of Filipino English. Such dictionary is more unlikely to come about, with Tagalog having taken on identity-marking functions more recently and some are excessively pessimistic about the role of English in that country:

> The future of English in the Philippines does not look good. It no longer is viewed as a useful tool for socioeconomic advancement except for finding work overseas. All that is keeping English alive in the Philippines is literacy for the professions. (Thompson 2003, p. 365)

The assessment above may seem harsh. Borlongan et al. (2012, p. 70) continue to consider the typical Filipino a trilingual speaker, with Tagalog serving as a national identity marker, and they still see functions for English in intranational communication in the Philippines.

In Korea, the status of Korean English, an EFL variety, or Konglish—often viewed as an intermediate learner form (Hadikin 2014, pp. 8–9)—is to date unclear, with few or no lexical resources available. There are indicators, however, that speakers of Korean English view English for a Korean audience as very different from international English (p. 9). What will be interesting to see is if and to what degree negative perceptions about foreign educators in South Korea and other parts of Northeast Asia—stereotypically being perceived as "inconsiderate" or "ignorant and disrespectful of [Northeast Asian] culture and students" (Hadzantonis 2013, p. 119)—might have an effect of the development of English in the region.

Starting with Bolton (2002), Hong Kong English (HKE) has been explored as an emerging variety. For the past few years, a synchronic *Dictionary of Hong Kong English* has been available (Cumming and Wolf 2011). Wong (2017, p. 112) calculates that about a third of distinct words in HKE derive from Hong Kong/Cantonese customs (e.g., *lei ho ma* "how are you" in Cantonese), another third from colloquial formulaic sequences (e.g., pragmatic markers *ha* or *la*), and a bit more than 15% from "miscellaneous" Cantonese vocabulary items.

English in Japan plays a different role than in other Southeast Asian countries, yet it has a role nonetheless (Stanlaw 2004, p. 286). "Japanese English is English for Japanese purposes" (p. 287), which highlights grammatical correctness much more so than communicative competence; it is not considered a "stable variety" (Schneider 2011, p. 182), and there is no dictionary of Japanese English.

The situation in China may not be utterly unlike the one in Japan, though with a time lag of a few decades. Bolton (2003) is a sociohistorical account on Chinese Englishes, which has since been followed up with a number of studies (e.g., Xu et al. 2017). As in Japan, there is a complex array of attitudes toward learning English, which has drastically increased as a result of China joining the WTA or hosting the 2008 Beijing Olympics. In "China today, English is a means to perform the modern, bilingual, and global identity" (Fong 2017, p. 230). It may not be long before English will be ubiquitous and dominant in a range of roles in China, which would call for a dictionary of its own.

26.4.10 Africa

English has played a role in Africa since colonial times, yet it is perhaps one of the lexicographically most unknown areas with the exception of South Africa. Dictionaries of South African English have existed from the Apartheid era (e.g., Branford 1978), but no exclusive historical dictionary (Silva 1996) was available before the 1990s. The *Dictionary of South African English on Historical Principles* took great care at including loanwords from all 11 official South African languages and beyond, including the Indian, Khoisan, Nguni, Sotho, Malayo-Indonesian languages, as well as Dutch/Afrikaans. Mesthrie (2010) is more recent a more comprehensive inclusive mid-size dictionary edited by a variationist linguist (a rarity).

The *Dictionary of West African English* was considered "dormant for a few years" in the 1980s (Görlach 1990, p. 1491); today it is still somehow in the works (Wolf 2017), but it has

been outpaced by online dictionaries resembling glossaries in select West African nations. There is a Ghanaian English dictionary of exemplary quality (https://rogerblench.info/Language/English/Ghana%20English%20dictionary.pdf), as is *A Dictionary for Nigerian English* by Roger Blench in a 2005 "draft for circulation" (https://rogerblench.info/Language/English/Nigerian%20English%20Dictionary.pdf), focusing more on acrolectal Nigerian English, leaving aside Nigerian Pidgin English. It includes terms such as *heavy* "pregnant," *join* "to get on board a vehicle [taxi, etc.]," for example, *Where will you join taxi?*, or *moto* "car."

The situation in East Africa is much less-documented, although a number of empirical foundational studies exist. For Kenya, Skandera (2003) is perhaps one of the most readily available studies of lexis, with special emphasis of Kenyan English idioms. Atichi (2004) is interesting student work in empirical semantics in Kenyan English. A problem is that linguistic awareness of local features and nativization in English is still negligible, though it seems to have been changing recently. In Tanzania, the generation of the 14–18-year-olds see English much more as a unifying factor in their country than those in their 30s and 40s (Hillberg 2016, Figure 13).

26.4.11 Europe

Today we have studies of English as used in the expanding circle in Europe, such as Edwards (2016) on English in the Netherlands or Smit (2010) for Austria. These studies, however, generally focus on non-lexical phenomena and are conducted in the framework of English as a lingua franca. Special mention should be made of English loanwords in European languages, a phenomenon that has been studied—often with an exhortative or worrisome slant—for more than a century. Görlach (2003) offers unique quantitative data, an assessment methodology, and a comparative approach of English loanwords in Germanic, Romance, Slavic, and non-Indo-European languages. *A Dictionary of English in Europe* (Görlach 2001) documents 3800 English loanwords in European languages before 1995, listing, among others, words that look English but are not, for example, *handy* (German for mobile telephone), *dressman* (German for a male fashion model), *tennisman* (French for a tennis player), or *dress* (German for soccer uniform).

26.5 Learner Englishes: Dictionary Innovations

The most profound innovation in learner dictionaries of English came from a non-L1-speaking context of Japan. A. S. Hornby revolutionized the field when working at the Tokyo Institute for Research in English Teaching from 1924. Until then, dictionaries for learners were modeled closely on L1 lexicography that was toned down in scope but much less so in content. For Hornby and his associates, learner needs were central, not just an afterthought. Together with Michael West and others, Hornby established the *General Service List* first in 1936, the most important 2000 words for the learner of English (see West 1953), with the goal of maximum comprehension.

26.5.1 MELDs and BELDs

A key distinction in learner circles concerns the use of monolingual and bilingual dictionaries. There are monolingual English learner dictionaries (MELDs) and bilingual English learner dictionaries (BELDs), the latter of English and another language, either in one direction, the other direction, or bidirectionally.

While BELDs provide synonyms and near-synonyms in another language, for example, for *bank account* in an English—German BELD: *Bankkonto* (f.), Finnish: *pankkitili*, or Welsh: *cyfrif banc*—MELDs offer explanations in English only. MELDs limit themselves to a core vocabulary between 2000 and 3500 words to define all lexemes. The examples in Figure 26.3 illustrate the difference between an inclusive synchronic monolingual dictionary, such as the *Merriam-Webster Abridged* (bottom), and MELDs, in this case the *Oxford Advanced Learner's Dictionary* (OALD, top). As can be seen, Merriam-Webster uses a term from the headword to explain the concept (*account*) and more complicated terms such as *deposit*, *equivalent* or *subject to*, and *withdrawal*, which often cause the learner to look up one or more words to decipher the original definition, a frustrating enterprise that does not always lead to success. MELDs, Figure 26.3 above, use restricted vocabularies, such as the General Service List (West 1953) or the New General Service List (2800 words, based on the idea that these terms are needed to render and received "general services," e.g., shopping, greetings, etc. See https://www.newgeneralservicelist.org).

26.5.2 *Oxford Advanced Learner's Dictionary [of Current English]*

The OALD was first published in 1948 by A. S. Hornby, E. V. Gatenby, and H. Wakefield under the title *Idiomatic and Syntactic English Dictionary*. OALD established the current model of learner dictionaries (today available in 9th edition from 2015). A new edition, substantially revised, has been published every 5 years since 1995, which shows the increased need for updated learner dictionaries and market demand.

26.5.3 *The Six Mighty MELDs*

Today, there are six major MELDs, which are "often referred to as the Big Six: *Cambridge Advanced Learner's Dictionary* (*CALD*), *Collins COBUILD* (*COBUILD*), *Longman Dictionary of Contemporary English* (*LDOCE*), *Macmillan English Dictionary* (*MED*), *Merriam-Webster*

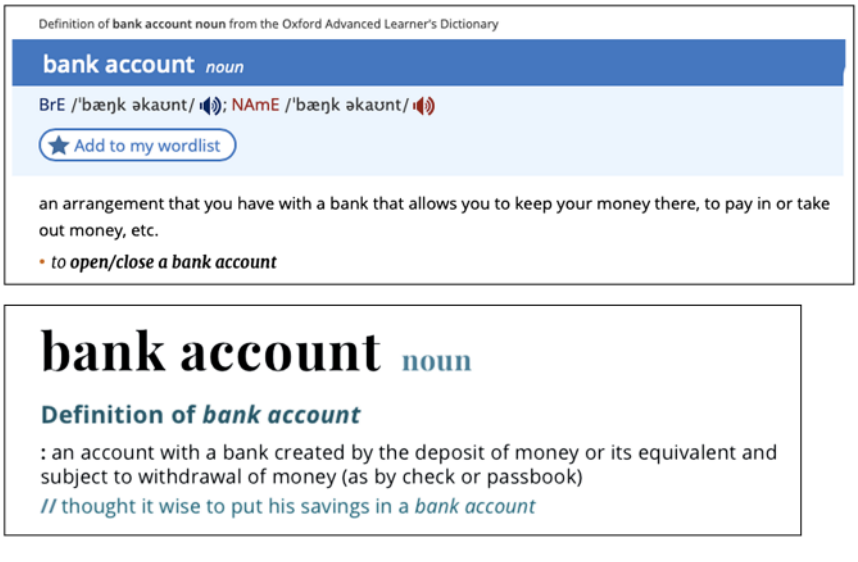

Figure 26.3 Entry for *bank account* in merriam-webster.com (above) and OALD (below), May 25, 2019. Dictionary.com, LLC.

Learner's Dictionary (*MWLD*), and *Oxford Advanced Learner's Dictionary* (*OALD*)" (Miller 2017, p. 354). While these dictionaries all began as hardcopy-only titles, around the year 2000 they were sold with a complementary CD-ROMs and have since transitioned to online delivery. Recently, all Big Six learner dictionaries "are now freely available online" (ibid) and one "major publisher (Macmillan) is now publishing its learner's dictionary only online, with no further paper copies" (ibid). In practice, OALD and LDOCE have probably had the biggest market shares, from which COBUILD and CALD could take away from, with MWLD and MED being relative newcomers. As this list of six shows, the learner market is economically a heavily contested area, an area that has on the lexicographical and linguistic levels been the main driving force in a field that has otherwise not been known for its bold innovations.

26.5.4 American Innovations

Partly a result of the hiatus of the OED between 1933 and 1957 (Brewer 2007), American dictionaries were drivers of innovation in the immediate post-WWII period. The American publishing houses perfected the method of citation collection and documentation in the paper file format and experimented with the design and layout of book publishing in the pre-digital age. With a large population eager to buy dictionaries, growing revenues allowed American publishing houses to invest in lexicography. One conceptual American innovation was the "grading" of dictionaries, by which we understand the adaptation in scope and defining style to different school grades. Graded dictionaries have been a landmark feature since the late nineteenth century, for example, the *Winston* dictionaries (Brown and Alexander 1937). Thorndike and Barnhart (1952a, 1952b) were published in a series designed along pedagogical principles that were based on a mathematical approach to the sizes of fascicles in each dictionary. These dictionaries sold well in the United States and they became the base for the series entitled "Dictionary of Canadian English," published by Gage Ltd. as of 1962 (Gregg 1993). The developments of the "abridged" dictionary, that is, a concise dictionary based on a "very large" one, and the related American *College Dictionaries*, which became bestsellers in their own right from the 1950s to the 1990s, year after year, in tens of thousands of copies, were the cash cows of the industry.

26.6 English as a Lingua Franca: Lexicographical Challenges

English as a lingua franca (ELF) has been researched extensively since the late 1990s. ELF is defined as conversations and exchanges *between users who do not share a first language and for whom English is the medium of choice and often the only shared language* (Seidlhofer 2011). With a ratio of non-native speakers of reasonable competence and native speakers of about 6:1 today (extrapolated from David Crystal, Dollinger 2019, p. 247, fn21), this variety represents one of the most dynamic fields in English linguistics today.

In terms of lexicography, ELF is confronted with additional challenges. ELF questions a number of key concepts in linguistics and applied linguistics today. First, the idea of the speech community, originally conceived as a locally and territorially defined one, becomes adapted in a global ELF community that is not defined by any territory. Second, the idea of competence is in need of revision, as the concept of the native speaker is rejected as an unnecessary black box that buries a lot of variation and variability in competence behind a label, which, ultimately, has a deterministic outlook (see Jenkins 2000).

26.6.1 Word-Formation and ELF

A lot of work has focused on the pragmatics, the negotiation of meaning in the moment in ELF encounters. This work has led to the conclusion that ELF cannot be defined by the feature-driven approach that is typical in World Englishes, as more variability is inherent in the notion of ELF than in any of Kachru's circle Englishes. The concept of ELF is more process-oriented than feature-oriented, while tendencies for feature principles exist. In terms of lexis, some work has focused on word-formation, other on loanwords, loan-renditions, and loan translations (calques), which are key ingredients in ELF conversations. In terms of word-formation, Pitzl et al. (2008) have shown that the same processes apply in ELF as in L1 Englishes, yet their distribution varies (cf. Plag 2003, for L1). Words such as *pronunciate*, *emaninate*, *financiate*, all attested in ELF conversations, are not treated as errors, but as "overt/emphatic" forms in ELF that L1 Englishes are devoid of (Seidlhofer 2011, Kindle edition, section 5.2). Use such as this would, with rules rooted in pragmatics rather than in grammar, need to be documented in ELF dictionaries as productive verb markers of emphasis.

26.6.2 Real-Time Processing and Dictionaries

ELF offers important lessons to linguists taking pride in studying the language as it is spoken by a particular group or speech community. Seidlhofer (2007) points out that if the descriptive axiom is taken seriously, ELF, as the most widely spoken variety in the world, would need to be given precedence. In terms of open class lexis, ELF uses a lot of ad-hoc loanwords and creations that are not arbitrary, but rule-governed and nonetheless variable. These include, on various levels of competence and depending on the L1 backgrounds of a given speaker or speaker pairing, *handy* ("cell phone," German L1 speaker), *decreet* ("decree" Dutch L1 speaker), *pre-thesis* ("qualifying paper before M.A. thesis," Dutch L1 speaker), or *zivildienst* ("non-violent service in lieu of mandatory military service," Austrian German L1 speaker).

Which of these should be entered in an ELF dictionary for, say, the European context? Following Searle, Seidlhofer takes recourse to a distinction between *constitutive rules* and *regulative conventions*. Constitutive rules are rules that make a language. So, if ELF uses a word-formation pattern of *-ate* to mark some verbs in L1 Englishes, for example, *dominate*, but not others, for example, *pronounce*, we may say that *-ate* is part of the regulative rule set of Englishes. The application and blocking of *-ate* in some verbs are regulative conventions that are solved differently in various varieties, African American Vernacular English (AAVE), Canadian English, and ELF. In other words, inner circle L1 *pronounce* and *dominate*, but ELF *pronunciate* and *dominate* alike are a matter of merely flavor, not systemic substance. This principle would allow for the documentation of constitutive and regulative rules alike in dictionaries, which would imply, however, that any ELF lexicographer would have to have a clear principle to tell one from the other, as native-speaker intuition would not be a suitable tool for editorial decisions.

26.7 State of the Art and Avenues Forward

Görlach charted the constraints and problems of documenting English globally, concluding a generation ago that his account "will have made clear that a great amount of research needs to be done before the lexical evidence is available that could satisfy the linguist" (Görlach 1990, p. 1479). In some areas, we have moved along the desired path, for example, OED-3, DARE, DCHP-2, the Scottish dictionaries, and some projects in Southeast Asia (Hong Kong) and, above all, New Zealand. In other areas, we have stalled, for example, there still is no sizeable Indian English dictionary and no large Irish English dictionary, let alone dictionaries of some early postcolonial varieties, such as Barbadian English, yet there is now Winer (2009).

With the noticeable dissociation of lexicography from the linguistics of English, both disciplines stand to lose. This is because without linguistics input, the discipline of lexicography can easily drift off into the compilation of lists; conversely, without an appreciation and consideration of the rich lexical components in language, any description of language will be, if not outright misleading, incomplete and unbalanced. A state of separation from lexicography is discernible in writings on World Englishes and lesser-known Englishes today, which are invested in phonology, morphosyntax, and pragmatics, usually without mentioning lexis, relegating dictionary making often to the hobbyist not the language professional. With new domains such as ELF or learner lexicography posing their own challenging questions, we stand at a crossroads today: how can lexicography—beyond any lighthouse projects—be made more central for the study of English varieties?

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Section 5: Discourse, Styles, and Usage

27 Speaking and Writing English

JIM MILLER AND ANDREEA S. CALUDE

27.1 Introduction

The study of spoken English is exciting, challenging, and controversial: exciting, because new and unexpected constructions keep turning up; challenging, because some syntactic constructions of spoken language resist analysis; controversial, because not all researchers recognize the study of spoken language as legitimate, far less its results. The very title of this chapter is controversial, since spoken language *tout court* does not differ from written language and analysts recognize genres or dimensions applying to both speech and writing (see Section 27.5). Nonetheless, spontaneous spoken language (Miller Weinert 1998) or conversation (Greenbaum and Nelson 1995a) is very different from other genres and that is the focus of this chapter.

The contrast between spoken and written language has long interested linguists, particularly linguists of the Prague School, who from the 1930s onwards have investigated the characteristics and functions of speech and writing. Teachers of English as a second language have always been aware that learners do not learn to *speak* like natives by reading books. Scholars pondering the relationship between language and society (including literacy) have to deal with spoken and written language. In societies with a standard and non-standard language, typically only the standard has an elaborated written variety; a central issue is the effect of written language on the spontaneous speech of individuals with long exposure to formal education.

Despite the interest, it is only in the past 30 years that the detailed and accurate study of spoken language has become possible through new technology: genuinely portable cassette recorders, small but high-fidelity microphones, foot controls enabling the analyst to listen many times to particular portions of a recording. Thanks to computers and concordance programs, analysts can quickly and accurately retrieve data from digitized transcriptions. Interestingly, much of the detailed work on spoken language has been done by investigators of non-standard varieties; little microanalysis has been carried out on spoken standard English in the United Kingdom, and what counts as spoken standard English is not clear (see Section 27.7).

Spoken language is more fundamental than written language; it appeared before written language in the general evolution of human beings; children acquire it before they learn to read and write, and all the societies with a known history had spoken language before they had writing. What is coming out of current and ongoing research with modern technology is that spontaneous spoken language is far more different from (formal) written language than had been suspected and every area of language is affected—morphology, phrase and clause syntax, and the organization of discourse.

The Handbook of English Linguistics, Second Edition. Edited by Bas Aarts, April McMahon, and Lars Hinrichs.

27.2 Content of the Chapter

Since most published work on English deals with the written language, this chapter takes the structures and functions of written English merely as a point of orientation and focuses on spontaneous or unplanned spoken English. Section 27.3 outlines the dimensions established by Biber which demonstrate that there is no boundary dividing all spoken language from all written language. It points out that, Biber notwithstanding, unplanned speech is a distinctive genre. Section 27.4 demonstrates the different typical constructions of spoken and written English, drawing on the quantitative analyses in Biber et al. (1999), Bowie and Aarts (2006), Calude (2008), D'Arcy (2014), Greenbaum and Nelson (1995b), Guz (2015), Kaltenböck (2005), Macaulay (1991), Miller and Weinert (1998), and Thompson (1988). Section 27.5 deals with objections to any analysis of unplanned speech. Sections 27.6.1 and 27.6.2 cover two general properties of unplanned speech, the irrelevance of the sentence and unintegrated syntax, while Section 27.6.3 sketches the salient features of discourse organization in unplanned speech. Section 27.7 briefly discusses major problems emerging from recent work on unplanned speech: which constructions are non-standard and the fact that some constructions require different analyses in unplanned speech and planned writing. The conclusion in Section 27.8 lists areas of research for which the study of unplanned speech has important implications.

27.3 Genres and Dimensions

It is essential to begin by making clear what data are under analysis. The central fact is that there is no single boundary dividing all spoken texts from all written texts. Different genres must be recognized, such as conversation, news broadcasts, conversation, and academic texts as used by Biber et al. (1999). There is space here to discuss only one recent and important development in the study of genres. Abandoning the usual genres, Biber (1988) established six dimensions cutting across speech and writing, and six sets of properties correlating positively or negatively with certain major properties of texts and their producers. For example, Dimension 1 has to do with involved versus informational production, that is, whether the text-producer is participating in face-to-face conversation with instant online production or writing carefully edited texts conveying carefully organized information; Dimension 3 has to do with explicit versus situation-dependent reference, that is, with whether the text-producer is setting out all the information in detail or leaving the listener/reader to fill in details from context.

Grammatical properties that correlate positively with Dimension 1 are, in descending order of weighting, adverbial clauses of reason and cause (*Do you know the way there cos I do*), propositional relative clauses (*Julia has resigned, which I think is unwarranted*), and adverbial clauses of condition and Wh-complements (*I believed what she told me*). Grammatical properties that correlate negatively, that is, which are not found in unplanned speech, are prepositional phrases, attributive adjectives, past participial phrases, and present participial phrases. The positive correlations match the number and type of adverbial clauses found by Miller and Weinert and the occurrence of complement clauses; the negative correlations match the types of noun phrases (NPs) listed in Table 27.1. Biber (1988, pp. 104–108) interprets the properties as reflecting the strategies adopted by speakers conveying a lot of information in unplanned speech: speakers avoid compressed, highly integrated structures, such as participial phrases, which are cognitively expensive.

Grammatical properties correlating positively with Dimension 3 are Wh-relative clauses in object positions (*the house which we have bought*), relative clauses introduced by preposition + Wh (*the house in which we are going to live*), Wh-relative clauses in subject position (*the people who sold us the house removed all the light fittings*), phrasal coordination

Table 27.1 Noun phrases in different types of text.

	Adjective + noun	*Noun + prepositional phrase*	*Noun + relative clause*	*Complex noun phrase*
	% of noun phrases belonging to each type			
Conversation (Miller and Weinert)	5.6 *a big adventure*	6.6 *the book on the table*	3.2 *the book that I liked*	0 *a new proposal from the agency which is likely to be rejected*
Letters to newspaper	19.7	18.8	3	3 *a rigorous and valid examination on applied economics that consists of three papers*

(*Sue and Sheena*, as opposed to *Sue bought a car and Sheena sold her motorbike*, which is an example of clause coordination), and nominalizations, that is, words ending in *-ity*, *-ment*, *-ness*, and *-tion*. Biber interprets these properties as reflecting referential explicitness, which is typically connected with precise writing but also with prepared spoken texts such as lectures and speeches.

In spite of the complexities outlined above, researchers continue to find spontaneous or unplanned speech very different from other types of text. Picking up the key points made above, however, we recognize that the key distinction is not speech versus writing but planned versus unplanned production of speech and writing. Planned production includes speech based on writing, such as lecturing, giving a sermon, and delivering a prepared speech. Unplanned production includes conversation, extempore narration, and impromptu discussion, but also writing activities such as composing personal e-mails or personal letters. Some speech production is semi-planned; for example, speakers narrating events which they have described previously and for which they have in memory ready-made phrases and clauses.

Unplanned spoken language has essential properties which determine certain characteristics of spoken texts. Spontaneous speech

i. is produced in real time with little or no planning and editing (many written texts are planned and edited);
ii. is subject to the limitations of short-term memory;
iii. is typically produced by people talking face to face;
iv. involves the use of pitch, amplitude, rhythm, and voice-quality;
v. is accompanied by gestures, eye-gaze, facial expressions, and body postures, all of which signal information.

The above properties engender certain linguistic properties:

a. A small quantity of information is assigned to each phrase and clause.
b. Speakers do embed clauses inside other clauses, but a typical pattern is one in which clauses are merely adjacent.
c. The syntax is less integrated than the syntax of planned writing.
d. Phrases contain fewer words and clauses contain fewer phrases.
e. The range of vocabulary, particularly Greco-Latinate, is less than in planned writing.

In addition:

f. Constructions occur in unplanned speech which are not used in writing, and vice-versa.
g. The organization of discourse involves a number of devices that are absent or infrequent in writing.

27.4 Differences Between Spontaneous Speech and Writing

This section discusses the general grammatical properties that distinguish unplanned speech from other types of text. The following sections look at particular properties, the abandonment of sentences, and the unintegrated syntax of unplanned speech.

27.4.1 Settings, Topics, and Informants

Consider (1) and (2).

(1) New York's **an incredible place** we went through the Bowery … and we had to keep the windows locked through there but it's **an incredible city** it's **mind-boggling** and the negroes are **fantastic** the clothes they wear they are **so magnificently turned out** flamboyancy that they just seem to carry off I was very impressed with the way that they dressed … it's **a marvelous city**.
(2) However defective our knowledge may be, we have ample evidence to show that great empires rose and fell in India, and that, as in religion, art, literature and social life, so in political organization, India produced her own system, distinctive in its strength and weakness.

(1) and (2) illustrate some of the differences between unplanned speech and planned writing. (1) is a narrative from spontaneous conversation and (2) is from Basham's *The Wonder That Was India*. (1) consists of a series of short main clauses. There is one subordinate clause, a contact relative clause, in the noun phrase *the way that they dressed*. Its structure is simple, a pronoun subject and an intransitive verb. The noun phrases are simple too; mostly pronouns or article + noun, and two with an adjective, *incredible*. There is a complex noun phrase, *flamboyancy that they just seem to carry off*, but it stands on its own and is not part of a clause.

(2) is typical of planned writing. It has three subordinate clauses—*however … may be*, *that great … India*, *that … weakness*—and a main clause, *we have … weakness*. In the first subordinate clause, the complement of *be*, *however defective*, is untypical of speech, where we would expect *no matter how defective*. The third subordinate clause contains a complex correlative construction, *as … life*, *so … organization*, quite untypical of planned speech, never mind unplanned. The passage contains a very complex noun phrase—*her own system*, *distinctive … weakness*, a type unknown in unplanned speech.

Are the differences between these texts typical of the differences between unplanned speech and writing? Early investigations produced different answers. Some analysts reported that spoken discourse had significantly more subordination, elaboration of syntax, and adverbs. Others reported that written narratives contained more subordinate constructions than spoken narratives but fewer coordinate constructions. Halliday (1989, pp. 76–91) proposed that written language has compact but simple syntax loaded with lexical items, whereas spoken language has intricate syntactic structure with many subordinate clauses but a small number of lexical items per clause. This structural difference stems, at least in

part, because while "the written sentence knows where it's going when it starts, the spoken clause complex does not" (Halliday 2016, p. 16).

Beaman (1984, pp. 76–91) resolved the contradictions by suggesting that the different results reflected differences in formality (setting, topic, and participants). These indeed seem to be part of the answer. One study concluding that spoken language has complex syntax was based on interviews with university students about school and university and essays about the students' life-plans. In the interactions, figures of authority, academics, interviewed people of junior status, students, in an institutional setting. They focused on one topic and invited narrative monologues from the students. These are ideal conditions for complex syntax because narrators have the floor in a formal setting and can concentrate on the narrative without interruptions.

Another factor is amount of exposure to formal written texts. The people with most exposure to writing experiences are typically (but not necessarily) those with the longest exposure to formal education; significantly, the abovementioned study analyzed the language of speakers who had successfully undergone a long process of formal education to reach university. Halliday's (1989) examples of speech have complex syntax and vocabulary and sound very typical of speakers in command of written English (see Miller and Weinert 1998, pp. 18–20) Unfortunately, samples of speakers have usually been organized with respect to gender, age, and social class, but not length and type of formal education or reading habits. The problem may be potentially alleviated by taking into account speakers' occupation, as can be done with data from the Spoken BNC2014 corpus (Love et al. 2017), see, for instance, recent research using these data in the *International Journal of Corpus Linguistics* (volume 22, issue 3), including differences in demonstrative cleft use across speaker occupation (Calude 2017). But the main issues of reading habits and the effect of education still stand because people's occupations do not always reflect their education background perfectly.

A third factor is experience of unplanned speaking in formal situations. Consider the use of propositional relative clauses such as *The noise went on all night, which we thought outrageous*. Millard (2003), analyzing transcripts of radio discussions and phone-in programs, found that presenters and regular members of discussion panels produced ten such relative clauses, but that non-regular members produced none. Miller and Weinert (1989) found none, nor did they find non-restrictive relative clauses such as *the girl, who acted very courageously, was praised by the police*. In Millard's data, non-restrictive relative clauses were produced by regular speakers and presenters. Finegan and Biber (1994, pp. 337–338) sum up the view adopted here: speakers who engage in literate activities more often tend to use complex "literate" syntax and vocabulary more often in unplanned speech, and vice versa for speakers who do not engage often in literate activities.

27.4.2 Morphology

Derivational morphology is of direct relevance to the issue of planned and unplanned speech. English has a very large stock of lexical items built from Greco-Latinate roots which occur more frequently in planned texts, especially formal written texts but also in speeches, news broadcasts, and academic discourse. They are much less frequent in unplanned speech. Even Biber, working on conversations involving middle-class, middle-aged, university-educated males (1986, p. 389 n. 4), found that abstract nouns ending in *tion*, *-ity* were relatively infrequent. Similarly, in a different corpus of speech from a wider sample of speakers, Biber et al. (1999) found that in conversation *-tion* occurred around 500 times per million words; the others occurred less frequently. *-tion* was three times as frequent in fiction, nine times as frequent in news broadcasts, and 18 times as frequent in academic texts. *-ity* was twice as frequent in fiction, six times as frequent in news broadcasts, and ten times as frequent in academic prose. A similar pattern held for compound nouns. D'Arcy (2014) found that

disyllabic adjectives which show consistent variation between synthetic and analytic patterns (*happier* vs. *more happy*) in various varieties of written English are simply absent from spoken vernacular (NZ) English because the kinds of adjectives likely to exhibit this type of variation are simply not used in the vernacular.

27.4.3 Syntax

Many syntactic constructions are used both in speech and writing but there are significant differences. There are constructions typical of speech but not writing and excluded from copyedited written text. The constructions that occur in both speech and writing often differ in complexity, frequency of occurrence, function, and position. The most controversial question is whether spontaneous speech can be analyzed as having sentences. This is discussed in Section 27.5.

27.4.3.1 Noun Phrases

Judgments of complexity are based on two properties: the number of words in a phrase and phrases in a clause, and the depth of embedding. Noun phrases provide good illustrations. Miller and Weinert (1998, p. 146) found that, in a monologue sample, 50% of the noun phrases consisted of a pronoun and other 7% consisted of a single non-pronominal word. When NPs consisting only of a numeral (*give me two please*) or a quantifier (*I'd like more*) were counted, the percentage of one-word NPs rose to 64. Few NPs contained other constituents, as shown in Table 27.1. Note the different percentages found in letters to a quality newspaper (Miller and Weinert 1998, p. 154).

Counting types of NPs is not sufficient, where they occur in clauses is also important. The main tendency is clear: in subject position, speakers use simple NPs. In Thompson's (1988) data, the subject NPs of transitive clauses did not have adjectives, although some subject NPs of intransitive clauses did. Likewise, in the monologue analyzed by Miller and Weinert, no adjectives occurred in subject NPs. This pattern accords with the findings of Crystal (1979, p. 164) working on conversations in the Survey of English Usage (later the London-Lund Corpus). He found that 77% of the clauses had as subject a pronoun or an empty word such as *it* and *there*. The pattern is confirmed in Biber et al. (1999, pp. 235–237). Aarts and Wallis (2014) also find that noun complexity is reduced in spoken language, but their results point to another crucial factor in this equation: the genre of speech investigated. Some speech genres, private dialogue genres in particular, show greater similarity to the conversation data analyzed by Miller and Weinert (1998) than others.

Schilk and Schaub (2016) investigate different types of noun phrase patterns across four different text types (academic written prose in the humanities, social letters, unscripted speeches, and conversation) in five regional English varieties using the International Corpus of English (ICE) Corpora (ICE-Canada, ICE-Hong Kong, ICE-India, ICE-Jamaica, and ICE-Singapore). They build regression models to test various predictors of noun phrase complexity; where complexity is gradient and defined on a four-tiered scale. They find that conversation transcripts involve noun phrases with the lowest complexity, followed by interactional written texts (social letters), followed by unscripted speeches, and, finally, by academic texts. Their results point to informational content as being another dimension to structural considerations, rather than a strict spoken/written distinction.

27.4.3.2 Clause Constructions

Certain clause constructions are quite untypical of spontaneous speech and do not occur in the data of Miller and Weinert. Examples are shown in Table 27.2.

Table 27.2 Constructions typical of writing and not attested in the spontaneous spoken data of Miller and Weinert.

Type of construction	
Gapping	Jim washed, and Margaret dried, the dishes
Accusative and infinitive	We consider her to be the best candidate
Possessive gerund	His having resigned before he even took up the post astonished everyone
Free participle	Browsing in the bookshop, I came across a book on Peter the Great
Participial phrase	The book rejected by the publisher, the plane sitting on the runway at Heathrow
Infinitive as clause subject	To see Naples and die would be pretty stupid
Gerund as clause subject	Skiing in summer is difficult

Table 27.3 Types of relative clauses in a sample of the spontaneous spoken data of Miller and Weinert.

Type of relative clause	*Number*	*Example*
Wh	0	the book which we gave her the girl who phoned
Th	35	the house that they bought the student that complained
Contact	37	the house they bought the town they live in
Non-restrictive	0	We met her brother, who plays golf. [She has only one brother. Incidentally, he plays golf.] (Compare the restrictive relative clause, We met her brother who plays golf. [She has several brothers; we met the golf-playing one.])
Whom, whose	0	the lawyer whom we know the friend whose car we bought

Gerunds and infinitives occurred but only very simple ones: *I like skiing* and *I love to go skiing*. Biber et al. (1999, p. 754) found that infinitives and gerunds are relatively rare in conversation and most common in fiction, followed by news broadcasts and academic prose.

Other constructions, such as relative clauses, occur in speech and writing but with different frequencies and in partly different forms, as shown in Table 27.3.

Macaulay (1991, p. 64) comments that in his middle-class interviews 20% of the relative clauses are non-restrictive, but only 5% in the working-class interviews. (Non-restrictive relative clauses are typical of planned writing and there is some connection between social class and length of formal education.) Biber et al. (1999, p. 610) found that contact relative clauses were proportionately most common in conversation. Biber et al. found a miniscule number of relative clauses with *whom* and even fewer with *whose*. Other differences concern the use of shadow or resumptive pronouns and the occurrence of subject gaps. These are discussed in Section 27.6 below.

Table 27.4 Percentage of finite subordinate clauses in different text-types.

Conversation	*Fiction*	*Quality newspaper*	*Semi-academic journal*
25	26	41	45

Source: From Miller and Weinert (1998).

Table 27.5 Number of finite adverbial clauses per million words.

Conversation	*Fiction*	*News*	*Academic prose*
11 000	10 500	7500	6300

Source: Biber et al. 1999.

Miller and Weinert (1998, p. 93) found more complement clauses than relative clauses in their conversational data. Sixty-six percent of the former were contact complement clauses. Biber et al. (1999) do not provide directly comparable figures but they do comment that post-predicate *that* clauses are particularly common in conversation (*It is essential that this is done immediately* as opposed to *That this be done immediately is essential*). Examples such as the latter are also absent from the conversational data of Miller and Weinert. The ratios of finite subordinate clauses to the total number of finite clauses in samples of speech and writing show interesting patterns. See Table 27.4.

Finite adverbial clauses present a complex pattern. Thompson (1985) carried out a study of finite and non-finite adverbial clauses and non-restrictive relative clauses in databases of informal speech, informal writing, and formal writing. (Both types of clause are peripheral, i.e., not embedded in other constituents but are loosely attached to their host clause.) Thompson found that informal speech had the highest proportion of finite adverbial clauses. Greenbaum and Nelson (1995b, p. 186) found a lower percentage of finite adverbial clauses in spoken English, a higher percentage in informal written texts, and the highest in formal written texts, but whereas they analyzed monologues, broadcast discussions, and conversation, Thompson confined herself to monologues. Biber et al. (1999, p. 826) also found that finite adverbial clauses were (marginally) more frequent in conversation. See Table 27.5.

Looking at different types of adverbial clauses, they found that in conversation the most frequent types of finite adverbial clauses were condition, reason/cause, and time in decreasing order of frequency; Miller and Weinert (1998, p. 93) found the same types but in reverse order of frequency. Clauses of concession, result, purpose, and manner are much less frequent in the data of Biber et al., (1999) and Miller and Weinert found no adverbial clauses of concession at all.

Even within what looks to be the same construction type, there may be subtle differences in use across speech and writing genres. Kaltenböck (2005) analyzed *it*-extraposed constructions and found that these exhibit two rather distinct types: (1) the more prototypical type involving GIVEN-then-NEW information structuring, in which the extraposed clause encodes NEW information, and (2) a less prototypical type of *it*-extraposition, in which the extraposed clause is GIVEN rendering the information flow in the construction as NEW-then-GIVEN. It is the latter and less prototypical type of *it*-extraposition that Kaltenböck finds in spoken language, with the former and more prototypical type occurring in writing. The two construction sub-types also have distinct functions; the construction in speech favors urgency-first, whereas the written language type follows the end-weight principle, structuring information favoring the ease of cognitive pressures.

27.5 Can Unplanned Speech be Analyzed?

In spite of the word, phrase, and clause constructions described above, the study of unplanned speech is not uncontroversial. The very possibility of studying spoken language has been called into question. Huddleston and Pullum (2002, pp. 11–12)—henceforth H&P—invoke the many disfluencies in conversation. By contrast, Labov (1972 p. 203) described as myth the ungrammaticality of everyday speech, also reiterated up by Halliday (2016, p. 13). Labov had to edit only 10% of the utterances produced by his sample of non-academic speakers discussing familiar subjects, which matches the experience of Miller and Weinert (1998, p. 383) with their conversation data. Academics discussing complex topics in complex language produce far more disfluent utterances.

H&P worry that word sequences resulting from slips might be wrongly taken to represent grammatical facts and that actual utterances reflect only imperfectly "the system that defines the spoken version of the language." This worry is met by the rules of fieldwork. Single examples are treated with caution until the analyst collects more examples and checks the data against the findings of other analysts (see the salutary lesson of *sat* and *stood* in Section 27.7.1). A final check is whether a construction occurs in writing that is unplanned because it is produced within strict time limits or is very informal, for example, personal letters, e-mails, and even newspaper reports and articles, which are produced to deadlines and without the rigorous sub-editing of pre-computer days. Many constructions begin life confined to spoken language but make their way into writing, particularly texts that are not subject to the scrutiny of teachers and publishers' editors. As an example, H&P (2002, p. 1069) say that the example *It is unreasonable what she suggests* is incorrect, but the authors have noted the same construction, as in *It's unfair what they're doing to the union*, in conversation, radio discussions, and examination scripts. Copy-editors would exclude it, but in speech it is very common. Because spoken language is not "self-conscious" or "self-monitored" (Halliday 2016, p. 12), it enables the potential for innovation to flourish, making it an ideal place to look at where language change is going.

Halliday (1989) observes that the production of written language also presents disfluencies—restarts, repetitions, and anacolutha. Editorial tidying-up removes them, but they can be seen in, for example, handwritten personal letters and examination scripts. Analysts of written language also have to deal with unique examples, particularly of lexical items; they ensure the item is clearly labeled with its technical term, *hapax legomenon*. One-off syntactic structures are relegated to footnotes in reference grammars or annotated editions of literary texts.

27.6 General Syntactic and Discourse Properties of Unplanned Speech

27.6.1 Sentences and Clauses

Sentences are the traditional basic unit of syntax. Many analysts propose to keep sentences not only for the analysis of written language but to analyze spoken language as consisting of clauses and combinations of clauses, or "clause clusters," to use the term introduced by Halliday (1989).

There are three major reasons why sentences are not suited to the analysis of spoken language. One is that speakers do not share intuitions about what counts as sentences in spoken language. Wackernagel-Jolles (1971) found that senior undergraduate students listening to a recording and provided with an unpunctuated transcript of the words did not agree on sentence boundaries; for one narrative they agreed that 29 sentences were possible but agreed on final boundaries for only six.

Another is that there are no reliable criteria for recognizing sentences. Speakers do not always pause between one putative sentence and the next, and intonation contours may include more than one main clause. Finally, speakers typically produce loosely connected phrases and clauses unlike the neat hierarchical structures associated with formal written language and courses in syntax. Indeed, utterances may consist of fragments of clauses but be perfectly interpretable; they belong to a particular text and context which support the interpretation.

Miller and Weinert (1998, chapter 2) observe that what counts as a text sentence varies from one language culture to another and has varied from one century to another in English. They point out that text sentences do not correspond neatly to the system sentences of linguists, system sentences being units within which analysts can handle constituent structure and dependency relations. In any case, the traditional tests for constituent structure apply inside single clauses, and while a few dependency relations cross clause boundaries, the densest networks of dependency relations occur within single clauses. The abandonment of the sentence for the analysis of spontaneous speech seems only sensible.

Nonetheless, some analysts remain neutral or change their mind. Crystal (1979, p. 159) concluded strongly in favor of the clause and against the sentence for spoken language but later (Crystal 1995, pp. 214–215) he asserted that we do speak in sentences but that speech and writing differ in sentence organization. McCarthy (1998, pp. 79–82) points to various problems: utterances interpretable as the realization of sentences but produced by two or more speakers; clauses introduced by *cos* or *if* which do not modify a main clause and function like main clauses; the general absence of well-formed sentences from spoken discourse. He does not explicitly abandon the sentence but does declare that grammar becomes discourse when sentence-based units of description fail to account for the facts, and he does focus on discourse.

Chafe (1994, pp. 139–145) regards sentences as viable for spoken language but redefines them as corresponding more to short paragraphs. Central to this view are prototypical intonation units consisting of a single coherent intonation contour, possibly followed by a pause and stretching over a maximum of six words. These contours and sequences of words may correspond to clauses, phrases, or simply fragments of syntax. Each intonation contour encompasses one piece of information. However, speakers regularly deal with conglomerates of information, which Chafe calls "centers of interest"; they use one intonation pattern to signal that a given conglomerate has not been completed and another pattern to signal that it has. Chafe identifies the latter pattern with sentence-final intonation.

Greenbaum and Nelson (1995a, p. 5) reject Chafe's analysis because the recognition of centers of interest is subjective and unreliable. Presumably Chafe would counter that what is crucial is the pattern of intonation signaling completion of a given chunk of utterance, but his sentences nonetheless correspond to paragraphs. The proponents of clauses claim that clauses can be recognized by picking out verbs (finite or non-finite) and their modifiers.

Going one step further in granularity, Bowie and Aarts (2016) propose that clausal fragments are legitimate units of analysis of spoken language and provide pragmatic and grammatical criteria for identifying these (see pp. 261–263). The debate over sentences and spoken language will continue, as well as over the best unit of analysis in this type of language.

27.6.2 Integrated and Unintegrated Syntax

The syntax of formal written language is said to be integrated while that of spontaneous spoken language is unintegrated. Consider the following examples.

(3) If you've got some eggs about whose age you are not sure here's a useful test.
(4) if you've got some eggs you're not sure about their age here's a useful test (cookery program on New Zealand television).

In (3), the noun *eggs* is modified by the relative clause *about whose age you are not sure*. *About whose age* is the complement of *sure* but is at the front of the clause. The relative pronoun *whose* connects the relative clause to *eggs*. Crucially, the relative clause immediately follows the head noun *eggs* and is held to be embedded; that is, in process terms, the basic noun phrase is *some eggs*, the direct object of *'ve got*. Into that noun phrase is inserted the relative clause.

In (4), the relative clause is replaced by *you're not sure about their age*. This looks like a main clause; there is no relative pronoun and the clause is linked to *eggs* by the personal possessive pronoun *their*. *About their age* is the complement of *sure*, which it follows, as is normal for adjective complements in main clauses. All the evidence indicates that *you're not sure about their age* is a main clause which is adjacent to *some eggs* but not embedded in it. The differences are summed up by saying that the second clause is integrated into the noun phrase in (3) but not in (4).

(5) is an example of a relative clause embedded in a noun phrase but with no overt pronoun linking it to the head noun.

(5) I only wear shoes that I'm not thrown forward on my toes (BBC radio discussion).

The relative clause is *that I'm not thrown forward on my toes*. It modifies the head noun *shoes* and is linked to it by the complementizer *that*. But inside the relative clause there is no Wh-pronoun or even an ordinary pronoun linking with *shoes*. A formal written English equivalent is *shoes by which I am not thrown forward on my toes* and a possible spoken version is *shoes that I'm not thrown forward on my toes by them*. In the former *which* provides the link, in the latter *them*.

Another type of integrated construction is in (6).

(6) Only Nato forces stand between what that man is doing and a huge tragedy.

The integrated syntax lies in the complement of *between*. The noun phrase [*what* [*that man is doing Ø*]] is coordinated with the noun phrase *a huge tragedy*. The actual spoken version of (6), from a BBC radio discussion, is in (7).

(7) Only Nato forces stand between that man what he's doing and a huge tragedy.

In (7), the basic complement of *between* is *that man and a huge tragedy*. Interpolated between the two noun phrases is the free relative clause *what he's doing*. The free relative clause is not embedded in another constituent; it is simply adjacent to *that man*. Its subject, *he*, is co-referential with *that man*. (7) puts the human protagonist at the center of the event, *that man* being the "direct object" of *between*; he is mentioned first and then the relevant characteristic is mentioned, what he is doing.

Other examples are—*Everybody knows Helen Liddell how hard she works* [radio discussion] and *I've been meaning to phone and ask about the new baby and Alan how they're getting on*. The construction is far from new; (8) is from the Authorized Version of the New Testament and is a straight calque of the New Testament Greek (see Miller and Weinert 1998, p. 362).

(8) Consider the lilies of the field how they grow.

The New Testament is a written text but it is a written record of what was spoken. Later groups of translators seem to have considered the unintegrated syntax of (8) unsuitable for writing. The Good News Bible has *Look at how the wild flowers grow* and the Revised English Bible has *Consider how the lilies of the field grow*.

The classic Wh-cleft construction offers a good example of integrated syntax, as in (9).

(9) What they will do is use this command to save the data.

Is links the clauses *what they will do* and *use this command to save the data*. The second clause can be thought of as integrated into the overall structure by losing its subject and its tense. The typical Wh-construction in spontaneous speech is exemplified in (10). No integration has taken place; the clause following *is* has a subject and its own tense.

(10) Right, well, what you're doing is you're drawing a line.

Reversed Wh-clefts can also be unintegrated, for example, *that's what this stuff's based on is intuition* (Calude 2008, p. 111, ex. 42).

Guz (2015) provides a taxonomy of various levels of integration of Wh-clefts in spoken English, arranged on a cline from more- to less-integrated. The cline includes clefts which exhibit a mismatch in tense, aspect, and mood of the copula verb and the verb in the cleft clause, prosodic separation between the copula and the cleft clause, omission of the copula altogether, omission of subject pronouns in the cleft clause, and multi-clause focus constituents. The data analyzed by Guz suggest that unintegrated Wh-clefts are indeed very common in spontaneous spoken language and there is no evidence that they form a barrier to communication.

Other construction types with unintegrated syntax involve a doubling of the copula *be*, also termed DOUBLE *be* (Massam 2017), such as *The problem is, is that this construction is never found in written language*. Massam argues that what are treated by some as a "linguistic curiosity" (2017, p. 121) constitute in fact a unified set of recurrent constructions which can be analyzed syntactically using existing grammatical entities and notions.

The examples in (11) provide further instances of unintegrated syntax.

(11) a. It's unfair what they're doing to the union (radio discussion).
b. It has been well documented the effect "phONEday" had on both business and domestic users (article in *The Independent*).

It is the subject of *is unfair* in (11)a and *has been well documented* in (11)b. What is unfair or well-documented is conveyed by the free relative clause *what they're doing to the union* and the noun phrase *the effect* …. In formal writing, and this is why (11)b is surprising, we would expect the free relative clause and the long noun phrase to be the subjects: *what they're doing to the union is unfair* and *the effect "phONEday" had … has been well documented*.

(12) shows another construction typical of spontaneous speech but not of (planned and edited) writing.

(12) This older woman in the class she likes to kid us all on.

(12) begins with the noun phrase *this older woman in the class* and continues with the complete clause *she likes to kid us all on*. The subject of the clause, *she*, is co-referential with the initial noun phrase. The explanation of the noun phrase—clause structure as a way of dealing with complex subject phrases looks plausible for examples such as (13) but not at all plausible for (14), with a very short noun phrase.

(13) The people who are listening to this many of them will not understand the complexities (radio discussion).
(14) The driver you get a good laugh with him (conversation).

Occasionally, the construction is used to contrast two referents, as in (15), from a road report on Classic FM.

(15) There's been an accident in Kent on the M26 but the earlier accident on the A28 that's now been cleared.

Speakers could use the construction to escape from a syntactic mix-up but most examples do not display any signs of syntactic breakdown such as hesitations and repetitions. The primary function of the structure is to establish referents and make them salient; its secondary function is to enable speakers and listeners to handle complex referring expressions. (13) enables listeners to establish the referent of *the people who are listening to this* and then to decode the clause *many of them will not understand the complexities*. *Them* provides the link to *the people who are listening to this*.

Classic indirect question clauses are integrated with the main clause.

(16) I asked where the new form came from.

The Wh-complement of *asked* conveys a question. It begins with the interrogative *where*, but the rest of the clause has declarative constituent order. Compare (17)a and (17)b, in which the Wh-complements have the word order and structure of a Wh-interrogative clause with subject–auxiliary inversion (see further examples of unintegrated complement clauses in Weinert 2012). (17)a is from conversation and (17)b is from a university final examination script. (This type of indirect question is generally ignored in discussions of English syntax, but note (18) from an article in the newspaper *Scotland on Sunday*.)

(17) a. I can't remember now what was the reason for it.
b. The question centers on where did this new form come from.
(18) No one is sure how long are the passages leading off from this center.

Cheshire (2005) documents recurrent and productive use of lone *when*-clauses in spoken English, that is, *when*-clauses which are traditionally thought to occur together with a main clause on which they are syntactically and discoursally dependent, but which are in fact left hanging in her corpus data. Cheshire argues that such clauses are not functionally equivalent to traditional adverbial clauses and that their role in the discourse is different to written adverbial clauses.

This section concludes with examples of a further three spoken constructions: relative clauses with shadow pronouns in (19), clauses with preposed prepositional phrases and shadow pronouns in (20), and clauses in which what looks like a complementizer is separated from the rest of the clause by a pause, as in (21). It suffices to say that unintegrated constructions have attracted substantial attention in English (and other languages alike), and what initially proved to be an isolated quirk of an ideologically tainted linguistic genre is beginning to look like a well-established and widely used grammatical strategy (see for instance the collection of papers in Dehé and Kavalova 2005, and in Evans and Watanabe 2016).

(19) I'm one of these people that I don't like to be surprised.
(20) Out of the twenty-four traditional medicine shops they visited rhino horn was for sale in nineteen of them [radio report].
(21) a. Plus, the lack of ordered rules means that OT analyses are not burdened with various intermediate levels of representation.
b. Although, English has been the most successful language in becoming a lingua franca.

27.6.3 The Organization of Spoken Discourse

Speakers and writers combine clauses into larger chunks of text. Whatever the type of a written text (see Section 27.3), its writer(s) and reader(s) are not face to face, and writers typically have more time than speakers to edit their text. Some types of spoken text are also edited, and may be partly or wholly scripted. Examples are talks on radio or television, lectures, and sermons. Other types of spoken text are produced face-to-face and in real-time with no scripting; examples are informal conversation, interviews, and impromptu narratives.

The differences are reflected in the use of different syntactic devices for various discourse functions in unplanned and unscripted texts. (The functions of intonation and amplitude are ignored here.) Speakers use syntax (as described above) that can be produced online but listeners need texts that they can interpret online. Information is carefully staged with a small quantity of information assigned to small syntactic units and highlighted to make sure the listener's attention is engaged. For example, NEW entities may be introduced in written discourse by means of indefinite direct objects—*In this section I discuss a difficult construction*. NEW entities in unplanned (and even planned) speech are introduced, and thereby highlighted, by means of special structures—*there's a difficult construction I want to discuss*. Speakers use a range of highlighting devices for introducing NEW entities or reintroducing entities (which can be individuals or entire events). Examples are *I've got a friend who…* or (reintroduction) *(you) see the bridge over the river you have to cross it very slowly* or *you know the bridge over the river you have to cross it very slowly…*, where *the bridge* is highlighted by being the direct object of *see* and *know*. Entire clauses can be highlighted: *you know when we get home can we watch tv?*

GIVEN entities (e.g., people and things in the immediate context or previously mentioned) are regularly introduced into a conversation by means of the NP–clause construction exemplified in (12), repeated here as (22).

(22) This older woman in the class she likes to kid us all on.

The construction helps to ensure that discourse referents are clearly established. The NP fixes the referent and the clause conveys the relevant information about the referent. Not so frequent, but playing a similar discourse role, is the clause–NP structure as in *it's not very good the wine*; the final NP both clarifies and firmly establishes the referent of *it*. In Macaulay's (1991, p. 81) Scots data, the clause subject and the final NP can be pronouns, as in *He was some man him*. Macaulay analyzes *him* as reinforcing the referent of *he*. Neither construction is used in writing (except in written dialogue). Carter and McCarthy refer to heads—*this older woman…*, and tails—*…the wine*, and Biber et al. (1999), use "preface" (but not "epilogue"). The construction which H&P find incorrect, *It's unfair what they're doing to the union*, achieves the same effect, establishing the important property and then clarifying and reinforcing the referent of *it* (see too the discussion of (7) in Section 27.6.2).

In unplanned speech speakers introduce topics, move from one part of a conversation to another, correct what they have just said (mistakes or misleading accounts are not infrequent in unplanned speech), and draw a line under sections of conversation. Consider the excerpt from conversation in (23).

(23) A: What is it you're after anyway.
B: We're after everything I mean not not the phonetics because that's fairly well known anyway em it's the syntax we're after.

Speaker A introduces a new sub-topic with a Wh-question, simultaneously signaling with *anyway* that he is lacking a crucial piece of information in spite of B's previous

account. In his reply, speaker B uses a typical phrase, *I mean*, to revise the information he has just given. He uses the spoken negative construction *not* plus NP to cancel one piece of information and an it-cleft to highlight the important information—*it's the syntax we're after*.

Speaker A could have introduced a new topic with a Wh-cleft, integrated or unintegrated; the first utterance in a politician's speech was *what I thought I'd do Chairman: the most important issue is the poll-tax* (example from Regina Weinert). Reverse Th-clefts are used to finish off a stretch of speech, say a chunk of narrative: *and this was him landed with a broken leg* (Macaulay 1991, p. 78).

Example (1) in Section 2.4.1 is a good example of information being staged. A possible written version is *New York is an incredible, mind-boggling city where the black people are magnificently and flamboyantly turned out*. This is an economical version but it lacks the effect of the spontaneous spoken version in which the adjectives are piled on one by one and even repeated and in which the opening clause *New York's an incredible place* is echoed in the clause that completes the description *It's a marvelous city*. As discussed earlier with respect to *it*-extraposition, speakers can handle a slightly different information flow than writers, and one which favors urgency over GIVEN-before-NEW, allowing speakers to focus on matters which require the most immediate attention first.

Finally, we note that speakers have to keep signaling their attitude toward the propositions they are conveying or receiving (what Halliday terms "the grammar of appraisal," 2016, pp. 18–19, and discussion in Cheshire 2005). They achieve this by means of a large number of particles such as *actually*, *well*, *anyway*, *in fact*, *really*, and so on, and by a series of stance-marking adverbs (see Schiffrin 1987, and the text commentaries in Carter and McCarthy 1997).

27.7 Questions Arising from the Study of Unplanned Speech

27.7.1 The Boundaries of Standard English

Better knowledge of the constructions of unplanned speech has alerted analysts to the fact that constructions previously considered non-standard are in fact used in spontaneous speech by speakers of standard and non-standard English alike. It can be difficult to say what constructions count as standard English. Unquestionably standard are *the young women whom I met* and *the young women who walk the dogs*, but *the young women what I met* is definitely non-standard. Many linguists admit *the young women who I met* as standard or *the young women that walk the dogs*, which would be rejected by many ordinary educated users. Controversy keeps breaking out over *the data are* versus *the data is*, *I never got the essay started till nine o'clock* [preferred: *I did not get*…] and *Even if they had arrived on time, they may have missed the accident* [preferred: … *they might have* …].

Comrie (1999, p. 88) does not himself use *Remember the man that's house got burnt down* but considers it acceptable colloquial standard speech. Some of his colleagues disagreed and many people simply reject spoken data. A referee reviewing a paper for the *Journal of Pragmatics* declared the Wh-cleft *what you're going to do—you're going to go up past the allotments* a performance error. The construction is so frequent in spoken texts (planned and unplanned) that it clearly belongs to the system of spoken English.

The construction does not always receive adequate analysis. One dialogue in Carter and McCarthy (1997) contains *I'd 've thought the first thing you do when it gets as dark and as wet and as miserable as this. You turn your lights on*…. Why is the utterance represented as two sentences, one of which is incomplete? The authors describe the comments ("clauses") as chained together by association and state that written English requires more complex linking,

that is, integration as discussed in Section 27.6.2: … *the first thing you do is to turn your lights on* (Carter and McCarthy 1997, p. 113).

This section concludes with a caveat: it is dangerous to rely on one's own intuition when labeling structures as non-standard or as incorrect. With respect to *the pilot was sat in one of the seats*, Carter and McCarthy (1997, p. 34) comment that the speaker spoke Yorkshire dialect and that standard English requires *was sitting*. Cheshire et al. (1993, pp. 70–71) observe that BE *sat/stood* had been reported as used in certain specific areas of England. Their research showed that the structure was widespread and characteristic of "a general non-standard or semi-standard variety of English," although Burchfield (1981), writing for the BBC, declared *was sat/stood there* unacceptable in any circumstances. Twenty years on the structure is widely used by, for example, reporters on the BBC *News at Ten* (though not by the presenter) and seems to be characteristic of unplanned speech. Many structures considered "non-standard" may be misclassified.

27.7.2 Problems of Analysis

A given construction may require different analyses in spoken and written language.

Consider (24).

(24) It's the wine that I was complaining about (not the food).

That I was complaining about looks like a relative clause—compare *It's wine which I was complaining about* and even *It's the wine about which I was complaining*. Consider now (25)–(27).

(25) It was because he was ill (that) we decided to return.
(26) It was in September (that) I first noticed it.
(27) It was in the restaurant that he proposed to her.

That cannot be replaced by *which*—**It was because he was ill which we decided to return*, etc.—and the *that* clauses modify an adverbial clause of reason *because he was ill* and the prepositional phrases *in September* and *in the restaurant*. Quirk et al. (1985 p. 1387)—henceforth Q&G—propose that the *that* clause in IT clefts is not a relative clause (relative clauses modify nouns) but an annex clause.

Q&G discuss another major property that (allegedly) distinguishes relative clauses from annex clauses. In (28) *that* is omitted.

(28) It was the President himself (that) spoke to me.

Since *the President* is the understood subject of the relative clause, say Q&G, the complementizer cannot be omitted, as shown by (29)a.

(29) a. *I'll lend you the book kept me awake.
b. I'll lend you the book that kept me awake.

In the presentative–existential construction in (30) *that* is absent, although *something* is the understood subject of the final clause *Ø keeps upsetting him*.

(30) There's something (that) keeps upsetting him.

Q&G are consistent; since *that* in (30) is omissible, *Ø keeps upsetting him* is an annex clause. They contrast (30) with (31), which they do analyze as having a relative clause.

(31) *I know a man lives in China.

In fact, (31) is acceptable and normal in spontaneous spoken English and has a presentative–existential function. The complementizer can be omitted in other presentative–existential structures such as (32), uttered by a theater manager, and (33), uttered by a teacher (NB *had* in the context was not causative).

(32) I had a witch disappeared down a trap (= trapdoor in the stage).
(33) We've got plenty of kids know very little about English.

To sum up, the concept of annex clauses by Q&G applies to formal written English but not to spontaneous spoken English (note the non-standard *He's a man likes his beer* where *man* is the understood subject of *Ø likes his beer*).

(26) and (27) are also untypical of spoken English, which has the construction in (34) and (35), not mentioned in Q&G (1985), H&P (2002), or Biber et al. (1999).

(34) It was in September when I first noticed it.
(35) It was in Edinburgh where we found the picture.

Note the free relative clauses *when I first noticed it* and *where we found the picture*. *It was in September* establishes a temporal referent. *When I first noticed it* picks up the referent, adds information to it, and can be glossed as "at which time I first noticed it" or even "that's when I first noticed it." This structure simply bypasses the difficulties of Q&G.

27.8 Conclusion

The syntax and discourse-organization of spontaneous speech are important for descriptions of English and for teaching non-native learners to "speak like a native." They are important for other reasons. Children acquire spoken language but learn written language, and any adequate theories of first language acquisition must take into account the data presented above. Questions arise, legitimate but not easily answered, about the usefulness of theories which are based on sentences, given the difficulties in recognizing sentences in spontaneous speech.

The differences between the syntactic structures of speech and writing are relevant to typology; for instance, spontaneous spoken English and written English occupy different locations in a typology of relative clauses. The differences are also relevant to accounts of historical change, since many syntactic changes begin in spoken language and spread into writing. Last, but for many scholars first, theories of the evolution of language must take account of the central fact that spoken language evolved first, not written language.

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28 English on Social Media

BROOK BOLANDER

28.1 Introduction

Writing in 1996, Wilbur (p. 6) maintains that "[w]hatever else Internet culture may be, it is still largely a text-based affair" (see also Yus 2011). However, despite the central role played by language, linguists did not immediately begin to pursue research on the Internet (Herring 1996, p. 3). Early exceptions include Baron's (1984) work on language change in connection with the perceived democratizing effect of the Internet, Murray's (1989) analysis of turn-taking structures, and the work of Ferrara et al. (1991) on "interactive written discourse." This latter publication sparked serious interest, and from the early 1990s we begin to see an upsurge in work which focuses on what Herring (2001, p. 613) has described as "a more or less coherent agenda" involving "the empirical description of computer-mediated language and varieties of computer-mediated discourse."

Much of this research has focused on English. This predominance of English in the research literature has multiple causes. The Internet first became popular in the English-speaking world (Mair, in press), with most websites and users of the Internet in the 1990s being English-speaking (Leppänen and Peuronen 2012). Given the fact that the Internet brought individuals with different linguistic repertoires into contact with one another, English also tended to be used as a link language for people who did not share another language with one another (Leppänen and Peuronen 2012, p. 385). The dominance of usage was also facilitated by the fact that computer scientists involved in both designing computers and the Internet relied on the American Standard Code for Information Interchange (ASCII), which rendered it challenging or even impossible to compute in other alphabets or characters (Leppänen and Peuronen 2012, p. 385).

However, while English continues to be dominant, the research literature also reflects changes in the ways it is used as a result of the Internet's growing multilingualism. While this change in the research literature partially stems from changes in practice, it also parallels a more general move in sociolinguistics to recognize that increasing globalization means that English seldom occurs in isolation, and that studying English means integrating analysis of the relationship between English and other languages it co-exists and co-occurs with (Blommaert 2014, p. 131). And, indeed, despite "fears that English might monopolize this new domain of communication" (Mair in press; see also Barton and Lee 2013), the Internet constitutes a space for language contact of an unprecedented degree (Paolillo 2007, p. 424), and hence a space where languages and scripts are mixed in interpersonal encounters, notably for identity work (Seargeant and Tagg 2011, pp. 502–503).

As suggested here, the focus adopted in this chapter is thus rather broad, and the discussion of research on English in social media is contextualized both against this

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backdrop of sociolinguistic research on language use online more generally and relationally vis-à-vis other languages. The research covered in the chapter is largely sociolinguistic, given that the majority of scholarship on English and Englishes in multilingual social media settings is from within sociolinguistics. This is most likely because of sociolinguists' recognition that the Internet is not solely a space for organization, but also central for ideational and relational exchange (Baym 1998; Bolander 2013). This is particularly the case for social media, whose very definition is predicated on the idea of interaction and connectedness (Zappavigna 2012).

To position the chapter's foci, I turn first to terminology in Section 28.2, and I reflect upon the meaning of the label social media in relation to a range of different terms and phases in the development of the web. In Sections 28.3 to 28.6, I explore developments in sociolinguistic research online and their relevance for the study of English. This particularly involves reflecting upon changes in foci and approaches to online context and how these variously relate to research on English. In addressing these, I foreground a progressive move away from a sole focus on English to a growing body of research which focuses on multilingualism involving English and on the multilingual Internet more generally. The chapter ends with a brief conclusion (Section 28.7). To avoid extensive listing of research, the position taken across the chapter is largely historiographic. At the same time, illustrative examples are discussed in each section to demonstrate core arguments and developments across time, in foci and approach.

28.2 Terminology

There are currently a range of terms to describe communication or discourse which is mediated by technology. These include computer-mediated communication (CMC), computer-mediated discourse (CMD) (Herring 2001), convergent media computer-mediated communication (CMCMC) (Herring 2009), digital discourse (Thurlow and Mroczek 2011), keyboard-to-screen communication (KSC) (Jucker and Dürscheid 2012), Internet-based communication (IBC) (Beisswenger 2007), Internet-mediated communication (IMC) (Yus 2011), and mobile communication (Deumert 2014).

The most prominent of the terms was and to some extent still is computer-mediated communication, which was used initially in the 1980s (Jucker and Dürscheid 2012), and which can be defined as "predominantly text-based human–human interaction mediated by networked computers or mobile telephony" (Herring 2007). A similar definition is espoused by Locher (2010, p. 1) who defines the concept in terms of its three stock components: communication, mediation, and computer. The notion of "communication" serves to foreground the exchange of both ideational and relational information; "mediation" underscores that this exchange is facilitated by technology; and "computer" refers to the specifics of this technology (Locher 2010, p. 1). Scholars who continue to employ the label computer-mediated communication tend then not to see it as restricting the focus to computers, despite this word surfacing in the stock phrase, but as encompassing technology more generally. In this sense, computer-mediated communication is as an umbrella term which includes modes which are not mediated via a computer (but via phones or tablets instead, for instance), and modes which are not Internet-based (but, for instance, mobile phone-based) (for a detailed discussion of terminology, see Jucker and Dürscheid 2012).

As Deumert (2014) underscores, to some extent such terms are used interchangeably in the research literature. To some extent, they are also variously interpreted, as the example of computer-mediated communication above suggests. At the same time though, the terms have different emphases, for example, on various forms of technology—the computer, the Internet, or the keyboard; or as regards the subject matter or type of

exchange—communication or discourse (Deumert 2014). These different emphases also surface in labels highlighting different stages in the development of the web: from Web 1.0 to Web 4.0, which are typically compared, for instance, as regards purpose, the involvement, degree of participation, and technological skills of social actors, technological affordances, and their relative novelty.

For my focus in this chapter on social media, Web 2.0 is the most relevant, as it underscores a junction at the turn of the century marked by the emergence of "web-based platforms" which "incorporate user-generated content and social interaction, often alongside or in response to structures and/or (multimedia) content provided by the sites themselves" (Herring 2013, p. 4). Web 2.0 or "the social web" (Zappavigna 2012, p. 2) is generally characterized as an interactive, dynamic, and user-generated space, and as shaped by a diverse range of people. It is seen to facilitate participation, social interaction, and exchange. In line with the points made in the introduction about the prominence of sociolinguistic work on both language and English online, describing Web 2.0 as "social" serves to underscore "a shift toward the Internet as an interpersonal resource rather than solely an information network" (Zappavigna 2012, p. 2). This shift typically also involves comparison with what was labeled ex post facto Web 1.0 (Herring 2013).[1] Web 1.0 is viewed as a comparatively static space, where content is read-only and generated by technologically savvy people who have the ability to create, author, moderate, and (hyper)link sites and content (Herring 2013).

Notions like Web 2.0 are useful because they remind us that online spaces do not simply cater to the exchange of information, but are primary sites for relational and interpersonal work involving a diverse range of individuals, and hence of great interest for sociolinguistic research on English in multilingual settings. And indeed, the increasing social nature of the web has led to an upsurge in scholarship on identity, performance, participation frameworks, and interactional patterns, and hence also an increased focus on users and what they do with and through language and other modalities. Much of this scholarship is on social media, which, as suggested above, are designated as being both prototypical and constitutive of Web 2.0. The label social media is then used to foreground the fact that particular web-based services facilitate interaction and connectedness between individuals and groups (Zappavigna 2012, p. 2). Typical examples include Facebook, Twitter, Instagram, YouTube, and WhatsApp.

However, Herring (2013) cautions from assuming that one can clearly demarcate between different stages in the development of the web.[2] More specifically, to suggest that not all Web 2.0 is new, she introduces a distinction between "familiar" (or existing phenomena which remain relevant in Web 2.0 environments), "reconfigured" (or those that are adapted to new environments), and "new" Web 2.0 (or emergent phenomena which either did not exist or were not widely and publicly recognized prior to Web 2.0) (Herring 2013, p. 1). In this chapter, I use the term social media to highlight the prominence of the relational and interpersonal, but following Herring (2013), I do not presume there is a fixed divide between Web 1.0 and Web 2.0. In this vein, I encompass discussion of work on familiar, reconfigured, and new Web 2.0 environments. And given my inclusion of early sociolinguistic research online, I also include literature which might more typically be subsumed under the heading of Web 1.0.

28.3 English as "The Language of CMC"

Initial sociolinguistic interest in language use online (late 1980s and 1990s) had as its core an interest in describing "the *language* of CMC" (Herring 1996, p. 3, emphasis in original). This typically entailed describing language in terms of sets of technological properties or features of either the Internet as a whole or individual modes (e.g., homepages, bulletin

boards, chat). This is reflected by phrases like "Netspeak" and "[t]he language of e-mail" or "[t]he language of chatgroups" (Crystal 2001), respectively. Within such research, technology was given precedence, such that it was assumed that shared technological features were responsible for the presence, absence, and types of linguistic features, and hence for the ensuing language (note here, too, the singular in Herring's (1996) phrasing "the language of CMC").

It is probable that this stemmed from the tendency to view online and offline spaces as inherently different and separate. As suggested by Orgad (2009, p. 36), despite no such separation being inherent to older forms of media, a marked distinction between the offline and online has "been constitutive of the understanding of the Internet from the earliest days of Internet research." This marked difference, in other words, may well have led to a search for what was responsible, with technology emerging as a possible answer. Much of the research literature from this time thus foregrounds issues of differences between online and face-to-face interaction (and hence between the spoken and the written, and the discussion of how mediated interaction might fit here), and related to this, on the relative degree of asynchronicity and synchronicity.[3]

An example is provided by the paper of Collot and Belmore (1996), "Electronic language: A new variety of English." This paper adapts Biber's (1988) multidimensional and multifeature analysis in an attempt to offer a corpus-based analysis of "electronic language" as a variety of English. It thereby assumes that shared "situational features" (here of bulletin board systems) will result in "a distinctive set of linguistic features" as well (Collot and Belmore 1996); and it manages to demonstrate that there are similarities between this "electronic language" and various genres of spoken (e.g., public interviews) and written (e.g., letters) language. While the study takes into account facets of the situation—which I turn to in more detail below—there is the assumption of a singular emergent variety of English which can be compared with written and spoken offline genres; and it is for this reason that I discuss this work as an example of early first "wave" research on English online (for an overview of waves of sociolinguistic research, see Androutsopoulos 2006; Bolander 2019; Bolander and Locher 2020).

A closer look at the volume (edited by Herring 1996) in which this chapter appears highlights that a focus on the language of CMC at the time typically also meant a focus on English. Indeed, 13 out of the 14 of the volume's chapters center on English. The data are diverse in many respects, for example, in terms of synchronicity and genre, but it lacks diversity as regards both the types of sites—which are all public or semi-public (for ethical reasons) and language—with the focus being almost solely on English. Herring (1996, p. 10) calls attention to this herself in a footnote, claiming that while "[t]his is in part a reflection of the predominance of English on Internet," there "is a need for published scholarship on computer-mediated interaction in other languages, and on CMC that involves language mixing" (notable exceptions for this time period are listed in Danet and Herring 2003).

28.4 Changing Contexts for the Study of English

To explore changing contexts for the study of English, we need to consider here both a shift away from what has since been labeled "computer determinism" and "technological determinism" (Androutsopoulos 2006; Baym 1995; Herring et al. 2013; Squires 2010) and the steady rise in research which focuses on languages other than English or on multilingualism involving English. This means taking into account both an upsurge in sociolinguistic research on English online which explores social and technological factors, as well as research on languages other than English and multilingualism involving English.

The most explicit call perhaps to consider both social and technological factors for the study of language use online is Herring's (2007) faceted-classification scheme for computer-mediated discourse, which is comprised of 10 medium factors and eight social factors, and which is illustrated through English-language blog data. These include the medium factors of synchronicity, message transmission, persistence of transcript, size of message buffer, channels of communication, anonymous messaging, private messaging, filtering, quoting, and message format; and the social factors of participation structure, participant characteristics, purpose, topic or theme, tone, activity, norms, and code. With antecedents in Hymes' (1974) SPEAKING mnemonic, the scheme is an unordered, open-ended etic grid. The facets stand in no a priori hierarchical relationship to one another, since "one cannot be assigned theoretical precedence over other for CMD as a whole; rather, the relative strength of social and technical influences must be discovered for different contexts of CMD through empirical analysis" (Herring 2007). While acknowledging the likelihood that the technological affordances of particular modes will "presumably mak[e] them more likely to occur" (Herring 2007), there is thus no necessary connection between a technological (or social) feature and emergent patterns of language use. It is through empirical evidence, then, that scholars can ascertain which factors coalesce, how they become mutually relevant, and how users exploit the various affordances in an attempt to realize their ideational and interpersonal goals.

In our own work on identity on Facebook, we were inspired by Herring's (2007) scheme, and we particularly highlighted the relevance of participant relationships and audience, in work where we focus on English (Bolander and Locher 2010, 2015) as well as in work which foregrounds questions of language choice and code-switching (Locher and Bolander 2014). In Bolander and Locher (2015), for example, we attempted to study identity construction in the "status updates" (SU) (N = 474) and "reactions to status updates" (RSU) (N = 228) of two focus groups: 10 individuals living in Switzerland and 10 individuals living in the United Kingdom. Drawing on the socio-psychological theory of positioning by Davis and Harre (1990),[4] we focused on "acts of positioning," as a means to explore how the underlining of a particular self at a particular point in time, can, through repetitions, over time, become salient for identity (Bolander and Locher 2015). To study positioning in this way, we developed a series of second-order categories on the basis of the data, which were grouped into five types: pastime, personality, humor,[5] relationship, and work. Although these were grounded in a qualitative analysis of each status update, the subsequent quantification of the five types meant we could explore patterns within and across our two focus groups, while also paying attention to idiosyncrasies. We thereby found striking similarities in percentages across the groups, with personality claims being made the most often, followed by pastime, humor, work, and relationship claims. In interpreting our findings and the salience of personality traits, we argued that the tendency for participants to have relationships anchored or grounded offline meant there was less need to establish or reinforce identity claims already known from participants' prior engagement with one another (Bolander and Locher 2015).

We also began to reflect upon on how we might build on our work on identity construction by considering the potential for these acts of positioning to involve various languages, and in Locher and Bolander (2014, p. 147) we asked "how code-switching […] is displayed in the SUs and RSUs and where we can find links to relational work and identity construction." To answer this research question, we coded each SU and RSU for the presence or absence of different languages, and for switches between SUs and RSUs (i.e., between turns). Our findings demonstrate that SUs were more monolingual than RSUs, and we found switching to occur both within RSUs as well as from SU to RSU. However, unlike our findings on identity which were strikingly similar across the two focus groups, in this research we found switching to be almost entirely lacking in our UK focus group. In looking closely at the switching in the Swiss focus group, we were able to find an increase in German and Swiss German in

RSUs. We argued that this finding could be explained by considering again social factors of participants and audience, with our participants addressing wider audiences in the SU but then switching to varieties used in other (offline) contexts in RSU interactions. As we underscore in our work, "[i]n many cases the prime language of these relationships 'anchored' in offline settings is Standard German (predominantly in written communication) or Swiss German (predominantly in oral communication)" (Locher and Bolander 2014, p. 180; see also Androutsopoulos 2013).[6]

At the time when we published this study, there was already a flurry of research on multilingualism online. This change from English to a heightened focus on multilingualism was sparked by two publications co-edited by Herrring and Danet: a 2003 special issue on "The multilingual Internet" for the *Journal of Computer-Mediated Communication* (Danet and Herring 2003), and a more extensive 2007 volume which builds on this special issue, and which contains 18 chapters variously dealing with issues of multilingualism online (Danet and Herring 2007). Yet, whereas the initial move away from a sole focus on English was marked by titles specifically emphasizing the Internet's multilingualism, the contents of later volumes suggest that it has become the norm to either focus on languages other than English or on multilingualism involving English. Thus, in the edited volume by Thurlow and Mroczek (2011), *Digital Discourse: Language in the New Media*, for example, nine of the 15 chapters focus on multilingual settings (some but not all of which involve English), with a further three centering on the performance and social meaning of multimodality. However, only some of the chapter titles suggest which language or languages are included in the papers. While scholarship focusing on multilingualism may of course choose to emphasize this in the titles (see, e.g., Lee's 2017 book called *Multilingualism Online*), the fact that there are publications which do not emphasize the language/s under analysis implies that the choice to focus on multilingual data is no longer necessarily marked.

28.5 A Closer Look at English and the Multilingual Internet

According to a 2009 UNESCO report on linguistic diversity on the Internet between 1998 and 2007, it has become increasingly difficult to measure and estimate absolute percentages of the use of different languages on the Internet. This is both because of "the explosion of users in Asia" and "search engine bias (toward English)" (Pimienta et al. 2009, p. 32). In relation to the latter, the authors of the report note that since 2005 it has become impossible to use results of search engines' indexes to objectively represent reality on the web. What one sees instead is "the reality within the web pages indexed by a specific search engine" (Pimienta et al. 2009, p. 33). By tabulating the absolute presence of different languages, the report is, however, able to demonstrate certain salient developments in the degree of multilingualism (Pimienta et al. 2009, p. 33). This becomes manifest in changes in the relative use of English. Whereas the frequency of English was at 75% in 1998, by 2005 it had dropped to 45% (Pimienta et al. 2009, p. 33). Figures on Internet World Statistics from April (30th) 2019 show that this trend has continued, with only 25.2% of all Internet users now employing English. This relative decrease in English has gone hand in hand with an increase in the use of other varieties. What is labeled as "Chinese" on Internet World Statistics is, for example, now employed by 19.3% of Internet users, and Spanish by 7.9% (Internet World Statistics). Such statistics are clearly hard to elicit given search engine bias, the challenge of determining what counts as a variety online, given increasing use of non-standard varieties online and online translanguaging (see also below), and the tendency for such sites not to take bilingualism or

multilingualism into account.[7] Such statistics are also not necessarily meaningful if we consider, for instance, that they conflate hierarchies of particular languages online with language users. They suggest, in other words, that the majority use English as a first or primary language, and not the fact that "[i]n reality, […] most of them are non-native speakers of English, for whom English is a resource on which they draw in different ways" (Leppänen and Peuronen 2012, p. 385). However, they do manifest that multilingualism online is on the rise and that it has repercussions for the extent to which and the ways in which English is used and imagined.

Since such multilingualism takes different forms, the phrase "the multilingual Internet" needs to be seen as an umbrella label. Androutsopoulos (2013), for instance, distinguishes between five "patterns of multilingualism in CMC" (see also Leppänen and Peuronen 2012). These include "the multilingual Internet as a whole," "the coexistence of different languages on a web page or thread," "language choices for emblems," "sequential language choices lacking a dialogical interrelation," and "code-switching." While Androutsopoulos's aim in distinguishing between these patterns is to highlight the ways in which code-switching is distinct from other types of multilingualism, this listing offers a useful means of conceptualizing the Internet's multilingualism more generally, and thus of recognizing the breadth and depth of possible research desiderata and foci.

The first (the multilingual Internet as a whole) and second (the coexistence of different languages on a web page or thread) draw attention to multilingualism that ensues from the fact that the Internet is increasingly an amalgamation of and "available" in multiple languages. Particular applications, including many web environments, are also comprised of different units, for example, "editorial content, user-generated content, advertisements, graphic-designed banners, user comments," which may be in various languages (Androutsopoulos 2013, p. 671). To these categories we can add the example of whole social media applications being available in multiple languages. For example, since 2008, Facebook has existed in languages other than English (Lenihan 2011). More recently, particular technological affordances of social media offer participants the ability to transcend their own communicative repertoires. An example of this is Facebook's translate option for status updates and reactions to status updates. The third category of multilingualism is "language choices for emblems," which leads to what Androutsopoulos (2013) refers to as a kind of "emblematic bilingualism," in the form, for example, of screen names or user signatures. The fourth category of "sequential language choices lacking a dialogical interrelation" foregrounds the potential for spaces to contain more than one language without these language choices necessarily being responsive and hence dialogically interrelated. Examples included here are system messages that might be in a different language than the rest of the interaction, or responses to a video or other "spectacle" or "prompt" in Web 2.0 environments which might be in a different language from the content of the video or prompt they are responding to. These are to be distinguished from the fifth category of multilingualism—code-switching—which is then defined as comprising instances where languages become "dialogically interrelated by responding to previous, and contextualizing subsequent contributions" (Androutsopoulos 2013, p. 673).

This heightened multilingualism has had and continues to have widespread implications for the degree, nature, and social meanings of language contact, while also prompting for increased metatheoretical engagement with how one might describe and research these contact scenarios. While language contact has been approached from various perspectives, in this section I discuss new research developments which can broadly be positioned under what Blommaert (2010) has called a "sociolinguistics of mobility," as part of a larger sociolinguistics of globalization. In contrast to what is labeled a "sociolinguistics of distribution," a sociolinguistics of mobility "see[s] sociolinguistic phenomena and processes as characterized by mobility" (Blackledge and Creese 2017, p. 31). More specifically, scholars working

within this framework argue that increased mobility under conditions of globalization warrants a rethinking of both the notion of language and its relationship to space and time. An understanding of language in terms of discrete, bounded categories, which are mapped onto singular, geographical (often national) territories and linear temporalities, is thereby problematized, with scholars instead foregrounding a view of language as a resource, which is patterned according to multiple, interacting, and simultaneous scales (Blommaert 2010). Terms used to discuss language from this perspective include "languaging" (Jörgensen 2008), translanguaging (Li and Hua 2013), translocal language practice (Pennycook 2007), transglossia (Garcıa 2013; Sultana et al. 2015), transidiomatic practices (Jacquemet 2005), and translingual practices and translingualism (Canagarajah 2013). As terms used within sociolinguistics more generally these are not particular to social media. However, a look at research on social media shows its increased engagement with such approaches to language.

An illustrative example for social media is Schreiber's (2015) paper "'I am what I am': Multilingual identity and digital translanguaging." In this paper, Schreiber (2015) adopts the notion of "translanguaging" to study the multilingual practices and semiotic resources employed by Aleksandar, a student of English studying at a Serbian university. She thereby aims to complexify what she views as a paradoxical treatment of "identity" and "language." While, scholars have readily moved toward a social constructivist approach to identity (as fluid, emergent, intersubjective, and dynamic), identity continues to be viewed as bound to particular languages. Given that there is no necessary link between "a language" and "an identity," Schreiber (2015, p. 70) questions the idea of "multilingual writers as deliberately switching between languages in order to communicate with different audiences or display aspects of their identities." She demonstrates this via an analysis of Aleksandar's linguistic history, online composing processes, and perceptions toward his own writing. Bringing together these various sources of "screen-based" and "user-based" data (Androutsopoulos 2008) shows how Aleksandar utilizes a range of linguistic and semiotic resources to shape his online identity and to thereby establish his membership in local and global communities (Serbian rap artist). In doing so, Schreiber (2015, p. 72) argues for the implications of her approach for the study of bilingualism and multilingualism, and a move away from an additive perspective which views individuals as "double monolinguals" or "parallel monolinguals."

Critical consideration of the meaning of language and the concurrent emphasis on resources and situated practices also encompasses reflection on the validity of and questions of the relationship between varieties. Seargeant and Tagg (2011, p. 511), for instance, use social media as a lens to think through the question of whether the concept of "variety" still has "phenomenological reality," or should rather be treated as an "instrumental way of describing aspects or features of the discourse." Drawing on communication between Thai speakers via Facebook (SUs and comment function) and instant messaging service (MSN via Blackberry), they demonstrate that their participants engage in extensive mixing of features commonly associated with English, Thai (sometimes transliterated into Roman script), and digital discourse. The types and degree of mixing are linked to the group being translocal and thus not in the same geographical space at the time they were interacting, yet with members having "shared cultural roots and mobility patterns" (Seargeant and Tagg 2011, p. 509). Mixing practices are also linked to the affordances provided by these different linguistic resources. For the participants of Seargeant and Tagg, English appears to have become integral to their online literacy, and it provides them with a range of different semiotic opportunities, which is larger than what the use of Thai alone would afford (Seargeant and Tagg 2011, p. 509). Yet, the sheer variety of forms they produce—from "standard-like" to "non-standard, and even nonce forms"—suggests that these practices

should not, as a whole, be described as reflecting a "norm-dependent variety," in accordance with perceptions of Thailand as an "expanding circle country" (Seargeant and Tagg 2011, p. 509).

While acknowledging the possibility of describing the observed digitally mediated linguistic phenomenon used by their participants according to "a terminology based around varieties," the discourse produced as a whole can thus not be classified as a variety (Seargeant and Tagg 2011, p. 511). In arguing for the need for a "post-varieties' approach" then, the authors suggest an alternate starting point. Rather than beginning from a varieties' perspective, the starting point should instead constitute a focus on resources and their use against the backdrop of their contextual appropriateness and framing (Seargeant and Tagg 2011, p. 511) (for further examples of research encompassing analyses of mixing practices involving English online, concurrent with explicit metatheoretical reflection, see Jacquemet 2005, 2010, on "transidiomatic practices" in the Adriatic ethno/mediascape; and You 2011, on Chinese white-collar workers' multilingual creativity on an electronic bulletin board).

Alternate starting points for the critical study of variety are illustrated by Mair (2013) and Mair (in press), which probe into the relationship between language and space, and the relative value of varieties offline and online. Mair (2013), for example, introduces a methodology for digitally mapping vernacular language practices, so as to enable study of their global spread and to explore questions of the relative importance of different varieties of English. The research forms part of a broader interest in the increased multidialecticality of online Englishes (Mair 2013, p. 257), with Mair (2013, p. 257) referring here to "post-national uses of World Englishes." Using the example of Nigerian Pidgin and the Nairaland Forum, and by mapping physical, offline locations where individuals are posting onto a geographical map of the world, Mair (2013, p. 275) visualizes the spread of "non-traditional, displaced, and mediated uses of vernaculars." In doing so, he demonstrates that there is "no longer a supposedly natural link between Nigerian English and the territory of the nation state Nigeria, or between pidgin and its West African regional and social base" (Mair 2013, p. 257; see also Heyd 2016). Indeed, while the map shows a persistent community base for the vernaculars in Nigeria, it also highlights dense usage in London, the northeastern US seaboard, Toronto, and the Midwest/Great Lakes (Mair 2013, p. 267).

This distribution though does not only shed light on the relationship between varieties online and offline as regards questions of space and territory. Drawing on data from the expanded version of the Corpus of Cyber-Nigerian, Mair (in press) studies both the presence and use of particular varieties online and the physical, geographical spaces framing their usage. In doing so, he is able to demonstrate unexpected shifts in value; in the form of differences in the degree of continued usage of features of Nigerian Standard English and Nigerian Pidgin among posters writing from Nigeria, the United States, and the United Kingdom. Analyzing a range of forms used by the top 200 posters to the forum, he shows that while there is an over-representation of Nigeria as "the territorial base of Nigerian Standard English" (manifest here in the examples of *equipment* and *stuffs*), features of Nigerian Pidgin (*abi*, *na wa,* and *wetin be*) persist across territorial space. Hence, whereas "a nationally prestigious new standard, such as Jamaican Standard English and Nigerian Standard English, tend[s] to "dissipate" in CMC, […] the corresponding nonstandard forms, Jamaican Creole and Nigerian Pidgin, continue to thrive in the new medium" (Mair in press). Most strikingly perhaps this active cultivation of Nigerian Pidgin continues despite forum guidelines which discourage its use. This change in "sociolinguistic prestige" is interesting in its own right. But it also offers a reminder of the value of critically studying Englishes online for the study of Englishes more generally.

28.6 English Between Online and Offline Social Media Sites

A final development I wish to consider in this chapter as relevant for the study of English in social media involves the implications of the increased blurring of the lines between online and offline spaces. In this sense, this penultimate chapter returns to the notion of context, first taken up in Section 28.3. In exploring English as the language of CMC in Section 28.3 above, I quoted Orgad (2009, p. 36) as arguing for the persistence of a view of the online and the offline as different and separate. This perspective of distinctiveness has shaped research, such that many studies of online language use focus on the online, and thereby ignore the physical, material worlds of online users. As argued by Jones (2004, p. 21):

> "[r]eading many academic accounts of computer-mediated communication […] [one is left] with the impression that such interaction takes place in a kind of virtual vacuum with little connection to the material worlds of the people sitting in front of computer screens and producing the words that analysts spend so much time dissecting and interpreting."

Jones is critical of this tendency given that the majority of users do not see the two as distinct, but instead conceive of the online as an "extension" of offline interactions, with online practices serving to "ground [users] within their existing material communities and circumstances" (Jones 2004, p. 24). And indeed, since Jones' (2004) publication we can see a growing engagement in the research with the entangled relationship between online and offline spaces, and its implications for research foci, theory, and methodology.

Methodologically, this typically involves enhanced ethnographic observation of and interaction with users, often via qualitative interviews, thereby complements (multimodal, conversation, and discursive) analyses of texts. This is a situated approach (Barton and Lee 2013), which can be characterized as one which draws on both screen-based and user-based data; and which, as a result of the increasing importance of contact with users, can also entail observation of users offline (for examples, see Baym 2003; Bolander 2012, 2013; Jones 2004; Lee 2011; Spilioti 2011; Tagg 2016; Tagg and Seargeant 2016; Wargo 2015; Bolander 2019).

In the research of Barton and Lee (2013) on multilingualism, identity construction, digital literacies, and stance-taking, we see evidence for this kind of "ecological approach [which] accept[s] that all activities are situated and that people's actions both affect and are affected by the environment they are in" (Barton and Lee 2013, p. 13). This also tends to involve a mixing of methods. For example, in their study of their multilingual Hong Kong university students' Web 2.0 writing activities, they draw on a pre-interview survey, interview data, observation of participants' profiles, observation of their linguistic practices, and screen recordings. With backgrounds in literacy studies, the authors argue for the importance of combining "the study of practices with the analysis of texts in order to understand language online" (Barton and Lee 2013, p. 11). The study of practices is facilitated by their development of the methodology of the techno-biographic interview, which they use to analyze participants' relationships with technology (Barton and Lee 2013). The techno-biographic interview prompts interviewees to recount their experiences with technology by explicitly encouraging them to take a reflexive stance. Participants are thereby prompted to do so in relation to their current practices, their online participation, life history, domains of life, transitions, cross-generational comparisons, and language, while also recounting a typical day with technology.

A further example is provided by Tagg's (2016) research on the embedded text messaging practices of Laura, a middle-class woman in rural England. Drawing on Bakhtin's notion of heteroglossia, Tagg conducts an interactional analysis involving a qualitative analysis of Laura's texting interactions, quantitative corpus data, and ethnographic interviews. Focusing on how "social difference" is negotiated across texted (written) interactions, Tagg (2016, p. 61) is able to demonstrate the important role played by linguistic choices and hence also of the value of "treating digital and written resources as valid objects of study within sociolinguistics" (Tagg 2016, p. 60).

A complementary but alternate perspective and the final example I discuss here is provided by Lee (2015) who underscores the complex and entangled relationship between online and offline spaces by taking not an online space as an entry point, but the use of enregistered digital discourse in offline public spaces in Hong Kong. She thereby focuses on how meanings of digital discourse are both reconstructed and recontextualized offline in public spaces in Hong Kong and what might motivate these processes. In this work, the Internet is thus explored not as separate from public space, but as part of the linguistic or semiotic landscape of a particular place/locality. To study its social meanings, Lee takes photos ($N = 243$) of examples of digital discourse across a variety of different sites and annotates these according to location (commercial/business, official/institutional, and mobile [e.g., t-shirts, trains]), language (English, Chinese, and bilingual), and "Internet-specific language features" (e.g., @, Facebook "like," and the heart symbol <3) (Lee 2015, pp. 179–180). By conducting spontaneous interviews with 20 passersby, she is further able to explore their social meanings, and to hence raise questions, for instance, surrounding the commodification and branding potential of digital discourse (as related to its dominance in commercial/business sites) and questions of standard language ideology (as related to the comparative institutional/official settings) (for a discussion on enregistered Internet language in connection with questions of Standard English, see Squires 2010).

28.7 Conclusion

This chapter discusses English on social media from various vantage points which I endeavor to integrate in the course of reviewing research trends and providing examples. The first provides insight into key developments in sociolinguistic research on social media, particularly as regards changing conceptualizations of the Internet (as compared with offline spaces), foci, and approaches. In discussions of such core developments, the chapter thus highlights a shift away from an understanding of context in technological terms to one which includes social factors and offline settings. These changes are relevant to sociolinguistic research on English online, particularly against the backdrop of the predominance both of English online and in the research literature.

As argued, however, the Internet has become an increasingly multilingual and multimodal space, and the second main vantage point on English on the multilingual Internet is contextualized against this backdrop. In probing language contact scenarios involving English, the chapter discusses trends in social media research as part of a broader "sociolinguistics of mobility." Seargeant and Tagg (2011, p. 497) argue that limitations of the category of discrete languages become particularly visible where change is most obvious: that is, in connection with "(1) the global spread of English and the diverse linguistic practices that have resulted from it; and (2) the linguistic practices of CMD." This point stands for computer-mediated discourse more generally. However, as outlined in this chapter, social media are participatory and interactive. Social media thus facilitate the potential coming into contact of various people and resources via a compression of both space and time. They

thereby offer an interesting lens through which to explore questions of language and its relationship to space and time. Against this backdrop, the chapter also reviews examples from a growing body of work which probes into the meaning and use of Englishes in social media settings; and into the complex relationship between language and social and physical space. This pluralist focus is warranted given the increased multilingualism and multidialectalism of the Internet.

Finally, the chapter briefly turns to the relevance of the blurring of the lines between online and offline settings and the rise in scholarship which reflects upon the need to contextualize online practices more thoroughly vis-à-vis both online and offline spaces for the study of English. In doing so, it foregrounds the persistent importance in changes in what is viewed as context for questions of data and methodology. In ending with research demonstrating this complexity, the chapter ends with examples on the validity of taking a situated approach of this kind, and of how doing so might challenge the very meaning of the preposition "on" in the title of this chapter, "English on Social Media."

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NOTES

1 Increasingly, comparisons involve considering Web 3.0 and Web 4.0, which are not, however, addressed in this chapter.
2 Thurlow (2013) also reminds us that technological affordances that make possible interactivity and participation do not guarantee that this will be reflected in practice.
3 Whereas the former, referring to interaction in real-time, was associated predominantly with the spoken dimension of language use, the latter, referring to interaction which takes place with a time lag, was, in turn, associated with the written dimension.
4 Davis and Harre (1990, p. 45) define positioning as "the discursive process whereby selves are located in storylines as observably and subjectively coherent participants in jointly produced story lines."
5 We chose to keep humor separate from personality because of its salience and given that it can overlap with all the other categories, so as to be able to explore the move in more detail.
6 We also underscore the importance of our finding for methodology, arguing "this […] highlights the need to conceptualize code-switching in Facebook as both individually produced and co-constructed" (Locher and Bolander 2014, p. 171).
7 Internet World Stats, for instance, acknowledges that it "assign[s] only one language per person in order to have all the language totals add up to the total world population," despite recognizing that "many people are bilingual or multilingual" (Internet World Statistics). It also states that illiteracy or infants have not been adjudged (Internet World Statistics).

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29 Gender, Sexuality, and the English Language

EVAN HAZENBERG

29.1 Introduction

Our social understanding of what we mean by "gender" has changed considerably over the past few decades—shifting from a deterministic category informed by biology to a socially constructed schema reflecting post-structuralist framing of emergent identities—and our linguistic approach to the study of language, gender, and sexuality has shifted in parallel. Although there have long been accounts of sex differences in language use (e.g., Jespersen 1922) and *sex* was a factor in early descriptive accounts of language (e.g., Fischer 1958), the field of language and gender as an academic discipline was largely spurred by Robin Lakoff's 1973 article, *Language and Woman's Place*, which described some of her observations on the relationship between the language used by women and the subordinate position of women in society. Her commentary was limited to the white, middle-class American women that she was able to observe easily, and subsequent studies aimed at quantifying and exploring her observations largely found they were oversimplifications of more complex behaviors, if not reductivist stereotypes with little empirical foundation. Nevertheless, the sentiments that Lakoff tapped into—that there is a direct link between social categories of gender, social and political agency, and the linguistic resources available to members of a speech community—resonated with feminists, linguists, and the general public alike, and her article (later published as a stand-alone book, re-issued in 2004 with additional commentary) all but invented the field of language and gender research: a systematic, grounded, and critical interrogation of the relationship between language and gender.

So why has language and gender captured so much attention in recent decades? The 1990s in particular was a bumper period in our cultural obsession with men's and women's communication; books such as Deborah Tannen's (1990) *You Just Don't Understand* and John Gray's (1992) *Men Are From Mars, Women Are From Venus* graced our bestseller lists and bookshelves, painting a world where the communicative practices of men and women were so distinct that it was only with training that we were able to communicate at all. These ideas have stuck around and continue to have an impact on our framing of gendered interactions, particularly in contexts which can be reduced to he said/she said, and where men's culpability for abhorrent behavior can be reclassified as "miscommunication" (e.g., Ehrlich 2001, 2003). We gender infants from the day they are born, not only in our color choices and toy options, but also in how we talk to them, how we teach them the appropriate ways to behave and to interact, and how we model the femininities and masculinities that we expect them to grow into. So rather than asking why the sudden interest in language and gender, a more

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productive question might be: why not earlier? Why did no one ask these questions before Lakoff shone a light on them?

The answer to that lies partly in who was in a position to ask questions at all. Women have been students in academia for a long time, but their presence on faculties and as researchers is a relatively recent phenomenon. The non-masculine perspective on questions of gender had largely been ignored, because the research agenda had been set by men (typically white, middle-class, educated) to whom interrogating the gender hierarchy was not an obvious project to undertake. The naturalness and common-sense appeal of traditional gender roles, with women subordinate to men across most domains, obviously sat comfortably with such men, since the entire social order was orchestrated to serve their interests. *Naturalness* and *common sense* are insidious precisely because we are not supposed to notice them, or the ideologies that underpin them, let alone ask awkward questions. Feminism and queer resistance have been jointly engaged in interrogating these privileged positions for a few decades now, questioning heteronormative patriarchies (among other things). The subsequent proliferation of research in language and gender and queer linguistics is testament to how important it is that these questions are asked.

While much of the research touched on in this chapter does not provide much empirical support for popular stereotypes of gendered language—that is, *women are more polite, men are more assertive*—it is interesting to note the incredible staying power of those stereotypes. Many are assumed to be innate differences about males and females, arising out of biology rather than social structures. It was historically common sense that females were fundamentally distinct from males, and that males were the superior sex, so language deficiencies in women fit into the natural order of things. Pop psychology and pseudoscience continue to reinforce notions of fundamental differences between the sexes. The search for some deeper truth about sex difference is an ongoing project, spurred on by social fascination and no small amount of confirmation bias. In spite of the fact that most studies—those conducted under scientific principles of replicability, falsifiability, and general good practice—find overwhelming sameness in the brains of females and males rather than differences (see Eliot 2009, for an overview), marginal observations in scientific studies get amplified by the press and popular media, and used to justify all manner of presupposition and prejudice. Partly this is the effect of our deeply embedded common-sense notions of gendered difference, and partly it is a resistance to the change that this research demands: people are unlikely to give up their positions of power without a fight, and any serious reckoning with the gender and sexual politics of our age is likely to point out systematic inequalities that need to be addressed. These tensions are often presented as a zero-sum game by those invested in the status quo: we cannot give more power or privilege to women without taking it away from men, and we certainly cannot have that. The critical lens on the inequalities facing women and sexual minorities is being countered with a moral panic about the death of masculinity, despite the fact that the changes being advocated for would be to the benefit of men as well as women, and to the straight majority as well as the queer community.

These are interesting times, and the intersection of language with gendered and sexual identities provides a useful perspective on both social changes and linguistic ones. This chapter will look at some of the developments in the field of language and gender, starting with some of the early work on sex differences and building toward the more socially constructed perspectives that permit multiple femininities and masculinities, and the linguistic resources available for presenting and interpreting such identities. This is not a discussion of political correctness in language or of sexism per se, nor indeed is it a discussion of grammatical gender. Instead, it is intended as an overview of the history of linguistic engagement with links between language use and social categories of identity. It will discuss some of the shifts in perspective relating to sex, gender, and sexuality, and touch on some of the key studies that have shaped the field.

29.2 Sex Differences in Language Use

Differences in how men and women use language have drawn attention and commentary for a very long time, and been generally derogatory toward women. Otto Jespersen's (1922) account of language includes several observations on women's use of language—such as women having smaller vocabularies, talking before thinking, and speaking emotionally rather than grammatically—some of which continue to resonate with contemporary stereotypes about how women speak. But these types of observations are essentially anecdotal: they come from men noticing something about women and remarking on it, and we tend to notice differences. A more scientific approach—an evidence-based one rather than one based principally on introspection and common sense—began to take effect as a quantitative descriptive paradigm crept into English linguistics.

On the one hand, there are clearly anatomical differences between adult females and adult males that affect the organs of speech production. With most males being physically larger than most females, overall sex differences in the dimensions of the throat, mouth, and nasal passage can affect the acoustic signals produced by females and males. At puberty, males also undergo more extreme physical changes in vocal tract anatomy under the influence of testosterone than females do, inducing a thickening of the vocal folds themselves—the stretches of skin that vibrate to produce speaking pitch—which results in a generally lower voice for males than for females. At this level of granularity, which is fundamentally anatomical, *sex* makes sense as a category to differentiate speakers. However, the mere existence of anatomical differences does not in itself mean that these differences are at the root of linguistic variation in production. For one thing, gender differences are regularly observed in the speech of children, who have not undergone puberty and whose physical dimensions do not show the same scale of size differences. It is generally accepted that these children are picking up on social cues from adults, and reproducing them in their own speech—suggesting that, at least in part, gender effects on speech production can be socially acquired rather than physiologically inevitable. Studies of vowels, which are produced with vocal fold vibration and therefore are affected by anatomical differences, can still show gender effects even when the measurements and analyses are normalized to account for sex differences, further problematizing the causal link between anatomy and speech production. And studies that examine voiceless segments—when the vocal folds are not vibrating at all, and differences in voice pitch are therefore irrelevant—can also show consistent and systematic differences between women and men, as well as within groups of women and men.

The field of language variation—of examining the different realizations of a particular linguistic form, either within a given speech community or between different such communities—introduced a new rationale for taking a more careful, quantitative approach to this question of sex differences in language use. One early study in English looked at school-aged children and the realization of word-final "-ing," in words like *walking* and *thinking* (Fischer 1958). This was variably realized as a standard velar [ɪŋ] *walking* or as a non-standard apical [ɪn] *walkin*, more associated with informal speech styles. The girls in this study used more of the standard variant, and the boys used more of the non-standard, although "model boys" used more of the standard than their less well-behaved peers. The sex effect, although undeniably present, pointed to a more complex relationship than simple biology, tempered by some kind of social positioning within the social context of the school.

Understanding how variation patterns within a population of speakers clearly entails understanding something about those speakers and how they relate to each other, which prompted the development of an analytical approach that took both social and linguistic factors into consideration. William Labov's early work in Martha's Vineyard (Labov 1963)

and New York (Labov 1964) highlighted some interesting patterns with respect to linguistic innovation in English, which paralleled that previously observed in Switzerland (Gauchat 1905) and which were subsequently observed in other English-speaking communities (e.g., Trudgill 1972; Labov 1990). According to these studies, women are innovators with some types of variation, introducing novel forms into their speech communities; with other types, women are conservative, maintaining their use of more standard forms. This has been dubbed Labov's *gender paradox*.

The idea of a gender paradox has drawn criticism, however, for its essentializing approach to gender. The paradox is based on what is essentially a binary and biological distinction between *women* and *men*, using sex as a straightforward and analytically unproblematic way to categorize participants. These early studies devoted less time and energy to understanding and unpacking the socially constructed nature of gender than they did to the deconstruction of, for example, class and ethnicity (Eckert 1989a). Although there was engagement with intersecting social indices such as class/gender, ethnicity/gender, age/gender,[1] and the roles of power and prestige within the speech community were put forward as explanations for the gender/sex differences observed, it was not until the mid- to late-1980s that linguists interested in the nuanced relationship between language and social categories of gender began to propose more socially oriented ways of analyzing the relationship between *gender*—as opposed to *sex*—and language variation.

29.3 Gender as an Alternative to Sex

Where *sex* is a biologically determined categorization drawing on "natural kind" classifications—which are not themselves uncontested, as queer and trans people challenge the naturalness of binary gender, and medical and biological sciences challenge the straightforwardness of the male–female sexual dichotomy (e.g., Fausto Sterling 2000)—gender is a much more complex entity to grapple with. *Sex* is essentially physical: it describes a biological (genetic and/or anatomic) configuration of the body, and for the majority of the population, biological *femaleness* or *maleness* is unproblematically linked to social categories of *femininity* and *masculinity*, respectively. But the use of the singular forms to describe these social categories is misleading, as it implies a homogeneity within the categories of *women* and *men* that is unwarranted. At a very basic level, there are necessarily going to be age, ethnicity, class, education, and sexuality differences within each of these categories, but adopting these finer-grained classifications is still treating gender as a product of biology: the fundamental criterion is anatomy, and then there is a further social-sorting process applied.

But the way that gender works in the real world, the normative frameworks that it applies on our daily interactions and the effects that these have on actual human beings, is not as tidy as this basic sorting approach implies. William Labov and Peter Trudgill have argued that linguistic differences that align with gender are primarily about *prestige*, where symbolic capital associated with particular linguistic forms serves a stand-in for material capital. Their position is that people without ready access to money, influence, or clout in their community (i.e., women) have to fall back on notions of *correctness* as sources of authority, while those who control the material capital (i.e., men) do not have such a high investment in symbolic capital. Penelope Eckert (1989a, p. 257) goes further, framing femininity as "a culturally defined form of mitigation or denial of power," in contrast to masculinity's "affirmation of power." In explicitly linking gender with issues of power, there is a shift away from thinking of gender as a static property of individuals toward an understanding of gender as a product of social processes that are deeply tied to hierarchical and asymmetric relations in communities. Linguistic differences observed between women and men are thus not simple products of biology or of "common-sense" interpretations of gender roles, but rather reflect the

differential resources available to women and to men, and the consequential differences in evaluation placed on their respective linguistic practices.

The shift toward thinking about gender as emergent within social communities narrowed the scope of language and gender in a sense, turning attention from the universal and toward the locally constituted relationships between gender and power. The *Community of Practice* model (e.g., Eckert and McConnell-Ginet 1992) seeks to examine how linguistic resources are deployed within tight-knit groups organized around particular projects or social ends, and *social networks* (e.g., Milroy and Milroy 1985) draw on fine-grained analyses of family, friendship, neighborhood, and work ties to more carefully tease apart how social mobility and gender interact. These ethnographic approaches in language and gender allow the researcher to consider quantitative observations of variation against a qualitative backdrop of locally relevant and locally constructed gender and power relations, grounding the study of language and gender in a much more concrete way than large-scale survey-style studies were able to.

The analytical turn from global to local has also meant that meaningful variation at the level of the individual does not have to disappear into aggregate analysis, but can be explored in its own right. This has allowed a more serious engagement with the linguistic practices of a more diverse range of identities, and consequently a more diverse range of social structures that give rise to gendered practices. After all, gender differences are not something that pop into existence in adulthood from out of a void, but are the product of early and consistent socialization, starting in childhood and continuing throughout the lifespan—so a gender-oriented approach to language calls for attention to the linguistic practices at different key social and developmental periods.

Exactly when, how, and from whom children acquire gendered ways of speaking is not entirely clear. There is compelling evidence from linguistics and psychology that children are exposed from a very young age to different styles of speech and interaction from the women and men in their lives. Childcare is often disproportionately provided by women, so young children are potentially exposed to more feminine speech styles than masculine ones, and studies have found systematic differences in how mothers and fathers talk to their children, in terms of interruptions (Greif 1980), the use of diminutives (Gleason et al. 1994), and narrative styles (Reese et al. 1996). But these differences in child-directed speech are not just about the gender of the speaker: parents also adapt their language according to the gender of the child being addressed (Foulkes et al. 2005). From a very young age, then, children are being systematically acculturated into the gendered expectations of their communities, making this early input crucial in setting the stage for increasing social and linguistic differentiation across the lifespan. Robertson and Murachver (2003) found that strong sex-role beliefs in children—which were stronger in boys than in girls—had an effect on the extent to which children would accommodate their speech styles to those of their adult interlocutors, suggesting that children are not only passively receptive of these gendered expectations, but actively using them to position themselves in social interaction.

Deborah Tannen (1990) traces the roots of adult gender differences in interaction to different styles of play that girls and boys engage in, and to the language practices that come out of this play—cooperative versus competitive styles, for example. If boys and girls tend to play differently, and if those differences are rewarded by their peers and by adults when they align with gendered expectations, then it is not hard to see how these could be amplified and focused over time. However, as Deborah Cameron (2008) points out in *The Myth of Mars and Venus*, the types of linguistic practices stereotypically associated with women and men—sequences that could be classed as cooperative or competitive—are actually present in the speech of both girls and boys, so the appealing symmetry of Tannen's explanation starts to fall apart. While there undoubtedly are differences in how young children play together, and how that play reinforces gendered expectations, the link is not necessarily as direct as we might like it to be.

As children grow up, of course, they begin to construct identities against a larger backdrop than their immediate home and family life provides. Adolescence and pre-adolescence have been identified as key life-stages in the cementing of the gendered social order. Young women come to realize the extent of the limitations that gender ideologies place on them, and invest in symbolic means of accruing social capital within the context of the heterosexual marketplace, that emerging social backdrop of maturity against which adult forms of femininity and masculinity are constructed oppositionally, under the clichéd premise that opposites attract. Adolescence and pre-adolescence also mark important life-stages in terms of language variation and change, and these two phenomena—language change and social movement into more explicitly gendered configurations—are closely related. Adolescence is a period of figuring out the social systems that we inhabit, and carving out a space for ourselves within them; and in Western cultures (especially North American and European ones), young women come to use language in particular ways to position themselves in relation to each other, to young men, and to the social fabric of their communities. School is an important proving ground for much of this identity work, and Eckert's work in a suburban high school in Detroit (Eckert 1989b) highlights differences between young women and young men with regard to how central language is in constructing a social persona. Young men are evaluated on what they do: on their athletic or academic success, for example; while young women are evaluated on who they are: their personality, their friendship groups, and their popularity. Without recourse to the "objective" standards of success available to their male peers (trophies and related accolades), young women draw on more "subjective" means of positioning themselves in relation to other groups of young women, and language emerges as highly productive for this kind of social positioning. Eckert found that linguistic differences between the two dominant social groups—*jocks* who were deeply invested in the school culture, and *burnouts* who were oriented to a more urban and blue-collar work culture—were more extreme for women than for men, and she attributed this pattern to the extent to which young women were drawing on symbolic capital to assert social category membership, in the absence of more direct means. Many of these generalizations about gendered categorization in adolescence hold outside of the school setting as well (see, e.g., Norma Mendoza-Denton's (1996, 2011) work with Chicana gang girls): adolescence is when we carve out our own identities in our communities, and language is a tool that we can load with gendered meaning.

Adolescence and early adulthood are also important stages in the development of our sense of sexuality. The *heterosexual* marketplace is premised on adult-like relationships (whether explicitly sexual or not) between women and men, which imposes a secondary set of social expectations and limitations on relationships within same-sex peer groups. Staking a claim to a non-heteronormative identity complicates these foundational relationships in at least two ways: it violates the underlying other-oriented expectations that shape much of the adolescent and young adult social landscape, and it threatens the presumptive non-sexuality of homosocial relationships. Work on language and masculinities (e.g., Kiesling 2005, 2007) has examined the careful way that men construct friendship and affection within the limits of heteronormative frameworks, drawing on indirectness to balance the inherent conflicts between heterosexism (the default assumption of heterosexuality and an associated derogation of homosexuality) and male solidarity (the establishment of close bonds between men to the exclusion of women). The pursuit of male solidarity risks pushing heterosexism past its acceptable limits, so requires careful management on the part of individuals and the community more generally in terms of how affection can be safely expressed. Interestingly, the same kinds of tensions do not seem to have been articulated in groups of women. This is not to say that women do not make any social distinctions based on sexuality, but rather that socially constructed versions of femininity in many communities seem to allow more physical and emotional intimacy between women without violating the tacit heterosexism of friendship.

While gender and sexuality are not precisely reflexes of the same social processes (they are largely independent of each other—*masculinity* does not predict either *heterosexuality* or *homosexuality*, although *lesbian* does predict *femininity* in a way that *gay* does not predict *masculinity*), they are nevertheless closely related. If the homosocial edges of masculinity are policed more stringently than those of femininity, then at least the social management of sexuality must be gendered. The linguistic resources we use to present our gendered identities can also be used to index our sexualities, and the broad field of language and gender that has come to recognize the centrality of sexuality to questions of gendered identity.

29.4 Sexuality

While homosexual behavior has been attested in human cultures across time and space (e.g., Mondimore 1996) as well as within animal populations (e.g., Sommer and Vasey 2006), the social identity categories of *gay* and *lesbian* are relatively recent, reflecting the merger of sexual activity and social position in society. Your sexual proclivities are no longer reflective of what you *do*, but rather of who you *are*. This shift effectively moved sexuality into the public realm, and allowed for the articulation of a new set of femininities and masculinities to become visible. Early research into the language of these newly visible lesbian, gay, and bisexual communities[2] focused primarily on homosexual men, which is perhaps unsurprising given the default androcentrism of early language research. This focus on the language habits of men is presumably due at least in part to the social salience of sexual deviance among men, particularly in the aftermath of Oscar Wilde's trial in 1895 that brought London's homosexual subcultures into the public eye, and reframed sexuality as a public and socially relevant aspect of masculinity. Sexual variation (at the time conceived of as sexual deviance) was presented as a social and legal problem that had to be tackled, particularly prior to the start of organized gay liberation movements in the 1960s and 1970s. Western society has often relegated women to the margins generally, and with women's sexuality widely constructed as passive and procreative, women who acted with sexual agency were even further marginalized. This is not to say that women involved sexually with other women were completely invisible—sexual contact between women has been a pornographic staple for centuries (e.g., Toulalan 2003)—but such depictions are often understood in terms of the male gaze (e.g., Rivers 1995): they are not representations of lesbianism per se, but rather of male fantasies of lesbianism. The actual lived experiences of women who would today be described as lesbian are harder to establish historically, so it is complicated to try to reconstruct their language as it would have been used: synchronic invisibility has led to historical erasure.

Some very early work on terminology used by and about homosexuals (Legman 1941) included lesbians as part of the discussion, but the field of interest narrowed relatively quickly to the argots and anti-languages used by homosexual men in the United Kingdom (particularly in the 1950s and 1960s) to signal their identities to others who knew the code. The most well-known of these is *polari*. Polari did not arise spontaneously from homosexual men's networks, but rather grew from a combination "rhyming slang, circus backslang, Romany, Latin, and criminal cant" (Lucas 1997, p. 85), tracing its roots back to eighteenth-century subcultures that mixed homosexuals, gypsies, and thieves into a heterogeneous outgroup. Use of polari was a kind of identity performance, quite possibly invisible to anyone disinclined to notice it, but allowing for the development of a shared homosexual men's repertoire, which included language. But why was there no equivalent argot for lesbians? Cameron (2011, p. 102) points out that, historically, women did not have access to the kinds of public spaces available to men, which would have inhibited the creation of the kinds of social networks that give rise to communities of affiliation. Women did not generally have

the same opportunities to create collective non-heterosexual identities that their male counterparts did, and when conditions did allow for communities to emerge, the social pressures acting on women were markedly different from those acting on men. In patriarchal societies, men living independently of women are more tolerated than women living independently of men.

Research on lexical items and slang continued to dominate much of the work in lesbian and gay language studies until the 1980s and 1990s, when attention began to shift toward sociophonetic indices of sexuality. The phonetic dimension of language is a productive one for encoding social information in a systematic and socially interpretable way. Here, again, focus on gay men continued to draw the most attention, with a number of studies (e.g., Gaudio 1994; Smyth et al. 2003; Levon 2006; Smyth and Rogers 2008; Smith et al. 2010) attempting to identify the phonetic correlates of the stereotypically gay (men's) voice. These studies, both perception- and production-based, tended to find that people were pretty good at identifying the sexual orientation of men, but that the specific linguistic and phonetic cues being used to make those assessments were hard to pin down. The picture that emerged from across these various studies was that the "gay-sounding voice"—which Cameron and Kulick describe as "a cluster of phonetic features that have come to be associated with gay men's speech" (2003, p. 96)—is not comprised of a single phonetic cue that either is or is not deployed, but is more productively thought of as a set of features that can be used in any number of combinations to produce a recognizable or interpretable social effect. Studies have also looked for phonetic differences in the perception and production of speech by lesbian and queer women, particularly focused on pitch and pitch variation (e.g., Moonwomon-Baird 1985; Van Borsel et al. 2013), and some studies of sociophonetics have included both gay men and lesbians (e.g., Pierrehumbert et al. 2004; Munson et al. 2006; Munson 2007). Findings from these studies are even less consistent than those examining the speech of gay(-sounding) men, which in itself is not that surprising. There seems to be no easily accessible stereotype of lesbian speech to mirror that of gay men—it is straightforward to elicit intuitions from people about "what gay men sound like," and there tends to be a lot of overlap between different people's observations, but the same is not true for "what lesbian women sound like." *Lesbian* as a category does not seem to rely on the same degree of phonetic performance as *gay man*, and some people have argued that lesbian identities are created through discourse and semiotic practices (e.g., Moonwomon-Baird 1985; Queen 1997) rather than through articulatory details.

This is an important point to consider, because it counters the presumptive symmetry that can be taken for granted between heteronormative women and men more generally: if men do X, then there ought to be some counterpart X′ that women do. Where men are competitive, women are taken to be cooperative; where women build rapport through conversation, men use conversation to exchange knowledge. These illusory symmetries are rarely borne out by linguistic research, but they remain deeply entrenched in our intuitive understandings of gender. So if gay men create identities using a particular set of linguistic resources, we should expect lesbian women to do the same—not with the same linguistic features, but nevertheless they ought to carve out an identity that parallels that of gay men. But as Zwicky (1997) points out, there are some core differences in how gay men and lesbian women position themselves vis-à-vis their heteronormative counterparts: gay men are said to construct identities in opposition to "societally masculine norms" (p. 30), while lesbians are not distancing themselves from straight women, but are instead intensifying their identification with communities of women more broadly. So while a logic of social difference would demand some kind of performance of identifiable difference, a performance of deeper affiliation and affinity would not.

It is important when thinking about sexuality and language that we are careful not to directly equate sexual preference or orientation with sexual *identity*. From a language

production perspective, the actual mechanics of our preferred sexual acts are less relevant than the kind of person we want to be socially understood to be—so at best, performative queer identities are a snapshot of a *type* of gendered identity, rather than representative of everyone who could be categorized in the same way. Not all gay men perform camp identities, for example; some do, but studies that aim to codify the linguistic practices of camp gay men are doing precisely that: making observations about the performance of *campness*, not about masculine homosexuality more generally. This is not to say that there are not groups of people who share certain social and linguistic features in common—just as *masculine* and *feminine* are social constructs that are embodied at the level of the individual but aggregate into socially recognizable groups, so are identity categories like *lesbian* and *gay*—but it is a note of caution about how we ask our questions, and how we interpret our findings. Language and gender are as much about who we spend time with, those with whom we are engaged in co-creating interpretable identities, as they are about the macrosocial categories that we belong go. Kiesling's (2005, 2007) studies of heteronormative masculinities in a US college fraternity are no more universally representative of straight men than the exploration of Kennedy and Davis (2014) of an early lesbian community in Buffalo is representative of all lesbian and queer women. Some kind of essentialism—of binning participants into categories for analytical purposes—is an inescapable part of any kind of community-level linguistic analysis, but it must be done carefully and responsibly, relying on ethnographic observation to support the categorization schema, and the generalizations that we can make based on any one study must be tempered. That Jane and Michaela are both lesbians does not in itself give us any reason to think their language practices are likely to be comparable. That they are both members of the same sports teams, are part of the same bar culture, and are actively involved in creating comparable styles of queer femininity—which we would only know through careful fieldwork and observation—gives us more justification for thinking that they may be using a shared set of linguistic resources.

A lot of the contemporary linguistic research on gender and sexuality falls under what Eckert (2012) would categorize as the *third wave* in variation study: examining the stylistic practices of situated individuals, and developing an understanding of how microlinguistic features are deployed by people to create and present particular identities. This approach is less concerned with what happens at the level of the community than it is with how individual members of a community construct gender and sexuality through interaction. The mapping of form to social meaning is a central question within this research approach: Robert Podesva, for example, has studied the speech of gay male professionals (2007, 2008, 2011) across different social situations and types of interaction—professional, casual, within a close friendship group, etc.—and explored the different social meanings that any given linguistic variant can carry, depending on the context and the persona being produced in that moment. Where community-level studies tend to focus on patterns of use and correlations, this emphasis on style focuses on the production of interpretable social meaning.

The extension of language and gender as a discipline to include sexuality has also had the effect of creating a new field of study: *queer linguistics*. There are two broad senses in which this term gets used, and they refer to quite different enterprises. The first has the meaning of "the study of language used by and in LGBTQ+ communities," and can quite straightforwardly be thought of as a sub-field of language and gender generally: how do queer people construct and present identities as queer people through language, and what are the linguistic resources used to accomplish this? The second sense of *queer linguistics* is a larger project, which Koller (2013, p. 572) presents as an imperative to "uncover and destabilize normativity." This sense puts it outside of the traditional field of language and gender studies—one could argue, in fact, that language and gender becomes a sub-category of queer linguistics, one way in which normativities (heteronormativity, homonormativity, normative patriarchal power structures, etc.) can be studied and understood as part of processes of destabilization.

Much of the research carried out under this second type of queer linguistics is more closely aligned with discourse and conversation analyses than with variation, and generally examines the ways in which power dynamics play out in language use. Celia Kitzinger's studies on the emergence of heterosexuality in interaction (2005a, 2005b) interrogate the naturalness of heterosexuality and its unmarked status; but normativities run deeper than sexuality, and queer linguistics is also invested in looking more closely at gendered identity itself.

29.5 Trans Identities and Language

The majority of people identified at birth (if not in utero) as either female or male will identify as women and men, respectively, sliding without difficulty into the socially feminine and masculine roles for which they have been prepared throughout childhood. However, this is not universally true, and for some people, inner sense of identity does not align tidily with outward bodies and/or associated social expectations. Trans[3] identities present an interesting take on the question of language and gender from at least two perspectives. First, there is the question of how individuals can agentively use the gendered linguistic cues in their communities to present themselves in a socially interpretable way. For people who want to be recognized and understood as women, how is that accomplished? In what ways, and by what mechanisms, can the gendered norms that we are socialized into as children be agentively overwritten in adulthood? And second, the language used by trans people allows an exploration of the ways in which normative binaries can be challenged. From identity terms and category labels that problematize the naturalness of biology and social identity, to gendered presentations that deliberately distance the speaker from a continuum of masculine and feminine, the linguistic resources that trans people draw on to manipulate gendered presentations and perceptions can shed light on how language accomplishes gender, and how gender shapes language.

Research into trans language practices is a relatively recent subfield of language and gender, partly because trans identities have not been publicly visible for as long as queer identities. The rates at which people are identifying as trans have increased dramatically in the past decade or so (see, e.g., Trans Youth Can! (2018) for Canadian figures on pediatric referrals to gender-affirming clinics). Some people dismiss this as a new fad in the world of gender and sexual politics, but the sense within trans communities seems to be that it is easier to come out as trans now than it has been in the past, and therefore more people are opting to transition than to live in secrecy or denial. Whatever the reasons, the increased visibility of trans lives and experiences has meant that researchers are able to document and analyze language used by trans people, as well as language used in and around trans communities, a project which Kulick (1999, p. 615) identified as "one of the most urgent tasks facing scholars interested in transgender and language."

From a phonetics perspective, there has been considerable research into voice phenomena among trans people, particularly from a speech therapy perspective (e.g., Coleman 1983; Carew et al. 2007; Holmberg et al. 2010), framed by a particular emphasis on acoustic parameters (e.g., fundamental frequency, resonance, voice quality) with respect to the perceived femininity of trans women's voices. Less attention has been paid to the voices of trans men (but see, e.g., Van Borsel et al. 2000; Papp 2011), largely because testosterone administered therapeutically as part of medical transition generally lowers the speaking pitch (F0) into a canonically masculine range. If the voice lowers "for free" for trans men but must be deliberately manipulated into a higher register by trans women, then there is an opportunity to explore whether any hierarchical relationships exist in the linguistic cues that we attend to in the perception of gender. Anecdotally, several of the trans men that I have worked with have told me that, as their voices deepen during transition, they feel less constrained in other

aspects of gendered presentation; they know that their linguistic flamboyance is likely to be read as queer, but crucially, queer and *masculine*. On the other hand, trans women have told me that, if their voices are not read as *feminine*, nothing else they do linguistically will be interpreted as feminine either, instead marking them as queer men. Although these observations have not been tested empirically, they do point toward some degree of primacy of voice in the binary perception of gender, and it would be interesting to investigate whether "successful" voice performance (however problematically that is understood) correlates with greater linguistic freedom in other domains.

The variationist lens has also been turned toward trans identities and language, as it has been on sexuality. Sociophonetic variation in particular has been a fruitful enterprise (e.g., Zimman 2012), and to a lesser extent so have studies that explore lexical/discourse variation (e.g., Brown 2009) and studies that look at variation across multiple linguistic levels (e.g., Hazenberg 2016, 2017a). A common approach in such studies is to compare the speech of trans people with demographically comparable cis people, which allows an examination of the range of variation in different speech groups generally, but also to explore which dimensions of linguistic variation seem available for identity work, and which do not. Of course, this is not the only approach taken, and Lal Zimman's body of work in particular (e.g., Zimman 2016, 2017) bridges the sociophonetic and the discursive, exploring the linguistic practices that frame and interpret sexed bodies and sexuality in trans-positive ways (see also Bagemihl 1997; Yerke and Mitchell 2011). Issues around category labels and intersecting identities (see, e.g., Feu'u 2017; Hazenberg 2017b) have also been examined, as has the use of English outside of anglophone contexts for doing transgressive gender work (see, e.g., Besnier (2003) for *fakaleitī* in Tonga, and Hall and O'Donovan (1996) for *hijras* in India).

Although a relatively recent discipline, trans language studies offer a unique perspective on the complex inter-relationships between sex, gender, and sexuality, and is arguably the newest frontier in the field of language and gender. However, it is unlikely to be the last such frontier: as new gendered identities continue to be articulated within trans communities, the study of language will continue to offer insights into how gender and sexuality are constructed, constituted, maintained, and challenged.

29.6 Conclusions and Reflections

The field of language and gender has come a long way since the late 1970s and early 1980s, when scholarly attention started to be seriously turned toward the linguistic construction of femininities and masculinities. An interesting example to illustrate the changes and developments discussed in this chapter is to consider the linguistic study of /s/: the voiceless alveolar fricative sound found at the beginning of words such as *start*, *sing*, and *sweet*, and the end of words such as *hiss* and *coarse*. One of the reasons that it has attracted so much linguistic attention is the degree of gendered meaning it seems to carry, at least in English (think, for example, of the stereotyped gay lisp). The fact that it does not carry gendered meaning—or indeed show any significant gender differences—in all languages (e.g., Heffernan 2004; Fuchs and Toda 2010) is strong evidence that the meaning it does carry is social, rather than simply a reflection of physiological differences between males and females. Furthermore, because it is a voiceless segment (i.e., produced without any vibration of the vocal folds), it is unaffected by differences in voice pitch, and although there are physiological differences in vocal tract dimensions between men and women, the gendered effect in English seems to be strictly social.

In 1968, two researchers independently concluded that listeners were able to identify speaker sex based solely on voiceless fricatives heard in isolation (Ingemann 1968;

Schwartz 1968)—that is to say, stripped of all other vocal, linguistic, or other gender-contextual cues, people could tell women and men apart from these very minimal linguistic cues. In English, women generally produce /s/ with a higher spectral peak than men; this higher-peaked, hissier-sounding /s/ is produced closer to the front teeth, and a lower-peaked, more sh-like /s/ is produced further back (e.g., Jongman et al. 2000). While it is tempting to ascribe these differences to some kind of sexual dimorphism, research does not bear this out. Stuart-Smith (2007) found significant differences in /s/ production between young working-class and middle-class women in Glasgow, and there is no evidence of anatomical differences along class lines among women of the same age. Similarly, there are no anatomical differences between gay and straight men that could account for differences in /s/ production, but there seems to be a strong relationship between gay-sounding male voices and a fronted /s/ on the one hand, and straight-sounding voices and a retracted /s/ (e.g., Linville 1998; Smyth and Rogers 2008) on the other. The effect does not seem restricted to masculine sexualities, although the pattern among women is less clear-cut, with some studies (e.g., Hazenberg 2016) finding no clear differences among women along dimensions of sexuality, and others reporting lesbian-sounding women with lower-frequency (more retracted) /s/ than straight-sounding women (e.g., Munson et al. 2006). Given the richness of gender and sexuality that can be encoded in /s/, then, what are trans people doing? Hazenberg (2016) found trans men and women in Ottawa patterning in parallel with their cis peers, Zimman (2012) found that trans men in San Francisco who identified as heterosexual had lower-frequency /s/ than those who identified as queer or as non-binary, while Podesva and Van Hofwegen (2016) found complex relationships between gender, age, sexuality, and community affiliation for trans women in California.

So what does this messy picture of /s/ actually tell us about language and gender? For one thing, it demonstrates that broad sweeping statements about what "women" and "men" do linguistically masks a lot of socially meaningful variation within those categories. There are multiple femininities and masculinities, and speakers are able to deploy different linguistic forms to create those identities—just as listeners make use of their social understanding of those forms to interpret the linguistic and gendered performances of others. But it also shows that we perceive the linguistic practices of others through social lenses: a high-frequency /s/ can signal a particular identity if the person who is producing it is understood to be performing femininity; it carries a very different set of meanings if they are seen to be performing masculinity. An older woman using a particular form may be doing something very different from a younger woman using the same form, and someone from a small town may be working from a different interpretative framework than someone from the big city.

The diachronic shift from sex to gender as a social factor in language study and the subsequent reconfiguration of gender into a multidimensional gendered identity mark important developments in the field of language and gender. Research in these areas is never exclusively about language, because language operates within a complex social order where gender and sexuality are important dimensions of identity. It is as much about gender and society as it is about gender and language, making it an important social dimension to language research more generally. It links important social categories which have not been at the forefront of linguistic interest for very long (especially sexuality and trans identities) with both linguistic and social change, and can therefore produce important insights into the role of social performativity in language. While the field has come a long way in a relatively short period of time, there are boundless avenues as yet unexplored, and doubtless the next decade will push us in new and exciting directions, calling on us to reconsider aspects of gendered identity that we currently take for granted.

NOTES

1 Note that this is not *intersectionality* in the sense of Kimberle Crenshaw's (1989) critique of feminism and antiracist politics, but rather an analytical cross-tabulation of multiple social categories as applied to the population samples used in these linguistic studies.

2 Early initialisms used to refer to non-heteronormative communities and people included *LGB* (lesbian, gay, and bisexual) and *GLB* (gay, lesbian, and bisexual). This was later extended to include [loosely defined] trans identities (*LGBT*), and in recent years has had several different letters added by various groups in different places (e.g., *LGBTTQ2A** in North America, *LGBTQAFF* in the Pacific, etc.), reflecting an increasing proliferation of identity terms and labels within and surrounding these communities. This is one of the reasons why the term *queer*, previously exclusively a pejorative, has been brought back into circulation as a putatively neutral umbrella term. Although not universally embraced as an acceptable term, it is used quite frequently among young members of *queer communities*, who have had little systematic experience of *queer* as a slur. Whether or not the status of *queer* ever becomes fully uncontested remains to be seen. The initialism *LGBTQ+* is still used frequently, as is *LGBQ* by those who separate trans identities from ones organized around sexual attraction.

3 I am using *trans* as an umbrella term to refer generally to people who identify as transgender, transsexual, and any other identities characterized by a misalignment of internal gender identity and external or imposed categorization. This usage is neither unproblematic nor uncontested, but as with *queer*, it is offered as an imperfect solution to the highly complex issue of collective terms of reference. The term *trans women* refers to women who were identified at birth as male, but who live as women; *trans men* refers to men who were identified as female but who live as men. The opposite of *trans* is *cis*: *cis men* were identified at birth as male and live as men, and *cis women* were identified as female and live as women.

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30 Language and Literature: Stylistics

PETER STOCKWELL

30.1 Introduction

It might seem obvious that literature, the most culturally valued and aesthetically prestigious form of language practice, is best studied using the resources developed in the field of linguistics. However, this truism has not always been obvious to a wide range of disciplines, all of which claim a different stake in the study of the literary. Much of this contentiousness has arisen out of the historical baggage accumulated by institutionalized disciplines, out of territorial self-interest, and (it must be said) out of intellectual laziness, as well as the legitimate arguments around the validity and scope of linguistics. Stylistics is the discipline that has bridged these areas, and stylisticians have found themselves engaged in arguments not only with literary critics, cultural theorists, philosophers, poets, novelists, and dramatists, but also with practitioners of linguistics. On the one hand it is argued that the artistic endeavor of literature cannot be amenable to the sort of rigorous analytical procedures offered by linguistic analysis; on the other hand, it is argued that descriptive linguistics cannot be applied to artificial texts and readerly interpretations. For one group, stylistics simply and reductively dissects its object; for the other, the object simply cannot be described in a scientifically replicable and transparent manner.

The multivalent position of stylistics has its roots in the histories of language study and literary criticism, and the make-up of modern university departments which fossilize particular disciplinary boundaries and configurations. Stylistics has therefore come to be regarded as an essentially interdisciplinary field, drawing on the different sub-disciplines within linguistics to varying degrees, as well as on fields recognizable to literary critics, such as philosophy, cultural theory, sociology, history, and psychology. However, by the end of this article, I would like to argue that stylistics is in fact a single coherent discipline—in fact, is naturally the central discipline of literary study, against which all other current approaches are partial or are themselves interdisciplinary. In order to arrive at that position, we must consider the history of stylistics, the status of stylistic analysis, some examples of stylistic practice, and a review of the latest paradigms and principles in stylistics research.

30.2 A Brief History of Stylistics

Broadly viewed as the analysis of linguistic form and its social effects, stylistics can be seen as a direct descendant of *rhetoric*, which constituted a major part of the training of educated men for most of the past two and a half millennia. Of the five classical canons of rhetoric,

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modern stylistics overlaps considerably with "elocutio," the selection of style for an appropriate effect. (The other four divisions of rhetorical skill were: invention, the organization of ideas, memory, and delivery). It is important to note the situated and integrated nature of the discipline: rhetoric was concerned not only with linguistic form but also inextricably with the notion of the appropriacy of the form in context. The context was typically and primarily for spoken discourse, though rhetorical discussion was also applied to written texts. In the course of the twentieth century, stylistics developed with an almost exclusive focus on written literature, while at the same time the link between formalism and readerly effects became weakened.

According to Fowler (1981), there were three direct influences which produced stylistics: Anglo-American literary criticism; the emerging field of linguistics; and European, especially French, structuralism. Early twentieth-century literary criticism tended either to be historical and based in author-intention, or more focused on the texture of the language of literary works. The latter, though also encompassing textual editing and manuscript scholarship, mainly focused on the "practical criticism" of short poems or extracts from longer prose texts. Such "close reading" was largely informed by a few descriptive terms from the traditional school-taught grammar of parts of speech. This British practical criticism developed in the United States into the "New Criticism." Whereas the former placed readerly interpretation first with close reading to support it, the New Critics focused on "the words themselves." Famous essays by Wimsatt and Beardsley (1954a, 1954b) and others argued for the exclusion of any considerations of authorial intention or the historical conditions of contemporary production of literary works, and also against any psychologizing of the literary reading experience.

Despite the rather uncompromising stance taken by New Criticism, the belief that a literary work was sufficient unto itself did not amount to a pure descriptive account of literary texts. Interpretative decisions and resolutions simply remained implicit in terms of the social conditions and ideologies that informed them, while being dressed up in an apparent descriptive objectivity. A more rigorous descriptive account was being developed in the field of linguistics. As Fowler (1981) points out, Bloomfieldian structural linguistics evolving between the 1920s and 1950s offered a precise terminology and framework for detailed analyses of metrical structure in poetry. Chomskyan transformational-generative grammar from 1957 onward provided a means of exploring poetic syntactic structure with far more sensitivity to detail than had ever been possible in literary criticism. And Hallidayan functionalism added a sociocultural dimension that began to explain stylistic choices in literary texts.

The third area which influenced stylistics was European structuralism, arising out of Saussurean semiology and Russian formalism through the work of Jakobson, Barthes, Todorov, Levi-Strauss, and Culler, among others. Branded "formalists" by their detractors, the Moscow linguistic circle, the St. Petersburg group *Opoyaz*, and later the Prague school linguists developed many of the main concerns of modern poetics, including studies of metaphor, the foregrounding and dominance of theme, trope, and other linguistic variables, narrative morphology, the effects of literary defamiliarization, and the use of theme and rheme to delineate perspective in sentences. The formalists called themselves "literary linguists," in recognition of their belief that linguistics was the necessary ground for literary study.

Stylistics began as a distinct approach to literary texts in the hands of Spitzer (1948), Wellek and Warren (1949), and Ullmann (1964), for example, but it really emerged from the 1960s onward as the different influences mentioned above came to be integrated into a set of conventions for analysis. From formalism and practical criticism came the focus of interest on literature and the literary, and from linguistics came the rigor of descriptive analysis and the scientific concern for transparency in that description. Though stylistic analysis could be

practiced on any sort of text, much discussion involved the specification of "literariness" and the search to define a "literary language"—this preoccupation dominated to such an extent that stylistics has come to be identified very strongly with the discussion of literature, with non-literary investigations delineating themselves separately as *critical linguistics* or *critical discourse analysis* or *text linguistics* and so on. Of course, the notion of literariness makes no sense within a purely formalist or structuralist paradigm, since a large part of what is literary depends on the social and ideological conditions of production and interpretation. Nevertheless, stylistic analyses flourished in the 1970s, especially explorations of the metrics and grammar of poetry, and explanations of deviant or striking forms of expression in prose fiction.

Concerns with literariness, the investigation of artificial rather than natural language, and the specter of capricious interpretation all served to make theoretical and applied linguists in other areas of linguistic study rather suspicious of stylistics. At a time when the various branches of linguistics were claiming prestige and institutional funding as social sciences, those who were interested in literary analysis tended to be regarded as operating at the "soft" end of the discipline. Equally and contrarily, literary critics and philosophers tended to regard the practices of stylisticians as being mechanistic and reductive. Since stylisticians often worked in literature departments, the most heated debates occurred with literary critics: traditional liberal humanist critics attacked a perceived irreverence for literary genius and its ineffable product; critics excited by the rise of literary theory as a discipline attacked stylistics for claiming to be merely a method without an ideological or theoretical underpinning. Notorious examples of the antagonism include the debate between the stylistician Roger Fowler and the literary critic F. W. Bateson (see Fowler 1971, for an account), centering on the question of rigorous descriptiveness against literary sensibility; or the attack by Stanley Fish and defense by Michael Toolan (see Fish 1980; Toolan 1990), circling around the status of interpretation in literary reading.

Although vigorous defenses of stylistics continued to be raised in the 1970s, the field largely sidestepped the theoretical quagmire by taking an explicitly practical approach in the form of "pedagogical stylistics." This was a natural consequence of teaching (English) language using literary texts: foreign language learners took most readily to a linguistic approach to literature without importing any undue concern for theoretical niceties nor any misplaced reverence for the literary artefact. Teaching language through literature mirrored stylistics very clearly: texts tended to be those of contemporary literature; stylistically deviant texts were popular because they were fun and were easy for the teacher to illustrate a specific point of usage; grammar and lexical choice were discussed as a motivating means of accessing the literature, rather than studied dryly for their own sake. Stylistics thus took itself out of literature departments and found adherents in education and modern language study around the world, enthusiastically supported by the international cultural promotion agency of the UK government, the British Council (see Widdowson 1975, 1992; Brumfit 1983; McCarthy and Carter 1994).

At the same time, advances in pragmatics, sociolinguistics, and discourse analysis in the 1970s allowed stylistics to move beyond the analysis of short texts and sentence-level phenomena. Studies involving speech act theory, norms of spoken interaction, politeness, appropriacy of register choice, dialectal variation, cohesion and coherence, deictic projection, turn-taking, and floor-holding all allowed stylistics the opportunity of exploring text-level features and the interpersonal dimension of literature, especially in prose fiction and dramatic texts. New labels for a host of sub-disciplines of stylistics blossomed: "literary pragmatics," "discourse stylistics," "literary semantics," "stylometrics," "critical linguistics," "schema poetics," and so on. Stylistics came to identify itself as virtuously interdisciplinary, though it should perhaps properly be seen in this period as "inter-sub-disciplinary."

By the early 1980s, stylistics had established itself as a coherent set of practices largely based in Europe, mainly in Britain and Ireland, with strong centers in the Germanic and Scandinavian countries, representation in Spain as a major English as a Foreign Language (EFL) destination for British teachers, with a separate tradition of *stylistique* operating in France, Italy, Greece, and Turkey. Stylistics also developed where teaching links to Britain were strongest: in Australasia, India, Japan, and parts of Africa in the Commonwealth. The term "stylistics" was nowhere near as widely used in North America, where generative grammar maintained its paradigmatic hold on linguistics, and post-structuralist theory enthralled those literature departments that aspired to more than character-study and a simple historicism.

30.3 The Status of Stylistic Analysis

One reason for the historical debates around stylistics has been the difficulty of defining "style." Even in its most simple sense of variation in language use, many questions instantly arise: variation from what? varied by whom? for what purpose? in what context of use? The different sub-disciplines that have been drawn on in stylistics have also brought along different senses of the term. Variationist sociolinguists treat style as a social variable correlated with gender, or class, for example, and have developed a cline of formality on this dimension. Anthropologists and ethnomethodologists have identified style with the contextual "domain" in which the language variety is used, so that style has developed a wider sense close to that of "register." Style as an interpersonal feature involves psychological and socially motivated choices, so style can be seen as the characteristic pattern of choices associated with a writer's or projected character's "mind-style," or the pattern associated with particular periods, genres, or literary movements. Most broadly, since every dimension of linguistic expression represents a choice—whether idiosyncratic or socially determined—the limits of "style" can be seen to be the limits of language itself, which is not very helpful.

One central tenet in modern stylistics has been to reject the artificial analytical distinction between form and content. Contrary to the practice of traditional rhetoric, style cannot be merely an ornamentation of the sense of an utterance, when it is motivated by personal and sociocultural factors at every level and is correspondingly evaluated along these ideological dimensions by readers and audiences. Style is not merely free variation. Even utterances which are produced randomly (as can be seen in surrealist and nonsense works) are treated conventionally against the language system in operation. Moreover, there can be no synonymy in utterances, since the connotations even of close variations are always potentially significant. Taking this argument to its logical end, even the same sentence uttered twice is "stylistically" non-synonymous, since the context of the second occasion of utterance is different from that of the first.

Clearly, the sense of "stylistic" being used here has moved on a great deal from the earlier formalist sense of "the words themselves." The sorts of things stylisticians have been doing over the last 20–30 years have added more and more dimensions to the strictly "linguistic" level, encompassing more of what language is while not losing sight of the necessity to ground descriptions in tangible evidence. Sociocultural and psychological factors have become a more central part of stylistic considerations.

Since the early 1990s, stylistics has continued in an expansive phase. Criticized for constantly focusing on deviant or odd texts, stylisticians shifted to the analysis of less stylistically striking writing, and presented variation in terms of norms and patterns that were internally marked in the literary work. The search for a linguistic definition of literariness was largely abandoned, with the literary being located in contexts of production and interpretation. The emphasis turned to examining the continuities between literary creativity and

everyday creativity, and to how literary reading is continuous with the reception of language in general. Sociolinguistic findings informed literary analysis. Cognitive psychological aspects fed into stylistic exploration. Developments in pragmatics and discourse analysis continued to offer new tools and areas of investigation for stylistics. Insights into language use provided by corpus linguistics were drawn on, and computational techniques applied to literary works. Stylistics in its most broad sense has become one of the most dynamic and interdisciplinary fields within applied linguistics.

In response to its invigorated position within literary studies, stylistic practice has recently attracted a new series of methodological attacks, as well as debates between stylisticians themselves around theoretical issues and ideologies. However, the key arguments and issues being discussed can still be seen as rehearsals of concerns that have been of interest throughout the history of poetics. For example, there have been several variations on the theme of the position of stylistics as a science or as part of a more artistic endeavor. Most stylistics adheres to the scientific practices of presenting rigorous and systematic method and being explicit about its assumptions. Studies mainly conform to a Popperian approach to scientific method: they are transparent, explicit in their hypotheses and expectations, and are therefore falsifiable in the sense that other readers can compare their own readings and see how they differ from the stylistician. Only the principle of the replicability of the study is problematic in stylistics, since the reading experience is unrepeatable. For integrationalists (such as Harris 1980, 1981, 2000; Toolan 1996), this is a serious problem: in rejecting the Jakobsonian "code" model of language as involving what they scornfully term "telementation," in effect they remove any possibility of stable or comparable analyses. Mere formalism is not an analysis of language as communication, they argue, but then the move of stylistics toward encompassing more context ultimately renders the products of analysis merely as idiosyncratic readings, little different from the intuitive expressions of traditional literary criticism.

The key issue here is the question of interpretation, and the importance of noticing a difference between the textual object, reading, and interpretation. As I have argued elsewhere in response to the integrationalist critique (see Stockwell 2009), stylistics can be regarded theoretically as a form of hermeneutics. Texts exist as autonomous objects, but the "literary work" is an actualization of that object produced only by an observing consciousness (in the terms used by Ingarden 1973a, b). The object of stylistic analysis (the literary work as opposed to the material literary text) comes into existence only when read. Since readers come with existing memories, beliefs, and both personal and social objectives, the context of the literary work is already conditioned by interpretation, even before reading begins (see Gadamer 1989). This means that reading is the process of becoming consciously aware of the effects of the text in the process of actualization: reading is inherently an analytical process, in this sense. Stylistics is simply the formal and systematic means of recording the same process and making it available for comparison.

As Toolan (1990, pp. 42–46) points out, stylistics can be used for a variety of purposes, including the teaching of language and of literature. It can also be used as a means of demystifying literary responses, understanding how varied readings are produced from the same text; and it can be used to assist in seeing features that might not otherwise have been noticed. It can shed light on the crafted texture of the literary text, as well as offering a productive form of assistance in completing interpretations, making them more complex and richer. Stylistics can thus be used both as a descriptive tool and as a catalyst for interpretation.

These two possible functions of stylistics have been debated as if they were mutually exclusive: is stylistics a type of descriptive linguistics or is it a type of critical theory? The sense of exclusivity arises only if it is assumed that description is unideological. There are some stylisticians who argue that stylistics is simply a tool which can then be used in the service of a range of critical and interpretative positions. For example, it is an objective fact

that a certain poem has a certain set of noun phrases from a particular semantic domain. Or it is a fact that the viewpoint in a certain novel is consistently a first-person focalization. However, I would argue against this position, first on the theoretical dimension set out above that interpretation at least partly precedes analysis, and second on the practical dimension: since stylistics as a tool can only be manifest by being used, the fact that it is a descriptive tool in an ideal state is true but irrelevant in practice. As soon as stylistic analysis is undertaken, it partakes of ideological motivations, from the nature of the reading to the selection of the particular work and particular linguistic model for analysis. Examining noun phrases in the poem, rather than verb phrases, or describing them as a semantic domain, or choosing to explore focalization are all matters of ideological selection. So we might as well admit the fact and accept the ideological foundations on which we are operating.

Such debates within stylistics indicate that the field is far from settled at the theoretical level. It is a strange fact that the emphasis on practical application has meant that stylistics has a generally accepted method and approach while theoretical disagreements about the status of the discipline have continued around a relatively consistent analytical practice. Any differences in stylistic approach tend to arrange themselves along a cline from "linguistic stylistics" to "literary stylistics" (see Carter 1997), reflecting the motivations of the researcher rather than any programmatic political attachment. Linguistic stylisticians tend to be interested in exploring language using literature; literary stylisticians tend to be interested in exploring literature through analysis of its language. The former are more likely to be language teachers and the literary text is the equivalent of the data in applied linguistics. The latter are more likely to be cognizant of critical theoretical issues. However, the best stylisticians, in my view, are those who perceive an animating value in both positions.

30.4 Some Examples of Stylistic Practice

A consequence of the expansion of stylistics into matters of sociocultural and readerly context is that stylistics has also come to be interlinked with related fields such as narratology, social semiotics, critical discourse analysis, cognitive poetics, and other approaches concerned with literary and culturally important texts. To attempt to represent this diversity, even for illustrative purposes only, in a short article such as this would be impossible. In this section, then, I will simply indicate the sort of practical work that has been undertaken under the umbrella of stylistics. For convenience here, examples will be arranged roughly along the linguistic rank scale, and according to the areas of linguistics set out in this *handbook*, though it is important to remember that few modern stylistic studies are so exclusively focused. Work in, for example, the point of view of fictional characters might involve an analysis of how lexical choices, modal expressions, the directionality of verbs, and other deictic features combine to produce the overall effect and characterization.

Early stylistic studies (as mentioned above) were often in the area of poetic metrics, and there has been a recent resurgence of interest in matters of prosody and phonology in poetry. Traditional descriptions of "feet" and "meter" were enriched by "generative metrics," which sought to establish the transformational rules by which well-formed stress patterns in poetry were related to an abstract metrical pattern (see Chomsky and Halle 1968; Chatman 1964; and also Attridge 1982, 1995; Fabb 1997). Stylistics shifted attention from metrics as a descriptive labeling to a consideration of the foregrounding patterns in verse: this involved an explanation of how certain features were made more salient than the background pattern, often through repetition, parallelism, positioning, or co-occurrence with thematically significant syllables, words, or phrases. This allowed phono-aesthetic effects to be explored, without resorting to simplistic equations of sound and sense. The point here was to

demonstrate the poet's craft in organizing the texture as a literary feature in support of the developing meaning of the work.

To illustrate with a very simple example, here is the first part of Thomas Hardy's "The Darkling Thrush":

I leant upon a coppice gate
When Frost was spectre-gray,
And Winter's dregs made desolate
The weakening eye of day.
The tangled bine-stems scored the sky
Like strings of broken lyres,
And all mankind that haunted nigh
Had sought their household fires.

Written on New Year's Eve, 1900, the poem continues to describe the apparent death and starkness of the landscape, explicitly symbolic of the old century's end. A stylistic analysis would note the uniformly regular rhythm in the prosody here, supported by the repetitions of /p/ in the first line, /s/ in the second, /d/ in the third, and so on. These produce an unremittingly strong emphasis throughout, with heavy pauses at the end of each line in spite of the syntax which runs across the line-endings. In particular, there are repetitive consonant clusters /sk/, /st/, /zd/, which often coincide with stressed syllables. Almost every word is monosyllabic or disyllabic, leaving the heaviest emphasis to fall on key content words: "Frost," "spectre," "Winter," "dregs," "tangled," "scored," "haunted," and so on. The two exceptions are "weakening," which is itself prosodically weakened in context toward a disyllabic pronunciation as "weak'ning," and the only other key polysyllabic word which is thus prominent in this stanza: "desolate." In everyday speech, this word would take heavy stress on the first syllable, and contrastive lighter stress on the second and third syllables. The meter and end-line rhyme position in the poem force attention on the word, making it difficult to read without emphasizing the final syllable as "late."

After a second stanza which largely hammers home the same effect as the first, the third stanza begins:

At once a voice arose among
The bleak twigs overhead
In a full-hearted evensong
Of joy illimited;
An aged thrush, frail, gaunt, and small,
In blast-beruffled plume,
Had chosen thus to fling his soul
Upon the growing gloom.

The contrast here is striking, and a stylistic analysis would again draw attention to the differences apparent here against the phonological norms set up by the poem so far, such as the obvious multiple repetition of the vowel in the first line. Notice, too, how lexis is being selected to maintain the patterns already established: "illimited," not "unlimited"; "plume," not "plumage." Whereas the repetitions of consonants and consonant clusters in the first stanza were largely embedded within word boundaries, here they are more properly alliterative as word-initial elements ("blast-beruffled," "growing gloom"). The third line of this stanza breaks the monotonous rhythm at the same time as the lexical choices begin to shift from the semantic field of superstition ("spectre," "haunted") to that of religion ("evensong," "soul," and in the next stanza, "carollings" and "blessed Hope"). Again, a stylistic discussion

would notice the correspondences between metrics and thematics here, in order to support a particular interpretative line and demonstrate the reading.

Though such phonological exploration of poetry most typically remains focused at the microlevel, stylistics has also investigated suprasegmental and sociolinguistic aspects of the phonological dimension in, for example, the representation of accents in prose fiction. Given that novelists tend not to write in phonetic notation, the graphological creativity involved in representing all forms of pronunciation such as Scots (Hugh MacDiarmid, Irvine Welsh, James Kelman), a Somerset (William Shakespeare) or Dorset accent (Thomas Hardy), Mississippi (Mark Twain), or West African (Ken Saro-Wiwa) is of interest to stylisticians. Again, such studies would not treat the literary representation as dialectological data but as a symbolic representation in which language establishes identity, develops characterization, conveys realist texture, and asserts a political ideology.

Notice, of course, how even my simple illustrations here inescapably spill out of the purely phonological level, drawing in semantics, graphology, and syntax however briefly. In a similar way, stylistic analyses which focus on lexical choices are also likely in reality to draw in aspects of syntax and grammar. My own studies of science fictional neologisms, for example, necessarily paid attention to the syntactic positioning, the word-class, and the derivations and inflections in context that increase the sense of plausibility and verisimilitude in those science fictional worlds (see Stockwell 2000). Often, the interaction between different linguistic levels serves to signal some literary complexity. For example, surrealist poetry might have a highly normative syntactic form but a highly unusual set of lexical collocations: Philip O'Connor's "Blue bugs in liquid silk/talk with correlation particularly like/two women in white bandages" is syntactically well-formed and is even suggestive of an explanatory register, except that the semantic sequence is extremely odd. Several W. H. Auden poems set up a serious topic (cancer, death, state repression) in lexical choices from coherent and consistent semantic fields, only to undermine them by setting the poem to a nursery-rhyme style of prosody, in order to signal irony, satire, or bathos. These few examples illustrate that both deviant texts and relatively normative texts are amenable to stylistic study, even narrowly at the level of lexis.

The lexical choices made in a poem or ascribed to a character in fiction serve as clear markers of the imagined speaker's perspective, opinions, and identity. Naming and pronominal choices, expressions of modality, the selection from among synonyms, and idiomatic forms are often deployed to be consistent with lexical collocates, and with grammatical organization. Stylistic analysis can reveal very subtle differences between characters' styles of speaking and thinking; when those styles are highly deviant from typical everyday discourse, a stylistic analysis can illuminate the microcraft of the literary work, suggesting connections between parts of the text that might otherwise have been only subconsciously realized. For example, Steve Aylett's (1999) novel, *The Inflatable Volunteer*, presents a first-person narrative that is either set in a rich fantasy world or represents the hallucinatory imagination of the focalizer, Eddie. Eddie's narrative style generates a sense of discomfort and unease in most readers of the novel; my students describe it impressionistically as very weird, but not weird enough to be completely mad:

> Bone midnight Eddie–the little red lizard curled up in a rose. Yeah there's nightmares and nightmares–you know what I'm saying. I've taken part in some where the curtains have caught fire off the devil's roll-up and the clueless bastard ghosts have barged in late and we were all of us shuffling apologies to the poor sod on whom we were meant to be slamming the frighteners. Torment's not what it was. Subjective bargaining and the bellyflop of the old smarts flung a spanner in the works an age ago Eddie. That and lack of imagination. Nothing like a spider in the mouth to get you thinking.
>
> (Aylett 1999, p. 5)

Here Eddie is talking to himself, and his lexical choices include phrases which are genuine casual idiomatic expressions ("you know what I'm saying," "spanner in the works"). However, these are also mixed up throughout the novel with lexical clusters that sound almost idiomatic ("slamming the frighteners," which could be derived from "putting the frighteners on"?), as well as a great number of phrases that have the flavor of idioms, but seem to be newly invented ("the devil's roll-up," "nothing like a spider in the mouth"). The effect of the entire novel is a disconcerting defamiliarization of the world, accompanied by the disorientating effect of the prose style. These effects can be locally identified and explained at the lexical level, where the style of the novel plays a major part in its success.

Again, though an analysis focusing on the lexical and phrasal levels would be the most interesting here, a stylistic account of representative passages from the novel would also need to explore the more global features of narratological style and the various shifts in point of view. Even a microanalysis of selected passages would probably draw in matters of lexicogrammar more broadly, including the syntactic organization and matters of transitivity, for example. Indeed, Hallidayan functional grammar has been a very productive approach in the field of stylistics over the past 40 years. One of the earliest and still most famous such studies was that presented by Halliday (1971), in which he investigated the unusual patterning of transitivity in William Golding's 1955 novel, *The Inheritors*. Large parts of the novel are written from the point of view of Lok, a Neanderthal man living in a community which encounters a more technologically advanced group he calls "the new people." Halliday shows first how Lok's limited world-view is represented by his inability to name new technology: bows and arrows, for him, are unlexicalized, and he has to explain the perceived effect of a stick becoming shorter and longer and a tree next to him acquiring, with a click, a new branch. Halliday develops these observations at the lexical level into an analysis of the transitivity relations in the clauses used by Lok. His focalization is dominated by material action processes and intransitives, in order to represent a simple world-view with a limited sense of abstraction, generalization, and cause and effect. As Halliday (1971, p. 360) points out, "In *The Inheritors*, the syntax is part of the story."

Clearly, in setting out to explore the texture of novels, any stylistic analysis of readable length cannot possibly be exhaustive, and I have mentioned that a process of selection and excerpting of key passages is necessary. This unavoidable selection is part of what makes stylistics an interpretative enterprise rather than a mechanistic or purely descriptive approach. Scenes or passages that appear intuitively to be key parts of the text, or which create oddities in readerly sensation, are often good places to begin a more systematic stylistic analysis. It could even be said that the mark of a good stylistician is someone who selects a particular analytical tool best suited to the passage in hand. Sometimes this selection is very obvious: it makes sense to investigate the murder scenes in crime novels in order to discern elements of blame, justification, motive, disguise of the identity of the murderer, and other narratological factors crucial to the novel's suspense or psychological tension. Carter (1997), for example, explores the transitivity relations in the murder scene of Joseph Conrad's 1907 novel *The Secret Agent*, showing how the agency is deflected from the victim's murderer and it is inanimate objects and disembodied limbs which appear to act. The murder is thus depersonalized and blame is shifted away from the murderer.

For illustration, here is another murder scene:

> Just after 8:15 p.m. that same evening a man was taking the lid off the highly-polished bronze coal-scuttle when he heard the knock, and he got slowly to his feet and opened the door.
>
> 'Well, well! Come on in. I shan't be a minute. Take a seat.' He knelt down again by the fire and extracted a lump of shiny black coal with the tongs.

> In his own head it sounded as if he had taken an enormous bite from a large, crisp apple. His jaws seemed to clamp together, and for a weird and terrifying second he sought frantically to rediscover some remembrance of himself along the empty, echoing corridors of his brain. His right hand still held the tongs, and his whole body willed itself to pull the coal towards the bright fire. For some inexplicable reason he found himself thinking of the lava from Mount Vesuvius pouring in an all-engulfing flood towards the streets of old Pompeii; and even as his left hand began slowly and instinctively to raise itself towards the shattered skull, he knew that life was ended. The light snapped suddenly out, as if someone had switched on the darkness. He was dead.
>
> (Dexter 1991, p. 517)

The reader of this terrifying passage in the crime novel, *The Silent World of Nicholas Quinn*, knows the identities neither of the victim nor his murderer. However, there are several clues in the style of the passage that might pass into the reader's awareness and can be illuminated through a stylistic analysis.

For example, the identity of the victim is kept secret by the careful selection of referential style in the cohesive chain of noun phrases. He is first unspecified as "a man," then co-referred to simply using the pronouns "he" and "his," suggesting this is the reader's first encounter with him (in fact, this is a red herring, since we later find out the victim is Mr. Ogleby, a character we have met previously). However, certain definite noun phrases then signal a point-of-view shift into the man's head: the proximal deictics of "that same evening," "the lid," "the… scuttle," "the knock," "the door," and "the tongs" all suggest his familiarity with the contents of the room. In particular, "the knock" (rather than "a knock" here) suggests that the visitor (and his/her knock at the door) was expected and also known to the victim.

The reader might even begin to gain a sense of characterization in the style of the passage. Someone who, rather redundantly, specifies "Just after 8:15 p.m. that same evening" appears to be someone who likes precision and is rather fastidious—note also how his coal scuttle is highly polished. As the psychological viewpoint in the narrative, he also likes the specification offered by multiple adjectival modifiers: "highly-polished bronze," "lump of shiny black," "enormous," "large, crisp," "weird and terrifying," "empty, echoing," and so on. These aspects of his life contrast sharply with the stark unmodified statement, "He was dead." The phatic greeting ("Well, well!") suggests not only familiarity with the visitor, and a certain warmth ("Come on in" rather than, say, "Come in," or "Do come in"), but also offers inferences to be made about the speaker's age and social class: "shan't" also supports my sense of an upper middle-class middle-aged educated and rather pedantic man. This sense of his level of education is also perhaps confirmed by the erudite reference to the ancient destruction of Pompeii. In fact, as we later discover, the victim, Mr. Ogleby, is an Oxford academic responsible for the examinations system. We discover his murder at the same time as the detective, Inspector Morse, and so even though we have been given access to this striking passage, we share some of Morse's shock at the news. The subtlety of stylistic clues in the passage also reflects, of course, the piecing together of clues by the detective in the crime novel.

In the long third paragraph, noun phrases denoting the parts of his body are used metonymically to stand for him: he is already being stylistically disembodied at the moment of his murder. Furthermore, a quick analysis of the predicate processes in this paragraph reveals that the disembodied limbs are the active participants in material processes ("right hand held," "left hand began to raise"). Mostly, though "he" is distanced from the action by being placed as a participant in relational and mental processes: "seemed," "sought," "willed," "knew." The main actions take place in conditional or subordinate level clauses, relativized by "as if." The outcome of all of this textual organization is that the victim's conscious mind

is immobilized in his dying body, and his desires for action are rendered unproductive. The first five sentences of the paragraph are extremely hypotactically complex; the final sentence consists of a single clause expressing, ironically, an existential process: "He was dead." The choice of past tense for the verb here generates particular horror: the sentence plays out for the reader the realization in the mind of Ogleby that in fact he has been dead for the duration of the paragraph.

This brief illustrative stylistic analysis, focusing on lexicogrammar, connects the selected passage with matters of characterization, suspense, and point of view. In the process, I have drawn briefly on pragmatics, discourse analysis, sociolinguistics, narratology, and the cognitive effects of cohesion. At these macrolinguistic levels, it is easy to see the possible linkages to be made with more purely literary concerns such as characterization, narrative structure, tone and atmosphere, genre, texture, realism, and viewpoint, for example. From the standpoint of more well-established branches of linguistics, this practice might look hopelessly eclectic. However, for stylistics to account fully for the organizational patterns and readerly effects of literary works, such a wide-ranging approach is essential, since the object of study itself is various, protean, and complex. As a result of its interdisciplinary contact with critical and cultural theory, modern stylistics is at a stage of being able to provide a principled account of the textural complexity of literature.

30.5 Emerging Work in Stylistics

There is a growing body of work in stylistics which marries up detailed analysis at the microlinguistic level with a broader view of the communicative context. Indeed, it is this integrative direction that seems to me to characterize the various emerging concerns of the discipline. Of the numerous different developments that I outline below, all have in common the basic stylistic tenets of being rigorous, systematic, transparent, and open to falsifiability. All set out to draw the principled connections between textual organization and interpretative effects. In short, they present themselves as aspects of a social science of literature, rather than a merely poetic encounter with the literary. Modern stylistics continues the century-old tradition of denying any separation of interpreted content from textual form, and it is interesting to note books and courses appearing which exchange the term "stylistics" for the term "literary linguistics," reappropriating the Russian formalists' term for themselves.

In this respect, stylistics *necessarily* involves the simultaneous practice of linguistic analysis and awareness of the interpretative and social dimension. The act of application is what makes stylistics a fundamentally singular discipline of applied linguistics, arguing that formal description without ideological understanding is partial or pointless. If there is a paradigm in stylistics, it is this, and it seems to me to make stylistics a unified discipline at heart, with spin-offs into history, social study, philosophy, and literary archaeology, as practiced in literature departments around the world.

The discipline of stylistics is currently drawing much of this work to itself. For example, studies of the sociolinguistics of writing have led to a renewed emphasis on the various literatures of the world in different international Englishes. The ways that writers use different vernaculars to represent a greater richness of cultural voices are being explored stylistically. These studies include explorations of particular authors and communities around the world, as well as more theoretical work on how "voice" is represented in literature. The holistic sense of "voice" involves many of the historical concerns of stylistics: mind-style, character viewpoint, deixis, modality, and so on. In some respects, the current interest in voice represents a re-evaluation of these textual patterns renewed through the readerly construction of the psychology of the speaker.

Also along the readerly dimension, a major evolution in stylistics has been the development of "cognitive poetics" (also called "cognitive stylistics"). Applying the growing field of cognitive science to the experience of literary reading has been generating many interesting new insights into literature. These range from the almost purely psychological to the almost purely textual, but the vast majority of cognitive poetic studies combine our understanding of readerly cognitive processes with textual reality in the stylistic tradition (see Stockwell 2002, 2009; Gavins and Steen 2003; Semino and Culpeper 2003). Cognitive poetics has added new facilities to stylistics, enabling the field to address key current issues such as a principled account of "texture," an understanding of how the thematics of reading a literary text works, or how a piece of literature can generate and sustain emotion. These developments simply extrapolate the continuing evolution of stylistics toward encompassing matters that were traditionally the ground of literary critics alone.

Underlying much of this principled interest in social and psychological context is a renewed sense of *ethics* in stylistic research. Non-literary stylistic analysis has developed through critical linguistics and critical discourse analysis alongside stylistics: the interaction between the two fields has been constant and close and consequently very productive (see, e.g., Fairclough 1995; and Mills 1995). Along with the ethical awareness that the literatures of the world ought to be studied sociolinguistically, fields such as feminist linguistics have worked to remind stylisticians (and all applied linguists) of our ethical responsibilities and the impossibility of an ideologically neutral linguistic theory.

Stylistics has also continued to draw on methodological innovations in linguistics. In particular, corpus linguistics and the use of computerized concordances and other analytical tools have revolutionized the systematic study of literary texts (see Thomas and Short 1996). The continuities between literary creativity and the creativity apparent in everyday discourse have been revealed in all their complexity largely out of the fruitful interaction of stylistics and corpus linguistics. New methods such as these can be used to explore levels of language from lexical collocations right up to narrative organization. At the same time, the pedagogical element in stylistics has also developed strongly. Stylistic methods are now the paradigmatic approach in the foreign-language classroom, and the applied study of creativity is becoming standard in native-speaker language-teaching too.

Stylistics, as a discipline, is therefore very much in its heyday. It is a progressive approach in the sense that stylisticians strive constantly to improve their knowledge of how language works, while at the same time being aware of the useful insights of its own tradition. Its challenges arise from an apparently boundless appetite for drawing in the different disciplines and levels of language study, and the desire of its practitioners to be at once rigorously disciplined and also engaged and passionate about verbal art.

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31 English Usage: Prescription and Description

PAM PETERS

31.1 Introduction

31.1.1 Definitions of "Usage"

The French loanword *usage* has always been polysemous in English, referring to the customary way of doing something, as well as accepted practice or the body of rules associated with a group or an occupation. The earliest application of *usage* to "the established or customary use of language," according to the *Oxford English Dictionary* (OED III, online 2018), was by Chaucer in his translation of Boethius (c. 1400), when he used it in the referring generally to the "words of the people" and the "usage of mankind." Yet the later citation from Defoe's *Essay on Projects* (1697) frames it more prescriptively, amid his proposal for establishing an English academy like the Académie Française, and the hope that "the voice of this society [i.e., the English academy] should be sufficient authority for the usage of words." Defoe's authoritarian approach contrasts with classical principle echoed by some eighteenth-century commentators, that common usage is the arbiter of language, its rules, and norms ("usus quem penes arbitrium est et jus et norma loquendi," Horace *Ars Poetica* ll.71–72). Yet few recognized the full implications of the quotation (Leonard 1962, pp.139–165), and the century goes down in English language history as "the age of correctness," not achieving the scientific advances of other contemporary disciplines.

Though the *Oxford Dictionary* project provided an enormous stimulus to empirical approaches to usage in the nineteenth century, the tug-of-war between descriptive and prescriptive approaches to English usage only intensified during the twentieth century. Prescriptive appraisals of usage resurfaced with Henry Fowler's *A Dictionary of Modern English Usage* (1926), whose strong discriminations between acceptable and abhorrent expressions made him a household word. The judgmental stance on *usage* is spelled out in Eric Partridge's title *Usage and Abusage* (1942), and others like the *A Concise Dictionary of Correct English* (Phythian 1979). These different understandings of *usage* in principle and practice are captured in OED III (online 2018), which maintains the original inclusive definition of *usage* quoted above, but defines the compound *usage guide* as one that deals with "conventionally accepted use of (especially formal written) language and grammar"—the typically narrower conception of *usage* which these works embody. On the other side of the Atlantic, the current definition of *usage* in *Merriam-Webster's Dictionary* (online 2020) remains

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inclusive: "the way in which words and phrases are actually used…in a language community," though it must be said that many American *usage guides* are prescriptive, as we shall see (Section 31.2.2 below). The clearest recognition of these different understandings of *usage* is still to be seen in the *Canadian Oxford Dictionary's* (1998) two-part definition: "established or customary use of words, expressions, constructions, etc., as opposed to what is prescribed." With that, both descriptive and prescriptive approaches to language usage are on the table.

31.1.2 The Scope of English Usage

The two different understandings of *usage* just discussed make for enormous differences in scoping the subject. By the descriptive, inclusive approach, the subject of *usage* research is the English language at large a vast, multilayered system. By the prescriptive approach, only selected elements of the language are considered, those on which judgments may be brought to bear.

Since Fowler's *Modern English Usage* (1926), the subject typically entails a miscellany of linguistic cruxes including spelling, pronunciation, lexical semantics, collocation, and grammar, which are mostly treated in isolation, without systematic appraisal of their place in the language. Fowler's alphabetical list of topics is varied by later commentators on usage, especially those who wrote in different parts of the English-speaking world. But the "old chestnuts" are usually there, as if no usage guide could do without them, even though the tide of usage (in the other sense of the word) may have passed them by. English usage commentary has thus something in common with the medieval complaint tradition, as noted by Milroy and Milroy (1999). Burchfield in his *New Fowler's Modern English Usage* (1996) maintains the conventional critiques of words such as *aggravate*, *alright*, *enormity*, *hopefully*, *unique*, while adding some linguistic bêtes noires of his own. Yet whatever the selection, the alphabetical format of usage books seems to reduce the subject to a limited set of items on which pronouncements can be made. They are of course the tips of icebergs, crystallized out of the larger dynamics of the English language.

Prescriptive approaches to usage effectively limit the scope of the subject and atomize it, while imbuing it with polarized values of right and wrong. Fowler was "an instinctive grammatical moralizer" (Jespersen, quoted in Gowers 1965, p. viii), following his years in the classroom. Prescriptivism tends to preempt interest in natural linguistic variation, and reinforces the ideology of standardization (Milroy and Milroy 1999; Peters 2017). More crucially, it disregards or ignores lexical and grammatical research that illuminates the very issues which usage commentators like to address. The lack of lateral referencing in many usage books (Peters and Young 1997, pp. 317–319) suggests their remoteness from linguistic research and scholarship, and a reluctance to refer even to the work of other usage commentators. The right to make one's own judgments is assumed.

All this explains why the prescriptive commentator on English usage and the descriptive linguist have been poles apart for most of the last two centuries. They have scoped the subject quite differently, working in and publishing for different communities of practice. The large research endeavors of descriptive linguists rest on methodologies unknown or unavailable to prescriptive commentators. Their different products will be reviewed below in Sections 31.2 and 31.3. Section 31.4 then brings linguistic-descriptive methods to bear on usage prescription, to discuss the impact of usage commentary on the actual usage of particular constructions. Section 31.5 considers the diversification of usage throughout the English-speaking world, and implications for the lexicography of usage.

31.2 Research on Usage Writing in Britain and North America

31.2.1 Usage Writers from the Eighteenth to Twentieth Century: The Quest for Authority

The first prescriptive accounts of English usage were a by-product of eighteenth-century efforts to codify the grammar of the language. Earlier comments on points of interest in the emerging English vernacular can be found in the sixteenth century (Tucker 1961), and the earliest attempt to schematize such things as the English future tense can be found in Wallis's *Grammatica Linguae Anglicanae* ([1653] 1969). But the eighteenth and nineteenth centuries saw an explosion of writing on English grammar, idiom, and points of usage which challenged those attempting to bring order to the vernacular chaos. The most comprehensive review of these endeavors is found in Leonard's *The Doctrine of Correctness in English Usage, 1700–1800* (1962), where they are contextualized in terms of the philosophical and cultural movements of their time. Most pertinent in relation to usage discriminations was the quest for authority, sought initially from Latin and Greek grammar, which sanctioned basics such as the eight "parts of speech" into which English words have traditionally been classified, as well as nineteenth-century extrapolations such as proscription of the "split infinitive" and the "preposition at the end of a sentence/clause." The applications of the classical models to English idiom were however limited, and the grammarians also turned to "universal grammar" or mathematical logic to rationalize their judgments, for example, the disallowance of negative concord on grounds that two negatives make a positive, beginning with Lowth (*A Short Introduction to English Grammar* 1762). But external reference points were few, and many points of usage were evaluated ad hoc with *ipse dixit* judgments, as grammarians affirmed their own individual authority. Usage judgments were then often contradictory, as Leonard (1962, pp. 251–307) shows in a remarkable table which lines up authors who approved and those who disapproved of particular elements of grammar.

The contradictoriness of usage judgments and the quest for authority are recurrent aspects of usage writing in the nineteenth century, both in England and America. Baron (1982) charts them under the heading of "schoolmastering the language," and the demands of applying the diverse prescriptions of eighteenth-century grammarians to the needs of teaching English in the classroom. Amid rising interest in "scientific lexicography" in Victorian England (Willinsky 1994, p. 14ff), *ipse dixit* judgments were more readily challenged, as in the very public controversy over the attempt by Henry Alford, Dean of Canterbury, to claim the royal imprimatur for his usage selections, which he published as "The Queen's English" (1863). Alford's appeal to royal authority was pilloried in a volume titled *The Dean's English* (1864) by George Washington Moon, a fellow of the Royal Society of Literature, and the London-born son of American parents. Against Alford's often usage-based preferences, Moon published his own set of rule-governed prescriptions, and was able to point out anomalies in Alford's position. He reacted also to anti-American aspects of Alford's preferences (Baron 1982, pp. 190–197). The controversy was followed with interest on both sides of the Atlantic, but it added little fresh substance to the canon of English usage.

More lasting success in claiming royal authority went with the Fowler brothers (Henry and his older brother George), and their much larger reference on grammar and usage, titled *The King's English* (1906). From correspondence with the publisher we learn that this title was not the one originally proposed: it was the less arresting formula *The New Solecist: For Sixth Form Boys and Journalists*, which would have tied the book too closely to the classroom and

the newspaper office. The royal title addressed a more universal readership, and served also to divert attention from the scholarly limitations of the book, about which the authors were unapologetic in a letter (10 July 1905) to the publisher:

> *As to the expert, we have done our best to keep out of his danger; that is, we have practically based no arguments on historical grounds, have made no pretensions whatever to technical knowledge, and have occasionally implied that our authority is only that of a hour's start*. (quoted in Burchfield 1979, p. 9)

This extraordinary affirmation of the *ipse dixit* principle was no impediment to the success of *The King's English*, which ran to second and third editions (1907, 1931), suggesting that it satisfied the pedagogical market and its use there lent educational authority to the usage tradition. In Britain and in the United States, usage issues were keenly examined in the classroom, hence the proverbial *Miss Fidditch*, the prescriptive language teacher conjured up by the American stylist Joos (1967).

The King's English anticipates Henry Fowler's *A Dictionary of Modern English Usage* (1926) in various ways, in its didactic and sometimes hectoring stance, and in exhibiting examples of bad writing, especially from the daily press, to make a point. But the alphabetically organized *Dictionary* provided easier access to the widened range of lexical and syntactic raw material, and additional topics such as affixes, spelling, and selected pronunciations. The miscellany of items, the alphabetic format, and the didactic stance of Fowler's *A Dictionary of Modern English Usage* became the generic model for prescriptive usage books by others as the century progressed (Straaijer 2018). Yet there have been few critical appraisals of Fowler's work. Monographs by Burchfield (1979) and McMorris (2001) have been largely biographical, not to say hagiographical. Quirk ventured a few iconoclastic remarks in an article "The toils of Fowler and moral Gowers" (1972), but otherwise the critique of Fowler's prescriptions has been left to descriptive language analysts (see Sections 31.3 and 31.4 below).

Fowler's undeniable legacy can be seen in the sequence of usage guides published after him. His title is emulated in several others: *A Dictionary of Modern American Usage* (Horwill 1935); *Dictionary of American-English Usage* (Nicholson 1957); *Dictionary of Modern American Usage* (Garner 1998), as well as *Dictionary of Modern Australian Usage* (Hudson 1993) and Burchfield's *New Fowler's Modern English Usage* (1996), all published by Oxford University Press. The Oxford imprint no doubt helped/helps to associate these books with the *Oxford Dictionary* and its monumental scholarship, and to lend its genuine authority to them. However, their actual connections with the *Dictionary* are tenuous, except in Burchfield's case.

31.2.2 The Lexicography of Usage after Fowler: New Sources of Authority

Critical research on usage guides of the twentieth century takes off in the 1970s with Roy Copperud's *American Usage: The Consensus* (1970). There Copperud sought to synthesize the divergent opinions of contemporary American usage writers and dictionaries. His conclusions were subverted by the subjectivities of the raw material, yet his was a first attempt to compare the spectrum of prescriptive opinion.

A much more rigorous analysis by Cresswell (*Usage in Dictionaries and Dictionaries of Usage*, 1975) compared usage material from 10 dictionaries and 10 usage books to see how far they coincided with each other, and especially with the usage notes of *The American Heritage Dictionary* (1969, 1971) (= *AHD*). Cresswell was able to show that the "consensus" of these works was very limited, both in the range of items that they covered and their judgments

about them. Of the 318 items compared, only five (= 2%) were treated in all 20 works (1975, p. 123), and opinions diverged on their acceptability. Their acceptance by members of the *AHD* usage panel ranged from 16% to 70%.

The *AHD* usage panel had been specially created by the American Heritage Publishing Company to lend authority to the *Dictionary's* stance on usage, so as to set itself apart from *Webster's Third New International Dictionary (WIII)* (1961). In its constitution, the *AHD* panel was more like an Académie Française than a body of language experts, with high-profile authors and social commentators such as Isaac Asimov, Jacques Barzun, Alistair Cook, and Walter Lippmann among the original membership of 165—a kind of "cultured elite" (Landau 1979, p. 4). Few were linguistic specialists or language historians. Rather there was a bias toward writers, editors, and columnists who had been outspoken in their criticisms of *WIII*, as had the *AHD* editor himself, William Morris (Morton 1994, pp. 228–230). The panelists' votes on acceptable usage were quite erratic though skewed toward the negative on most items of grammar and idiom (Cresswell 1975, pp. 40–44). The fact that they were asked to provide opinions on each particular usage, rather than assess its general currency, would no doubt have fostered this response (cf. Marckwardt and Walcott 1938, p. 59). The usage panel's ratings (with some reconstitution of its membership) have remained a feature of subsequent editions of *AHD*. The ratings were prevailingly conservative, in line with the panel members' average age (estimated at 61+ by Nunberg (1990, p. 481), although changes in the panel's approval ratings are sometimes commented on in notes to successive *AHD* editions. See for example the usage note in *AHD4* (2000) on the verb *premiere*, showing the decline in its disapproval rating: now 49% where it was 84% in *AHD1* (1969/71). The publishers presumably saw it as vindicating the panel's sensitivity to usage, rather than belatedly acknowledging usage trends, and preferred to retain the panel as an "authority" which they alone could invoke.

A usage panel of 136 persons was also retained for the *Harper Dictionary of Contemporary Usage*, edited by William Morris and Mary Morris (1975). There were some overlaps in membership with the original *AHD* panel, but it consisted more of media "personalities" (Landau 1979, p. 4). Their outspoken comments are attached to more than 100 entries in the book, lending it the tone of "a very average talk show" according to the American Library Association's *Booklist* review (1976). But they allude interestingly to other local language "authorities" in the US, such as Harvard University, and the *New York Times* (e.g., on *finalize*).

The American usage panel can nevertheless be seen as a methodological innovation of the twentieth-century usage book industry—remarkable as a collective means of supporting conservative positions on usage. No other usage guide among the 40 surveyed by Peters and Young (1997), published in the United States, United Kingdom, or Australia between 1950 and 1995, involved such a large reference group. Usage guides of that period were typically written by one or two authors, who took for granted the *ipse dixit* right to pass their own judgments on usage. This went hand in hand with the lack of lateral referencing already noted (only 20% contained a bibliography). The data provided for discussion were quite often used for negative exemplification (found in 40% of publications surveyed), whether the examples were concocted, or derived from published texts. *The Right Word at the Right Time* (1985) highlighted its judgments of right/wrong/questionable usage with red ticks, crosses, and question marks on the quotations of published authors—who might be surprised at their treatment there. No one would welcome being cited in Hudson's *The Dictionary of Diseased English* (1977), or the subsequent *The Dictionary of Even More Diseased English* (1983).

The usage guides surveyed in Peters and Young (1997) were also examined on their judgments on 11 points of usage, in terms of whether they found them "unacceptable," usable under "restricted" circumstances, or quite "acceptable" (extending Cresswell's (1975) dichotomy of "restricted"/"acceptable"). As a set, the 20 British books surveyed were more

consistently conservative than the (16) American or the (6) Australian, which both presented a wider range of positions and one or two descriptively oriented examples, including *Webster's Dictionary of English Usage* (1989). But profound conservatism could also be found among the American examples, most notably *The Careful Writer* (1965) by Bernstein (Consulting Editor to the *New York Times*), who espoused British rather than contemporary American usage on questions such as use of the subjunctive; and Wilson Follett, who dubbed "promiscuous" the acceptance of usage alternatives by descriptive linguists (1974: *Introduction*). Both were among the most conservative of the usage authors analyzed by Cresswell (1975), returning a negative vote on more than 80% of the usage items they discussed.

Apart from the American usage panel, the main methodological innovation among the usage guides surveyed by Peters and Young (1997) was the use of corpus data, found in two isolated cases. One of these was *A Dictionary of Contemporary American Usage* (1957), by Bergen and Cornelia Evans, who used a purpose-built corpus of journalistic texts and undergraduate writing to support their description of American usage. The other corpus-based publication was Peters's *The Cambridge Australian English Style Guide* (1995), which made use of the Australian Corpus of English (ACE). *Webster's Dictionary of English Usage* (1989) refers very occasionally to data from the American Brown Corpus, but otherwise uses the large collection of citations held in the *Merriam-Webster's Dictionary* files to describe usage trends. It is worth noting that these and other corpus-based usage guides published since 1995, such as the *Guide to Canadian English Usage* (Fee and McAlpine 1997), and *The Cambridge Guide to English Usage* (Peters 2004), have all have been written outside Britain.

Few of the usage books published in the second half of the twentieth century were empirically oriented toward language data. On Algeo's (1991, pp. 6–13) scale of usage books, most site themselves toward the "subjective, moralizing" end, rather than the other where "objectivity and reportage" of usage are the author's goals. Algeo made Fowler (1926) the exemplar of the first, and *Webster's Dictionary of English Usage* (1989) exemplar of the second. More recent publications such as Burchfield (1996) and Garner (1998, 2003, 2009) still seem to sit more toward the subjective end of the scale, despite the large volumes of citational data they present. What is telling is the authors' tendency to use their data only in support of *a priori* judgments about correct use—or to identify negative examples (for example, Burchfield's treatment of *alright*, and Garner's use of *data* with singular agreement). They show only occasional, grudging acceptance of usage trends, and otherwise affirm the prescriptive approach. Like their predecessors, they provide no access to the findings of contemporary linguistic research into regional, social, and genre-related variation in usage.

31.3 Descriptive Approaches to English Usage in the Twentieth Century

31.3.1 Lexical and Grammatical Description

Descriptive and empirical appraisals of English usage can be found throughout the twentieth century, amid research into every level of the language. They shed light from time to time on points of usage discussed by prescriptivists, without it being their prime concern. Major projects on the English lexicon and English grammar have been supported by large British or American publishing houses, notably Oxford, Merriam-Webster, and Longman. But seminal work on English grammar has also been carried out by individual researchers, as discussed below. All have contributed important data to the analysis of usage.

Empirical work on the history of the English lexicon reached a climax in the 1930s with the publication of the final volumes of the *New Oxford Dictionary* (1884–1928) and the 1933 *Supplement*. The *Dictionary*'s entries on words such as *disinterested/less/none/than* are illuminated by a wealth of historical citations, providing long, dispassionate records of their semantics and collocational properties, and incidentally showing how narrow and arbitrary the comments of prescriptivists have been. The recency of usage prescriptions comes to light by comparison with the *Dictionary*'s much longer perspective. For example, its original note on *like* (from the first edition)—"Now generally condemned as vulgar or slovenly, though examples may be found in many writers of standing"—still stands as a monument to the descriptive approach, which is generally maintained in the second edition. Perceived weaknesses in the range of sources in the first edition were addressed in work toward the second (Willinsky 1994, pp. 162–189), with citational material taken increasingly from texts published outside Britain and North America.

Webster's Third New International Dictionary (1961), edited by Philip Gove, also embraces a wealth of citational evidence, using it to drive definitions, and to register a full range of alternative forms, such as the alternative past tenses for *sink*, *spring*, etc. It provides occasional notes to contextualize variants, as in the notorious case of *ain't*, which became contentious in the furor over *WIII*'s documentation of marginal and nonstandard usages. The *Dictionary's* descriptive stance was unfortunately represented as "permissiveness" by the media (Morton 1994, pp. 172–173); and the backlash was successfully exploited the *American Heritage Dictionary* (1969, 1971) with its usage panel. The conservative reaction may be symptomatic of the postcodification phase in the evolution of new Englishes (Peters 2012). Fortunately, the accumulated data of *WIII* could be accessed and effectively used by Gilman et al. in the writing of the *Webster's Dictionary of English Usage* (1989).

Controversial elements of English usage were embraced in the descriptive grammar of Danish philologist Jespersen (1909–1949, 7 vols.). Like the OED, it makes extensive use of historical citations, to show the evolution of English grammatical practices, and bring to light the more idiomatic aspects of grammar, which were made controversial by prescriptivists. Jespersen was able to demonstrate the long history of such things as hypercorrect *whom* in parenthetic clauses (vol. iii, p. 98); of relative *whose* applied to nonhuman antecedents (vol. iii, pp. 129); and of variations to formal patterns of concord (vol. ii, p. 66, 152, pp. 181–182). His source material justifying *alright* and the use of the accusative with the *-ing gerund*-participle proved powerful in much publicized controversies with Fowler through the Society for Pure English (Fowler: Tract no. 18, 1924, and Jespersen: Tract no. 25, 1926). Jespersen's historical data were used by Marckwardt and Walcott (1938) along with other authorities to recalibrate the usage findings of Leonard's 1928 elicitation experiments.

Useful data on usage issues also come from C. Fries's very original, descriptive *American English Grammar* (1940). This was a radical departure from traditional grammars, using the inductive methodology of field linguistics to develop grammatical categories for English language, rather than simply applying those handed down from the Greeks. The *Grammar* was totally based on data from a large corpus of bureaucratic correspondence written to the US Department of the Interior during World War I (Fries 2010, p. 114). The corpus contained more than 3000 letters by more and less educated correspondents, divided into three categories which he labeled Standard, Colloquial, and Vulgar, based on the education and occupations of the writers (Fries 1940, pp. 6–33). Despite the obvious limitations of his corpus, Fries's *Grammar* is an object lesson in how a corpus could be used to drive grammatical description, to profile grammatical variation, and address usage controversies such as those discussed below (Sections 31.4.1.1 and 31.4.1.4). His interest in sociolinguistic divergence—when the dominant paradigm still foregrounded regional divergence—anticipates research on sociolects of speech by several decades. He provides the first breakdown of more and less "standard" usage in English grammar.

In descriptive grammars of later twentieth century, data from more heterogeneous corpora than Fries's play an increasingly central role. *A Comprehensive Grammar of the English Language* (1985) by Quirk et al. makes occasional reference to London University's The Survey of English Usage, along with occasional references to regional or stylistic differences in usage. All are reminders of variation within English usage, and serve to explain some of the variants. Corpus data are very systematically used in the later *Longman Grammar of Spoken and Written English* (1999), by Biber et al. With the large Longman corpora, they were able to profile variation across written and spoken usage, and to systematically contrast British and American differences in conversational style.

These major ventures in describing the English lexicon and grammar were all founded on large volumes of data, from citational archives or from databases of texts (i.e., corpora). The grammars make explicit use of it, as the evidential base for the description of the language usage. The computerized corpus is perhaps the single most important development for the description of English usage.

31.3.2 New Methods for Gathering Linguistic Data on Usage

The earliest computer corpora (compiled with printed material from 1961) were designed to profile different genres of writing as much as regional differences in usage. Hence, the 15 different text types of the American Brown Corpus and the British Lancaster-Oslo/Bergen (LOB) Corpus, with 500 samples taken from nine types of nonfiction, from the daily press, government, and academia; and six different types of fiction (with a 3:1 ratio of nonfiction to fiction). Apart from supporting contrastive studies of written styles, the parallel structures of the Brown Corpus and LOB Corpus (and their analogs in Australia and New Zealand) support research on regional difference in English usage. Short-term intraregional developments in American and British usage can now be profiled with the help of the Freiburg corpora (Frown and FLOB) with data from the 1990s, and others from earlier in C20 (B-Brown/B-LOB from the 1930s), as well as the early C21 (AmE06/BE06), as the enlarged "Brown family" (Leech 2014). The lack of spoken material in these corpora has been addressed in the expanding set of ICE corpora (International Corpus of English), which now includes 27 regional corpora, compiled in countries where English is used as a first or second national language. Larger corpora, such as the 40-million-word Longman Corpus on which the *Longman Grammar* (Biber et al. 1999) was based, and the 100-million-word British National Corpus, were compiled in the last decade of C20 by major publishing houses, and included large volumes of transcribed speech to facilitate comparative studies of spoken and written usage. New benchmarks for corpus size have since been set in the United States with the 560-million-word COCA (Corpus of Contemporary American English) with written and spoken material from 1990–2017; and COHA (Corpus of Historical American English) with 400 million words from works published between 1810 and 2000, both compiled by Mark Davies at Brigham Young University, Utah. Davies also compiled the largest corpora so far, that is, GloWbE (Global Web-based English) a 1.4-billion-word corpus of online texts (websites and blogs) collected in 2012 from 20 English-using countries (Davies and Fuchs 2015); and NOW (News on the Web), a monitor corpus of online newspapers and magazines, begun in 2012 and ongoing in 2020 (currently 5.6 billion words).

The date-stamping of all these corpora allows their data to be used in charting changes in English usage during the last two centuries. Meanwhile, diachronically designed corpora provide evidence of usage in earlier centuries, including ARCHER (A Representative Corpus of Historical English Registers) with samples from nonfiction genres including journals and letters as well as fiction (drama) from 50-year periods between 1650 and 1990, compiled by Biber and colleagues (Biber et al. 1994). The pre-modern English period is covered by a

number of historical corpora, notably those compiled by researchers at the University of Helsinki with texts from Old, Middle, and Early Modern English, to be found at <http://www.helsinki.fi/varieng/CoRD/corpora/HelsinkiCorpus/index.html>.

Corpus resources allow us to map the variable landscape of English usage, with data of known provenance and periods in time. This remains their great value, despite the very large volumes of data that usage researchers may gather from the Internet. Through corpus data, we gain a synoptic view of trends in usage in different communicative contexts, and across a range of styles. The adoption of colloquial elements of usage in what are regarded as more "serious" types of writing offers the chance to see larger trends such as the widespread conversationalization of usage (Mair and Leech 2006), with impacts on grammar and lexical choices, as well as shifts in the registers and subregisters marked by them (Biber and Gray 2013).

Despite their advantages, corpus data from written sources tend to foreground the usage of those with access to publishing, thus typically that of the older generation (Minugh 2002, p. 72). Sociolinguistic research on attitudes to usage has been illuminated by other methods developed during C20, most notably elicitation tests conducted among known groups of language users. The technique was used to elicit acceptability judgments on disputed usages, by researchers such as Leonard (1932; noted in Marckwardt and Walcott 1938), who asked their 229 judges (including linguists, teachers, authors, editors, businessmen) to rate 230 items on a scale from "literary" to "standard, cultivated, colloquial" to "vulgar." The judges' decisions converged on 173 of the items, but on the remainder, the judgments of professional linguists tended to be more favorable than that of others. Mittins et al. (1970, p. 18) noted a similar tendency among the English teachers and lecturers included in his 450 judges. They were asked to assess the acceptability of a set of 50 usage items' judgments in terms of spoken and written English, with formal/informal subcategories within each.

This same experimental technique was used by Greenbaum (1977) to investigate grammatical variables among American and British university students, they being provided with example sentences, and asked to insert their preferred form. The questionnaires returned allow the researcher to quantify results in terms of the user's age, education, etc., which are not necessarily available with corpus material, and are especially useful for researching rarer morphological variants, such as the attachment of foreign plurals to English words (this was the focus of one of the six Langscape surveys, run by Peters (1998–2000) through *English Today*). Elicitation provides a controlled context for researching spoken usages, which are otherwise subject to unpredictable pragmatic variables. Similar surveys have since been conducted online, through language newsletters such as *Australian Style*, and usage databases such as *Bridging the Unbridgeable* based at Leiden University.

Elicitation tests provide alternative lights on the status of usage variants, targeting community language attitudes and values which constitute the climate of usage practice. In combination with corpus data, elicitation techniques give us triangulation on the state of usage, and a means of assessing stylistic trends in the shorter and longer term. For their use in a case study, see Section 31.4.1.4 below.

31.4 The Impacts of Prescriptive Writing on English Usage

31.4.1 Case Studies of the Relationship between Prescription and Common Usage

Despite the occasional findings of descriptive lexicographers and grammarians discussed in Section 31.3.1 above, there has been little research until recently on the longer-term effects of prescriptivism on the language itself. Seminal studies such as Auer (2009) on the subjunctive

and Anderwald (2016) on the forms of irregular verbs have compared the commentaries of historical grammars on elements of usage with historical language data, and found little evidence of lasting language change to be attributed to them. The discussion here explores the possible impacts of prescriptive usage guides on present-day English. Questions to be asked are whether the guides' prescriptions reflect contemporary usage; and how far common usage seems to respond to their prescriptions. Let us focus on a set of issues that have been subject to prescriptivism through a series of usage guides, and examine the language trends contemporary with them. This will show whether the prescriptions were effectively behind or abreast of usage in their time; and whether usage subsequently seems to fall into line with them. The four well-established issues of usage to be discussed are:

(i) Future *shall* and *will*.
(ii) Mandative subjunctive.
(iii) Conjunctive *like*.
(iv) Pronoun selections with the *-ing* gerund-participle.

Empirical data can be gathered on the usage of these items contemporary with the prescriptive publication, or later—as some measure of their longer-term influence on the English language.

31.4.1.1 Future Shall and Will

The research of Fries (1925) on *shall* and *will* made use of drama texts over three centuries (from 1560 to 1920), to chart their interrelationship in expressing the English future tense, which puzzled generations of grammarians. The earliest formulation, that of Wallis (1653), was to prescribe *shall* as the future auxiliary for the first person, and *will* for the second and third persons, as if to provide roles for both. His "rules" were confined to declarative statements in main clauses, but extended idiosyncratically by others to cover subordinate clauses and questions. Fowler (1926) further elaborates their differences in several columns of discussion. Yet Fries's data enabled him to show that the "rules" assigning *shall* and *will* to different persons for the future were never really in touch with the interactive spoken discourse of contemporary drama. Instead, *will* is always the dominant usage for the first person, and the major variant for the third person. *Shall* was the major variant for the second person only up to the later eighteenth century. Research by Biber et al. (1999), based on the Longman corpus of British and American English, shows *will* always dominant in declarative syntax, with *shall* in the majority only for first person polite questions/suggestions. When *shall* occurs with second and third person subjects, it is heavily nuanced with the "speaker's guarantee" (Huddleston and Pullum 2002, p. 195). In their semantics, both *shall* and *will* are highly polysemous like other modal verbs: capable of expressing prediction as well as volition, and also obligation, depending on the communicative context (Peters 2013, pp. 210–213). But the two are far from equally used after centuries of prescription. Language evidence from Fries's historical corpus shows that the original prescriptive rules did not reflect common usage of their time, nor have they had any enduring effect on common usage of the two modals. Any conformity to the prescriptive rules seems to be highly context-dependent.

31.4.1.2 Mandative Subjunctive

The decline of the English subjunctive was a commonplace of usage commentary from the eighteenth century on (Auer and Gonzalez-Diaz 2005), as its forms converged with those of the indicative, except for the verb *Be*. Data from the ARCHER corpus confirm the downward trend, apart from a "blip" in the more formal genres of late eighteenth-century and/or

early nineteenth-century writing, attributable to the emphasis of contemporary grammars on it being "polite" usage (Auer and Gonzalez-Diaz 2005, pp. 323–325, p. 335). Fowler (1926) described the remnants of the subjunctive in a potpourri of comments on contemporary forms as "alives," "revivals," "survivals," and "arrivals"; but his advice was to avoid using the subjunctive altogether—the course of least resistance. Low usage of the present subjunctive in Britain after WWII was documented in corpus-based research by Johansson and Norheim (1988), which might indeed seem to reflect Fowler's influence on this aspect of English usage. Yet their data from the LOB and Brown corpora also showed that American use of the present or mandative subjunctive was much higher; and subsequent studies (Peters 1998; Hundt 1998a) have confirmed this result with comparative corpus data from elsewhere (the United States, as well as Australia and New Zealand). Thus, in "settler" Englishes outside Britain, use of the mandative has held steady in standard usage, whereas it had become confined to the formal fringe, according to Quirk et al. (1985). With fresh evidence from a longitudinal corpus of literary texts from 1900 to 1990, Overgaard (1995) was able to show that use of the mandative subjunctive had been low but relatively stable in Britain up to the end of WWII. Nothing in her findings suggested the impact of Fowler's advice—only that British use of the construction was substantially lower than American during the first half of the century. The transatlantic difference had in fact been noted by Gowers ([1954], 1973), who foreshadowed its possible impact on British usage. Strang (1970, p. 37) noted British use of the mandative subjunctive reviving in tandem with lexical influences from the United States. The trend is shown very graphically in Overgaard's data for second half of C20, with a sharp rise in British use from 1960 to 1990. The increase was confirmed by Hundt (1998b), using comparative data from the FLOB and Frown corpora. So, the post-WWII stimulus of American English on British use of the mandative subjunctive seems to have far outweighed Fowler's advice to avoid it. Research by Crawford (2009) shows quite similar use of the mandative following the key "trigger" verbs in the British and American news sections of the Longman corpus. It is "very much alive" in a variety of complementation structures (Huddleston and Pullum 2002, p. 999). So, while the patterns of mandative usage over the last 250 years seem to reflect some positive and negative influences from prescriptive writing, they are only short-term and in particular regional contexts. These limitations in time and place come to light through more recent international English research, based on corpus evidence from the late twentieth and early twenty-first centuries.

31.4.1.3 Conjunctive "Like"

Regional divergences contribute to the still unsettled status of *like* as a conjunction. Though rooted in the history of English, its use seems to have increased substantially during C19, and to have been anathema to some, as the OED comments (quoted above, in Section 31.3.1). Fowler (1926) was relatively detached about it, allowing readers to decide for themselves which way to go. But Strunk and White ([1959], 1972) made no bones about conjunctive *like* being the style of the "illiterate," and Bernstein (1965) likens it to wearing shorts to dinner at a restaurant. Follett (1966) and Morris and Morris (1975) also found it unacceptable. The prescriptive position on *like* thus seems to have been hardening in the United States, thrown into the public arena through the controversy over the grammar of a cigarette advertisement: *Winston tastes good, like a cigarette should*. Yet corpus data from the Brown and LOB corpora of the 1960s provide a remarkable foil to the American furor about this usage of *like*—showing that US writers made considerable use of it, far more than their British counterparts (Peters 1993). Table 31.1 presents the 1960s data matched with data from comparable corpora 30 years later (Frown and FLOB). The overall picture for the use of conjunctive *like* with a personal pronoun following as subject of the clause, is much the same, as shown in Table 31.1.

Table 31.1 Relative frequency of conjunctive *like* in matching corpora of American and British English.

	Brown (1960s)		*LOB (1960s)*		*Frown (1990s)*		*FLOB (1990s)*	
	raw no.	**norm'd*	*raw no.*	**norm'd*	*raw no.*	**norm'd*	*raw no.*	**norm'd*
Nonfiction	9	0.024	0		10	0.026	4	0.011
Fiction	42	0.336	13	0.104	49	0.392	14	0.112
Totals	51		13		59		18	

* The normalized figures represent the raw numbers of occurrences relative to the number of 2000-word samples of nonfiction (375) and fiction (125) in the corpora.

Table 31.1 shows that the relative frequencies of conjunctive like with a following subject pronoun were remarkably stable for American and British writers across three decades. In the total figures, American writers make much more use of conjunctive *like* than the British, while the normalized figures show that both use it much more freely in fiction than nonfiction. Its use is thus stylistically marked on both sides of the Atlantic, but the effect is much stronger in British English. This is somewhat paradoxical, given the negative position taken by American usage commentators of the 1960s and 1970s, contrasting with Fowler's accommodation of it in British usage (reproduced without change in the Gowers's edition (1965)). Yet the generic distribution of conjunctive *like* shown in Table 31.1 is similar on both sides of the Atlantic: both American and British writers (and editors) allow it to render relaxed, speech-like discourse, but tend to restrict its usage in more formal, serious writing (Huddleston and Pullum 2002, p. 1158). The data also illustrate the tendency of prescriptive commentators to privilege the formal style which eschews conjunctive *like*, and to foreground its practices as if they were "common usage." Alternative and colloquial constructions are relegated to the opposite side of the stylistic scale, in that unhappy dichotomy between written and spoken usage which underlies much of the ideology of "standard" English (Milroy and Milroy 1999). Other corpus data show that conjunctive *like* is an element of common usage especially following verbs such as *seem/sound/look* (Peters 2004, pp. 323–324), which take their place in nonfiction as well as fiction.

31.4.1.4 Pronoun Selections with the -ing gerund-participle

Stylistic and sociolinguistic stratification seem now to be key factors in the question of whether the genitive or accusative personal pronoun should be used to precede an *-ing* gerund-participle. Some eighteenth-century grammarians, for example, Lowth (1762) accommodated its "amphibious" behavior, but others such as Webster (1789) insisted on the genitive as the "genuine English idiom." Fowler (1926) agreed that it should be "they spoke of my being there," and disparaged the accusative construction "they spoke of me being there" as the "fused participle." He did however allow that the genitive was less satisfactory with nouns and indefinite pronouns (as in "they spoke of the secretary's/everyone's being there"). Jespersen (1909–1949, vol. 5, pp. 133–140) provides ample examples of the use of the accusative pronoun by well-known writers from the nineteenth and early twentieth centuries—enough to show its currency, at least in speech-like discourse. In American data from the earlier C20, discussed by Fries (1940), the two structures almost equally represented in the "Standard" samples of correspondence (just 52% of examples had the genitive pronoun), whereas the accusative prevailed by 66% in data from the "Vulgar" samples. These modest statistics suggest that the accusative construction was ordinary American

usage in the first half of the twentieth century, whereas the genitive construction prescribed by Strunk and White ([1959]/1972) was the style of the "educated" American. The corpus data in Table 31.2 below confirm that although use of the genitive pronoun was strongly preferred by American writers in the 1960s, the gap between its use and that of the accusative narrowed in the ensuing 30 years (compare Brown and Frown figures), and is now relatively smaller than that of British writers (compare LOB and FLOB figures). If there was any immediate impact on usage from the prescriptions of Fowler and Strunk and White, the effect has faded.

Table 31.2 also offers Australian data from the ACE corpus compiled in the 1980s, by way of comparison with the British and American. They show an overall preference for the accusative, reversing the preference for the genitive in fiction in both northern hemisphere varieties, and making the accusative almost equally acceptable in Australian nonfiction. It was nevertheless a sociolinguistic choice, according to the pioneer usage writer Murray-Smith (1987, 1989, p. 403): "people of a literary bent may feel uneasy if the possessive [genitive] is not used […, yet] others may regard it as an unnecessary affectation." Despite this, the contemporary ACE data show how Australian usage was turning against the genitive. In subsequent research based on the 1990s ICE corpora and both written and spoken texts, the Australian preference for the accusative again contrasts with the continuing commitment of the British to the genitive (Peters 2009a). Further sociolinguistic research via an *Australian Style* survey (2003, pp. 10–11) confirmed the Australian preference for the accusative, endorsed by a large majority across the age spectrum but especially by the people under the age of 45 years. This broader use of the accusative with *-ing* gerund-participles can be seen as an element of the general trend toward colloquialization in Australian usage (Peters and Collins 2012), and ready accommodation of informal idiom in writing (Delbridge 2001, pp. 313–314). In the northern hemisphere, there still seems to be some stylistic pressure to use the genitive with the *-ing* gerund-participle. Yet, the overall ratio between the two constructions in the Frown and FLOB data shows that the gap between them is narrowing. The deprecation of the accusative by Fowler and Strunk and White is evidently fading.

31.4.2 Summary of Case Studies (i) to (iv)

The findings of the four syntactic case studies discussed above show that the impact of usage prescriptions associated with each of them has been relatively restricted or short-lived. In some cases (*shall/will*), the prescription bore no resemblance to contemporary usage. In others such as the mandative subjunctive, prescriptions in its favor arguably left their mark on formal British style around 1800 (Auer and Gonzalez-Diaz 2005), but did not arrest the overall decline in its usage—and may or may not have been further reduced by Fowler's advice to avoid it. Again, in the cases of conjunctive *like* and pronoun selections with the *-ing* gerund-participle, the prescriptions were aligned with formal style rather than common usage, which seems likely to be overtaken by increased colloquialization of everyday English prose (Mair and Leech 2006). In other areas of grammar, such as verb morphology (Anderwald 2014, 2016), the influence of C19 grammars can also be called into question because they simply noted or prescribed a variant that was already in use, so the fact that it prevailed was not a result of being foregrounded in grammars or usage guides. Research on English verb forms, based on ICE corpora of British, Australian, and New Zealand English, shows substantial variation still in evidence at the turn of the millennium (Peters 2009b). We may echo Anderwald's (2016) conclusion that the impact of prescriptive publications on actual language change has been "greatly overestimated." Prescriptivism may nevertheless be involved in language changes that interconnect with social issues (Curzan 2014), such as those often mentioned under the misnomer of "political correctness."

Table 31.2 Relative frequencies of genitive and accusative pronouns with *-ing* gerund-participle constructions, in five corpora of American, British, and Australian English.

	Brown 1960s		*LOB 1960s*		*ACE 1980s*		*Frown 1990s*		*FLOB 1990s*	
	gen	*acc*	*gen*	*acc*	*gen*	*acc*	*gen*	*acc*	*gen*	*acc*
Nonfiction: raw no.	21	0	27	6	11	9	17	4	21	8
Nonfiction: norm'd/325 samples	0.065		0.083	0.018	0.034	0.028	0.052	0.012	0.065	0.023
Fiction: raw no.	19	6	14	10	4	11	6	5	10	7
Fiction: *norm'd/175 samples	0.108	0.034	0.08	0.057	0.023	0.063	0.034	0.029	0.057	0.04
Totals	40	6	41	16	15	20	23	9	31	15

The data in Table 31.2 are confined to instances where the *-ing* gerund-participle follows a prepositional verb. They thus exclude constructions which are predisposed to (a) the accusative, for example, transitive verbs like *find/get/have/keep/see/show/watch* (Biber et al. 1999, p. 750), as in *got/kept/watched them laughing*; and (b) the genitive, as when the pronoun serves as determiner of the noun phrase (NP) subject of a complement clause (Huddleston and Pullum 2002, p. 1192), as in *I enjoyed his reading of the poem*.

The availability of datable corpora of English has greatly enhanced the descriptive linguist's ability to analyze how far language prescriptions reflect the language of their times, and the relative influence and/or durability of their prescriptions. Synchronic reference corpora compiled at strategic intervals in time, such as the LOB/FLOB and Brown/Frown pairs, provide comparative evidence on the relative frequency of a particular usage over decades through the twentieth and into the twenty-first centuries. Meanwhile diachronic corpora—such as COHA consisting of works published from the early nineteenth century through to the year 2000, or the ARCHER corpus (with its different text types sampled from the seventeenth century on)—help to track the longer-term processes of usage change. The different text types sampled in smaller corpora like those in the Brown family, the ICE network and ARCHER, and much larger ones like the BNC (1975–1993) and COCA (1990–2017) with plenty of transcribed speech, allow us to identify the styles of writing or speaking that harbor more and less formal usage variants. Research on regional variation is also supported by the smaller (1-million-word) corpora compiled in different English-speaking countries (i.e., the "Brown" family and the ICE network), helping to show where there are regional and temporal differences in usage, and how far global trends are reflected in each of them. The GLoWbE corpus of online texts contains the largest number of regional varieties (20), including both "inner" and "outer" circle varieties of English. It adds significantly to the range of corpora providing rich data for multifaceted research, showing local syntactic and stylistic variation as well as international variation in usage, for example, in the use of singular and plural agreement with *data* (Peters 2018). Data from the smaller corpora (e.g., the Brown/LOB family) can be combined in multifactorial analysis, so as to build a model of the linguistic and contextual variables impacting on syntactic choices, for example, the relativizer used in restrictive relative clauses (Hinrichs et al. 2015). Having datable data from synchronic and diachronic multigeneric corpora makes it possible to calibrate the accuracy or artificiality of usage prescriptions in relation to common usage, and to trace the paths of changes in usage.

31.5 The Power of Prescriptivism: Polarizing, Persistent, Pervasive

31.5.1 Polarization of Understandings of Usage and Usage Controversies

Prescriptivism is increasingly (since 2000) seen as a sociocultural phenomenon in its own right, bearing both cross-language research (Straaijer 2016; Tieken-Boon van Ostade and Percy 2017) and focusing on English itself (Curzan 2014; Tieken-Boon van Ostade 2018). The typology of prescriptive rules proposed by Curzan (2014, pp. 24–40), that is, standardizing, stylistic, restorative, politically responsive types, helps to differentiate their underlying motivations and/or intended sociolinguistic impacts. But as we have seen in Section 31.4 above, prescriptions which are essentially stylistic, for example, avoidance of conjunctive *like*, are often taken as proscriptive and widely applied so as to become a quasi-grammatical standard, representing "correct" usage. Alternative usages are rarely seen as neutral in public discourse on matters of usage, in the print media or in radio talkback, only as good versus bad usage. The expectation that only one of the alternatives can be "correct" feeds insecurities (Baron 1982), and creates a kind of "moral panic" (Cameron 1995).

The public's felt need for usage guidance is certainly reflected in the continuous and expanding range of usage guides from the second half of the twentieth century (Peters and Young 1997). With much shared content and recurrent topics ("old chestnuts"), they vary considerably in their judgments and over time, sometimes hardening their attitudes on

usage issues against the consensus of others. A noteworthy example is the *split infinitive*, which was tolerated by Fowler (1926) and Gowers (1965) with the advice to "use it if you have to…" But Fraser, in his 1973 revision of Gowers's *The Complete Plain Words* takes a harder line, as did Bernstein (1965) in the United States: both speak of it as "taboo." The scope of a prescription may be gradually extended, as when the concern over split infinitives becomes further anxiety about putting an adverb between an auxiliary and the lexical verb (Bernstein, p. 427; Gowers/Fraser 1973, p. 219). A further extension of this, noted by Nunberg (1990, p. 473), is manifest in the avoidance of using an adverb between *to* and a gerund. Fowler's modulated advice about not splitting the infinitive has hardened up by later exponents of the tradition, and been overgeneralized into other grammatical contexts. Fowler's model for the deployment of *that* and *which* in restrictive and nonrestrictive relative clauses has also been hardened up by prescriptivists after him. He himself presented it as an ideal: "it would be idle to pretend that it is observed…," but it has become a "standard" rule in the hands of publishers' editors, especially in the United States (Tottie 2002, p. 166). A marked increase in its use in later twentieth-century American English has been confirmed in the corpus-based research (p. 820) of Hinrich et al. (2015), showing the force of the prescription. Their study also showed some increase in the use of *that* in British English over the same period, suggesting other contributing factors, such as the global trend toward more colloquialization of English. In the data of Hinrich et al., increased use of *that* in restrictive relative clauses correlated with decreased use of passive verb constructions (also the focus of prescriptive commentary), raising the possibility that prescriptivism may prompt a "portfolio" of prescribed alternatives to be implemented by writers and editors.

Polarized understandings of usage are matched in the conventional polarization of the prescriptive and descriptive approaches to usage. The two are regularly presented as opposites, witness the Dutch project "Bridging the Unbridgeable," in which linguists are usually identified as the descriptivists, while prescriptivists are more varied in their affiliations, stakeholders in language controversies but not linguistically trained (Straaijer 2016). They conceptualize usage very differently (pp. 236–237), and interactions between them have been notably heated. Protagonists for prescriptivism can be combative and anti-linguistic, as was educator John Honey in "*Language Is Power: The Story of Standard English and Its Enemies*" (1997). His title was a rallying cry, like that of Lynne Truss (2003), drumming up support for all-out war ("zero-tolerance") on punctuation. The publication of such books bespeaks a readership ready to enlist on matters of correct language—despite Curzan's (2014) skepticism that they are actually read. The eponymous author of *Garner's Modern English Usage* (2009) presents himself as the *descriptive prescriber* (p. xl), as if to moderate between the two poles. Yet his prefatory essay on "making peace in the language wars" continues to treat descriptivists and prescriptivists as opposing camps, and to take issue with linguistic scholarship. Members of the public can be drawn into adversarial debate, showing that linguists' attempts to alleviate popular anxieties about correct usage and present a more accommodating view are not necessarily well-received. In the United Kingdom, Jean Aitchison's 1996 Reith lectures on "The Language Web" stirred up a hornet's nest of negative reactions—presumably because her liberating line on the repressive role of prescriptivism challenged conservative language values for some listeners. Steven Pinker's *The Sense of Style: The Thinking Person's Guide to Writing in the 21st Century* (2014) with its inclusive approach to most contentious points of usage seems to have escaped similarly savage responses, perhaps because of its disarming subtitle. His unfailingly skillful writing and lecturing may go some way to bridging the gap in the United States.

31.5.2 Institutionalization of Prescribed Elements

Usage prescriptions are embedded in many language-oriented industries, as commentators have noted. Cameron (1995) points out that the publishing industry and the editorial profession are not neutral parties in maintaining public awareness of usage sanctions. They have a

gatekeeper role in enforcing selected usage practices, and exercise constraints on their authors through "house style," sometimes justified as a kind of corporate identity. Style and usage in government documents are similarly constrained by reference to national government style guides where they exist (as in the United States and Australia). In Australia, the government style guide is also widely used in the commercial publishing industry and by newspaper houses, contributing to the "hyperstandardization" of some features of written usage, especially spelling (Peters 2014). The progressive effects of editorial practice come to light in research on English in multilingual contexts such as South Africa, where regional innovations (e.g., in relation to the progressive aspect) are "conventionalized" and legitimized in the process of publishing (Kruger and Van Rooy 2017). But globally speaking, the most powerful force in institutional prescriptivism is editorial software (Curzan 2014), that is, the computerized grammar and style checkers that pick up on points of usage which can be accessed on the surface of language and automatically identified. These include spelling and some inflectional morphology, as well as syntactic issues such as split infinitives, and aspects of word choice for plainer English. Used at any point in the writing, editing, and publication process, they serve to hold the line on variations in style and usage in the name of editorial consistency. As Straaijer (2016, p. 237) comments, they represent the "unquestioned need" for prescriptive practices in the media.

Educational institutions are still expected to be mediators of Standard English and bastions of "correct" usage—taken to task when any liberalization of the English language curriculum is mooted. Strong criticism of the Kingman report (1988) and the Cox report (1989) on the UK English language curriculum showed the gulf between expert linguistic opinion and conservative educational politics (Cameron 1995, pp. 87–93). Educators themselves in some cases (e.g., Honey) insisted on the need to focus purely Standard English in teaching ESL (English as a Second Language), denying any value in trying to embrace lectal variation of students in classroom. A strong emphasis on Standard English only is also typical of ESL teaching by British and American educational institutions. Pennycook (1994) puts the spotlight on role of British Council in this regard; but American publishers and educational institutions are engaged in similar activities in non-Commonwealth countries such as Japan and China. As "dominant" nations in Clyne's (1992, pp. 459–460) publishing hierarchy, they naturally focus on own standard forms, maintaining the two codes in their respective spheres of influence.

All these centripetal, normative forces exercise powerful constraints on the kind of English language used in particular regions and institutions. They provide structural support for prescriptive positions on usage, though not necessarily concerned with its particulars. The pervasive conservatism generated by prescriptive attitudes to usage is still a force to reckon with, for those who engage with the dynamism of common usage.

31.6 Diversification of English Usage, New Descriptive Challenges

The description of English usage in the twenty-first century presents larger challenges than ever because of centrifugal forces in the language itself. First-language users of English are accessing it from ever further afield, and more freely. What was previously mediated in print is now continuously available through the Internet. Second-language users can construct their own amalgam out of the Englishes with which they come into contact. Thus, the *China Daily* press and other publications may blend elements of British and American usage as part of their written code (Peters 2003, pp. 36–37). This is part of the evolutionary process for new Englishes (Schneider 2007), adding to the family of "English languages" (McArthur 1998).

Meanwhile language descriptivists are empowered with an array of new linguistic methodologies and quantities of data from common usage that lend strength to their work. While the data from large corpora are voluminous, there are more sophisticated computer tools and statistical methods to deal with them. We are better placed now than ever before to provide accurate accounts of regional, social, and genre-based variation, and to identify larger patterns of usage that make for effective style (Pinker 2014). The limitations of the prescriptive usage guide will have been transcended within less than a century of Fowler's original *Modern English Usage*.

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32 Mobility and the English Language

AMELIA TSENG AND LARS HINRICHS

32.1 Introduction

This chapter reports on research into how mobility shapes the structure, social functions, and interactional meanings of English around the world. The nexus between English and mobility is unique both in terms of the linguistic outcomes that have resulted from contact between English and other languages, as well as between varieties of English, and by virtue of the fact that English is the dominant world language in terms of the breadth of its spread and use. Other standardized European languages that spread through colonialism, such as Spanish, French, Portuguese, Dutch, and German, have not seen change and diversification to the same extent as English. At the same time, English stands out among standard languages through its pragmatics and lexis, which are highly diversified, stratified, and absorbent of loan material (Anchimbe and Janney 2017; Hughes 2000; Minkova and Stockwell, this volume). In this chapter, we focus on the specific role of mobility in the diachronic development of, and synchronic variation in, the specific case of English, rather than a general look at language and mobility.

32.1.1 Key Concepts in the Study of English and Mobility

Our interest in this chapter lies both in how mobility influences the English language and in the social and communicative functions of English in a mobile world. We discuss aspects of the spread and usage of English, and report on studies of language and identity in English-using situations influenced by mobility. We also engage with critical perspectives on the link between English and mobility and propose directions for future investigation.

At the outset, we must discuss what is meant by "mobility." In the relevant literature, there is a cline of uses for this term, reaching from traditional, more concrete to more recent and abstract understandings. From a classificatory perspective, a number of different processes are described by *mobility*. To specify any given case at hand, one might consider questions such as the following:

Who or what moves? In its most traditional sense, mobility refers to the movement of speakers as groups in migratory events that then lead to new instances of language contact. The history of English holds many examples here, cf. the Norman Conquest, or the colonial expansion of the British empire. In other cases, or under different analytical viewpoints, mobility may apply to individuals, languages, ideologies, individual features, or

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even stretches of discourse. Bohmann (2016) provides an example of a speaker in rural Jamaica who, as he is interviewed for a TV news broadcast, produces a specific stretch of discourse. His words, said in a mix of mesolectal Creole and English, with markers of hypercorrection toward English, are then implicitly confronted by members of the audience with societal expectations for standard English, and become heavily mediatized and recirculated via YouTube. The speaker, who thus involuntarily comes into a somewhat doubtful kind of fame, is not himself mobile, but this series of medial speech events is heavily shaped by mobility in more than one step: the co-existence in Jamaica of forms of Creole and standard English, and of strong language ideologies favoring the standard, is a consequence of British colonial mobility. The subsequent global distribution of the speaker's words, aided by electronic media, is an act of transnationalism that illustrates the modes of cohesion of Jamaica as a global speech community, widely dispersed across its (secondary) diaspora.

What are the spaces of mobility? Mobility may not in all cases be adequately described as movement across space. As illustrated in the previous paragraph, it may be manifested in the indexical embedding or features of the social or interactional context of discourse. Conversely, if our interest turns to the consequences of mobility in the space of interactional context, the question of the role of geographical space still remains.

To what extent does mobility reflect socially variable agency and privilege? The colonial history of slavery illustrates that there are distinct linguistic consequences of a mobility that is the result of the theft and forcible dislocation of humans away from their homeland, as compared to movement by choice or as a form of privilege. For example, the linguistics of pidginization and creolization distinguishes between substrates (i.e., the native languages of slaves) and superstrates (the native languages of colonizer), which together enter into the language contact from which pidgins and creoles emerge (Sebba 1997; Holm 2000). Similarly, the linguistic outcomes of modern-day refugee biographies, shaped as they are by different levels of agency and privilege, are highly variable (Blommaert 2009; Baynham 2006).

How ephemeral or quotidian is mobility? Not all mobility results in permanent relocation. The notion of "transient multilingual communities" has been proposed (Mortensen 2017; see also Pitzl 2018; Bohmann 2020) as a way of describing communities of practice that arise from non-permanent mobility, for example, in work settings.

We first turn to a brief discussion of theoretical approaches and current sociolinguistic questions, critiquing traditional notions of processes of language movement across time and space. Next, we present a brief overview of mobility influences on English and present two case studies from diasporic Anglophone, bilingual communities in North America. We then address English form, usage, and identities in different world contexts and at different scales (Blommaert 2010). Toward the end of the chapter we turn to forward-looking questions regarding the dominance of English and diversification by globalization and new media, as well as the implications of English and migration for social justice. The chapter concludes with a summary and discussion of key points.

32.1.2 Different Chronological Angles

English has been strongly affected by mobility throughout its history. Modern English was shaped by waves of invasion and migration into Britain, as well as within the British Isles via English crown expansionism. British colonialism then resulted in spread and diversification of English overseas. US imperialism and globalization further expanded the reach of English (Crystal 2012). However, in the present day, there is more variation in Englishes, their uses, and their social significance worldwide than can be explained through regular processes of change and differentiation. In this chapter, we will look at mobility as a process that helps to shape English in the present moment, continuously and through a multitude of complex processes of migration and contact. Research in this area adds new perspectives into the

sociolinguistics of diaspora and the relationship between the forms, functions, and social meanings of language.

32.2 Challenges for the Linguistic Profession: Integrated Methodologies and New Research Directions

Traditional, linear approaches to time and movement are increasingly critiqued as the growing mobility associated with globalization raises new questions for sociolinguistics as a field. Coupland (2010) notes that "contact models in sociolinguistics have tended to deal with flows as transference—as movement of codes and people across predefined and unchanging boundaries—rather than in terms of transformation and transcendence" (p. 10). Sociolinguistics of globalization also complicates this construct, drawing attention to hybridity, mobility, transnational flows of people and communication, and multiple scalar levels of sociolinguistic contact, interaction, and meaning, rather than focusing on traditional assumptions of unity of "language, place, and nation-state" and clearly identifiable boundaries between languages, places, and nation-states (Blommaert 2003, 2010). Research in the paradigm of World Englishes has recently decentered the traditional privileging of Britain and former colonies of the "inner circle" (such as the United States, Canada, Australia, and New Zealand) that is inherent in the formative three-concentric-circles model proposed by Kachru (1985). An influential critique of the hierarchical implications of Kachru's model has been advanced, for example, by Pennycook (2007; see also Mesthrie and Bhatt 2008). Similarly, research challenging native speakers as a social construct also calls attention to the racial and postcolonial assumptions underlying native English speakers as idealized language and cultural subjects (i.e., they are Western and white; Comprendio and Savski 2019; Holliday 2015).

Such paradigmatic debates within the field of World Englishes studies underscore the need for integrated research approaches that can take the complexity of social and linguistic factors into account. Much research in this area is applied and anthropologically informed, incorporating discourse analysis and ethnography, and illustrating the spirit of Heller (2007, 2011), who emphasizes the need to view language as a social resource within dynamic value frameworks that are related to mutually influential local and global ("glocal") contexts (Robertson 1992). This viewpoint emphasizes language use, social function, and value, rather than attempting to examine languages as structural systems divorced from their social contexts of use and production.

Following this perspective, we are led to questions such as this:

> First, how does globalization create **new value systems in which language is implicated** (including new values for language use and for the language varieties themselves)? Secondly, how are the **discourses of globalization** valued in different places and under different conditions? (Coupland 2010, p. 16)

This chapter examines these new approaches and their implications for the study of interaction, social meaning, and language structure.

32.3 The Effects of Mobility on English

32.3.1 Historically and in Diaspora Contexts

We now turn to a brief overview of key aspects of the influence of mobility on English. Historically, mobility influenced the development of English, both in terms of the Anglo-Saxon migration that brought the early roots of English to the British Isles and into contact

with indigenous languages which left their marks (for example, Celtic languages, as well as French, Danish, and the transnational influence of Latin (Schreier and Hundt 2013; Van Gelderen 2014). As a colonial and imperial language, English spread throughout the British colonies and later empire, giving rise to new varieties often divided into "inner" and "outer" circle varieties, a term which distinguishes the United Kingdom, Anglophone North America, and Australia/New Zealand from later colonies such as India and Nigeria (but see Bruthiaux 2003, for a critique of Kachru's model). Ethnolects, pidgins, and creoles also arose throughout the period of colonial expansion. African-American English (AAE) offers a well-studied example of ethnolectal formation under circumstances of colonial expansion, forced migration of enslaved peoples, and social segregation (Mufwene et al. 1998).

Continuous contact between English and other languages in its different (post)colonial contexts has led to new forms and practices of language and language use. For example, more recent minority diasporic communities in Anglophone countries offer insights into the complexity of factors affecting varietal emergence and repertoire use. In two North American case studies from our own research, we find that varietal emergence and repertoire use are intrinsically linked to social context. Circumstances of migration and settlement interact with home-country and host-country language ecologies to create opportunities for language contact and motivations for accommodation and adoption. These processes are mediated by communicative need and by recursive processes of identity construction and negotiation, drawing on new and existing language ideologies such as language as a marker of group membership or authenticity. These particular ethnoracially marginalized communities are interesting as examples of transnationalism, language and dialect contact, and transfer and recentering of linguistic ideologies and identities in modern diasporas.

Hinrichs (2011, 2014, 2018) offers a case study in transnationalism, examining a diasporic contact scenario between varieties of English among Toronto English speakers with Jamaican heritage. A sizable minority community (about 3% of Torontonians are of Jamaican nationality; Statistics Canada 2016), the speech of Jamaicans in Toronto is of particular linguistic interest as the community sees contact between two "New Englishes" (Platt et al. 1984): one, the community's heritage language Jamaican Creole, a creole that has yet to undergo standardization and official recognition by the state where it is the native language of the majority of the population (Brown-Blake 2008; Devonish 1986); the other, Ontario-Canadian English, an established inner-circle variety that is sociolinguistically and geolinguistically integrated into the system of North American dialects (Labov et al. 2006). These varieties are here mixed in the practices of a relatively young diasporic community: having emerged since the 1960s/1970s, the Toronto Jamaican community is about a generation younger than that of West Indian immigrants in London (it is an "emerging" as opposed to a "mature" diasporic community, cf. Hinrichs 2014). As Hinrichs shows (2014), Toronto-Jamaicans born in the 1960s and 1970s use both of their culturally encoded repertoires either in code-switching practices or in a fused variety that features stable phonetic markers from both varieties. The speech of speakers born since about 1990 also suggests that an advanced, more fully integrated multi-ethnolect may be emerging that is spoken by young Torontonians across ethnic affiliations, but draws heavily on Toronto English, Jamaican Creole, as well as the heritage repertoires of other immigrant ethnicities (Denis 2016; Denis et al. 2019).

Tseng (2015, 2020) provides a case study of migration and language contact outcomes in her examination of Latino linguistic repertoires in relationship to local and (trans) national identities and ideologies in the Washington, D.C. metropolitan area's global-city context. The internal diversity of the substantial Latino population relates to historic and ongoing migratory flows, primarily post-1970s, within the region's stratified social ecology marked by diversity, transnationalism, and historic racial segregation. Washington, D.C. also has a history as a majority-Black, then majority-minority, city. Tseng finds evidence of African-American English influence on Latinos' English, and of stylistic use of AAE

features to index local identity and authenticity. This identity construction relates to racialized local ideologies but does not use AAE features as an index of Blackness per se. Further, ideologies toward the correctness of linguistic repertoires operate across languages and reflect the intersection of prescriptive US-based and transnational (Latin American) beliefs about linguistic correctness. These ideologies target African-American English as incorrect or "ghetto," often conflating it into a deficit discourse about second-generation Latinos where their Spanish and English are both viewed as incorrect or "broken." This finding shows the emergence and multiscalar recentering of language ideologies, and their interaction. Similar to repertoire and translanguaging research that argues that multilinguals do not experience their languages in separation, but as an integrated whole, this indicates that language ideologies are not limited to the particular language(s) they are targeting in bilingual repertoires, but can interact and cross-pollinate with consequences for varietal emergence and perception, among other aspects.

We now turn to a discussion of the effect of mobility on the shape, spread, and usage of English, and of English-associated identities, and provide further examples.

32.3.2 Structure

As the examples provided in the earlier text demonstrate, mobility has historically affected English grammar on all dimensions (phonetics/phonology, morphology, syntax, lexicon, pragmatics). The trend continues in examination of World Englishes. Within Anglophone countries there are many other examples of varieties induced by language and dialect contact such as Multicultural London English (Cheshire et al. 2011) and ethnic Australian Englishes (Clyne et al. 2001), and migration may play a role in well-established US vowel shifts and dialect formation (Wölck 2002; Labov 2007; Johnstone 2013). Much research also focuses on the importance of group and individual identity and of prescriptive or positive language ideologies in the social valuation and hence support or avoidance of linguistic forms.

"Outer circle" (e.g., later-colonial, often non-white) varieties have tended to be dismissed as "non-native," non-standard, or deficient English rather than varieties in their own right. This concept has been strenuously contested by scholars who demonstrate the systematicity of Indian Englishes (Bhatt 1995; Kachru 1990), and when viewed through a raciolinguistic lens (Rosa and Flores 2017) is revealed as a pathologizing of the languages based on presumed inferiority of their speakers within colonial systems and race hegemonies. In addition to phonetic variation, scholars have also noted that Indian English and Nigerian English, to take two examples, differ from British English, etc., in terms of intonation, stress patterns, and pragmatics (Gut 2005; Féry et al. 2016), likely as a consequence of substrate language influence.

"Expanding circle" use (Kachru 1985), where English tends to be used as a non-native *lingua franca*, such as in East Asia, is different. Here also, historically, substrate-influenced ethnic varieties such as Singapore English emerged, as well as other contact-influenced forms such as Hong Kong English, which unmistakably vary from English in other places regardless of whether or not they have achieved varietal status (Hung 2000). The steady increase of English as a global or second/foreign language (TESOL/EFL) in non-native contexts is another interesting area to observe mobility and change. Perhaps due to lack of time-depth, relatively little research examines the effects of expanding circle use on long-term language evolution. However, they are a particularly interesting area to view mobility-related changes in language norms and usage.

Canagarajah (1999) refers to both the outer and expanding circles as the periphery, and notes that English use in these contexts challenges notions of native speakers as having "full" and "monolingual" proficiency, as well as raising new uses and identities (p. 4).

32.3.3 Usage and English-Associated Identities

We now turn to a brief discussion of English usage. English usage is highly varied based on mobility in different contexts. Its status as a global language aligns with social stratification, moving from diglossic postcolonial contexts to a deterritorialized elite status as the language of economic access (Ricento 2015). For example, the international prestige and functional benefit of English have led to a preference for it over home languages in Singapore despite official bilingual policies (Shouhui and Liu 2010). English can serve as a resource for navigating local needs and social hierarchies. For example, Myers-Scotton (1993, 1995) found that English (like other colonial languages) is used to index education and authority in Africa, but also resisted as a sign of arrogance and non-local identity. Its role in negotiating power in multilingual interactions between individuals, in schools, and in families is well established in the United States and United Kingdom (Cashman 2005; Wei 1994, among many others). Another area of interest is linguistic accommodation in lingua franca English and the emergence of new multilingual practices in informal communication between refugees and the resident population (Bohmann 2020; Seargeant et al. 2017). English has also been noted for its role in strategies of navigating around Afrikaans and the history of apartheid in South Africa (De Klerk 1996; Penny 1997); in negotiating South African identity to avoid this historic association abroad (Barkhuizen 2013); and in avoiding the privileging of specific groups in multi-ethnolinguistic, mediated contexts in Africa (e.g., Spitulnik 1998, in the context of Zambian radio). English also retains strong ideological status as a nationalist symbol in Anglophone countries. In the United States, English as the colonial language is enshrined as the de facto (though not de jure) national language and as such is a prime smokescreen in nationalist ideologies which see other languages as threatening markers of foreignness and inability/refusal to assimilate (see the "English only" movement, Zentella 1997). Similar motivations underlie increased British emphasis on English in immigration gatekeeping (Blackledge 2009).

32.4 Future Questions on Mobility-Driven Dominance and Diversification of English

New circumstances of globalization inspire new questions in about current developments in English. Mobility is not new, but globalization gives rise to new circumstances of intensified contact, diversity, speed, and multiple scales (although see Pavlenko 2018; Czajka and de Haas 2014, for critiques of "superdiversity" as a construct). The scale of social/economic stratification is now global. Within this, English enjoys a unique and uniquely privileged position as a world or global language due to the historic circumstances enumerated in the earlier text and the extension of US economic and political influence from the second half of the twentieth century (Crystal 2012). We define world languages or global languages based on status and function, following Ammon (2010) and Crystal (2012), by number of speakers, economic strength associated with the language, being used as a lingua franca by native and non-native speakers in a widely distributed range of contexts, including official capacities, and having a range of pluricentral norms. To this last point, the recent field of World Englishes focuses on Englishes worldwide, including manifestations and uses of English as a lingua franca and in "expanding circle" regions.

Tabouret-Keller (2007) notes:

> The particular forms that globalization takes today allow for the development of regional forms of global languages as well as for variation in forms of multilingualism, that is, for a multiplication of forms and practices with varied reaches, and varied value. The spaces

> where these emerge are tied to the concrete manifestations of globalized markets, that is, to what forms exactly are taken by increased mobility of goods and people, increased facility of communication, and restructuring of arrangements and relations of production and consumption.(Tabouret-Keller 2007, p. 357, in Heller 2007).

In the following sections, we attempt to unpack these relationships and the processes of linguistic change and social meaning in English in a globalized world.

32.4.1 New Understandings of Mobility

Traditional sociolinguistic perspectives on language and spatial mobility have tended to view flows as transference—as movement of codes and people across predefined and unchanging boundaries—or what Coupland (2010) described as "a dominant but reductive mode of describing the spread of linguistic variables over restricted horizontal spaces" (p. 15). A major recent challenge to this traditional perspective is flows of language which are not necessarily synchronous with movement of people through traditional geospace, such as that facilitated by digital communication. Another example is global hip-hop (Pennycook 2003). While—as language is always a social practice—social interaction and social networks continue to play an important role in both cases, the social contexts in which they are grounded are neither limited by traditional geographic boundaries nor diffused by movement of peoples across them. Some other examples of English mobility where crossing geographical boundaries may be involved but are not the most defining characteristic include transnational uses of English and English as a lingua franca in non-native encounters, including between different non-native speakers in Anglophone and non-Anglophone countries (Guido 2008, 2012; Seargeant et al. 2017).

As part of linguistic flows, the social meanings of English are expanded in different contexts, as new centers of reference emerge (Blommaert 2010). Meyerhoff and Niedzielsky (2003) note the influence of United States and to a lesser extent British English in New Zealand English lexicon and phonetic variation, and note that many features are re-interpreted or nativized as part of national/local linguistic identity, while other features remain exotic. This indicates that the transmission of features and their interpretation are more complicated than often portrayed in research on global languages, where hybridity is either celebrated without reference to structural hegemony, or the role of this hegemony is overstated.

Pennycook (2007) notes:

> I use the term global Englishes to locate the spread and use of English within critical theories of globalization. English is closely tied to processes of globalization: a language of threat, desire, destruction and opportunity. It cannot be usefully understood in modernist states-centric models of imperialism or world Englishes, or in terms of traditional, segregationist models of language. Thus, while drawing on the useful pluralization strategy of world Englishes, I prefer to locate these Englishes within a more complex vision of globalization. This view seeks to understand the role of English both critically—in terms of new forms of power, control and destruction—and in its complexity—in terms of new forms of resistance, change, appropriation and identity. It suggests that we need to move beyond arguments about homogeneity or heterogeneity, or imperialism and nation states, and instead focus on translocal and transcultural flows. English is a translocal language, a language of fluidity and fixity that moves across, while becoming embedded in, the materiality of localities and social relations. English is bound up with transcultural flows, a language of imagined communities and refashioning identities.

As Pennycook emphasizes (following Pratt 1992), the importance of transcultural flows may be "understood as a 'phenomenon of the contact zone' describing how 'subordinated or marginal groups select and invent from materials transmitted to them by a dominant or metropolitan culture.'" He also notes the importance of informal uses of English and their social significance, focusing on youth culture and hip-hop, and of English being recentered in local cultural forms and practices.

Slang offers an example of a locus for partial bits of English to circulate across national boundaries and being reinterpreted in non-native social contexts (Coleman 2014). Slang operates on a continuum between standard English and non-standard local vernaculars, for example, an "unstandardized local form" of English in Scotland and Creole in Jamaica (Coleman 2014, p. 6). The same term can be regarded as slang in one context, and nativized into the local standard in others. For example, terms that are slang in other contexts can be part of the standard in Indian English, while a combination of indigenous terms, loanwords, and other global slang terms make up the slang of this vernacular. Or "standard English" terms, non-slangy in inner circle countries, may become part of slang as a substitution for local language terms in non-native contexts.

English in global hip-hop cultures adds another dimension to mobility, examining how English and elements of English move transnationally for hybrid cultural, style, and identity purposes. The chapters in Alim et al. (2009) make it clear that English, particularly AAVE and local usages, is an important aspect of hip-hop internationally, often skillfully meshed with other languages. These creative, hybridized uses run counter to official uses and approved varieties of English, as for example those encouraged through educational policy and schools. The locality of English usage and forms in these contexts challenges notions of correctness and language purity while also challenging the notion that English globally is necessarily hegemonic. Further, English as part of what the authors call "hip-hop linguistics" complicates notions of authentic speech as related to native speaker status, of language prestige, and of language spread via movement of people across national boundaries, as English in global hip-hop spreads through cultural movement and reinterpretation.

32.4.2 Linguistic Constructions of Identity

English has taken on new roles in non-traditional spaces, which continue to emerge. These spaces give rise to new uses and identities, or the way speakers construct and relate to their complex multilingual biographies and repertoires, specifically with regard to the role of English. English is part of multilingualism, often elite multilingualism, in post-colonial contexts and via EFL in non-traditional areas. These identities interact with local meanings and with new forms and practice, as in the examples provided in the earlier text (Meyerhoff and Niedzielsky 2003; Alim et al. 2009). The Singapore study of Shouhui and Liu demonstrates that English is associated with economic access and with this aspect of being Singaporean, and Gu and Patkin (2012) in Hong Kong found that immigrant youth emphasized English proficiency as a means of contesting their lower local status based on not speaking or being Cantonese. Duran's (2016) 2-year ethnography of a male Karenni refugee notes the importance of English in his multilingual/transnational identity and social capital, as well as being an integral part of his personal agency and social/professional roles.

32.4.3 Digital Englishes

New media has given space for a range of multimodal English practices, new forms, and norms. While the field of digital English is too vast to be addressed in this chapter, some key examples are increased language and modal hybridity online and offline; virtual

communities and social networks which are not geographically bounded; and increased possibility for English reach as well as continued limits on access by region, economic status, and technological education (Friedrich and de Figuierdo 2016). Digital media affects English mobility in a major way through increasing access in education (Alsagoff et al. 2012) and social media and entertainment more generally (McKay 2012; Sundqvist and Wikström 2015; Yong and Campbell 1995). Schneider (2016) notes that online media gives scope for studying language attitudes and performativity, as well as register and text types, but that more research remains to be done in these areas.

Digital communication raises questions for notions of varieties: Seargeant and Tagg (2011) note that Thai interactants online draw on their bilingual English/Thai repertoires in a "communicative act which draws on available semiotic resources in a semi-improvised way, exhibiting certain very broad regularities in terms of the constraints of the technology and the mutual competencies and orientations of its participants, but otherwise drawing in sundry ways on features from different 'systems'" (p. 511). For these users, English "appears to have become an intrinsic element of their online literacy practices, and seemingly offers a broader range of semiotic opportunities (such as the indexing of different degrees of social distance, and the flexibility to overcome the limitations of available technologies) than Thai alone would" (p. 509). However, they are not orienting to a particular English variety, nor is this an example of an emergent variety. The authors note, "We appear, then, to be at the intersection of what is regular (i.e., systematic) and what is free-flowing and possessed of a complexity which, in epistemic terms at least, evades being captured by a generalised conceptual terminology" (p. 511), a theme echoed in much research on Internet linguistics (Androutsopoulos 2014; Leppänen and Peuronen 2020). However, they also note that "the fact that this data does not fit with the Three Circles model does not invalidate the model if one views it in the context of critical theory, as attempting to reorder the concerns of the discipline and promote non-native usages as legitimate and worthy of dedicated research. This is an important point to stress. For while a post-varieties approach might be appropriate for the detailed sociolinguistic analysis of specific examples of data, the notion of the variety and the status this has as an element of social organization may yet be more appropriate for the description of a community's language use in contexts where the focus is not simply on strategies of communication but also on cultural and political identity" (p. 512).

32.5 Critical Perspectives and Implications for Social Justice

In this section, we address key issues of power, privilege, representation, and erasure, with concrete consequences for minoritized speakers' lives and rights, and for minority languages. Much discrimination exists toward non-standard forms of English associated with non-Anglo groups, such as ethnic minority dialects, pidgins and creoles, and World Englishes. English as a global language also raises questions about representation and access, as globalization exacerbates social inequality, and minority language extinction.

32.5.1 Language Attitudes and Ideologies

Language attitudes and more structured systems of beliefs (ideologies) draw on motivations in the social environment to reinforce stigma and privilege via language. These beliefs manifest in notions of "correct" and "standard" language, versus stigmatized non-standard varieties; as was briefly discussed in the earlier text, they relate to raciolinguistic beliefs such as "real English speakers are white." Privileging of certain (white, inner circle, native speaker)

speakers and varieties (educated, "neutral," "standard") thus operates intersectionally related to different scalar levels of social context.

32.5.2 Proficiency Privilege

Proficiency-related discrimination is an important aspect of English and mobility. Proficiency, or lack thereof, serves as a social marker as well as practically granting or limiting access to English-speaking contexts. However, proficiency itself is not so easily defined as is often assumed. While often assumed to be self-evident, proficiency and the "native speaker" are themselves ideological constructs. Stigma against non-native accents clearly extends beyond perceptible differences in phonetics, intonation, etc.; phonetic differences are seen as a marker of "otherness" and negative social characteristics (Lippi-Green 2012). The notion of what it means to have "native speaker proficiency" is well-established as grounded in ideology that assumes a natural, inherent connection between place, language, and social group membership, and that monolingual norms reflect idealized language proficiency (Davies 2003; Ferguson 1983; Grosjean 1989; Holliday 2006). Much challenge to these assumptions has come from the EFL literature and literature on "outer circle" Englishes and ethnolects (Bhatt 1995; Holliday 2015; Kachru et al. 2009). English as a global language in non-native contexts raises new questions for the relevance and definition of native speakers, commensurate with broader calls for focus on flexible, dynamic linguistic repertoires rather than considering languages as clearly bounded systems. While much of this criticism has come from research on language and globalization, however, there is the question of whether this same research can reproduce traditional beliefs about proficiency, such as in notions of "truncated repertoires" (Blommaert 2010; Flores and Lewis 2016).

32.5.3 Sociolinguistic Marginalization

The role of English as a lingua franca can be qualified at the local level. Seargeant et al. (2017) note the relationship and potential tension between English and host country languages in the linguistic repertoires of immigrants to non-anglophone countries. Their study of returned Bangladeshi migrant workers showed desire for English related to its usefulness, and that in practice this related to English as a lingua franca and language of business and medicine, but that the usefulness of English coexisted with that of on-site dominant languages such as Arabic. They posit that English in these situations is a "qualified lingua franca" (p. 23), where local languages are more broadly required in day-to-day interactions.

The intersection of linguistic ideology with institutions is an important one for social justice, as institutions embody unequal power relations (for example, the state and individual). An area of interest is linguistic accommodation in English-dominant lingua franca communication between African migrants and representatives of institutions in the new host societies. For example, Guido (2008, 2012) notes that different outer circle and non-native English norms under institutional conditions of immigrant interviews (for example, Nigerian migrants being interviewed by Italian officials) impede intercultural communication and lead to misunderstanding. In this case, as in examples from Belgium, the asylum seekers' outer circle English varieties are misunderstood by non-native speaker European officials within the structural and hierarchical confines of the interview process (Maryns 2016). Jacquemet (2015), Maryns ([2006] 2014), and others similarly note the problematic intersection between institutional/communicative assumptions, such as the importance of denotational names and legitimate narrative practices, in asylum interviews. Further, the assumptions of languages themselves as indicators of national origins are problematic, as shown by Blommaert's (2009) example of "Joseph," a young African man whose background was multilingual (as is common in Africa) and transnational, complicated by

conflict-induced migration. Joseph was initially interviewed in one of his dispreferred languages (his mother's language, Kinyarwanda) despite being more comfortable in English, which had entered his linguistic repertoire through English-medium schooling. His proficiency in English and Runyankole were then taken as indications that he was from Uganda, not Rwanda, where Kinyarwanda and French are more widely spoken. Ultimately, his application was denied as his linguistic profile did not coincide with narrow correlations between language and national belonging.

32.5.4 Language and Nationalism (United States and United Kingdom)

An important site for the intersection of identity with ideology and institutional power is the role of English in nationalism, as in the English-only movement in the United States (Wiley 2007; Zentella 1997) and the increased focus on English testing as a barrier to citizenship in the United Kingdom (Blackledge 2009).

Another important site is language policy in non-inner-circle areas, where English is largely seen as instrumentally useful from a national perspective. In this context, supporting English learning can be seen as part of national identity as modern, wealthy, and cosmopolitan (Shouhui and Liu 2010), or as striving to become so.

32.5.5 Linguistic Imperialism

Critical perspectives examine the power dynamics of English as a global language in the globalized world economy, with the implications this raises for exclusion along the lines of attitudes, ideologies, proficiency, and sociohistorical positioning outlined in the preceding text. While English is seen as a tool for mobility, giving social capital and access to higher scales of economic interaction, it also helps to replicate the social stratification which is amplified under globalization (Sassen 1994). Further, English as a global language also raises questions of linguistic imperialism, neoliberal language imposition in intersection with elite and instrumental discourses of multilingualism at the expense of languages seen as of less value. The spread of English as a global language thus also raises important questions about its role, and the role of other world languages, in impeding minority language maintenance or actively encouraging their extinction.

32.6 Conclusion

This chapter has provided an overview of key aspects of the impact of mobility on the English language historically and through the present day. As we did so, we have articulated challenges to traditional notions of the relationship between language, place, and peoples, while acknowledging the continued impact of these beliefs on English speakers today. In particular, we have focused on the intersection of ideologies of proficiencies, correctness, and belonging with minoritized English speakers. Along the way, we have problematized traditional theoretical notions of mobility and the native speaker, challenged the traditional linguistic focus on linguistic systems and features to the exclusion of social context and interaction, and indicated the need for integrated research methodologies to adequately capture the complexity of language and society as highlighted by English and mobility. We have also highlighted a number of challenges for future research raised by English under globalization, English as a global language, and non-traditional English speakers.

Some key points are that languages are not bounded and static but dynamic and constantly changing. A primary factor in this is mobility, as it catalyzes sociolinguistic contact. Mobility has been around forever, but it is different and more intense now under globalization. We think languages are static and pure because they are key parts of our ideologies about group (and national) identity. Our beliefs about who "really" speaks a language, and what it means to speak it well, are social constructs. In the case of English,[1] they are quite race-based, which is not surprising given how ideologies of ethnoracial distinction and hierarchy were foundational in European nation-building and expansion projects, how primary they were in British expansionism, and how relevant they continue to be in US expansionism.

It is important to remember that the processes described here do not happen in a vacuum. Mobility-induced language contact is always already a site of social power struggle and negotiation, the historical dynamics of which, more often than not, are reflected in vestigial present-day ecologies of prestige and stigma among standard versus vernacular varieties. The privilege and power of English blind us toward the underlying complexities of those processes that ultimately drive the spread of English—an argument that leads, for example, Pennycook (2000) to argue in favor of detailed qualitative studies of natural and performed language in newly English-using contexts, or in his words: of an interest in "postcolonial performativity."

Future research could productively address questions about language contact in which English is part of new, expanding, and largely underexplored multilingual ecologies (such as underexplored geographical areas; digital media; transnational networks; and professional spaces). More research remains to be done on the long-term effects of language contact on English forms in the "expanding circle" (Kachru 1985). Further research remains to be done on the proliferation of English-related identities, interactional practices, and language-learning in emergent contexts and in traditional sites being transformed by migration. In sum, despite the broad and deep body of research on English linguistics, much still remains to be done in order to understand the effects of mobility on English and vice versa, particularly in terms of previously neglected sites and geographical decoupling.

NOTE

1 Of course, English is not alone in this assumption, as it is a common one in the modern age, including in linguistics and language education.

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