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语言导论

An Introduction to Language

(10th Edition)

Victoria Fromkin
Robert Rodman
Nina Hyams

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An Introduction to Language 10e

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In memory of Simon Katz and Lauren Erickson

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Preface

> Well, this bit which I am writing, called Introduction, is really the er-h'r'm of the book, and I have put it in, partly so as not to take you by surprise, and partly because I can't do without it now. There are some very clever writers who say that it is quite easy not to have an er-h'r'm, but I don't agree with them. I think it is much easier not to have all the rest of the book.
>
> **A. A. MILNE,** *Now We Are Six*, 1927

> The last thing we find in making a book is to know what we must put first.
>
> **BLAISE PASCAL** (1623–1662)

The tenth edition of *An Introduction to Language* continues in the spirit of our friend, colleague, mentor, and coauthor, Victoria Fromkin. Vicki loved language, and she loved to tell people about it. She found linguistics fun and fascinating, and she wanted every student and every teacher to think so, too. Though this edition has been completely rewritten for improved clarity and currency, we have nevertheless preserved Vicki's lighthearted, personal approach to a complex topic, including witty quotations from noted authors (A. A. Milne was one of Vicki's favorites). We hope we have kept the spirit of Vicki's love for teaching about language alive in the pages of this book.

The first nine editions of *An Introduction to Language* succeeded, with the help of dedicated teachers, in introducing the nature of human language to tens of thousands of students. This is a book that students enjoy and understand and that professors find effective and thorough. Not only have majors in linguistics benefited from the book's easy-to-read yet comprehensive presentation, but also majors in fields as diverse as teaching English as a second language, foreign language studies, general education, the cognitive and neurosciences, psychology, sociology, and anthropology have enjoyed learning about language from this book.

Highlights of This Edition

This edition includes **new developments in linguistics and related fields** that will strengthen its appeal to a wider audience. Much of this information will enable students to gain insight and understanding about linguistic issues

and debates appearing in the national media and will help professors and students stay current with important linguistic research. We hope that it may also dispel certain common misconceptions that people have about language and language use.

Exercises (250) continue to be abundant in this edition, and more research-oriented exercises have been added for those instructors who wish their students to pursue certain topics more deeply. Many of the exercises are multipart, amounting to more than 300 opportunities for "homework" so that instructors can gauge their students' progress. Some exercises are marked as "challenge" questions: they go beyond the scope of what is ordinarily expected in a first course in language study. An **answer key** is available to instructors to assist them in areas outside of their expertise.

Chapter 1, "**What Is Language?**" continues to be a concise introduction to the general study of language. It contains many "hooks" for engaging students in language study, including "Language and Thought," which takes up the Sapir-Whorf hypotheses; the universal properties of languages including signed languages of the deaf; a consideration of animal "languages"; and the occasional silliness of self-appointed mavens of "good" grammar who beg us not to carelessly split infinitives and who find sentence-ending prepositions an abomination not to be put up with.

Chapter 2, "**Morphology: The Words of Language**," launches the book into the study of grammar with morphology, the study of word formation, as that is the most familiar aspect of grammar to most students. The subject is treated with clarity and an abundance of simple illustrations from non-English languages to emphasize the universality of word structure including the essentials of derivational versus inflectional morphology, free and bound morphemes, and the hierarchical structure of words.

Chapter 3, "**Syntax: The Sentence Patterns of Language**," is the most heavily revised chapter of former editions. Once it has introduced the universal and easily understood notions of constituency, syntactic categories (parts of speech), phrase structure trees, structural ambiguity and the infinite scope of language, the chapter delves into the now nearly universally accepted X-bar grammatical patterns for describing the deeper and more subtle syntactic structures of English and other languages. The topic is approached slowly and developed painstakingly so as to inform and not overwhelm. In particular, the current views on binary branching, heads and complements, selection (both C- and S-), and transformational analysis within the X-bar framework are carefully explained and illustrated. Formalisms are held to the bare minimum required to enhance clarity. Non-English examples abound in this chapter as throughout the entire book, and the weighty elements of theory are lightened by the inclusion of insightful examples and explanations, supplemented as always by quotations, poetry, cartoons, and humor.

Chapter 4, "**The Meaning of Language**," on semantics, has been more finely structured so that the challenging topics of this complex subject can be digested in smaller pieces. Still based on the theme of "What do you know about meaning when you know a language?" the chapter first introduces students to truth-conditional semantics and the principle of compositionality.

Following that are discussions of what happens when compositionality fails, as with idioms, metaphors, and anomalous sentences. Lexical semantics takes up various approaches to word meaning, including the concepts of reference and sense, semantic features, argument structure, and thematic roles. The most dramatic upgrade of this chapter is a newly expanded and modernized section on pragmatics. Here we discuss and illustrate in depth the influence of situational versus linguistic context on the communicative content of utterances, the significance of implicature in comprehension, Grice's Maxims of Conversation, presuppositions, and J. L. Austin's speech acts.

Chapter 5, "**Phonetics: The Sounds of Language**," retains its former organization and continues to embrace IPA (International Phonetics Association) notation for English in keeping with current practices, with the sole exception of using /r/ in place of the technically correct /ɹ/ when illustrating English. We continue to mention alternative notations that students may encounter in other publications.

Chapter 6, "**Phonology: The Sound Patterns of Language**," has been streamlined by relegating several complex examples (e.g., metathesis in Hebrew) to the exercises, where instructors can opt to include them if it is thought that students can handle advanced material. The chapter continues to be presented with a greater emphasis on insights through linguistic data accompanied by small amounts of well-explicated formalisms, so that the student can appreciate the need for formal theories without experiencing the burdensome details.

Chapter 7, "**Language in Society**," has been moved forward in the book from previous editions to emphasize its growing importance as a major subfield of linguistics. Growth in this area of study, even in the few years since the ninth edition, has been astronomical. We have strived heartily to present the established facts and principles of sociolinguistics while bringing up to date subjects such as banned languages (it's still happening); dead and dying languages (also still happening); gender differences; minority dialects such as Hispanic English ("Spanglish"); languages in contact such as pidgins, creoles, and lingua francas that may be found in linguistically heterogeneous areas; the use of computers in sociolinguistic analysis; second language teaching; and bilingual education, among others.

Chapter 8, "**Language Change: The Syllables of Time**," has been updated with the latest research on language families, language relatedness, and language typology. Also, in response to reviewers' requests, a detailed and more complex illustration of the application of the comparative method to two contemporary dialects to reconstruct their ancestor—often called "internal reconstruction"—is now part of this chapter.

Chapter 9, "**Language Acquisition**," has been thoroughly restructured and rewritten to enhance clarity since the ninth edition. In addition, much of what has been learned about second language acquisition (adult learning of a foreign language) has been folded into this chapter along with an entirely new section on "heritage languages," the learning of an intrafamily language after immigration to a country where that language is not spoken (e.g., Yiddish by Jews who emigrated from Russia).

Chapter 10, "**Language Processing and the Human Brain**," could well have been entitled "psycholinguistics and neurolinguistics" but that may have made the subject seem overly daunting. This chapter combines a straightforward discussion of many of the issues that regard the psychology of language—what the mind does—with the neurology of language—what the brain does—during language usage. Dramatic changes in the understanding of the brain's role in language processing are occurring virtually every day owing to the rapid enhancement of the ability of neurolinguists to measure brain activity to tiny degrees of sensitivity at extremely precise locations. This chapter reports on those techniques and some of the results regarding language and the brain that ensue. The psycholinguistic portion of this chapter appeared as the first half of chapter 9 in the ninth edition; the second and greater portion of this chapter is an enlargement and updating of chapter 2 from the ninth and previous editions.

Chapter 11, "**Computer Processing of Human Language**," is an expansion into a full chapter of what was the second half of chapter 9 in the ninth edition. The fundamentals of computational linguistics are still covered and have been clarified and expanded, but the force driving the promotion of the subject into a chapter of its own is the astonishing progress in the application of computers to human languages, which has burgeoned to a degree hardly imaginable even as we wrote previous editions. Anchoring the extensive new material in this chapter is the introduction of the Culturomic Revolution in the computer processing of language, in which computers have analyzed billions (with a *b*) of lines of text with results that will astonish even the most blasé readers. Culturomics, which is concerned with published, written texts, is soon to be augmented by "twitterology," a study of "on-the-fly" language usage by billions of people (i.e., "twitterers") in thousands of languages, only beginning to be linguistically analyzed as the this edition goes to press. But those who wish to keep abreast of the power of computers applied to language will find this chapter indispensable.

Chapter 12, "**Writing: The ABCs of Language**," has undergone a mild rewriting to further improve clarity. Texting and twittering, while largely unstudied by linguists, are included in a new section adding a further dimension to what it means to write a language.

Terms that appear bold in the text are defined in the revised **glossary** at the end of the book. The glossary has been expanded and improved so that the tenth edition provides students with a linguistic lexicon of nearly 700 terms, making the book a worthy reference volume.

The **order of presentation of chapters 2 through 6** was once thought to be nontraditional. Our experience, backed by previous editions of the book and the recommendations of colleagues throughout the world, has convinced us that it is easier for the novice to approach the structural aspects of language by first looking at morphology (the structure of the most familiar linguistic unit, the word). This is followed by syntax (the structure of sentences), which is also familiar to many students, as are numerous semantic concepts. We then proceed to the more novel (to students) phonetics and phonology, which students often find daunting. However, the book is written so that individual instructors can present material in the traditional order of phonetics,

phonology, morphology, syntax, and semantics (chapters 5, 6, 2, 3, and 4) without confusion, if they wish.

As in previous editions, the primary concern has been basic ideas rather than detailed expositions. This book assumes no previous knowledge on the part of the reader. An updated list of references at the end of each chapter is included to accommodate any reader who wishes to pursue a subject in more depth. Each chapter concludes with a summary and exercises to enhance the students' interest in and comprehension of the textual material.

Additional Resources

Linguistics CourseMate. *An Introduction to Language* includes Linguistics CourseMate, which helps students gain a deeper and more comprehensive understanding of the textual material.

Linguistics CourseMate includes:

- an interactive eBook, with highlighting, note taking and search capabilities
- interactive learning tools including:
  - Quizzes
  - Flashcards
  - Audio files
  - Web Links
  - and more!

Go to www.cengagebrain.com to access these resources, and look for this icon  to find resources related to your text in Linguistics CourseMate.

Answer Key. The Answer Key for *An Introduction to Language* contains answers to all of the exercises in the core text, and is available to instructors through the publisher.

Instructor Companion Web Site. This password-protected companion site contains useful resources for instructors—including chapter-level PowerPoint lecture slides, and a downloadable version of the Answer Key. Go to www.cengagebrain.com to access the site.

Acknowledgments

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Erik Thomas	*North Carolina State University*	Sociolinguistics
Kie Zuraw	*University of California, Los Angeles*	Phonology

Brook Danielle Lillehaugen undertook the daunting task of writing the Answer Key to the ninth and tenth editions. Her thoroughness, accuracy, and insightfulness in construing solutions to problems and discussions of issues are appreciated by all who avail themselves of this useful document, including us, the authors.

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Kathryn Wolfe-Quintero, Department of World Languages, *University of South Florida*

Nicholas Sobin, Department of Languages and Linguistics, *University of Texas, El Paso*

Virginia Lewis, Department of Languages, Literature, and Speech Communication, *Northern State University*

Ulrike Christofori, Department of Humanities, Social Sciences, and Education, *San Joaquin Delta College*

Omer Silva-Villena, Departamento de Lenguas, Literatura, y Comunicación, *Universidad de la Frontera*, Chile

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[1]Some affiliations may have changed or are unknown to us at this time.

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Please forgive us if we have inadvertently omitted any names, and if we have spelled every name correctly, then we shall believe in miracles.

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The responsibility for errors in fact or judgment is, of course, ours alone. We continue to be indebted to the instructors who have used the earlier editions and to their students, without whom there would be no tenth edition.

Robert Rodman
Nina Hyams

About the Authors

VICTORIA FROMKIN received her bachelor's degree in economics from the University of California, Berkeley, in 1944 and her M.A. and Ph.D. in linguistics from the University of California, Los Angeles, in 1963 and 1965, respectively. She was a member of the faculty of the UCLA Department of Linguistics from 1966 until her death in 2000, and served as its chair from 1972 to 1976. From 1979 to 1989 she served as the UCLA Graduate Dean and Vice Chancellor of Graduate Programs. She was a visiting professor at the Universities of Stockholm, Cambridge, and Oxford. Professor Fromkin served as president of the Linguistics Society of America in 1985, president of the Association of Graduate Schools in 1988, and chair of the Board of Governors of the Academy of Aphasia. She received the UCLA Distinguished Teaching Award and the Professional Achievement Award, and served as the U.S. Delegate and a member of the Executive Committee of the International Permanent Committee of Linguistics (CIPL). She was an elected Fellow of the American Academy of Arts and Sciences, the American Association for the Advancement of Science, the New York Academy of Science, the American Psychological Society, and the Acoustical Society of America, and in 1996 was elected to membership in the National Academy of Sciences. She published more than one hundred books, monographs, and papers on topics concerned with phonetics, phonology, tone languages, African languages, speech errors, processing models, aphasia, and the brain/mind/language interface—all research areas in which she worked. Professor Fromkin passed away on January 19, 2000, at the age of 76.

ROBERT RODMAN received his bachelor's degree in mathematics from the University of California, Los Angeles, in 1961, a master's degree in mathematics in 1965, a master's degree in linguistics in 1971, and his Ph.D. in linguistics in 1973. He has been on the faculties of the University of California at Santa Cruz, the University of North Carolina at Chapel Hill, Kyoto Industrial College in Japan, and North Carolina State University, where he is currently a professor of computer science. His research areas are forensic linguistics and computer speech processing. Robert resides in Raleigh, North Carolina, with his two rescued greyhounds Gracie and Shelby-Sue.

NINA HYAMS received her bachelor's degree in journalism from Boston University in 1973 and her M.A. and Ph.D. degrees in linguistics from the Graduate Center of the City University of New York in 1981 and 1983, respectively. She joined the faculty of the University of California, Los Angeles, in 1983, where she is currently a professor of linguistics. Her main areas of research are childhood language development and syntax. She is author of the book

Language Acquisition and the Theory of Parameters (D. Reidel Publishers, 1986), a milestone in language acquisition research. She has also published numerous articles on the development of syntax, morphology, and semantics in children. She has been a visiting scholar at the University of Utrecht and the University of Leiden in the Netherlands and has given numerous lectures throughout Europe and Japan. Nina lives in Los Angeles with her pal Spot, a rescued border collie mutt and his olde English bulldogge companion, the ever soulful Nellie.

1

What Is Language?

> When we study human language, we are approaching what some might call the "human essence," the distinctive qualities of mind that are, so far as we know, unique to man.
>
> NOAM CHOMSKY, ***Language and Mind***, 1968

Whatever else people do when they come together—whether they play, fight, make love, or make automobiles—they talk. We live in a world of language. We talk to our friends, our associates, our wives and husbands, our lovers, our teachers, our parents, our rivals, and even our enemies. We talk face-to-face and over all manner of electronic media, and everyone responds with more talk. Hardly a moment of our waking lives is free from words, and even in our dreams we talk and are talked to. We also talk when there is no one to answer. Some of us talk aloud in our sleep. We talk to our pets and sometimes to ourselves.

The possession of language, perhaps more than any other attribute, distinguishes humans from other animals. According to the philosophy expressed in the myths and religions of many peoples, language is the source of human life and power. To some people of Africa, a newborn child is a *kintu*, a "thing," not yet a *muntu*, a "person." It is only by the act of learning language that the child becomes a human being. To understand our humanity, we must understand the nature of language that makes us human. That is the goal of this book. We begin with a simple question: what does it mean to "know" a language?

Linguistic Knowledge

> Do we know only what we see, or do we see what we somehow already know?
>
> CYNTHIA OZICK, "What Helen Keller Saw," *New Yorker*, June 16 & 23, 2003

When you know a language, you can speak and be understood by others who know that language. This means you are able to produce strings of sounds that signify certain meanings and to understand or interpret the sounds produced by others. But language is much more than speech. Deaf people produce and understand sign languages just as hearing persons produce and understand spoken languages. The languages of the deaf communities throughout the world are equivalent to spoken languages, differing only in their modality of expression.

Most everyone knows at least one language. Five-year-old children are nearly as proficient at speaking and understanding as their parents. Yet the ability to carry out the simplest conversation requires profound knowledge that most speakers are unaware of. This is true for speakers of all languages, from Albanian to Zulu. A speaker of English can produce a sentence having two relative clauses without knowing what a relative clause is. For example:

> My goddaughter who was born in Sweden and who now lives in Iowa is named Disa, after a Viking queen.

In a parallel fashion, a child can walk without understanding or being able to explain the principles of balance and support or the neurophysiological control mechanisms that permit one to do so. The fact that we may know something unconsciously is not unique to language.

Knowledge of the Sound System

> When I speak it is in order to be heard.
>
> ROMAN JAKOBSON

Part of knowing a language means knowing what sounds (or signs[1]) are in that language and what sounds are not. One way this unconscious knowledge is revealed is by the way speakers of one language pronounce words from another language. If you speak only English, for example, you may substitute an English sound for a non-English sound when pronouncing "foreign" words like French *ménage à trois*. If you pronounce it as the French do, you are using sounds outside the English sound system.

French people speaking English often pronounce words like *this* and *that* as if they were spelled *zis* and *zat*. The English sound represented by the initial letters *th* in these words is not part of the French sound system, and the mispronunciation reveals the French speaker's unconscious knowledge of this fact.

Knowing the sound system of a language includes more than knowing the inventory of sounds. It means also knowing which sounds may start a word,

[1]The sign languages of the deaf will be discussed throughout the book. A reference to "language," then, unless speech sounds or spoken languages are specifically mentioned, includes both spoken and signed languages.

end a word, and follow each other. The name of a former president of Ghana was *Nkrumah*, pronounced with an initial sound like the sound ending the English word *sink*. While this is an English sound, no word in English begins with the *nk* sound. Speakers of English who have occasion to pronounce this name often mispronounce it (by Ghanaian standards) by inserting a short vowel sound, like *Nekrumah* or *Enkrumah*, making the word correspond to the English system. Children develop the sound patterns of their language very rapidly. A one-year-old learning English knows that *nk* cannot begin a word, just as a Ghanaian child of the same age knows that it can in his language.

We will learn more about sounds and sound systems in chapters 5 and 6.

Knowledge of Words

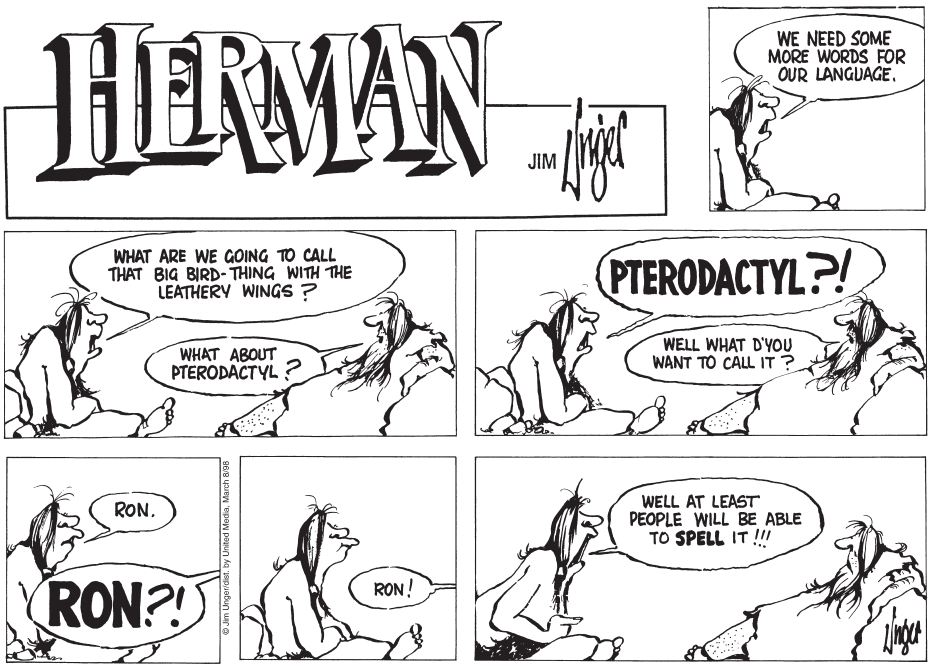
Sounds and sound patterns of our language constitute only one part of our linguistic knowledge. Beyond that we know that certain sequences of sounds signify certain concepts or **meanings**. Speakers of English understand what *boy* means, and that it means something different from *toy* or *girl* or *pterodactyl*. We also know that *toy* and *boy* are words, but *moy* is not. When you know a language, you know words in that language; that is, you know which sequences of sounds relate to specific meanings and which do not.

Arbitrary Relation of Form and Meaning

> The minute I set eyes on an animal I know what it is. I don't have to reflect a moment; the right name comes out instantly. I seem to know just by the shape of the creature and the way it acts what animal it is. When the dodo came along he [Adam] thought it was a wildcat. But I saved him. I just spoke up in a quite natural way and said, "Well, I do declare if there isn't the dodo!"
>
> MARK TWAIN, *Eve's Diary*, 1906

If you do not know a language, the words (and sentences) of that language will be mainly incomprehensible, because the relationship between speech sounds and the meanings they represent is, for the most part, an **arbitrary** one. When you are acquiring a language you have to learn that the sounds represented by the letters *house* signify the concept  ; if you know French, this same meaning is represented by *maison*; if you know Russian, by *dom*; if you know Spanish, by *casa*. Similarly,  is represented by *hand* in English, *main* in French, *nsa* in Twi, and *ruka* in Russian. The same sequence of sounds can represent different meanings in different languages. The word *bolna* means 'speak' in Hindu-Urdu and 'aching' in Russian; *bis* means 'devil' in Ukrainian and 'twice' in Latin; a *pet* is a domestic animal in English and a fart in Catalan; and the sequence of sounds *taka* means 'hawk' in Japanese, 'fist' in Quechua, 'a small bird' in Zulu, and 'money' in Bengali.

These examples show that the words of a particular language have the meanings they do only by convention. Despite what Eve would have us believe in Mark Twain's satire *Eve's Diary*, a pterodactyl could have been called *ron*, *blick*, or *kerplunkity*.



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As Juliet says in Shakespeare's *Romeo and Juliet*:

What's in a name? That which we call a rose
By any other name would smell as sweet;

This **conventional** and arbitrary relationship between the **form** (sounds) and **meaning** (concept) of a word is also true in sign languages. If you see someone using a sign language you do not know, it is doubtful that you will understand the message from the signs alone. A person who knows Chinese Sign Language (CSL) would find it difficult to understand American Sign Language (ASL), and vice versa.

Many signs were originally like miming, where the relationship between form and meaning is not arbitrary. Bringing the hand to the mouth to mean "eating," as in miming, would be nonarbitrary as a sign. Over time these signs may change, just as the pronunciation of words changes, and the miming effect is lost. These signs become conventional, so that the shape or movement of the hands alone does not reveal the meaning of the signs.

There is some **sound symbolism** in language—that is, words whose pronunciation suggests their meanings. Most languages contain **onomatopoeic** words like *buzz* or *murmur* that imitate the sounds associated with the objects or actions they refer to. But even here, the sounds differ from language to language and reflect the particular sound system of the language. In English *cock-a-doodle-doo* is an onomatopoeic word whose meaning is the crow of a rooster, whereas in Finnish the rooster's crow is *kukkokiekuu*. Forget *gobble gobble* when you're in Istanbul; a turkey in Turkey goes *glu-glu*.

Sometimes particular sound combinations seem to relate to a particular concept. Many English words beginning with *gl* relate to sight, such as *glare*, *glint*, *gleam*, *glitter*, *glossy*, *glaze*, *glance*, *glimmer*, *glimpse*, and *glisten*. However, *gl* words and their like are a very small part of any language, and *gl* may have nothing to do with "sight" in another language, or even in other words in English, such as *gladiator*, *glucose*, *glory*, *glutton*, *globe*, and so on.

To know a language we must know words of that language. But no speaker knows all the entries in an unabridged dictionary and even if someone did he would still not know that language. Imagine trying to learn a foreign language by buying a dictionary and memorizing words. No matter how many words you learned, you would not be able to form the simplest phrases or sentences in the language, or understand a native speaker. No one speaks in isolated words. And even if you could manage to get your message across using a few words from a traveler's dictionary, like "car—gas—where?" the best you could hope for is to be pointed in the direction of a gas station. If you were answered with a sentence it is doubtful that you would understand what was said or be able to look it up, because you would not know where one word ended and another began. Chapter 3 will discuss how words are put together to form phrases and sentences, and chapter 4 will explore word and sentence meanings.

The Creativity of Linguistic Knowledge

> All humans are artists, all of us . . . Our greatest masterpiece of art is the use of a language to create an entire virtual reality within our mind.
>
> DON MIGUEL RUIZ, 2012

> ALBERT: So are you saying that you were the best friend of the woman who was married to the man who represented your husband in divorce?
>
> ANDRÉ: In the history of speech, that sentence has never been uttered before.
>
> NEIL SIMON, *The Dinner Party*, 2000

Knowledge of a language enables you to combine sounds to form words, words to form phrases, and phrases to form sentences. You cannot buy a dictionary or phrase book of any language with all the sentences of the language. No dictionary can list all the possible sentences, because the number of sentences in a language is infinite. Knowing a language means being able to produce and understand new sentences never spoken before. This is the **creative aspect** of language. Not every speaker can create great literature, but everybody who knows a language can create and understand new sentences.

This creative aspect of language is quite easy to illustrate. If for every sentence in the language a longer sentence can be formed, then there is no limit to the number of sentences. In English you can say:

This is the house.

or

This is the house that Jack built.

or

This is the malt that lay in the house that Jack built.

or

This is the dog that worried the cat that killed the rat that ate the malt that lay in the house that Jack built.

And you need not stop there. How long, then, is the longest sentence? A speaker of English can say:

The old man came.

or

The old, old, old, old, old man came.

How many "olds" are too many? Seven? Twenty-three?

It is true that the longer these sentences become, the less likely we would be to hear or to say them. A sentence with 276 occurrences of "old" would be highly unusual in either speech or writing, even to describe Methuselah. But such a sentence is theoretically possible. If you know English, you have the knowledge to add any number of adjectives as modifiers to a noun and to form sentences with indefinite numbers of clauses, as in "the house that Jack built."

All human languages permit their speakers to increase the length and complexity of sentences in these ways; creativity is a universal property of human language.

Our creative ability is reflected not only in what we say but also in our understanding of new or novel sentences. Consider the following sentence: "Daniel Boone decided to become a pioneer because he dreamed of pigeon-toed giraffes and cross-eyed elephants dancing in pink skirts and green berets on the wind-swept plains of the Midwest." You may not believe the sentence; you may question its logic; but you can understand it, although you probably never heard or read it before now.

In pointing out the creative aspect of language, Noam Chomsky, who many regard as the father of modern linguistics, argued persuasively against the view that language is a set of learned responses to stimuli. True, if someone steps on your toes you may automatically respond with a scream or a grunt, but these sounds are not part of language. They are involuntary reactions to stimuli. After we reflexively cry out, we can then go on to say: "Thank you very much for stepping on my toe, because I was afraid I had elephantiasis and now that I can feel the pain I know I don't," or any one of an infinite number of sentences, because the particular sentences we produce are not controlled by any stimulus.

Even some involuntary cries like "ouch" change according to the language we speak. Step on an Italian speaker's toes and he will cry "ahi." French speakers often fill their pauses with the vowel sound that starts their word for 'egg'—*oeuf*—a sound that does not occur in English. Even conversational fillers such as *er*, *uh*, and *you know* in English are constrained by the language in which they occur.

The fact of human linguistic creativity was well expressed more than 400 years ago by Huarte de San Juan (1530–1592): "Normal human minds are such that . . . without the help of anybody, they will produce 1,000 (sentences) they never heard spoke of . . . inventing and saying such things as they never heard from their masters, nor any mouth."

Knowledge of Sentences and Nonsentences

> A person who knows a language has mastered a system of rules that assigns sound and meaning in a definite way for an infinite class of possible sentences.
>
> NOAM CHOMSKY, *Language and Mind*, 1968

Our knowledge of language not only allows us to produce and understand an infinite number of well-formed (even if silly and illogical) sentences. It also permits us to distinguish well-formed (grammatical) from ill-formed (ungrammatical) sentences. This is further evidence of our linguistic creativity because ungrammatical sentences are typically novel, not sentences we have previously heard or produced, precisely because they are ungrammatical!

Consider the following sentences:

a. John kissed the little old lady who owned the shaggy dog.
b. Who owned the shaggy dog John kissed the little old lady.
c. John is difficult to love.
d. It is difficult to love John.
e. John is anxious to go.
f. It is anxious to go John.
g. John, who was a student, flunked his exams.
h. Exams his flunked student a was who John.

If you were asked to put an asterisk or star before the examples that seemed ill formed or ungrammatical or "no good" to you, which ones would you mark? Our intuitive knowledge about what is or is not an allowable sentence in English convinces us to star *b*, *f*, and *h*. Which ones did you star?

Would you agree with the following judgments?

a. What he did was climb a tree.
b. *What he thought was want a sports car.[2]
c. Drink your beer and go home!
d. *What are drinking and go home?
e. I expect them to arrive a week from next Thursday.
f. *I expect a week from next Thursday to arrive them.
g. Linus lost his security blanket.
h. *Lost Linus security blanket his.

If you find the starred sentences unacceptable, as we do, you see your linguistic creativity at work.

These sentences also illustrate that not every string of words constitutes a well-formed sentence in a language. Sentences are not formed simply by placing one word after another in any order, but by organizing the words according to the rules of sentence formation of the language. These rules are finite in length and finite in number so that they can be stored in our finite brains. Yet, they

[2]The asterisk is used before examples that speakers find ungrammatical. This notation will be used throughout the book.

permit us to form and understand an infinite set of new sentences. They also enable us to judge whether a sequence of words is a well-formed sentence of our language or not. These rules are not determined by a judge or a legislature, or even taught in a grammar class. They are unconscious rules that we acquire as young children as we develop language and they are responsible for our linguistic creativity. Linguists refer to this set of rules as the **grammar** of the language.

Returning to the question we posed at the beginning of this chapter—what does it mean to know a language? It means knowing the sounds and meanings of many, if not all, of the words of the language, and the rules for their combination—the grammar, which generates infinitely many possible sentences. We will have more to say about these rules of grammar in later chapters.

Linguistic Knowledge and Performance

> "What's one and one and one and one and one and one and one and one and one and one?" "I don't know," said Alice. "I lost count." "She can't do Addition," the Red Queen interrupted.
>
> LEWIS CARROLL, *Through the Looking-Glass*, 1871

Speakers of all languages have the knowledge to understand or produce sentences of any length. Here is an example from the ruling of a federal judge:

> We invalidate the challenged lifetime ban because we hold as a matter of federal constitutional law that a state initiative measure cannot impose a severe limitation on the people's fundamental rights when the issue of whether to impose such a limitation on these rights is put to the voters in a measure that is ambiguous on its face and that fails to mention in its text, the proponent's ballot argument, or the state's official description, the severe limitation to be imposed.

Theoretically there is no limit to the length of a sentence, but in practice very long sentences are highly improbable, the verbose federal judge notwithstanding. Evidently, there is a difference between having the knowledge required to produce or understand sentences of a language and applying this knowledge. It is a difference between our knowledge of words and grammar, which is our **linguistic competence**, and how we use this knowledge in actual speech production and comprehension, which is our **linguistic performance**.

Our linguistic knowledge permits us to form longer and longer sentences by joining sentences and phrases together or adding modifiers to a noun. However, there are physiological and psychological reasons that limit the number of adjectives, adverbs, clauses, and so on that we actually produce and understand. Speakers may run out of breath, lose track of what they have said, or die of old age before they are finished. Listeners may become tired, bored, disgusted, or confused, like poor Alice when being interrogated by the Red Queen.

When we speak, we usually wish to convey some message. At some stage in the act of producing speech, we must organize our thoughts into strings of words. Sometimes the message is garbled. We may stammer, or pause, or produce **slips of the tongue** like saying *preach seduction* when *speech production* is meant (discussed in chapter 10).

What Is Grammar?

> We use the term "grammar" with a systematic ambiguity. On the one hand, the term refers to the explicit theory constructed by the linguist and proposed as a description of the speaker's competence. On the other hand, it refers to this competence itself.
>
> NOAM CHOMSKY AND MORRIS HALLE, *The Sound Pattern of English*, 1968

Descriptive Grammars

> There are no primitive languages. The great and abstract ideas of Christianity can be discussed even by the wretched Greenlanders.
>
> JOHANN PETER SUESSMILCH, in a paper delivered before the Prussian Academy, 1756

The way we are using the word *grammar* differs from most common usages. In our sense, the grammar is the knowledge speakers have about the units and rules of their language—rules for combining sounds into words (called *phonology*), rules of word formation (called *morphology*), rules for combining words into phrases and phrases into sentences (called *syntax*), as well as the rules for assigning meaning (called *semantics*). The grammar, together with a mental dictionary (called a *lexicon*) that lists the words of the language, represents our linguistic competence. To understand the nature of language we must understand the nature of grammar.

Every human being who speaks a language knows its grammar. When linguists wish to describe a language, they make explicit the rules of the grammar of the language that exist in the minds of its speakers. There will be some differences among speakers, but there must be shared knowledge too. The shared knowledge—the common parts of the grammar—makes it possible to communicate through language. To the extent that the linguist's description is a true model of the speakers' linguistic capacity, it is a successful description of the grammar and of the language itself. Such a model is called a **descriptive grammar**. It does not tell you how you *should* speak; it describes your basic linguistic knowledge. It explains how it is possible for you to speak and understand and make judgments about well-formedness, and it tells what you know about the sounds, words, phrases, and sentences of your language.

When we say that a sentence is **grammatical** we mean that it conforms to the rules of the mental grammar (as described by the linguist); when we say that it is **ungrammatical**, we mean it deviates from the rules in some way. If, however, we posit a rule for English that does not agree with your intuitions

as a speaker, then the grammar we are describing differs in some way from the mental grammar that represents your linguistic competence; that is, your language is not the one described. No language or variety of a language (called a *dialect*) is superior or inferior to any other in a linguistic sense. Every grammar is equally complex, logical, and capable of producing an infinite set of sentences to express any thought. If something can be expressed in one language or one dialect, it can be expressed in any other language or dialect. It might involve different means and different words, but it can be expressed. (We will have more to say about dialects in chapter 7.)

Prescriptive Grammars

> It is certainly the business of a grammarian to find out, and not to make, the laws of a language.
>
> JOHN FELL, *Essay towards an English Grammar*, 1784

> Just read the sentence aloud, Amanda, and listen to how it sounds. If the sentence sounds OK, go with it. If not, rearrange the pieces. Then throw out the rule books and go to bed.
>
> JAMES KILPATRICK, "Writer's Art" (syndicated newspaper column), 1998

> Any fool can make a rule
>
> And every fool will mind it
>
> HENRY DAVID THOREAU, *journal entry*, 1860

Not all grammarians, past or present, share the view that all grammars are equal. Language "purists" of all ages believe that some versions of a language are better than others, that there are certain "correct" forms that all educated people should use in speaking and writing, and that language change is corruption. The Greek Alexandrians in the first century, the Arabic scholars at Basra in the eighth century, and numerous English grammarians of the eighteenth and nineteenth centuries held this view. They wished to *prescribe* rather than *describe* the rules of grammar, which gave rise to the writing of **prescriptive grammars**.

In the Renaissance a new middle class emerged who wanted their children to speak the dialect of the "upper" classes. This desire led to the publication of many prescriptive grammars. In 1762 Bishop Robert Lowth wrote *A Short Introduction to English Grammar with Critical Notes*. Lowth prescribed a number of new rules for English, many of them influenced by his personal taste. Before the publication of his grammar, practically everyone—upper-class, middle-class, and lower-class—said *I don't have none* and *You was wrong about that*. Lowth, however, decided that "two negatives make a positive" and therefore one should say *I don't have any*; and that even when *you* is singular it should be followed by the plural *were*. Many of these prescriptive rules were based on Latin grammar and made little sense for English. Because Lowth

was influential and because the rising new class wanted to speak "properly," many of these new rules were legislated into English grammar, at least for the **prestige dialect**—that variety of the language spoken by people in positions of power.

The view that dialects that regularly use double negatives are inferior cannot be justified if one looks at the standard dialects of other languages in the world. Romance languages, for example, use double negatives, as the following examples from French and Italian show:

French:	Je	ne	veux	parler	avec	personne.
	I	not	want	speak	with	no-one.
Italian:	Non	voglio	parlare	con	nessuno.	
	not	I-want	speak	with	no-one.	

English translation: "I don't want to speak with anyone."

Prescriptive grammars such as Lowth's are different from the descriptive grammars we have been discussing. Their goal is not to describe the rules people know, but to tell them what rules they should follow. The great British Prime Minister Winston Churchill is credited with this response to the "rule" against ending a sentence with a preposition: "This is the sort of nonsense up with which I will not put."

Today our bookstores are populated with books by language purists attempting to "save the English language." They criticize those who use *enormity* to mean 'enormous' instead of 'monstrously evil.' But languages change in the course of time and words change meaning. Language change is a natural process, as we discuss in chapter 8. Over time *enormity* was increasingly used to mean 'enormous,' and now that President Barack Obama has used it that way (in his victory speech of November 4, 2008) and that J. K. Rowling uses it similarly in the immensely popular *Harry Potter and the Deathly Hallows*, that usage will gain acceptance. Still, the "saviors" of the English language will never disappear. They will continue to blame television, the schools, and even the National Council of Teachers of English for failing to preserve the standard language, and are likely to continue to dis (oops, we mean disparage) anyone who suggests that African American English (AAE)[3] and other dialects are viable, complete languages.

All human languages and dialects are fully expressive, complete, and logical, as much as they were two hundred or two thousand years ago. Hopefully (another frowned-upon usage), this book will convince you that all languages and dialects are rule-governed, whether spoken by rich or poor, powerful or weak, learned or illiterate. Grammars and usages of particular groups in society may be dominant for social and political reasons, but from a linguistic (scientific) perspective they are neither superior nor inferior to the grammars and usages of less prestigious members of society.

Having said all this, it is undeniable that the **standard** dialect (defined in chapter 7) may indeed be a better dialect for someone wishing to obtain a

[3]AAE is also called African American Vernacular English (AAVE), Ebonics, and Black English (BE). It is spoken by some (but by no means all) African Americans. It is discussed in chapter 7.

particular job or achieve a position of social prestige. In a society where "linguistic profiling" is used to discriminate against speakers of a minority dialect, it may behoove those speakers to learn the prestige dialect rather than wait for social change. But linguistically, prestige and standard dialects do not have superior grammars.

Finally, all of the preceding remarks apply to *spoken* language. Writing is another story (see chapter 12). Writing follows certain prescriptive rules of grammar, usage, and style that the spoken language does not, and is subject to little, if any, dialectal variation. And writing is not acquired naturally through simple exposure to others speaking the language as spoken languages are (see chapter 9), but must be taught.

Teaching Grammars

> I don't want to talk grammar. I want to talk like a lady.
>
> G. B. SHAW, *Pygmalion*, 1912

The descriptive grammar of a language attempts to describe the rules internalized by a speaker of that language. It is different from a **teaching grammar**, which is used to learn another language or dialect. Teaching grammars can be helpful to people who do not speak the standard or prestige dialect, but find it would be advantageous socially and economically to do so. They are used in schools in foreign language classes. This kind of grammar gives the words and their pronunciations, and explicitly states the rules of the language, especially where they differ from the language of instruction.

It is often difficult for adults to learn a second language without formal instruction, even when they have lived for an extended period in a country where the language is spoken. (Second language acquisition is discussed in more detail in chapter 9.) Teaching grammars assume that the student already knows one language and compares the grammar of the target language with the grammar of the native language. The meaning of a word is provided by a **gloss**—the parallel word in the student's native language, such as *maison*, 'house' in French. It is assumed that the student knows the meaning of the gloss 'house' and so also the meaning of the word *maison*.

Sounds of the target language that do not occur in the native language are often described by reference to known sounds. Thus the student might be aided in producing the French sound *u* in the word *tu* by instructions such as "Round your lips while producing the vowel sound in *tea*."

The rules about how to put words together to form grammatical sentences also refer to the learners' knowledge of their native language. For example, the teaching grammar *Learn Zulu* by Sibusiso Nyembezi states that "The difference between singular and plural is not at the end of the word but at the beginning of it," and warns that "Zulu does not have the indefinite and definite articles 'a' and 'the.'" Such statements assume students know the rules of their own grammar, in this case English. Although such grammars might be considered

prescriptive in the sense that they attempt to teach the student what is or is not a grammatical construction in the new language, their aim is different from grammars that attempt to change the rules or usage of a language that is already known by the speaker.

This book is not primarily concerned with either prescriptive or teaching grammars. However, these kinds of grammars are considered in chapter 7 in the discussion of standard and nonstandard dialects.

Universal Grammar

> In a grammar there are parts that pertain to all languages; these components form what is called the general grammar. In addition to these general (universal) parts, there are those that belong only to one particular language; and these constitute the particular grammars of each language.
>
> CÉSAR CHESNEAU DU MARSAIS, c. 1750

There are rules of particular languages, such as English or Arabic or Zulu, that form part of the individual grammars of these languages, and then there are rules that hold in all languages. The universal rules are of particular interest because they give us a window into the human "faculty of language" which enables us to learn and use any particular language.

Interest in language universals has a long history. Early scholars encouraged research into the nature of language in general and promoted the idea of *general grammar* as distinct from *special grammar*. General grammar was to reveal those features common to all languages.

Students trying to learn Latin, Greek, French, or Swahili as a second language are generally so focused on learning aspects of the new language that differ from their native language that they may be skeptical of the universal laws of language. Yet there are many things that all language learners know unconsciously even before they begin to learn a new language. They know that a language has its own set of sounds, perhaps thought of as its alphabet, that combine according to certain patterns to form words, and that the words themselves recombine to form phrases and sentences. The learner will expect to find verbs and nouns—as these are universal grammatical categories; she will know that the language—like all languages—has a way of negating, forming questions, issuing commands, referring to past or future time, and more generally, has a system of rules that will allow her to produce and understand an infinite number of sentences.

The more linguists explore the intricacies of human language, the more evidence accumulates to support Chomsky's view that there is a **Universal Grammar (UG)** that is part of the biologically endowed human language faculty. We can think of UG as the blueprint that all languages follow that forms part of the child's innate capacity for language learning. It specifies the different components of the grammar and their relations, how the different rules of these

components are constructed, how they interact, and so on. A major aim of **linguistic theory** is to discover the nature of UG.

The linguist's goal is to reveal the "laws of human language," as the physicist's goal is to reveal the "laws of the physical universe." The complexity of language undoubtedly means this goal will never be fully achieved. All scientific theories are incomplete, and new hypotheses must be proposed to account for new data. Theories are continually changing as new discoveries are made. Just as physics was enlarged by Einstein's theories of relativity, so grows the linguistic theory of UG as new discoveries shed new light on the nature of human language. The comparative study of many different languages is of central importance to this enterprise.

The Development of Grammar

> How comes it that human beings, whose contacts with the world are brief and personal and limited, are nevertheless able to know as much as they do know?
>
> BERTRAND RUSSELL, *Human Knowledge: Its Scope and Limits*, 1948

Linguistic theory is concerned not only with describing the knowledge that an adult speaker has of his or her language, but also with explaining how this knowledge is acquired.

All typically developing children acquire (at least one) language in a relatively short period with apparent ease. They do this despite the fact that parents and other caregivers do not provide them with any specific language instruction. Indeed, it is often remarked that children seem to "pick up" language just from hearing it spoken around them. Children are language-learning virtuosos—whether a child is male or female, from a rich family or a disadvantaged one, grows up on a farm or in the city, attends day care or has home care, none of these factors fundamentally affects the way language develops. Children can acquire any language they are exposed to with comparable ease—English, Dutch, French, Swahili, Japanese—and even though each of these languages has its own peculiar characteristics, children learn them all in very much the same way. For example, all children go through a babbling stage; their babbles gradually give way to words, which then combine to form simple sentences and then sentences of ever-increasing complexity. The same child who may be unable to tie her shoes or even count to five has managed to master the complex grammatical structures of her language and acquire a substantial lexicon.

How children accomplish this remarkable cognitive feat is a topic of intense interest to linguists. The child's inexorable path to adult linguistic knowledge and the uniformity of the acquisition process point to a substantial innate component to language development, what we referred to earlier as Universal Grammar. Children acquire language as quickly and effortlessly as they do because they do not have to figure out all the grammatical rules, only those that are specific to their particular language. The

universal properties—the laws of language—are part of their biological endowment. In chapter 9 we will discuss language acquisition in more detail.

Sign Languages: Evidence for Language Universals

> It is not the want of organs that [prevents animals from making] . . . known their thoughts . . . for it is evident that magpies and parrots are able to utter words just like ourselves, and yet they cannot speak as we do, that is, so as to give evidence that they think of what they say. On the other hand, men who, being born deaf and mute . . . are destitute of the organs which serve the others for talking, are in the habit of themselves inventing certain signs by which they make themselves understood.
>
> RENÉ DESCARTES, *Discourse on Method*, 1637

The sign languages of deaf communities provide some of the best evidence to support the view that all languages are governed by the same universal principles. Current research on sign languages has been crucial to understanding the biological underpinnings of human language acquisition and use.

The major language of the deaf community in the United States is **American Sign Language (ASL)**. ASL is an outgrowth of the sign language used in France and brought to the United States in 1817 by the great educator Thomas Hopkins Gallaudet.

ASL and other sign languages do not use sounds to express meanings. Instead, they are visual-gestural systems that use hand, body, and facial gestures as the forms used to represent words and grammatical rules. Sign languages are fully developed languages, and signers create and comprehend unlimited numbers of new sentences, just as speakers of spoken languages do. Signed languages have their own grammatical rules and a mental lexicon of signs, all encoded through a system of gestures, and are otherwise equivalent to spoken languages. Signers are affected by performance factors just as speakers are; slips of the hand occur similar to slips of the tongue. Finger fumblers amuse signers just as tongue twisters amuse speakers. These and other language games play on properties of the "sound" systems of the spoken and signed languages.

Deaf children who are exposed to signed languages acquire them just as hearing children acquire spoken languages, going through the same linguistic stages, including the babbling stage. Deaf children babble with their hands, just as hearing children babble with their vocal tracts. Neurological studies show that signed languages are organized in the brain in the same way as spoken languages, despite their visual modality. We discuss the brain basis of language in chapter 10.

In short, signed languages resemble spoken languages in all major aspects. This universality is expected because, regardless of the modality in which it is expressed, language is a biologically based ability. Our knowledge, use and acquisition of language are not dependent on the ability to produce and hear sounds, but on a far more abstract cognitive capacity.

What Is Not (Human) Language

> It is a very remarkable fact that there are none so depraved and stupid, without even excepting idiots, that they cannot arrange different words together, forming of them a statement by which they make known their thoughts; while, on the other hand, there is no other animal, however perfect and fortunately circumstanced it may be, which can do the same.
>
> RENÉ DESCARTES, *Discourse on Method and Meditation on First Philosophy*

All languages share certain fundamental properties, and children naturally acquire these languages—whether they are spoken or signed. Both modalities are equally accessible to the child because human beings are designed for human language. But what of the "languages" of other species: Are they like human languages? Can other species be taught a human language?

The Birds and the Bees

> Teach me half the gladness
> That thy brain must know;
> Such harmonious madness
> From my lips would flow,
> The world should listen then, as I am listening now.
>
> PERCY BYSSHE SHELLEY, 1792–1822, *To a Skylark*

Most animal species possess some kind of communication system. Humans also communicate through systems other than language such as head nodding or facial expressions. The question is whether the communication systems used by other species are at all like human language with its very specific properties, most notably its creative aspect.

Many species have a non-vocal system of communication. Among certain species of spiders there is a complex system for courtship. Before approaching his ladylove, the male spider goes through an elaborate series of gestures to tell her that he is indeed a spider and a suitable mate, and not a crumb or a fly to be eaten. These gestures are invariant. One never finds a creative spider changing or adding to the courtship ritual of his species.

A similar kind of gestural language is found among the fiddler crabs. There are forty species, and each uses its own claw-waving movement to signal to another member of its "clan." The timing, movement, and posture of the body never change from one time to another or from one crab to another within the particular variety. Whatever the signal means, it is fixed. Only one meaning can be conveyed.

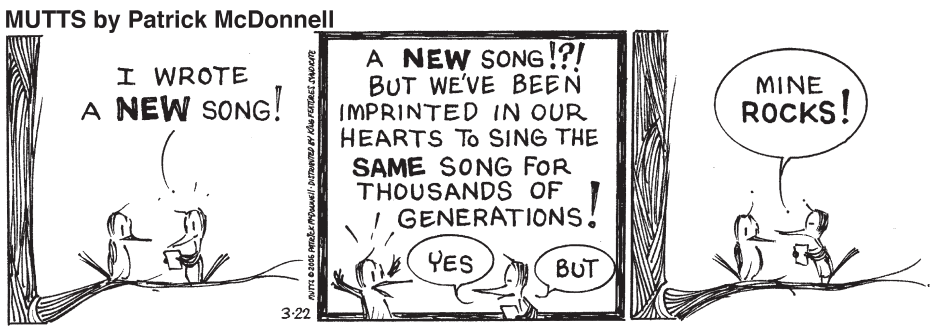
An essential property of human language not shared by the communication systems of spiders, crabs and other animals is its **discreteness**. Human languages are not simply made up of a fixed set of invariant signs. They are composed of discrete units—sounds, words, phrases—that are combined

according to the rules of the grammar of the language. The word *top* in English has a particular meaning, but it also has individual parts that can be rearranged to produce other meaningful sequences—*pot* or *opt*. Similarly, the phrase *the cat on the mat* means something different from *the mat on the cat*. We can arrange and rearrange the units of our language to form an infinite number of expressions. The creativity of human language depends on discreteness.

In contrast to crabs and spiders, birds communicate vocally and birdsongs have always captured the human imagination. Musicians and composers have been moved by these melodies, sometimes imitating them in their compositions, other times incorporating birdsongs directly into the music. Birdsongs have also inspired poets as in Shelley's *To a Skylark,* not to mention cartoonists.

Birds do not sing for our pleasure, however. Their songs and calls communicate important information to other members of the species and sometimes to other animals. **Birdcalls** (consisting of one or more short notes) convey danger, feeding, nesting, flocking, and so on. **Bird songs** (more complex patterns of notes) are used to stake out territory and to attract mates. Like the messages of crabs and spiders, however, there is no evidence of any internal structure to these songs; they cannot be segmented into discrete meaningful parts and rearranged to encode different messages as can the words, phrases, and sentences of human language. In his territorial song the European robin alternates between high-pitched and low-pitched notes to indicate how strongly he feels about defending his territory. The different alternations indicate intensity and nothing more. The robin is creative in his ability to sing the same song in different ways, but not creative in his ability to use the same units of the system to express different messages with different meanings. Recently, scientists have observed that finches will react when the units of a familiar song are rearranged. It is unclear, however, whether the birds recognize a violation of the rules of the song or are just responding to a pattern change.

Though crucial to the birds' survival, the messages conveyed by these songs and calls are limited, relating only to a bird's immediate environment and needs. Like the dog in Russell's quote above, birds cannot tell us their story,



Patrick McDonnell/King Features Syndicate

however beautifully they sing. Human language is different of course. Our words and sentences are not simply responses to internal and external stimuli. If you're tired you may yawn, but you may also say "I'm tired," or "I'm going to bed," or "I'm going to Starbucks for a double espresso." Notably, you also have the right to remain silent, or talk about things completely unrelated to your physical state—the weather, the movie you saw last night, your plans for the weekend, or most interesting of all, your linguistics class.

The linguists call this property of human language **displacement**: the capacity to talk (or sign) messages that are unrelated to here and now. Displacement and discreteness are two fundamental properties that distinguish human language from the communication systems of birds and other animals.

One respect in which birdsongs do resemble human languages is their development. In many bird species the full adult version of the birdsong is acquired in several stages, as it is for children acquiring language. The young bird sings a simplified version of the song shortly after hatching and then learns the more detailed, complex version by hearing adults sing. However, he must hear the adult song during a specific fixed period after birth—the period differs from species to species; otherwise song acquisition does not occur. For example, the chaffinch is unable to learn the more detailed song elements after ten months of age. A baby nightingale in captivity may be trained to sing melodiously by another nightingale, a "teaching bird," but only before its tail feathers are grown. These birds show a **critical period** for acquiring their "language" similar to the critical period for human language acquisition, which we will discuss in chapters 9 and 10. As with human language acquisition, the development of the birdsongs of these species involves an interaction of both learned and innate structure.

An interesting consequence of the fact that some birdsongs are partially learned means that variation can develop. There can be "regional dialects" within the same species, and as with humans, these dialects are transmitted from parents to offspring. Researchers have noted, in fact, that dialect differences may be better preserved in songbirds than in humans because there is no homogenization of regional accents due to radio or TV. We will discuss human language dialects in chapter 7.

Honeybees have a particularly interesting signaling system. When a forager bee returns to the hive she communicates to other bees where a source of food is located by performing a dance on a wall of the hive that reveals the location and quality of the food source. For one species of Italian honeybee, the dancing may assume one of three possible patterns: *round* (which indicates locations near the hive, within 20 feet or so); *sickle* (which indicates locations at 20 to 60 feet from the hive); and *tail-wagging* (for distances that exceed 60 feet). The number of repetitions per minute of the basic pattern in the tail-wagging dance indicates the precise distance: the slower the repetition rate, the longer the distance. The number of repetitions and the intensity with which the bee dances the round dance indicates the richness of the food source: the more repetitions and the livelier the bee dance the more food to be gotten.

Bee dances are discrete in some sense, consisting of separate parts and in principle they can communicate infinitely many different messages, like human language; but unlike human language the topic is always the same, namely food. They lack the displacement property. As experiments have shown, when

a bee is forced to walk to a food source rather than fly, she will communicate a distance many times farther away than the food source actually is. The bee has no way of communicating the special circumstances of its trip. This absence of creativity makes the bee's dance qualitatively different from human language.

As we will discuss in chapter 10, the human language ability is rooted in the human brain. Just like human language, the communication system of each species is determined by its biology. This raises the interesting question of whether it is possible for one species to acquire the language of another; more specifically, can animals learn human language?

Can Animals Learn Human Language?

> It is a great baboon, but so much like man in most things. . . . I do believe it already understands much English; and I am of the mind it might be taught to speak or make signs.
>
> ENTRY IN SAMUEL PEPYS'S DIARY, 1661

The idea of talking animals is as old and as widespread among human societies as language itself. All cultures have legends in which some animal speaks. All over West Africa, children listen to folktales in which a "spider-man" is the hero. "Coyote" is a favorite figure in many Native American tales, and many an animal takes the stage in Aesop's famous fables. Bugs Bunny, Mickey Mouse, and Donald Duck are icons of American culture. The fictional Doctor Doolittle communicated with all manner of animals, from giant snails to tiny sparrows, as did Saint Francis of Assisi.

In reality, various species show abilities that seem to mimic aspects of human language. Talking birds such as parrots and mynahs can be taught to faithfully reproduce words and phrases, but this does not mean they have acquired a human language. As the poet William Cowper put it: "Words learned by rote a parrot may rehearse; but talking is not always to converse."

Talking birds do not decompose their imitations into discrete units. *Polly* and *Molly* do not rhyme for a parrot. They are as different as *hello* and *goodbye*. If Polly learns "Polly wants a cracker" and "Polly wants a doughnut" and also learns to say *whiskey* and *bagel*, she will not then spontaneously produce "Polly wants whiskey" or "Polly wants a bagel" or "Polly wants whiskey and a bagel." If she learns *cat* and *cats*, and *dog* and *dogs*, and then learns the word *parrot*, she will not be able to form the plural *parrots* as children do. Unlike every developing child, a parrot cannot generalize from particular instances and cannot therefore produce sentences he has not been directly taught. A parrot—even a very verbose one—cannot produce an unlimited set of utterances from a finite set of units. The imitative utterances of talking birds mean nothing to the birds; these utterances have no communicative function. It is clear that simply knowing how to produce a sequence of speech sounds is not the same as knowing a language. But what about animals that appear to learn the meanings of words? Do they have human language?

Dogs can easily be taught to respond to commands such as *heel*, *sit*, *fetch*, and so on, and even seem to understand object words like *ball*, *toy*, and so on. Indeed, in 2004 German psychologists reported on a Border collie named

Rico who had acquired a 200-word vocabulary (containing both German and English words). When asked to fetch a particular toy from a pile of many toys Rico was correct over 90% of the time. When told to fetch a toy whose name he had not been previously taught, Rico could match the novel name to a new toy among a pile of familiar toys about 70% of the time—a rate comparable to that of young children performing a similar novel name task. More recently, a Border collie named Chaser who lives in South Carolina is reported to understand the names of 1022 toys! Chaser was taught these names over a 3-year period. And like Rico he is able to connect a novel name to a new toy placed in a huge pile of toys whose names he already knows.

Rico and Chaser are clearly very intelligent dogs and their name recognition skills are amazing. It is unlikely, however, that Rico or Chaser (or Spot or Rover) understands the *meanings* of words or has acquired a symbolic system in the way that children do. Rather, they learn to associate a particular sequence of sounds with an object or action. For Chaser and Rico the name 'Sponge Bob,' for example, might mean something like 'fetch Sponge Bob'—what the dog has been taught to do. The young child who has learned the name 'Sponge Bob' knows that it refers to a particular toy or TV character independent of any particular game or context. The philosopher Bertrand Russell summed up the dog rather insightfully, noting that ". . . however eloquently he may bark, he cannot tell you that his parents were honest though poor."

In their natural habitat, chimpanzees, gorillas, and other nonhuman primates communicate with each other through visual, auditory, olfactory, and tactile signals. Many of these signals seem to have meanings associated with the animals' immediate environment or emotional state. They can signal danger and can communicate aggressiveness and subordination. However, the natural sounds and gestures produced by all nonhuman primates are highly stereotyped and limited in the type and number of messages they convey. Their signals cannot be broken down into discrete units and rearranged to create new meanings. They also lack the property of displacement. Intelligent though they are, these animals have no way of expressing the anger they felt yesterday or the anticipation of tomorrow.

Even though primate communication systems are quite limited, many people have been interested in the question of whether they have the latent capacity to acquire complex linguistic systems similar to human language. Throughout the second half of the twentieth century, there were a number of studies designed to test whether nonhuman primates could learn human language, including both words (or signs) and the grammatical rules for their combination.

In early experiments researchers raised chimpanzees in their own homes alongside their children, in order to recreate the natural environment in which human children acquire language. The chimps were unable to vocalize words despite the efforts of their caretakers, though they did achieve the ability to understand a number of individual words. Primate vocal tracts do not permit them to pronounce many different sounds but because of their manual dexterity, sign language was an attractive alternative to test their cognitive linguistic ability. Starting with a chimpanzee named Washoe, and continuing over the years with a gorilla named Koko and another chimp ironically named Nim Chimpsky

(after Noam Chomsky—and the subject of a major motion picture, *Project Nim*, released Aug. 2011), intense efforts were made to teach them American Sign Language. Though the primates achieved small successes such as the ability to string two signs together, and occasionally showed flashes of creativity, none remotely reached the qualitative linguistic ability of a human child.

Similar results were obtained in attempting to teach primates artificial languages designed to resemble human languages in some respects. Common chimpanzees Sarah, Lana, Sherman, Austin, and more recently, a male bonobo (or pygmy chimpanzee) named Kanzi, were taught languages whose "words" were plastic chips, or keys on a keyboard, that could be arranged into "sentences." The researchers were particularly interested in the ability of primates to communicate using such abstract symbols.

These experiments also came under scrutiny. Questions arose over what kind of knowledge Sarah and Lana and Kanzi were showing with their symbol manipulations and to what extent their responses were being inadvertently cued by experimenters. Many scientists, including some who were directly involved with these projects, have concluded that the creative ability that is so much a part of human language is not evidenced by the chimps' use of the artificial languages. As often happens in science, the search for the answers to one kind of question leads to answers to other questions. The linguistic experiments with primates have led to many advances in our understanding of primate cognitive ability. Researchers have gone on to investigate other capacities of the chimp mind, such as causality. These studies also point out how remarkable it is that within just a few short years, without the benefit of explicit guidance and regardless of personal circumstances, all human children are able to create new and complex sentences never spoken or heard before.

Language and Thought

> It was intended that when Newspeak had been adopted once and for all and Oldspeak forgotten, a heretical thought—that is, a thought diverging from the principles of IngSoc—should be literally unthinkable, at least so far as thought is dependent on words.
>
> GEORGE ORWELL, appendix to *1984*, 1949

> The limits of my language mean the limits of my world.
>
> LUDWIG WITTGENSTEIN, *Tractatus Logico-Philosophicus*, 1922

Many people are fascinated by the question of how language relates to thought. It is natural to imagine that something as powerful and fundamental to human nature as language would influence how we think about or perceive the world around us. This is clearly reflected in the appendix of George Orwell's masterpiece *1984*, quoted above. Over the years there have been many claims made regarding the relationship between language and thought. The claim that the structure of a language influences how its speakers perceive the world around them is most closely associated with the linguist Edward Sapir and his student

Benjamin Whorf, and is therefore referred to as the **Sapir-Whorf hypothesis**. In 1929 Sapir wrote:

> Human beings do not live in the objective world alone, nor in the world of social activity as ordinarily understood, but are very much at the mercy of the particular language which has become the medium of expression for their society . . . we see and hear and otherwise experience very largely as we do because the language habits of our community predispose certain choices of interpretation.[4]

Whorf made even stronger claims:

> The background linguistic system (in other words, the grammar) of each language is not merely the reproducing instrument for voicing ideas but rather is itself the shaper of ideas, the program and guide for the individual's mental activity, for his analysis of impressions, for his synthesis of his mental stock in trade . . . We dissect nature along lines laid down by our native languages.[5]

The strongest form of the Sapir-Whorf hypothesis is called **linguistic determinism** because it holds that the language we speak *determines* how we perceive and think about the world. According to this view language acts like a filter on reality. One of Whorf's best-known claims in support of linguistic determinism was that the Hopi Indians do not perceive time in the same way as speakers of European languages because the Hopi language does not make the grammatical distinctions of tense that, for example, English does with words and word endings such as *did*, *will*, *shall*, *-s*, *-ed*, and *-ing*.

A weaker form of the hypothesis is **linguistic relativism**, which says that different languages encode different categories and that speakers of different languages therefore think about the world in different ways. For example, languages break up the color spectrum at different points. In Navaho, blue and green are one word. Russian has different words for dark blue (*siniy*) and light blue (*goluboy*), while in English we need to use the additional words *dark* and *light* to express the difference. The American Indian language Zuni does not distinguish between the colors yellow and orange.

Languages also differ in how they express locations. For example, in Italian you ride "in" a bicycle and you go "in" a country while in English you ride "on" a bicycle and you go "to" a country. In English we say that a ring is placed "on" a finger and a finger is placed "in" the ring. Korean, on the other hand, has one word for both situations, *kitta*, which expresses the idea of a tight-fitting relation between the two objects. Spanish has two different words for the inside of a corner (*rincón*) and the outside of a corner (*esquina*).

That languages show linguistic distinctions in their lexicons and grammar is certain, and we will see many examples of this in later chapters. The question is to what extent—if at all—such distinctions determine or influence the thoughts and perceptions of speakers. The Sapir-Whorf hypothesis is controversial, but

[4]Sapir, E. 1929. *Language.* New York: Harcourt, Brace & World, p. 207.

[5]Whorf, B. L., and J. B. Carroll. 1956. *Language, thought, and reality: Selected writings*. Cambridge, MA: MIT Press.

it is clear that the strong form of this hypothesis is false. Peoples' thoughts and perceptions are not determined by the words and structures of their language. We are not prisoners of our linguistic systems. If speakers were unable to think about something for which their language had no specific word, translations would be impossible, as it would be to learn a second language. English may not have separate words for the inside of a corner and the outside of a corner, but we are perfectly able to express these concepts using more than one word. In fact, we just did. If we could not think about something for which we do not have words, how would infants ever learn their first words, much less languages?

Many of the specific claims of linguistic determinism have been shown to be wrong. For example, the Hopi language may not have words and word endings for specific tenses, but the language has other expressions for time, including words for the days of the week, parts of the day, yesterday and tomorrow, lunar phases, seasons, etc. The Hopi people use various kinds of calendars and various devices for time-keeping based on the sundial. Clearly, they have a sophisticated concept of time despite the lack of a tense system in the language.

The Munduruku, an indigenous people of the Brazilian Amazon, have no words in their language for triangle, square, rectangle, or other geometric concepts, except circle. The only terms to indicate direction are words for upstream, downstream, sunrise, and sunset. Yet Munduruku children understand many principles of geometry as well as American children, whose language is rich in geometric and spatial words.

Though languages differ in their color words, speakers can readily perceive colors that are not named in their language. Grand Valley Dani is a language spoken in New Guinea with only two color words, black and white (dark and light). In experimental studies, however, speakers of the language showed recognition of the color red, and they did better with fire-engine red than off-red. This would not be possible if their color perceptions were fixed by their language. Our perception of color is determined by the structure of the human eye, not by the structure of language. A source of dazzling linguistic creativity is to be found at the local paint store where literally thousands of colors are given names like *soft pumpkin*, *Durango dust*, and *lavender lipstick*.

SHERMAN'S LAGOON © 2011 JIM TOOMEY

The Whorfian claim that is perhaps most familiar is that the Eskimo language Inuit has many more words than English has for snow and that this affects the worldview of the Inuit people. However, anthropologists have shown that Inuit has no more words for snow than English does: around a dozen, including *sleet*, *blizzard*, *slush*, and *flurry*. But even if it did, this would not show that language conditions the Inuits' experience of the world, but rather that experience with a particular world creates the need for certain words. In this respect the Inuit speaker is no different from the computer programmer, who has a technical vocabulary for Internet protocols, or the linguist, who has many specialized words regarding language. In this book we will introduce you to many new words and linguistic concepts, and surely you will learn them! This would be impossible if your thoughts about language were determined by the linguistic vocabulary you now have.

In our understanding of the world we are certainly not "at the mercy of whatever language we speak," as Sapir suggested. However, we may ask whether the language we speak *influences* our cognition in some way. In the domain of color categorization, for example, it has been shown that if a language lacks a word for *red*, say, then it's harder for speakers to reidentify red objects. In other words, having a label seems to make it easier to store or access information in memory. Similarly, experiments show that Russian speakers are better at discriminating light blue (*goluboy*) and dark blue (*siniy*) objects than English speakers, whose language does not make a lexical distinction between these categories. These results show that words can influence simple perceptual tasks in the domain of color discrimination. Upon reflection, this may not be a surprising finding. Colors exist on a continuum, and the way we segment into "different" colors happens at arbitrary points along this spectrum. Because there is no physical motivation for these divisions, this may be the kind of situation where language could show an effect.

The question has also been raised regarding the possible influence of grammatical gender on how people think about objects. Many languages, such as Spanish and German, classify nouns as masculine or feminine; in Spanish "key" is *la llave* (feminine) and "bridge" is *el puente* (masculine). Some psychologists have suggested that speakers of gender-marking languages think about objects as having gender, much like people or animals have. In one study, speakers of German and Spanish were asked to describe various objects using English adjectives (the speakers were proficient in English). In general, they used more masculine adjectives—independently rated as such—to describe objects that are grammatically masculine in their own language. For example, Spanish speakers described bridges (*el puente*) as *big*, *dangerous*, *long*, *strong*, and *sturdy*. In German the word for bridge is feminine (*die Brücke*) and German speakers used more feminine adjectives such as *beautiful*, *elegant*, *fragile*, *peaceful*, *pretty*, and *slender*. Interestingly, it has been noted that English speakers, too, make consistent judgments about the gender of certain objects (ships are "she") even though English has no grammatical gender of common nouns. It may be, then, that regardless of the language spoken, humans have a tendency to anthropomorphize objects and this tendency is somehow enhanced if the language itself has grammatical gender. Though it is too early to come to any firm conclusions, the results of these and similar studies seem to support a weak version of linguistic relativism.

Politicians and marketers certainly believe that language can influence our thoughts and values. One political party may refer to an inheritance tax as the "estate tax," while an opposing party refers to it as the "death tax." In the abortion debate, some refer to the "right to choose" and others to the "right to life." The terminology reflects different ideologies, but the choice of expression is primarily intended to sway public opinion. Politically correct (PC) language also reflects the idea that language can influence thought. Many people believe that by changing the way we talk, we can change the way we think; that if we eliminate racist and sexist terms from our language, we will become a less racist and sexist society. As we will discuss in chapter 7, language itself is not sexist or racist, but people can be, and because of this particular words take on negative meanings. In his book *The Language Instinct*, the psychologist Steven Pinker uses the expression *euphemism treadmill* to describe how the euphemistic terms that are created to replace negative words often take on the negative associations of the words they were coined to replace. For example, *handicapped* was once a euphemism for the offensive term *crippled*, and when *handicapped* became politically incorrect it was replaced by the euphemism *disabled*. And as we write, *disabled* is falling into disrepute and is often replaced by yet another euphemism, *challenged*. Nonetheless, in all such cases, changing language has not resulted in a new worldview for the speakers.

As prescient as Orwell was with respect to how language could be used for social control, he was more circumspect with regard to the relation between language and thought. He was careful to qualify his notions with the phrase "at least so far as thought is dependent on words." Current research shows that language does not determine how we think about and perceive the world. Future research should show the extent to which language influences other aspects of cognition such as memory and categorization.

Summary

We are all intimately familiar with at least one language, our own. Yet few of us ever stop to consider what we know when we know a language. No book contains, or could possibly contain, the English or Russian or Zulu language. The words of a language can be listed in a dictionary, but not all the sentences can be. Speakers use a finite set of rules to produce and understand an infinite set of possible sentences.

These rules are part of the **grammar** of a language, which develops when you acquire the language and includes the sound system (the **phonology**), the structure and properties of words (the **morphology** and **lexicon**), how words may be combined into phrases and sentences (the **syntax**), and the ways in which sounds and meanings are related (the **semantics**). The sounds and meanings of individual words are related in an **arbitrary** fashion. If you had never heard the word *syntax* you would not know what it meant by its sounds. The gestures used by signers are also arbitrarily related to their meanings. Language, then, is a system that relates sounds (or hand and body gestures) with meanings. When you know a language, you know this system.

This knowledge (**linguistic competence**) is different from behavior (**linguistic performance**). You have the competence to produce a million-word sentence

but performance limitations such as memory and endurance keep this from occurring. There are different kinds of "grammars." The **descriptive grammar** of a language represents the unconscious linguistic knowledge or capacity of its speakers. Such a grammar is a model of the **mental grammar** every speaker of the language possesses. It does not teach the rules of the language; it describes the rules that are already known. A grammar that attempts to legislate what your grammar should be is called a **prescriptive grammar**. It prescribes. It does not describe, except incidentally. **Teaching grammars** are written to help people learn a foreign language or a dialect of their own language.

The more linguists investigate the thousands of languages of the world and describe the ways in which they differ from each other, the more they discover that these differences are limited. There are linguistic universals that pertain to each of the parts of grammars, the ways in which these parts are related, and the forms of rules. These principles compose **Universal Grammar**, which provides a blueprint for the grammars of all possible human languages. Universal Grammar constitutes the innate component of the human language faculty that makes language development in children possible.

Strong evidence for Universal Grammar is found in the way children acquire language. Children learn language by exposure. They need not be deliberately taught, though parents may enjoy "teaching" their children to speak or sign. Children will learn any human language to which they are exposed, and they learn it in definable stages, beginning at a very early age.

The fact that deaf children learn **sign language** shows that the ability to hear or produce sounds is not a prerequisite for language learning. All the sign languages in the world, which differ as spoken languages do, are visual-gestural systems that are as fully developed and as structurally complex as spoken languages. The major sign language used in the United States is **American Sign Language (ASL)**. The ability of human beings to acquire, know, and use language is a biologically based ability rooted in the structure of the human brain, and expressed in different modalities (spoken or signed).

If language is defined merely as a system of communication, or the ability to produce speech sounds, then language is not unique to humans. There are, however, certain characteristics of human language not found in the communication systems of any other species. A basic property of human language is its **creativity**—a speaker's ability to combine the basic linguistic units to form an infinite set of "well-formed" grammatical sentences, most of which are novel, never before produced or heard. Human languages consist of discrete units that combine according to the rules of the grammar of the language. Human languages also allow us to talk about things that are removed in time and space from our immediate environment or mental or physical state. These are the properties of **discreteness** and **displacement** and they distinguish human language from the "languages" of other species.

For many years researchers were interested in the question of whether language is a uniquely human ability. There have been many attempts to teach nonhuman primates to communicate using sign language or symbolic systems that resemble human language in certain respects. Overall, results have been

disappointing. Some chimpanzees have been trained to use an impressive number of symbols or signs. But a careful examination of their multi-sign utterances reveals that unlike children, the chimps show little creativity or spontaneity. Their "utterances" are highly imitative (echoic), often unwittingly cued by trainers, and have little syntactic structure. Some highly intelligent dogs have also learned a significant number of words, but their learning is restricted to a specific context and it is likely that their "meanings" for these words are very different from the symbolic or referential meanings that would be learned by a human child.

The **Sapir-Whorf hypothesis** holds that the particular language we speak determines or influences our thoughts and perceptions of the world. Much of the early evidence in support of this hypothesis has not stood the test of time. More recent experimental studies suggest that the words and grammar of a language may affect aspects of cognition, such as memory and categorization.

References for Further Reading

Anderson, S. R. 2008. The logical structure of linguistic theory. *Language* (December): 795–814.

Bickerton, D. 1990. *Language and species*. Chicago: Chicago University Press.

Chomsky, N. 1986. *Knowledge of language: Its nature, origin, and use*. New York and London: Praeger.

___. 1975. *Reflections on language*. New York: Pantheon Books.

___. 1972. *Language and mind*. Enlarged ed. New York: Harcourt Brace Jovanovich.

Crystal, D. 2010. *Cambridge encyclopedia of language*. Cambridge, UK: Cambridge University Press.

Gentner, D., and S. Goldin-Meadow. 2003. *Language in mind*. Cambridge, MA: MIT Press.

Hall, R. A. 1950. *Leave your language alone*. Ithaca, NY: Linguistica.

Jackendoff, R. 1997. *The architecture of the language faculty*. Cambridge, MA: MIT Press.

___. 1994. *Patterns in the mind: Language and human nature*. New York: Basic Books.

Klima, E. S., and U. Bellugi. 1979. *The signs of language*. Cambridge, MA: Harvard University Press.

Lane, H. 1989. *When the mind hears: A history of the deaf*. New York: Vintage Books (Random House).

Milroy, J., and L. Milroy. 1998. *Authority in language: Investigating standard English*, 3rd ed. New York: Routledge.

Napoli, D. J. 2003. *Language matters: A guide to everyday thinking about language*. New York: Oxford University Press.

Pinker, S. 1999. *Words and rules: The ingredients of language*. New York: HarperCollins.

___. 1994. *The language instinct*. New York: William Morrow.

Premack, A. J., and D. Premack. 1972. Teaching language to an ape. *Scientific American* (October): 92–99.

Terrace, H. S. 1979. *Nim: A chimpanzee who learned sign language*. New York: Knopf.

Stam, J. 1976. *Inquiries into the origin of language: The fate of a question*. New York: Harper & Row.

Stokoe, W. 1960. *Sign language structure: An outline of the visual communication system of the American deaf*. Silver Spring, MD: Linstok Press.

Exercises

1. An English speaker's knowledge includes the sound sequences of the language. When new products are put on the market, the manufacturers have to think up new names for them that conform to the allowable sound patterns. Suppose you were hired by a manufacturer of soap products to name five new products. What names might you come up with? List them.

   We are interested in how the names are pronounced. Therefore, describe in any way you can how to say the words you list. Suppose, for example, you named one detergent *Blick*. You could describe the sounds in any of the following ways:

   bl as in *blood*, *i* as in *pit*, *ck* as in *stick*
   bli as in *bliss*, *ck* as in *tick*
   b as in *boy*, *lick* as in *lick*

2. Consider the following sentences. Put a star (*) after those that do not seem to conform to the rules of your grammar, that are ungrammatical for you. State, if you can, why you think the sentences are ungrammatical.

   a. Robin forced the sheriff go.
   b. Napoleon forced Josephine to go.
   c. The devil made Faust go.
   d. He passed by a large pile of money.
   e. He drove by my house.
   f. He drove my house by.
   g. Did in a corner little Jack Horner sit?
   h. Elizabeth is resembled by Charles.
   i. Nancy is eager to please.
   j. It is easy to frighten Emily.
   k. It is eager to love a kitten.
   l. That birds can fly flabbergasts.
   m. The fact that you are late to class is surprising.
   n. Has the nurse slept the baby yet?
   o. I was surprised for you to get married.
   p. I wonder who and Mary went swimming.
   q. Myself bit John.
   r. What did Alice eat the toadstool with?
   s. What did Alice eat the toadstool and?

3. It was pointed out in this chapter that a small set of words in languages may be onomatopoeic; that is, their sounds "imitate" what they refer to. *Ding-dong*, *tick-tock*, *bang*, *zing*, *swish*, and *plop* are such words in English. Construct a list of ten new onomatopoeic words. Test them on at least five friends to see whether they are truly nonarbitrary as to sound and meaning.

4. Although sounds and meanings of most words in all languages are arbitrarily related, there are some communication systems in which the "signs" unambiguously reveal their "meanings."
   a. Describe (or draw) five different signs that directly show what they mean. *Example*: a road sign indicating an S curve.
   b. Describe any other communication system that, like language, consists of arbitrary symbols. *Example*: traffic signals, in which red means stop and green means go.

5. Consider these two statements: I learned a new word today. I learned a new sentence today. Do you think the two statements are equally probable, and if not, why not?

6. An African grey parrot named Alex who was the subject of a 30-year experiment was reported to have learned the meanings of 150 words. There are many reports on the Internet about Alex's impressive abilities. In the light of evidence presented in this chapter, or based on your own Internet research, discuss whether Alex's communications were the results of classical operant conditioning, as many scientists believe, or whether he showed true linguistic creativity, as his trainers maintain.

7. A wolf is able to express subtle gradations of emotion by different positions of the ears, the lips, and the tail. There are eleven postures of the tail that express such emotions as self-confidence, confident threat, lack of tension, uncertain threat, depression, defensiveness, active submission, and complete submission. This system seems to be complex. Suppose that there were a thousand different emotions that the wolf could express in this way. Would you then say a wolf had a language similar to a human's? If not, why not?

8. Suppose you taught a dog to *heel*, *sit up*, *roll over*, *play dead*, *stay*, *jump*, and *bark* on command, using the italicized words as cues. Would you be teaching it language? Why or why not?

9. State some rule of grammar that you have learned is the correct way to say something, but that you do not generally use in speaking. For example, you may have heard that *It's me* is incorrect and that the correct form is *It's I*. Nevertheless, you always use *me* in such sentences; your friends do also, and in fact *It's I* sounds odd to you.

   Write a short essay presenting arguments against someone who tells you that you are wrong. Discuss how this disagreement demonstrates the difference between descriptive and prescriptive grammars.

10. Noam Chomsky has been quoted as saying:

    > It's about as likely that an ape will prove to have a language ability as that there is an island somewhere with a species of flightless birds waiting for human beings to teach them to fly.

In the light of evidence presented in this chapter, or based on your own Internet research, comment on Chomsky's remark. Do you agree or disagree, or do you think the evidence is inconclusive?

11. Think of song titles that are "bad" grammar, but that, if corrected, would lack effect. For example, the title of the 1929 "Fats" Waller classic "Ain't Misbehavin'" is clearly superior to the bland "I am not misbehaving." Try to come up with five or ten such titles.

12. Linguists who attempt to write a descriptive grammar of linguistic competence are faced with a difficult task. They must understand a deep and complex system based on a set of sparse and often inaccurate data. (Children learning language face the same difficulty.) Albert Einstein and Leopold Infeld captured the essence of the difficulty in their book *The Evolution of Physics*, written in 1938:

> In our endeavor to understand reality we are somewhat like a man trying to understand the mechanism of a closed watch. He sees the face and the moving hands, even hears its ticking, but he has no way of opening the case. If he is ingenious he may form some picture of a mechanism which could be responsible for all the things he observes, but he may never be quite sure his picture is the only one which could explain his observations. He will never be able to compare his picture with the real mechanism and he cannot even imagine the possibility of the meaning of such a comparison.

Write a short essay that speculates on how a linguist might go about understanding the reality of a person's grammar (the closed watch) by observing what that person says and doesn't say (the face and moving hands). For example, a person might never say *the sixth sheik's sixth sheep is sick as a dog*, but the grammar should specify that it is a well-formed sentence, just as it should somehow indicate that *Came the messenger on time* is ill-formed.

13. View the motion picture *My Fair Lady* (drawn from the play *Pygmalion* by George Bernard Shaw). Write down every attempt to teach grammar (pronunciation, word choice, and syntax) to the character of Eliza Doolittle. This is an illustration of a "teaching grammar."

14. Many people are bilingual or multilingual, speaking two or more languages with very different structures.

- **a.** What implications does bilingualism have for the debate about language and thought?
- **b.** Many readers of this textbook have some knowledge of a second language. Think of a linguistic structure or word in one language that does not exist in the second language and discuss how this does or does not affect your thinking when you speak the two languages.

(If you know only one language, ask this question of a bilingual person you know.)

c. Can you find an example of an untranslatable word or structure in one of the languages you speak?

15. The South American indigenous language Pirahã is said to lack numbers beyond two and distinct words for colors. Research this language using the Internet with regard to whether Pirahã supports or fails to support linguistic determinism and/or linguistic relativism.

16. English (especially British English) has many words for woods and woodlands. Here are some:

woodlot, carr, fen, firth, grove, heath, holt, lea, moor, shaw, weald, wold, coppice, scrub, spinney, copse, brush, bush, bosquet, bosky, stand, forest, timberland, thicket

a. How many of these words do you recognize?

b. Look up several of these words in the dictionary and discuss the differences in meaning. Many of these words are obsolete, so if your dictionary doesn't have them, try the Internet.

c. Do you think that English speakers have a richer concept of woodlands than speakers whose language has fewer words? Why or why not?

17. English words containing *dge* in their spelling (*trudge*, *edgy*) are said mostly to have unfavorable or negative connotations. Research this notion by accumulating as many *dge* words as you can and classifying them as unfavorable (*sludge*) or neutral (*bridge*). What do you do about *budget*? Unfavorable or not? Are there other questionable words?

18. With regard to the "euphemism treadmill": Identify three other situations in which a euphemism evolved to be as offensive as the word it replaced, requiring yet another euphemism. Hint: Sex, race, and bodily functions are good places to start.

19. **Research project**: Read the Cratylus Dialogue—it's online. In it is a discussion (or "dialogue") of whether names are "conventional" (i.e., what we have called *arbitrary*) or "natural." Do you find Socrates' point of view sufficiently well-argued to support the thesis in this chapter that the relationship between form and meaning is indeed arbitrary? Argue your case in either direction in a short (or long, if you wish) essay.

20. **Research project**: (Cf. exercise 15) It is claimed that Pirahã—an indigenous language of Brazil—violates some of the universal principles hypothesized by linguists. Which principles are in question? Is the evidence persuasive? Conclusive? Speculative? (Hint: Use the journal *Current Anthropology*, Volume 46, Number 4, August-October 2005 and the journal *Language*, Volume 85, Number 2, June 2009.)

21. There are, very roughly, about half a million words in use in today's English language according to current unabridged dictionaries. However, if we reach back to the beginnings of the printing press and examine large amounts of published English we find an additional half a million words now no longer in use, such as *slethem*, a musical instrument. (This matter is discussed in more detail in chapter 11 under the rubric "culturomics.") Write a short essay arguing one way or the other that the lexicon of the English language ought to be counted as containing one million or so words. Feel free, as always, to poke around the Internet to inform yourself further.

2

Morphology: The Words of Language

> By words the mind is winged.
>
> ARISTOPHANES (450 BCE–388 BCE)

> A powerful agent is the right word. Whenever we come upon one of those intensely right words . . . the resulting effect is physical as well as spiritual, and electrically prompt.
>
> MARK TWAIN

Every speaker of every language knows tens of thousands of words. Unabridged dictionaries of English contain nearly 500,000 entries, but most speakers don't know all of these words. It has been estimated that a child of six knows as many as 13,000 words and the average high school graduate about 60,000. A college graduate presumably knows many more than that, but whatever our level of education, we learn new words throughout our lives, such as the many words in this book that you will learn for the first time.

Words are an important part of linguistic knowledge and constitute a component of our mental grammars, but one can learn thousands of words in a language and still not know the language. Anyone who has tried to communicate in a foreign country by merely using a dictionary knows this is true. On the other hand, without words we would be unable to convey our thoughts through language or understand the thoughts of others.

Someone who doesn't know English would not know where one word begins or ends in an utterance like *Thecatsatonthemat*. We separate written words by spaces, but in the spoken language there are no pauses between most words. Without knowledge of the language, one can't tell how many words are in an utterance. Knowing a word means knowing that a particular sequence of sounds is associated with a particular meaning. A speaker of English has no difficulty in segmenting the stream of sounds into six individual words—*the*, *cat*, *sat*, *on*, *the*, and *mat*—because each of these words is listed in his or her mental dictionary, or lexicon (the Greek word for *dictionary*), that is part of a speaker's linguistic knowledge. Similarly, a speaker knows that *uncharacteristically*, which has more letters than *Thecatsatonthemat*, is nevertheless a single word.

The lack of pauses between words in speech has provided humorists with much material. The comical hosts of the show *Car Talk*, aired on National Public Radio (as reruns nowadays), close the show by reading a list of credits that includes the following cast of characters:

Copyeditor:	Adeline Moore (add a line more)
Accounts payable:	Ineeda Czech (I need a check)
Pollution control:	Maury Missions (more emissions)
Purchasing:	Lois Bidder (lowest bidder)
Statistician:	Marge Innovera (margin of error)
Russian chauffeur:	Picov Andropov (pick up and drop off)
Legal firm:	Dewey, Cheetham, and Howe (Do we cheat 'em? And how!)[1]

In all these instances, you would have to have knowledge of English words to make sense of and find humor in such plays on words.

The fact that the same sound sequences (Lois Bidder—lowest bidder) can be interpreted differently shows that the relation between sound and meaning is an arbitrary pairing, as discussed in chapter 1. For example, *Un petit d'un petit* in French means 'a little one of a little one,' but to an English speaker the sounds resemble the name *Humpty Dumpty*.

When you know a word, you know its sound (pronunciation) and its meaning. Because the sound-meaning relation is arbitrary, it is possible to have words with the same sound and different meanings (*bear* and *bare*) and words with the same meaning and different sounds (*sofa* and *couch*).

Because each word is a sound-meaning unit, each word stored in our mental lexicon must be listed with its unique phonological representation, which determines its pronunciation, and with a meaning. For literate speakers, the spelling, or **orthography**, of most of the words we know is included.

Each word in your mental lexicon includes other information as well, such as whether it is a noun, a pronoun, a verb, an adjective, an adverb, a preposition, or a conjunction. That is, the mental lexicon also specifies the **grammatical category** or **syntactic class** of the word. You may not consciously

[1]"Car Talk" credits from National Public Radio.™ Dewey, Cheetham & Howe, 2006, all rights reserved.

know that a form like *love* is listed as both a verb and a noun, but as a speaker you have such knowledge, as shown by the phrases *I love you* and *You are the love of my life*. If such information were not in the mental lexicon, we would not know how to form grammatical sentences, nor would we be able to distinguish grammatical from ungrammatical sentences.

Content Words and Function Words

> ". . . and even . . . the patriotic archbishop of Canterbury found it advisable—"
>
> "Found what?" said the Duck.
>
> "Found it," the Mouse replied rather crossly; "of course you know what 'it' means."
>
> "I know what 'it' means well enough, when I find a thing," said the Duck; "it's generally a frog or a worm. The question is, what did the archbishop find?"
>
> LEWIS CARROLL, *Alice's Adventures in Wonderland*, 1865

Languages make an important distinction between two kinds of words—content words and function words. Nouns, verbs, adjectives, and adverbs are the **content words**. These words denote concepts such as objects, actions, attributes, and ideas that we can think about, like *children, build, beautiful*, and *seldom*. Content words are sometimes called the **open class** words because we can and regularly do add new words to these classes, such as *Facebook* (noun), *blog* (noun, verb), *frack* (verb), *online* (adjective, adverb), and *blingy* (adjective).

Other classes of words do not have clear lexical meanings or obvious concepts associated with them, including conjunctions such as *and*, *or*, and *but*; prepositions such as *in* and *of*; the articles *the* and *a/an*, and pronouns such as *it*. These kinds of words are called **function words** because they specify grammatical relations and have little or no semantic content. For example, the articles indicate whether a noun is definite or indefinite—*the* boy or *a* boy. The preposition *of* indicates possession, as in "the book of yours," but this word indicates many other kinds of relations too. The *it* in *it's raining* and *the archbishop found it advisable* are further examples of words whose function is purely grammatical—they are required by the rules of syntax and we can hardly do without them.

Function words are sometimes called **closed class** words. This is because it is difficult to think of any conjunctions, prepositions, or pronouns that have recently entered the language. The small set of personal pronouns such as *I*, *me*, *mine*, *he*, *she*, and so on are part of this class. With the growth of the feminist movement, some proposals have been made for adding a genderless singular pronoun. If such a pronoun existed, it might have prevented the department head in a large university from making the incongruous statement: "We will hire the best person for the job regardless of his sex." Various proposals such as "e" have been put forward, but none are likely to gain traction because the closed classes are unreceptive to new membership. Rather, speakers prefer to recruit existing pronouns such as *they* and *their* for this job, as in "We will hire the best person for the job regardless of **their** sex." A convenient ploy used by

writers is *s/he* or *she/he* pronounced "shee-hee" when read aloud, as in *If any student wishes to leave early, s/he must obtain special permission.*

The difference between content and function words is illustrated by the following test that has circulated over the Internet:

> Count the number of F's in the following text without reading further, then check the footnote:[2]
>
> FINISHED FILES ARE THE
> RESULT OF YEARS OF SCIENTIFIC
> STUDY COMBINED WITH THE
> EXPERIENCE OF YEARS.

This little test illustrates that the brain treats content and function words (like *of*) differently. A great deal of psychological and neurological evidence supports this claim. As discussed in chapter 10, some brain-damaged patients and people with specific language impairments have greater difficulty in using, understanding, or reading function words than they do with content words. Some aphasics are unable to read function words like *in* or *which*, but can read the lexical content words *inn* and *witch*.

The two classes of words also seem to function differently in **slips of the tongue** produced by normal individuals. For example, a speaker may inadvertently switch words producing "the journal of the editor" instead of "the editor of the journal," but the switching or exchanging of function words has not been observed. There is also evidence for this distinction from language acquisition (discussed in chapter 9). In the early stages of development, children often omit function words from their speech, as in, for example, "doggie barking."

The linguistic evidence suggests that content words and function words play different roles in language. Content words bear the brunt of the meaning, whereas function words connect the content words to the larger grammatical context.

Morphemes: The Minimal Units of Meaning

> "They gave it me," Humpty Dumpty continued, "for an un-birthday present."
>
> "I beg your pardon?" Alice said with a puzzled air.
>
> "I'm not offended," said Humpty Dumpty.
>
> "I mean, what is an un-birthday present?"
>
> "A present given when it isn't your birthday, of course."
>
> LEWIS CARROLL, *Through the Looking-Glass*, 1871

[2]Most people come up with three, which is wrong. If you came up with fewer than six, count again, and this time, pay attention to the function word *of*.

Humpty Dumpty is well aware that the prefix *un-* means 'not,' as further shown in the following pairs of words:

A	B
desirable	undesirable
likely	unlikely
inspired	uninspired
happy	unhappy
developed	undeveloped
sophisticated	unsophisticated

Thousands of English adjectives begin with *un-*. If we assume that the most basic unit of meaning is the word, what do we say about parts of words, like *un-*, which has a fixed meaning? In all the words in the B column, *un-* means the same thing—'not.' *Undesirable* means 'not desirable,' *unlikely* means 'not likely,' and so on. All the words in column B consist of at least two meaningful units: *un* + *desirable*, *un* + *likely*, *un* + *inspired*, and so on.

Just as *un-* occurs with the same meaning in the previous list of words, so does *phon-* in the following words. (You may not know the meaning of some of them, but you will when you finish this book.)

phone	phonology	phoneme
phonetic	phonologist	phonemic
phonetics	phonological	allophone
phonetician	telephone	euphonious
phonic	telephonic	symphony

Phon- is a minimal form in that it can't be decomposed. *Ph* doesn't mean anything; *pho*, though it may be pronounced like *foe*, has no relation in meaning to it; and *on* is not the preposition spelled *o-n*. In all the words on the list, *phon* has the identical meaning 'pertaining to sound.'

Words have internal structure that is rule-governed. *Uneaten*, *undisputed*, and *ungrammatical* are words in English, but **eatenun*, **disputedun*, and **grammaticalun* (to mean 'not eaten,' 'not disputed,' 'not grammatical') are not words because we form a negative meaning of a word by prefixing *un-*, not by suffixing it.

When Samuel Goldwyn, the pioneer moviemaker, announced, "In two words: im-possible," he was reflecting the common view that words are the basic meaningful elements of a language. We have seen that this cannot be so, because some words contain several distinct units of meaning. The linguistic term for the most elemental unit of grammatical form is **morpheme**. The word is derived from the Greek word *morphe*, meaning 'form.' If Goldwyn had taken a linguistics course, he would have said, more correctly, "In two morphemes: im-possible."

The study of the internal structure of words, and of the rules by which words are formed, is **morphology**. This word itself consists of two morphemes, *morph* + *ology*. The suffix *-ology* means 'branch of knowledge,' so the meaning of *morphology* is 'the branch of knowledge concerning (word) forms.' Morphology also refers to our internal grammatical knowledge concerning the words of our language, and like most linguistic knowledge we are not consciously aware of it.

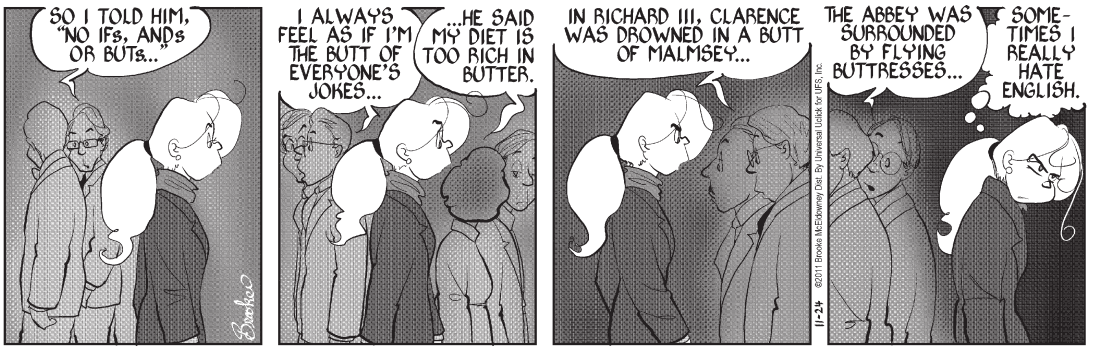
A single word may be composed of one or more morphemes:

one morpheme	boy
	desire
	meditate
two morphemes	boy + ish
	desire + able
	meditate + tion
three morphemes	boy + ish + ness
	desire + able + ity
four morphemes	gentle + man + li + ness
	un + desire + able + ity
more than four	un + gentle + man + li + ness
	anti + dis + establish + ment + ari + an + ism

A morpheme may be represented by a single sound, such as the morpheme *a-* meaning 'without' as in *amoral* and *asexual*, or by a single syllable, such as *child* and *ish* in *child + ish*. A morpheme may also consist of more than one syllable: of two syllables, as in *camel*, *lady*, and *water*; of three syllables, as in *Hackensack* and *crocodile*; or of four or more syllables, as in *hallucinate*, *apothecary*, *helicopter*, and *accelerate*.

A morpheme—the minimal linguistic unit—is thus an arbitrary union of a sound and a meaning (or grammatical function) that cannot be further analyzed. So solidly welded is this union in the mind that it is impossible for you to hear or read a word you know and not be aware of its meaning, even if you try! These two sides of the same coin are often called a **linguistic sign**, not to be confused with the *sign* of sign languages. Every word in every language is composed of one or more morphemes.

The Discreteness of Morphemes



9 CHICKWEED LANE © 2011 Brooke McEldowney. Reprinted by permission of Universal Uclick for UFS. All rights reserved.

Internet bloggers love to point out "inconsistencies" in the English language. They observe that while singers sing and flingers fling, it is not the case that fingers "fing." However, English speakers know that *finger* is a single morpheme, or a **monomorphemic word**. The final *-er* syllable in *finger* is not a

separate morpheme because a finger is not "something that fings." Similarly *butter* when not referring to goat-like behavior is monomorphemic food stuff, and *buttress*, to be sure, is neither a feminine form of *butt* nor has anything to do with locks of hair.

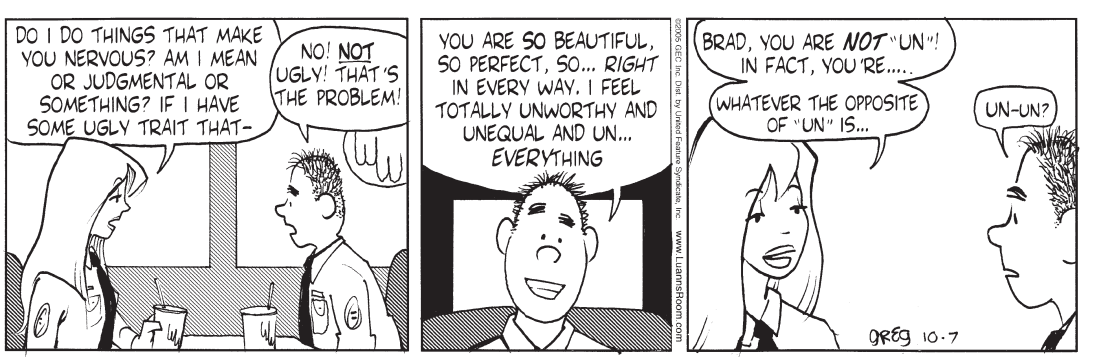
The meaning of a morpheme must be constant. The agentive morpheme *-er* means 'one who does' in words like *singer*, *painter*, *lover*, and *worker*, but the same sounds represent the comparative morpheme, meaning 'more,' in *nicer*, *prettier*, and *taller*. Thus, two different morphemes may be pronounced identically. The identical form represents two morphemes because of the different meanings. The same sounds may occur in another word and not represent a separate morpheme at all, as in *finger*.

Conversely, the two morphemes *-er* and *-ster* have the same meaning, but different forms. Both *singer* and *songster* mean 'one who sings.' And like *-er*, *-ster* is not a morpheme in *monster* because a monster is not something that "mons" or someone that "is mon" the way *youngster* is someone who is young. All of this follows from the concept of the morpheme as a *sound* plus a *meaning* unit.

The decomposition of words into morphemes illustrates one of the fundamental properties of human language—discreteness—a property that sets it apart from the animal communication systems discussed in chapter 1. In all languages, sound units combine to form morphemes, morphemes combine to form words, and words combine to form larger units—phrases and sentences.

Discreteness is an important part of linguistic creativity. We can combine morphemes in novel ways to create new words whose meaning will be apparent to other speakers of the language. If you know that "to write" to a DVD means to put information on it, you automatically understand that a *writable* DVD is one that can take information; a *rewritable* DVD is one where the original information can be written over; and an *unrewritable* DVD is one that does not allow the user to write over the original information. You know the meanings of all these words by virtue of your knowledge of the discrete morphemes *write*, *re-*, *-able*, and *un-*, and the rules for their combination.

Bound and Free Morphemes



Our morphological knowledge has two components: knowledge of the individual morphemes and knowledge of the rules that combine them. One of the things we know about particular morphemes is whether they can stand alone or whether they must be attached to a base morpheme. Some morphemes like *boy, desire, gentle,* and *man* may constitute words by themselves. These are **free morphemes**. Other morphemes like *-ish, -ness, -ly, pre-, trans-,* and *un-* are never words by themselves but are always parts of words. These **affixes** are **bound morphemes** and they may attach at the beginning, the end, in the middle, or both at the beginning and end of a word. The humor in the cartoon is Brad's stumbling over the bound morpheme *un-* in a questionable attempt to free it.

Prefixes and Suffixes

We know whether an affix precedes or follows other morphemes, for example that *un-*, *pre-* (*premeditate, prejudge*), and *bi-* (*bipolar, bisexual*) are prefixes. They occur before other morphemes. Some morphemes occur only as **suffixes**, following other morphemes. English examples of suffix morphemes are *-ing* (*sleeping, eating, running, climbing*), *-er* (*singer, performer, reader*), *-ist* (*typist, pianist, novelist, linguist*), and *-ly* (*manly, sickly, friendly*), to mention only a few.

Many languages have prefixes and suffixes, but languages may differ in how they deploy these morphemes. A morpheme that is a prefix in one language may be a suffix in another and vice versa. In English the plural morphemes *-s* and *-es* are suffixes (*boy*s, *lass*es). In Isthmus Zapotec, spoken in Mexico, the plural morpheme *ka-* is a prefix:

zigi	'chin'	kazigi	'chins'
zike	'shoulder'	kazike	'shoulders'
diaga	'ear'	kadiaga	'ears'

Languages may also differ in what meanings they express through affixation. In English we do not add an affix to derive a noun from a verb. We have the verb *dance* as in "I like to dance," and we have the noun *dance* as in "There's a dance or two in the old dame yet." The form is the same in both cases. In Turkish, you derive a noun from a verb with the suffix *-ak*, as in the following examples:

dur	'to stop'	durak	'stopping place'
bat	'to sink'	batak	'sinking place' or 'marsh/swamp'

To express reciprocal action in English we use the phrase *each other*, as in *understand each other*, *love each other*. In Turkish a morpheme is added to the verb:

anla	'understand'	anlash	'understand each other'
sev	'love'	sevish	'love each other'

The reciprocal suffix in these examples is pronounced *sh* after a vowel and *ish* after a consonant. This is similar to the process in English in which we use *a* as the indefinite article morpheme before a noun beginning with a consonant, as in *a dog*, and *an* before a noun beginning with a vowel, as in *an apple*. The same morpheme may have more than one slightly different form (see exercise 6, for example). We will discuss the various pronunciations of morphemes in more detail in chapter 6.

In Piro, an Arawakan language spoken in Peru, a single morpheme, *-kaka*, can be added to a verb to express the meaning 'cause to':

cokoruha	'to harpoon'	cokoruhakaka	'cause to harpoon'
salwa	'to visit'	salwakaka	'cause to visit'

In Karuk, a Native American language spoken in the Pacific Northwest, adding *-ak* to a noun forms the locative adverbial meaning 'in.'

ikrivaam	'house'	ikrivaamak	'in a house'

It is accidental that both Turkish and Karuk have a suffix *-ak*. Despite the similarity in *form*, the two meanings are different. Similarly, the reciprocal suffix *-ish* in Turkish is similar in form to the English suffix *-ish* as in *boyish*.

Similarity in meaning may give rise to different forms. In Karuk the suffix *-ara* has the same meaning as the English *-y*, that is, 'characterized by' (*hairy* means 'characterized by hair').

aptiik	'branch'	aptikara	'branchy'

These examples illustrate again the arbitrary nature of the linguistic sign, that is, of the sound-meaning relationship, as well as the distinction between bound and free morphemes.

Infixes

Some languages also have **infixes**, morphemes that are inserted into other morphemes. Bontoc, spoken in the Philippines, is such a language, as illustrated by the following:

Nouns/Adjectives		Verbs	
fikas	'strong'	fumikas	'to be strong'
kilad	'red'	kumilad	'to be red'
fusul	'enemy'	fumusul	'to be an enemy'

In this language, the infix *-um-* is inserted after the first consonant of the noun or adjective. Thus, a speaker of Bontoc who knows that *pusi* means 'poor' would understand the meaning of *pumusi*, 'to be poor,' on hearing the word for the first time, just as an English speaker who learns the verb *sneet* would know that *sneeter* is 'one who sneets.' A Bontoc speaker who knows that *ngumitad* means 'to be dark' would know that the adjective 'dark' must be *ngitad*.

Oddly enough, the only infixes in English are full-word obscenities, usually inserted into adjectives or adverbs. The most common infix in America is the word *fuckin'* and all the euphemisms for it, such as *friggin*, *freakin*, *flippin*, and *fuggin*, as in *ri-fuckin-diculous* or *Kalama-flippin-zoo*, based on the city in Michigan. In Britain, a common infix is *bloody*, an obscene term in British English, and its euphemisms, such as *bloomin'*. In the movie and stage musical *My Fair Lady*, the word *abso-bloomin-lutely* occurs in one of the songs sung by Eliza Doolittle.

Circumfixes

Some languages have **circumfixes**, morphemes that are attached to a base morpheme both initially and finally. These are sometimes called **discontinuous morphemes**. In Chickasaw, a Muskogean language spoken in Oklahoma, the negative is formed by surrounding the affirmative form with both a preceding

ik- and a following *-o* working together as a single negative morpheme. The final vowel of the affirmative is dropped before the negative part *-o* is added. Examples of this circumfixing are:

Affirmative		Negative	
chokma	'he is good'	ik + chokm + o	'he isn't good'
lakna	'it is yellow'	ik + lakn + o	'it isn't yellow'
palli	'it is hot'	ik + pall + o	'it isn't hot'
tiwwi	'he opens (it)'	ik + tiww + o	'he doesn't open (it)'

An example of a more familiar circumfixing language is German. The past participle of regular verbs is formed by tacking on *ge-* to the beginning and *-t* to the end of the verb root. This circumfix added to the verb root *lieb* 'love' produces ***ge**lieb**t***, 'loved' (or 'beloved,' when used as an adjective).

Roots and Stems

Morphologically complex words consist of a morpheme **root** and one or more affixes. Some examples of English roots are *paint* in *painter*, *read* in *reread*, *ceive* in *conceive*, and *ling* in *linguist*. A root may or may not stand alone as a word (*paint* and *read* do; *ceive* and *ling* don't). In languages that have circumfixes, the root is the form around which the circumfix attaches, for example, the Chickasaw root *chokm* in *ikchokmo* ('he isn't good'). In infixing languages the root is the form into which the infix is inserted; for example, *fikas* in the Bontoc word *fumikas* ('to be strong').

Semitic languages like Hebrew and Arabic have a unique morphological system. Nouns and verbs are built on a foundation of three consonants, and one derives related words by varying the pattern of vowels and syllables. For example, the root for 'write' in Egyptian Arabic is *ktb*, from which the following words (among others) are formed by infixing vowels:

katab	'he wrote'
kaatib	'writer'
kitáab	'book'
kútub	'books'

When a root morpheme is combined with an affix, it forms a **stem**. Other affixes can be added to a stem to form a more complex stem, as shown in the following:

root	Chomsky	(proper) noun
stem	Chomsky + ite	noun + suffix
word	Chomsky + ite + s	noun + suffix + suffix
root	believe	verb
stem	believe + able	verb + suffix
word	un + believe + able	prefix + verb + suffix
root	system	noun
stem	system + atic	noun + suffix
stem	un + system + atic	prefix + noun + suffix
stem	un + system + atic + al	prefix + noun + suffix + suffix
word	un + system + atic + al + ly	prefix + noun + suffix + suffix + suffix

With the addition of each new affix, a new stem and a new word are formed. Linguists sometimes use the word **base** to mean any root or stem to which an affix is attached. In the preceding example, *system*, *systematic*, *unsystematic*, and *unsystematical* are bases.

Bound Roots

> It had been a rough day, so when I walked into the party I was very chalant, despite my efforts to appear gruntled and consolate. I was furling my wieldy umbrella . . . when I saw her. . . . She was a descript person. . . . Her hair was kempt, her clothing shevelled, and she moved in a gainly way.
>
> JACK WINTER, "How I Met My Wife" by Jack Winter from *The New Yorker*, July 25, 1994. Reprinted by permission of the Estate of Jack Winter.

Bound roots do not occur in isolation and they acquire meaning only in combination with other morphemes. For example, words of Latin origin such as *receive*, *conceive*, *perceive*, and *deceive* share a common root, *-ceive*; and the words *remit*, *permit*, *commit*, *submit*, *transmit*, and *admit* share the root *-mit*. For the original Latin speakers, the morphemes corresponding to *ceive* and *mit* had clear meanings, but for modern English speakers, Latinate morphemes such as *ceive* and *mit* have no independent meaning. Their meaning depends on the entire word in which they occur.

A similar class of words is composed of a prefix affixed to a bound root morpheme. Examples are *ungainly*, but no **gainly*; *discern*, but no **cern*; *nonplussed*, but no **plussed*; *downhearted* but no **hearted*, and others to be seen in this section's epigraph.

The morpheme *huckle*, when joined with *berry*, has the meaning of a berry that is small, round, and purplish blue; *luke* when combined with *warm* has the meaning 'somewhat.' Both these morphemes and others like them (*cran*, *boysen*) are bound morphemes that convey meaning only in combination.

Rules of Word Formation

> "I never heard of 'Uglification,'" Alice ventured to say. "What is it?" The Gryphon lifted up both its paws in surprise. "Never heard of uglifying!" it exclaimed. "You know what to beautify is, I suppose?" "Yes," said Alice doubtfully: "it means—to make—prettier." "Well, then," the Gryphon went on, "if you don't know what to uglify is, you are a simpleton."
>
> LEWIS CARROLL, *Alice's Adventures in Wonderland*, 1865

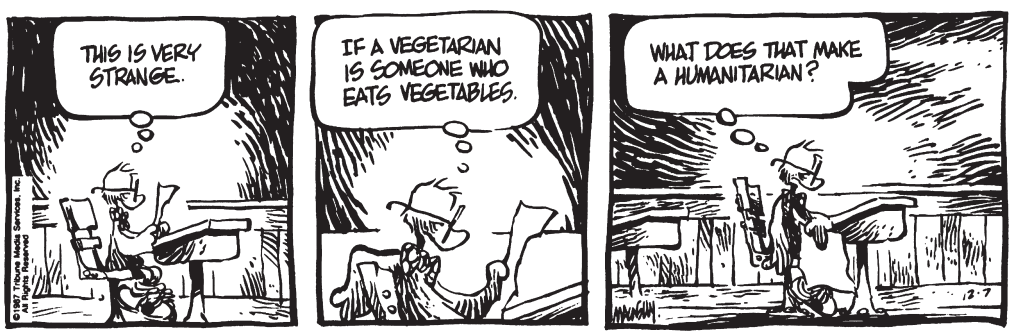
When the Mock Turtle listed the branches of Arithmetic for Alice as "Ambition, Distraction, Uglification, and Derision," Alice was very confused. She wasn't really a simpleton, since *uglification* was not a common word in English until Lewis Carroll used it. Still, most English speakers would immediately know the meaning of *uglification* even if they had never heard or used the word before

because they would know the meaning of its individual parts—the root *ugly* and the affixes *-ify* and *-cation*.

We said earlier that knowledge of morphology includes knowledge of individual morphemes, their pronunciation, and their meaning, and knowledge of the rules for combining morphemes into complex words. The Mock Turtle added *-ify* to the adjective *ugly* and formed a verb. Many verbs in English have been formed in this way: *purify*, *amplify*, *simplify*, *falsify*. The suffix *-ify* conjoined with nouns also forms verbs: *objectify*, *glorify*, *personify*. Notice that the Mock Turtle went even further: he added the suffix *-cation* to *uglify* and formed a noun, *uglification*, as in *glorification*, *simplification*, *falsification*, and *purification*. By using the **morphological rules** of English, he created a new word. The rules that he used are as follows:

Adjective + ify	→	Verb	'to make Adjective'
Verb + cation	→	Noun	'the process of making Adjective'

Derivational Morphology



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Bound morphemes like *-ify*, *-cation* and *-arian* are called derivational morphemes. When they are added to a base, a new word with a new meaning is derived. The addition of *-ify* to *pure—purify*—means 'to make pure,' and the addition of *-cation—purification*—means 'the process of making pure.' If we invent an adjective, *pouzy*, to describe the effect of static electricity on hair, you will immediately understand the sentences "Walking on that carpet really pouzified my hair" and "The best method of pouzification is to rub a balloon on your head." This means that we must have a list of the derivational morphemes in our mental dictionaries as well as the rules that determine how they are added to a root or stem. The form that results from the addition of a derivational morpheme is called a **derived word**.

Derivational morphemes have clear semantic content. In this sense they are like content words, except that they are not words. As we have seen, when a derivational morpheme is added to a base, it adds meaning. The derived word may also be of a different grammatical class than the original word, as shown by suffixes such as *-able* and *-ly*. When a verb is suffixed with *-able*, the result is an adjective, as in *desire + able*. When the suffix *-en* is added to an adjective, a

verb is derived, as in *dark* + *en*. One may form a noun from an adjective, as in *sweet* + *ie*. Other examples are:

Noun to Adjective	Verb to Noun	Adjective to Adverb
boy + -ish	acquitt + -al	exact + -ly
virtu + -ous	clear + -ance	
Elizabeth + -an	accus + -ation	
pictur + -esque	sing + -er	
affection + -ate	conform + -ist	
health + -ful	predict + -ion	
alcohol + -ic		

Noun to Verb	Adjective to Noun	Verb to Adjective
moral + -ize	tall + -ness	read + -able
vaccin + -ate	specific + -ity	creat + -ive
hast + -en	feudal + -ism	migrat + -ory
im- + prison	free + -dom	run(n) + -y
be- + friend		
en- + joy		
in- + habit		

Adjective to Verb
en + large
en + dear
en + rich

Some derivational affixes do not cause a change in grammatical class.

Noun to Noun	Verb to Verb	Adjective to Adjective
friend + -ship	un- + do	pink + -ish
human + -ity	re- + cover	red + -like
king + -dom	dis- + believe	a- + moral
New Jersey + -ite	auto- + destruct	il- + legal
vicar + -age		in- + accurate
Paul + -ine		un- + happy
America + -n		semi- + annual
libr(ary) + -arian		dis- + agreeable
mono- + theism		sub- + minimal
dis- + advantage		
ex- + wife		
auto- + biography		
un- + employment		

When a new word enters the lexicon by the application of morphological rules, other complex derivations may be **blocked**. For example, when *Commun* + *ist* entered the language, words such as *Commun* + *ite* (as in *Trotsky* + *ite*) or *Commun* + *ian* (as in *grammar* + *ian*) were not needed; their formation was blocked. Sometimes, however, alternative forms do coexist: for example, *Chomskyan* and *Chomskyist* and perhaps even *Chomskyite* (all meaning 'follower of Chomsky's

views of linguistics'). *Semanticist* and *semantician* are both used for linguists who study meaning in language, but the possible word *semantite* is not.

Finally, derivational affixes appear to come in two classes. In one class, the addition of a suffix triggers subtle changes in pronunciation. For example, when we affix *-ity* to *specific* (pronounced "specifik" with a *k* sound), we get specificity (pronounced "specifisity" with an *s* sound). When deriving *Elizabeth* + *-an* from *Elizabeth*, the fourth vowel sound changes from the vowel in *Beth* to the vowel in *Pete*. Other suffixes such as *-y*, *-ive*, and *-ize* may induce similar changes: *s**a**ne/s**a**nity*, *deduc**e**/deduc**t**ive*, *critic/critic**i**ze*.

On the other hand, suffixes such as *-er*, *-ful*, *-ish*, *-less*, *-ly*, and *-ness* may be tacked onto a base word without affecting the pronunciation, as in *baker*, *wishful*, *boyish*, *needless*, *sanely*, and *fullness*. Moreover, affixes from the first class cannot be attached to a base containing an affix from the second class: **need* + *less* + *ity*, **moral* + *ize* + *ive*; but affixes from the second class may attach to bases with either kind of affix: *moral* + *iz(e)* + *er*, *need* + *less* + *ness*.

Inflectional Morphology

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Function words like *to*, *it*, and *be* are free morphemes. Many languages, including English, also have bound morphemes that have a strictly grammatical function. They mark properties such as tense, number, person, and so forth. Such bound morphemes are called **inflectional morphemes**. Unlike derivational morphemes, they never change the grammatical category of the stems to which they are attached. Consider the forms of the verb in the following sentences:

1. I sail the ocean blue.
2. He sails the ocean blue.
3. John sailed the ocean blue.
4. John has sailed the ocean blue.
5. John is sailing the ocean blue.

In sentence (2) the *-s* at the end of the verb is an agreement marker; it signifies that the subject of the verb is third-person and is singular, and that the verb is in the present tense. It doesn't add lexical meaning. The suffix *-ed* indicates past tense, and is also required by the syntactic rules of the language when verbs are used with *have*, just as *-ing* is required when verbs are used with forms of *be*.

Inflectional morphemes represent relationships between different parts of a sentence. For example, *-s* expresses the relationship between the verb and the third-person singular subject; *-ed* expresses the relationship between the time the utterance is spoken (e.g., now) and the time of the event (past). If you say "John danced," the *-ed* affix places the activity before the utterance time. Inflectional morphology is closely connected to the syntax and semantics of the sentence.

English also has other inflectional endings, such as the plural suffix, which is attached to certain singular nouns, as in *boy/boys* and *cat/cats*. In contrast to Old and Middle English, which were more richly inflected languages, as we discuss in chapter 8, Modern English has only eight bound inflectional affixes:

English Inflectional Morphemes		Examples
-s	third-person singular present	She wait-s at home.
-ed	past tense	She wait-ed at home.
-ing	progressive	She is eat-ing the donut.
-en	past participle	Mary has eat-en the donuts.
-s	plural	She ate the donut-s.
-'s	possessive	Disa's hair is short.
-er	comparative	Disa has short-er hair than Karin.
-est	superlative	Disa has the short-est hair.

Inflectional morphemes in English follow the derivational morphemes in a word. Thus, to the derivationally complex word *commit* + *ment* one can add a plural ending to form *commit* + *ment* + *s*, but the order of affixes may not be reversed to derive the impossible *commit* + *s* + *ment* = **commitsment*.

Yet another distinction between inflectional and derivational morphemes is that inflectional morphemes are **productive**: they apply freely to nearly every appropriate base (except "irregular" forms such as *feet*, not **foots*). Most nouns take an *-s* inflectional suffix to form a plural, but only some nouns take the derivational suffix *-ize* to form a verb: *idolize*, but not **picturize*.

Compared to many languages of the world, English has relatively little inflectional morphology. Some languages are highly inflected. In Swahili, which is widely spoken in eastern Africa, verbs can be inflected with multiple morphemes, as in *kimeanguka* (ki + me + anguka), meaning 'it has fallen.' Here the verb root *anguka* meaning 'fall' has two inflectional prefixes: *ki-* meaning 'it' and *me* meaning 'completed action.'

Even the more familiar European languages have many more inflectional endings than English. In the Romance languages (languages descended from Latin), the verb has different inflectional endings depending on the subject of the sentence. The verb is inflected to agree in person and number with the subject, as illustrated by the Italian verb *parlare* meaning 'to speak':

Io parl**o**	'I speak'	Noi parli**amo**	'We speak'
Tu parl**i**	'You (singular) speak'	Voi parl**ate**	'You (plural) speak'
Lui/Lei parl**a**	'He/She speaks'	Loro parl**ano**	'They speak'

Russian has a system of inflectional suffixes for nouns that indicates the nouns' grammatical relation—whether a subject, object, possessor, and so on—something English does with word order. For example, in English, the sentence

Maxim defends Victor means something different from *Victor defends Maxim*. The order of the words is critical. But in Russian, all of the following sentences mean 'Maxim defends Victor' (the *č* is pronounced like the *ch* in *cheese*; the *š* like the *sh* in *shoe*; the *j* like the *y* in *yet*):

Maksim zašiščajt Viktora.
Maksim Viktora zašiščajet.
Viktora Maksim zašiščajet.
Viktora zašiščajet Maksim.

The inflectional suffix *-a* added to the name *Viktor* to derive *Viktora* shows that Victor, not Maxim, is defended. The suffix designates the object of the verb, irrespective of word order.

The grammatical relation of a noun in a sentence is called the **case** of the noun. When case is marked by inflectional morphemes, the process is referred to as **case morphology**. Russian has a rich case morphology, whereas English case morphology is limited to the one possessive *-'s* and to its system of pronouns. Many of the grammatical relations that Russian expresses with its case morphology are expressed in English with prepositions.

Among the world's languages is a richness and variety of inflectional processes. Earlier we saw how German uses circumfixes to inflect a verb stem to produce a past particle: *lieb* to ***ge**lieb**t,*** similar to the *-ed* ending of English. Arabic infixes vowels for inflectional purposes: *kitáab* 'book' but *kútub* 'books.' Samoan (see exercise 10) uses a process of **reduplication**—inflecting a word through the repetition of part or all of the word: *savali* 'he travels,' but *sava**va**li* 'they travel.' Malay does the same with whole words: *orang* 'person,' but *orang orang* 'people.' Languages such as Finnish have an extraordinarily complex case morphology, whereas Mandarin Chinese lacks case morphology entirely.

Inflection achieves a variety of purposes. In English verbs are inflected with *-s* to show third-person singular agreement. Languages like Finnish and Japanese have a dazzling array of inflectional processes for conveying everything from 'temporary state of being' (Finnish nouns) to 'strong negative intention' (Japanese verbs). English spoken 1,000 years ago had considerably more inflectional morphology than Modern English, as we shall discuss in chapter 8.

In distinguishing inflectional from derivational morphemes in Modern English we may summarize in the table below and the figure (2.1) that follows it:

Inflectional	Derivational
Grammatical function	Lexical function
No word class change	May cause word class change
Small or no meaning change	Some meaning change
Often required by rules of grammar	Never required by rules of grammar
Follow derivational morphemes in a word	Precede inflectional morphemes in a word
Productive	Some productive, many nonproductive

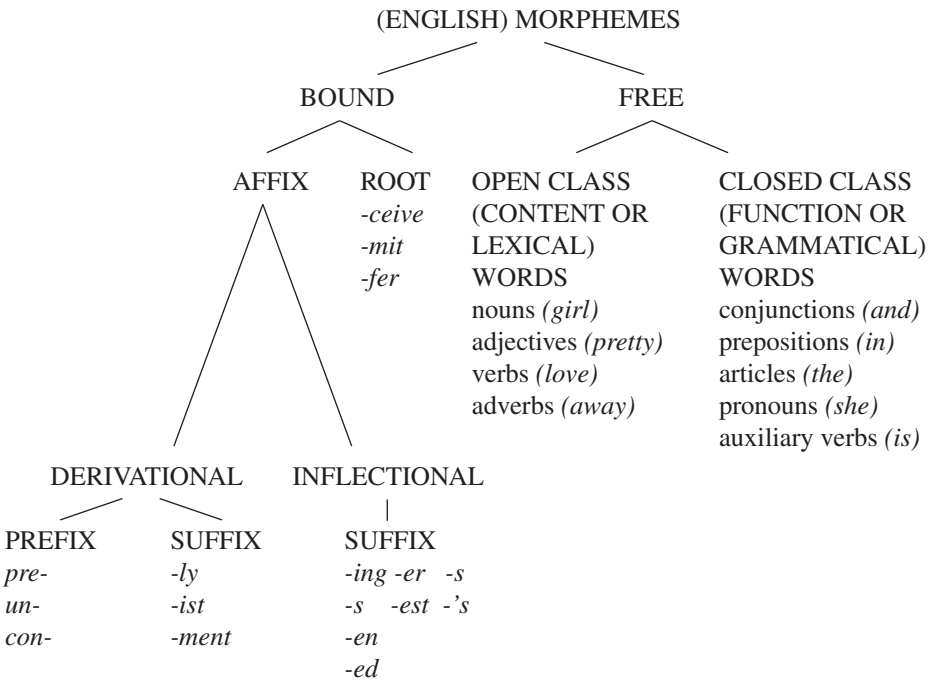
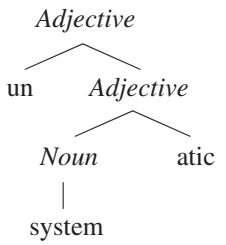


FIGURE 2.1 | Classification of English morphemes.

The Hierarchical Structure of Words

We saw earlier that morphemes are added in a fixed order. This order reflects the *hierarchical structure* of the word. A word is not a simple sequence of morphemes. It has an internal structure. For example, the word *unsystematic* is composed of three morphemes: *un-*, *system*, and *-atic*. The root is *system*, a noun, to which we add the suffix *-atic*, resulting in an adjective, *systematic*. To this adjective, we add the prefix *un-*, forming a new adjective, *unsystematic*.

In order to represent the hierarchical organization of words (and sentences), linguists use **tree diagrams**. The tree diagram for *unsystematic* is as follows:



This tree represents the application of two morphological rules:

1. Noun + atic → Adjective
2. un + Adjective → Adjective

Rule 1 attaches the derivational suffix *-atic* to the root noun, forming an adjective. Rule 2 takes the adjective formed by rule 1 and attaches the derivational prefix *un-*. The diagram shows that the entire word—*unsystematic*—is an adjective that is composed of an adjective—*systematic*—plus *un*. The adjective is itself composed of a noun—*system*—plus the suffix *-atic*.

Hierarchical structure is an essential property of human language. Words (and sentences) have component parts, which relate to each other in specific, rule-governed ways. Although at first glance it may seem that, aside from order, the morphemes *un-* and *-atic* each relate to the root *system* in the same way, this is not the case. The root *system* is "closer" to *-atic* than it is to *un-*, and *un-* is actually connected to the adjective *systematic*, and not directly to *system*. Indeed, **unsystem* is not a word.

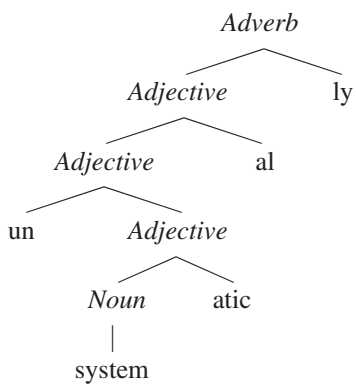
Further morphological rules can be applied to the given structure. For example, English has a derivational suffix *-al*, as in *egotistical*, *fantastical*, and *astronomical*. In these cases, *-al* is added to an adjective—*egotistic*, *fantastic*, *astronomic*—to form a new adjective. The rule for *-al* is as follows:

3. Adjective + al → Adjective

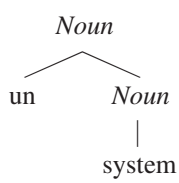
Another affix is *-ly*, which is added to adjectives—*happy*, *lazy*, *hopeful*—to form adverbs *happily*, *lazily*, *hopefully*. Following is the rule for *-ly*:

4. Adjective + ly → Adverb

Applying these two rules to the derived form *unsystematic*, we get the following tree for *unsystematically*:



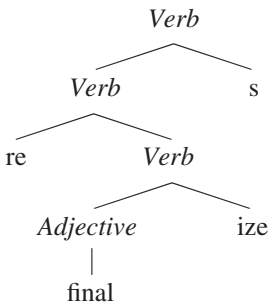
This is a rather complex word. Despite its complexity, it is well-formed because it follows the morphological rules of the language. On the other hand, a very simple word can be ungrammatical. Suppose in the above example we first added *un-* to the root *system.* That would have resulted in the nonword **unsystem*.



**Unsystem* is not a possible word because the rule of English that allows *un-* to be added to nouns is restricted to very few cases, and those always nouns that already have a suffix such as *un + employment*, *un + acceptance* or *un + feasability*. The large soft-drink company whose ad campaign promoted the *Uncola* successfully flouted this linguistic rule to capture people's attention. Part of our linguistic competence includes the ability to recognize possible versus impossible words, like **unsystem* and **Uncola*. Possible words are those that conform to the rules; impossible words are those that do not.

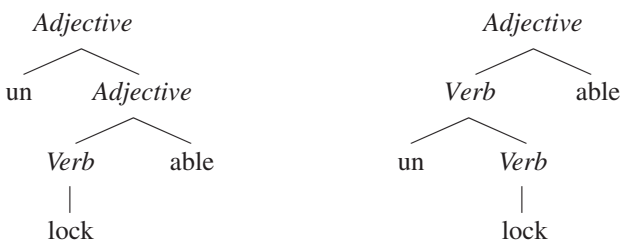
Tree diagrams make explicit the way speakers represent the internal structure of the morphologically complex words in their language. In speaking and writing, we appear to string morphemes together sequentially as in *un + system + atic*. However, our mental representation of words is hierarchical as well as linear, and this is shown by tree diagrams.

Inflectional morphemes are equally well represented. The following tree shows that the inflectional agreement morpheme *-s* follows the derivational morphemes *-ize* and *re-* in *refinalizes*:



The tree also shows that *re-* applies to *finalize*, which is correct as **refinal* is not a word, and that the inflectional morpheme follows the derivational morpheme.

The hierarchical organization of words is even more clearly shown by structurally ambiguous words, words that have more than one meaning by virtue of having more than one structure. Consider the word *unlockable*. Imagine you are inside a room and you want some privacy. You would be unhappy to find the door is *unlockable*—'not able to be locked.' Now imagine you are inside a locked room trying to get out. You would be very relieved to find that the door is *unlockable*—'able to be unlocked.' These two meanings correspond to two different structures, as follows:

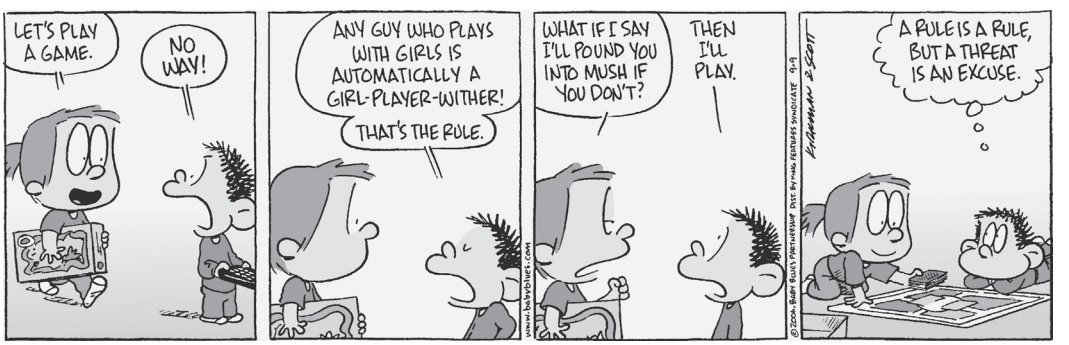


In the first structure the verb *lock* combines with the suffix *-able* to form an adjective *lockable* ('able to be locked'). Then the prefix *un-*, meaning 'not,' combines with the derived adjective to form a new adjective *unlockable* ('not able to be locked'). In the second case, the prefix *un-* combines with the verb *lock* to form a derived verb *unlock*. Then the derived verb combines with the suffix *-able* to form *unlockable*, 'able to be unlocked.'

An entire class of words in English follows this pattern: *unbuttonable*, *unzippable*, and *unlatchable*, among others. The ambiguity arises because the prefix *un-* can combine with an adjective, as illustrated in rule 2, or it can combine with a verb, as in *undo*, *unstaple*, *unearth*, and *unloosen*.

If words were only strings of morphemes without any internal organization, we could not explain the ambiguity of words like *unlockable*. These words also illustrate another key point, which is that structure is important to determining meaning. The same three morphemes occur in both versions of *unlockable*, yet there are two distinct meanings. The different meanings arise because of the different structures.

Rule Productivity



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> "Curiouser and curiouser!" cried Alice (she was so much surprised, that for the moment she quite forgot how to speak good English).
>
> LEWIS CARROLL, *Alice's Adventures in Wonderland*, 1865

We have noted that some morphological processes, inflection in particular, are productive, meaning that they can be used freely to form new words from the list of free and bound morphemes. Among derivational morphemes, the suffix *-able* can be conjoined with any verb to derive an adjective with the meaning of the verb and the meaning of *-able*, which is something like 'able to be' as in *accept* + *able*, *laugh* + *able*, *pass* + *able*, *change* + *able*, *breathe* + *able*, *adapt* + *able*, and so on. The productivity of this rule is illustrated by the fact that we find *-able* affixed to new verbs such as *downloadable* and *faxable*.

The prefix *un-* derives same-class words with an opposite meaning: *unafraid*, *unfit*, *un-American*, and so on. Additionally, *un-* can be added to derived adjectives

that have been formed by morphological rules, resulting in perfectly acceptable words such as *un + believe + able* or *un + pick + up + able*.

Yet *un-* is not fully productive. We find *happy* and *unhappy*, *cowardly* and *uncowardly*, but not *sad* and **unsad*, *brave* and **unbrave*, or *obvious* and **unobvious*. It appears that the "un-Rule" is most productive for adjectives that are derived from verbs, such as *unenlightened*, *unsimplified*, *uncharacterized*, *unauthorized*, *undistinguished*, and so on. It also appears that most acceptable *un-* words have polysyllabic bases, and while we have *unfit*, *uncool*, *unread*, and *unclean*, many of the unacceptable *un-* forms have monosyllabic stems such as **unbig*, **ungreat*, **unred*, **unsad*, **unsmall*, **untall*.

The rule that adds an *-er* to verbs in English to produce a noun meaning 'one who does' is a nearly productive morphological rule, giving us *examiner*, *exam-taker*, *analyzer*, *lover*, *hunter*, and even *girlplayerwither*, as the cartoon illustrates, but fails full productivity owing to "unwords" like **chairer*, which is not 'one who chairs.'

The "other" *-er* suffix, the one that means 'more' as in *greedier*, also fails to be entirely productive, as Alice's **curiouser* points out. The more syllables a word has, the less likely *-er* will work and we will need the word *more*, as in *more beautiful* (but not **beautifuler*) compared with the well-formed *nicer* or *prettier*.

Other derivational morphemes fall farther short of productivity. Consider:

sincerity	from	*sincere*
warmth	from	*warm*
moisten	from	*moist*

The suffix *-ity* is found in many other words in English, like *chastity*, *scarcity*, and *curiosity*; and *-th* occurs in *health*, *wealth*, *depth*, *width*, and *growth*. We find *-en* in *sadden*, *ripen*, *redden*, *weaken*, and *deepen*. Still, the phrase "*The tragicity of Hamlet" sounds somewhat strange, as does "*I'm going to *heaten* the sauce." Someone may say *coolth*, but when "words" like *tragicity*, *heaten*, and *coolth* are used, it is usually either a slip of the tongue or an attempt at humor. Most adjectives will not accept any of these derivational suffixes.

Even less productive to the point of rareness are such derivational morphemes as the diminutive suffixes in the words *pig + let* and *sap + ling*.

In the morphologically complex words that we have seen so far, we can generally predict the meaning based on the meanings of the morphemes that make up the word. *Unhappy* means 'not happy' and *acceptable* means 'fit to be accepted.' However, one cannot always know the meaning of the words derived from free and derivational morphemes by knowing the morphemes themselves. The following *un-* forms have unpredictable meanings:

unloosen	'loosen; let loose'
unrip	'rip; undo by ripping'
undo	'reverse doing'
untread	'go back through in the same steps'
unearth	'dig up'
unfrock	'deprive (a cleric) of ecclesiastic rank'
unnerve	'fluster'

Morphologically complex words whose meanings are not predictable must be listed individually in our mental lexicons. However, the morphological rules must also be in the grammar, revealing the relation between words and providing the means for forming new words.

Exceptions and Suppletions

> The exception gives Authority to the Rule
>
> GIOVANNI TORRIANO, *A Common Place of Italian Proverbs*, 1666

The morphological rule that forms plural nouns from singular nouns does not apply to words like *child*, *man*, *foot*, and *mouse*. These words are exceptions to the rule. Similarly, verbs like *go, sing, bring, run*, and *know* are exceptions to the inflectional rule for producing past-tense verbs in English.

When children are learning English, they first learn the regular rules, which they apply to all forms. Thus, we often hear them say *mans* and *goed*. Later in the acquisition process, they specifically learn irregular plurals like *men* and *mice*, and irregular past tense forms like *came* and *went*. These children's errors are actually evidence that the regular rules exist. This is discussed more fully in chapter 9.

Irregular, or **suppletive**, forms are treated separately in the grammar. You cannot use the regular rules to add affixes to words that are exceptions like *child/children*, but must replace the uninflected form with another word. For regular words only the singular form need be specifically stored in the lexicon because we can use the inflectional rules to form plurals. But this can't be so with suppletive exceptions, and *children*, *mice*, and *feet* must be learned separately. The same is true for suppletive past tense forms and comparative forms. There are regular rules—suffixes *-ed* and *-er*—to handle most cases, such as *walked* and *taller*, but words like *went* and *worse* need to be learned individually as meaning 'goed' and 'badder.'

When a new word enters the language, the regular inflectional rules generally apply. The plural of *geek*, when it was a new word in English, was *geeks*, not **geeken*, although we are advised that some geeks wanted the plural of *fax* to be **faxen*, like *oxen*, when *fax* entered the language as a shortened form of *facsimile*. Never fear: its plural is *faxes*. The exception to this may be a word "borrowed" from a foreign language. For example, the plural of Latin *datum* has always been *data*, never *datums*, though nowadays *data*, the one-time plural, is treated by many as a singular word like *information*.

The past tense of the verb *hit*, as in the sentence *Yesterday you hit the ball*, and the plural of the noun *sheep*, as in *The sheep are in the meadow*, show that some morphemes have no phonological shape at all. We know that *hit* in the above sentence is *hit* + *past* because of the time adverb *yesterday*, and we know that *sheep* is the phonetic form of *sheep* + *plural* because of the plural verb form *are*.

When a verb is derived from a noun, even if it is pronounced the same as an irregular verb, the regular rules apply to it. Thus *ring*, when used in the sense of 'encircle,' is derived from the noun *ring*, and as a verb it is regular. We say

the police ringed the bank with armed men, not **rang the bank with armed men*. In the jargon of baseball one says that the hitter *flied out* (hit a lofty ball that was caught), rather than **flew out*, because the verb came from the compound noun *fly ball*.

Indeed, when a noun is used in a compound in which its meaning is lost, such as *flatfoot*, meaning 'cop,' its plural follows the regular rule, so one says *two flatfoots* to refer to a pair of cops slangily, not **two flatfeet*. It's as if the noun is saying: "If you don't get your meaning from me, you don't get my special plural form."

Making compounds plural, however, is not always simply adding *-s* as in *girlfriends* or *sheepdogs*. For many speakers the plural of *mother-in-law* is *mothers-in-law*, whereas the possessive form is *mother-in-law's*; the plural of *court-martial* is *courts-martial* and the plural of *attorney general* is *attorneys general* in a legal setting, but for most of the rest of us it is *attorney generals*. If the rightmost word of a compound takes an irregular form, however, the entire compound generally follows suit, so the plural of *footman* is *footmen*, not **footmans* or **feetman* or **feetmen*.

Lexical Gaps

United Feature Syndicate

The vast majority of letter (sound) sequences that could be words of English—*clunt, spleek, flig*—are not. Similar comments apply to morphological derivations like *disobvious* or *inobvious*. "Words" that conform to the rules of word formation but are not truly part of the vocabulary are called **accidental gaps** or **lexical gaps**. Accidental gaps are well-formed but nonexisting words.

The actual words in a language constitute a mere subset of the possible words. There are always gaps in the lexicon—words not present but that could be added. Some of the gaps are due to the fact that a permissible sound sequence has no meaning attached to it (like *blick*, or *slarm*, or *krobe*). The sequence of sounds must be in keeping with the constraints of the language, however; **bnick* is not a "gap" because no word in English can begin with *bn*. We will discuss such constraints in chapter 6.

Other gaps result when possible combinations of morphemes never come into use. Speakers can distinguish between impossible words such as **unsystem* and **needlessity* and possible but nonexisting words such as *magnificenter* or *disobvious* (cf. *distrustful*). The latter are blocked, as noted earlier, owing to the presence of *more magnificent* and *nonobvious*. The ability to make this distinction is further evidence that the morphological component of our mental grammar consists of not just a lexicon—a list of existing words—but also of rules that enable us to create and understand new words, and to recognize possible and impossible words.

Other Morphological Processes

The various kinds of affixation that we have discussed are by far the most common morphological processes among the world's languages. But, as we continue to emphasize in this book, the human language capacity is enormously creative, and that creativity extends to ways other than affixation in which words may be altered and created.

Back-Formations

> [A girl] was delighted by her discovery that *eats* and *cats* were really *eat* + *-s* and *cat* + *-s*. She used her new suffix snipper to derive *mik* (mix), *upstair*, *downstair*, *clo* (clothes), *len* (lens), *brefek* (from *brefeks*, her word for *breakfast*), *trappy* (trapeze), even *Santa Claw*.
>
> STEVEN PINKER, *Words and Rules: The Ingredients of Language*, 1999

Misconception can sometimes be creative, and nothing in this world both misconceives and creates like a child, as we shall see in chapter 9. A new word may enter the language because of an incorrect morphological analysis. For example, *peddle* was derived from *peddler* on the mistaken assumption that the *-er* was the agentive suffix. Such words are called **back-formations**. The verbs *hawk*, *stoke*, *swindle*, *burgle* and *edit* all came into the language as back-formations—of *hawker*, *stoker*, *swindler*, *burglar* and *editor*. *Pea* was derived from a singular word, *pease*, by speakers who thought *pease* was a plural.

Some word creation comes from deliberately miscast back-formations. The word *bikini* comes from the Bikini atoll of the Marshall Islands. Because the first syllable *bi-* is a morpheme meaning 'two' in words like *bicycle*, some clever person called a topless bathing suit a *monokini* and a tank top with a bikini bottom a *tankini*. Historically, a number of new words have entered the English lexicon in a similar way, some of the most recent being the *appletini, chocotini, mintini* and *God-knows-what-else-tini* to be found as

flavor additives to the traditional martini libation. Based on analogy with such pairs as *act/action*, *exempt/exemption*, and *revise/revision*, new words *resurrect*, *preempt*, and *televise* were formed from the existing words *resurrection*, *preemption*, and *television*.

Language purists sometimes rail against back-formations and cite *enthuse* and *liaise* (from *enthusiasm* and *liaison*) as examples of language corruption. However, language is not corrupt; it is adaptable and changeable. Don't be surprised to discover in your lifetime that *shevelled* and *chalant* have infiltrated the English language (from *disheveled* and *nonchalant*) to mean 'tidy' and 'concerned,' and if it happens do not cry "havoc" and let slip the dogs of prescriptivism; all will be well.

Compounds

> [T]he Houynhnms have no Word in their Language to express any thing that is evil, except what they borrow from the Deformities or ill Qualities of the Yahoos. Thus they denote the Folly of a Servant, an Omission of a Child, a Stone that cuts their feet, a Continuance of foul or unseasonable Weather, and the like, by adding to each the Epithet of Yahoo. For instance, Hnhm Yahoo, Whnaholm Yahoo, Ynlhmnawihlma Yahoo, and an ill contrived House, Ynholmhnmrohlnw Yahoo.
>
> JONATHAN SWIFT, *Gulliver's Travels*, 1726

Two or more words may be joined to form new, compound words. English is very flexible in the kinds of combinations permitted, as the following table of compounds shows.

	Adjective	Noun	Verb
Adjective	bittersweet	poorhouse	whitewash
Noun	headstrong	homework	spoonfeed
Verb	feel-good	pickpocket	sleepwalk

Some compounds that have been introduced fairly recently into English are *Facebook*, *LinkedIn*, *Android apps, m-commerce*, and *crowdsourcing* (the practice of obtaining information from a large group of people who contribute online).

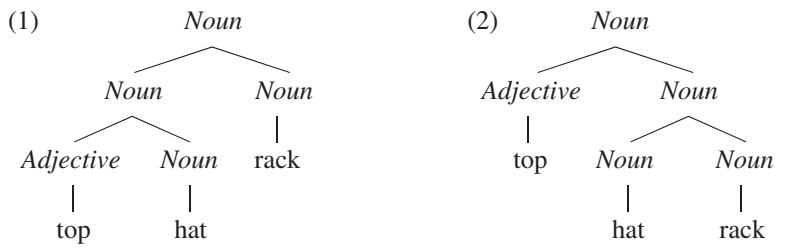
When the two words are in the same grammatical category, the compound will also be in this category: noun + noun = noun, as in *girlfriend*, *fighter-bomber*, *paper clip*, *elevator-operator*, *landlord*, *mailman*; adjective + adjective = adjective, as in *icy-cold*, *red-hot*, *worldly-wise*. In English, the rightmost word in a compound is the **head** of the compound. The head is the part of a word or phrase that determines its broad meaning and grammatical category. Thus, when the two words fall into different categories, the class of the second or final word determines the grammatical category of the compound: noun + adjective = adjective, as in *headstrong*; verb + noun = noun, as in *pickpocket*. On the other hand, compounds formed with a preposition are in the category of the nonprepositional part of the compound, such as (to) *overtake* or (the) *sundown*. This is further evidence that prepositions form a closed-class category that does not readily admit new members.

Although two-word compounds are the most common in English, it would be difficult to state an upper limit: Consider *three-time loser*, *four-dimensional*

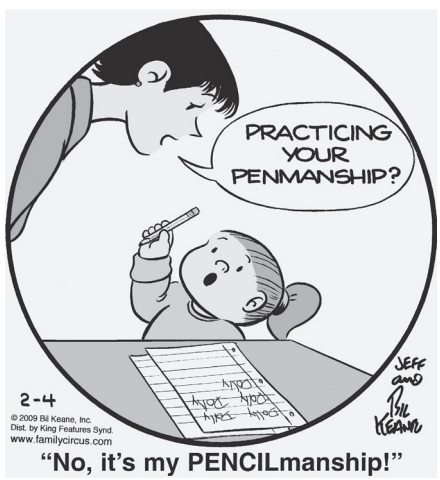
space-time, *sergeant-at-arms*, *mother-of-pearl*, *man about town*, *master of ceremonies*, and *daughter-in-law*. Dr. Seuss uses the rules of compounding when he explains "when tweetle beetles battle with paddles in a puddle, they call it a tweetle beetle puddle paddle battle."[3]

Spelling does not tell us what sequence of words constitutes a compound; whether a compound is spelled with a space between the two words, with a hyphen, or with no separation at all depends on the idiosyncrasies of the particular compound, as shown, for example, in *blackbird*, *six-pack*, and *smoke screen*.

Like derived words, compounds have internal structure. This is clear from the ambiguity of a compound like *top + hat + rack*, which can mean 'a rack for top hats' corresponding to the structure in tree diagram (1), or 'the highest hat rack,' corresponding to the structure in (2).



Meaning of Compounds



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The meaning of a compound is not always the sum of the meanings of its parts; a *blackboard* may be green or white. Not everyone who wears a red coat is a

[3]From FOX IN SOCKS by Dr. Seuss, Trademark™ & copyright© by Dr. Seuss Enterprises, L.P., 1965, renewed 1993. Used by permission of Random House Children's Books, a division of Random House, Inc., International Creative Management, and HarperCollins Publishers, Ltd., UK.

Redcoat (slang for 'British soldier' during the American Revolutionary War). The difference between the sentences "She has a red coat in her closet" and "She has a Redcoat in her closet" would have been highly significant in America in 1776.

Other compounds reveal other meaning relations between the parts, which are not entirely consistent because many compounds are idiomatic (idioms are discussed in chapter 4). A *boathouse* is a house for boats, but a *cathouse* is not a house for cats. (It is slang for a house of prostitution or whorehouse.) A *jumping bean* is a bean that jumps, a *falling star* is a star that (appears to) fall, and a *magnifying glass* is a glass that magnifies; but a *looking glass* is not a glass that looks, nor is an *eating apple* an apple that eats, and *laughing gas* does not laugh. *Peanut oil* and *olive oil* are oils made from something, but what about *baby oil*? And is this a contradiction: "horse meat is dog meat"? Not at all, since the first is meat *from* horses and the other is meat *for* dogs.

In the examples so far, the meaning of each compound includes at least to some extent the meanings of the individual parts. However, many compounds nowadays do not seem to relate to the meanings of the individual parts at all. A *jack-in-a-box* is a tropical tree, and a *turncoat* is a traitor. A *highbrow* does not necessarily have a high brow, nor does a *bigwig* have a big wig, nor does an *egghead* have an egg-shaped head.

Like certain words with the prefix *un-*, the meaning of many compounds must be learned as if they were individual whole words. Some of the meanings may be figured out, but not all. If you had never heard the word *hunchback*, it might be possible to infer the meaning; but if you had never heard the word *flatfoot*, it is doubtful you would know it means 'detective' or 'policeman,' even though the origin of the word, once you know the meaning, can be figured out.

The pronunciation of English compounds differs from the way we pronounce the sequence of two words that are not compounded. In an actual compound, the first word is usually stressed (pronounced somewhat louder and higher in pitch), and in a noncompound phrase the second word is stressed. Thus we stress *Red* in *Redcoat* but *coat* in *red coat*. (Stress, pitch, and other similar features are discussed in chapters 5 and 6.)

Universality of Compounding

Other languages have rules for conjoining words to form compounds, as seen by French *cure-dent*, 'toothpick'; German *Panzerkraftwagen*, 'armored car'; Russian *cetyrexetaznyi*, 'four-storied'; and Spanish *tocadiscos*, 'record player.' In the Native American language Tohono O'odham, the word meaning 'thing' is *ha?ichu*, and it combines with *doakam*, 'living creatures,' to form the compound *ha?ichu doakam*, 'animal life.'

In Twi, by combining the word meaning 'son' or 'child,' *ɔba*, with the word meaning 'chief,' *ɔhene*, one derives the compound *ɔheneba*, meaning 'prince.' By adding the word 'house,' *ofi*, to *ɔhene*, the word meaning 'palace,' *ahemfi* is derived. The other changes that occur in the Twi compounds are due to phonological and morphological rules in the language.

In Thai, the word for 'cat' is *mɛɛw*, the word for 'watch' (in the sense of 'to watch over') is *fâw*, and the word for 'house' is *bâan*. The word for 'watch cat' (like a watchdog) is the compound *mɛɛwfâwbâan*—literally, 'catwatchhouse.'

Compounding is a common and frequent process for enlarging the vocabulary of all languages.

"Pullet Surprises"

Our knowledge of the morphemes and morphological rules of our language is often revealed by the "errors" we make. We may guess the meaning of a word we do not know. Sometimes we guess wrong, but our wrong guesses are nevertheless "intelligent."

Amsel Greene collected errors made by her students in vocabulary-building classes and published them in a book called *Pullet Surprises*[4]. The title is taken from a sentence written by one of her high school students: "In 1957 Eugene O'Neill won a Pullet Surprise." What is most interesting about these errors is how much they reveal about the students' knowledge of English morphology. The creativity of these students is illustrated in the following examples:

Word	Student's Definition
deciduous	'able to make up one's mind'
longevity	'being very tall'
fortuitous	'well protected'
gubernatorial	'to do with peanuts'
bibliography	'holy geography'
adamant	'pertaining to original sin'
diatribe	'food for the whole clan'
polyglot	'more than one glot'
gullible	'to do with sea birds'
homogeneous	'devoted to home life'

The student who used the word *indefatigable* in the sentence

She tried many reducing diets, but remained indefatigable.

clearly shows morphological knowledge: *in* meaning 'not' as in *ineffective*; *de* meaning 'off' as in *decapitate*; 'fat' as in *fat*; *able* as in *able*; and combined meaning, 'not able to take the fat off.' Our contribution to Greene's collection is *metronome*: 'a city-dwelling diminutive troll'; and *oxymoron*: 'a really stupid cow.'

Sign Language Morphology

Sign languages are rich in morphology. They have root and affix morphemes, free and bound morphemes, lexical content and grammatical morphemes, derivational and inflectional morphemes, and morphological rules for their combination to form morphologically complex signs. The affixation is accomplished by preceding or following a particular gesture with another "affixing" gesture.

[4]Greene, A. 1969. *Pullet surprises.* Glenview, IL: Scott, Foresman.

The suffix meaning 'negation,' roughly analogous to *un-* or *non-* or *dis-*, is accomplished as a rapid turning over of the hand(s) following the end of the root sign that is being negated. For example, 'want' is signed with open palms facing upward; 'don't want' follows that gesture with a turning of the palms to face downward. This 'reversal of orientation' suffix may be applied, with necessary adjustments, to many root signs.

In sign language many morphological processes are not linear. Rather, the sign stem occurs nested within various movements and locations in signing space so that the gestures are simultaneous, an impossibility with spoken languages.

Inflection of sign roots also occurs in ASL and all other sign languages, which characteristically modify the movement of the hands and the spatial contours of the area near the body in which the signs are articulated. For example, movement away from the signer's body toward the "listener" might inflect a verb as in "I see you," whereas movement away from the "listener" and toward the body would inflect the verb as in "you see me."

Morphological Analysis: Identifying Morphemes

Case study 1

As we have seen in this chapter, speakers of a language know the internal structure of words because they know the morphemes of their language and the rules for their combination. This is unconscious knowledge of course and it takes a trained linguist to make this knowledge explicit as part of a descriptive grammar of the language. The task is challenging enough when the language you are analyzing is your own, but linguists who speak one language may nevertheless analyze languages of which they are not native speakers.

Suppose you were a linguist from the planet Zorx who wanted to analyze English. How would you discover the morphemes of the language? How would you determine whether a word had one, two, or more morphemes, and what they were?

The first thing to do would be to ask native speakers how they say various words. (It would help to have a Zorxese-English interpreter along; otherwise, copious gesturing is in order.) Assume you are talented in miming and manage to collect the following forms:

Adjective	Meaning
ugly	'very unattractive'
uglier	'more ugly'
ugliest	'most ugly'
pretty	'nice looking'
prettier	'more nice looking'
prettiest	'most nice looking'
tall	'large in height'
taller	'more tall'
tallest	'most tall'

To determine what the morphemes are in such a list, the first thing a field linguist would do is to see whether some forms mean the same thing in different words, that is, to look for *recurring* forms. We find them: *ugly* occurs in *ugly*, *uglier*, and *ugliest*, all of which include the meaning 'very unattractive.' We also find that *-er* occurs in *prettier* and *taller*, adding the meaning 'more' to the adjectives to which it is attached. Similarly, *-est* adds the meaning 'most.' Furthermore by having our Zorxese-English interpreter pose additional questions to our native English-speaking consultant we find that *-er* and *-est* do not occur in isolation with the meanings of 'more' and 'most.' We can therefore conclude that the following morphemes occur in English:

ugly	root morpheme
pretty	root morpheme
tall	root morpheme
-er	bound morpheme 'comparative'
-est	bound morpheme 'superlative'

As we proceed we find other words that end with *-er* (e.g., *singer*, *lover*, *bomber*, *writer*, *teacher*) in which the *-er* ending does not mean 'comparative' but, when attached to a verb, changes it to 'a noun who "verbs,"' (e.g., *sings*, *loves*, *bombs*, *writes*, *teaches*). So we conclude that this is a different morpheme, even though it is pronounced the same as the comparative. We go on and find words like *number*, *somber*, *butter*, *member*, and many others in which the *-er* has no separate meaning at all—a *somber* is not 'one who sombs' and a *member* does not *memb*—and therefore these words must be monomorphemic.

Case study 2

Once you have practiced on the morphology of English, you might want to go on to describe another language. Paku was invented by the linguist Victoria Fromkin for a 1970s TV series called *Land of the Lost*, made into a major motion picture of the same name starring Will Farrell in 2009. This was the language used by the monkey people called Pakuni. Suppose you found yourself in this strange land and attempted to find out what the morphemes of Paku were. Again, you would collect your data from a native Paku speaker and proceed as the Zorxian did with English. Consider the following data from Paku:

me	'I'	meni	'we'
ye	'you (singular)'	yeni	'you (plural)'
we	'he'	weni	'they (masculine)'
wa	'she'	wani	'they (feminine)'
abuma	'girl'	abumani	'girls'
adusa	'boy'	adusani	'boys'
abu	'child'	abuni	'children'
Paku	'one Paku'	Pakuni	'more than one Paku'

By examining these words you find that the plural forms end in *-ni* and the singular forms do not. You therefore conclude that *-ni* is a separate morpheme meaning 'plural' that is attached as a suffix to a noun.

Case study 3

Here is a more challenging example, but the principles are the same. Look for repetitions and near repetitions of the same word parts, taking your cues from the meanings given. These are words from Michoacan Aztec, an indigenous language of Mexico:

nokali	'my house'	mopelo	'your dog'
nokalimes	'my houses'	mopelomes	'your dogs'
mokali	'your house'	ikwahmili	'his cornfield'
ikali	'his house'	nokwahmili	'my cornfield'
nopelo	'my dog'	mokwahmili	'your cornfield'

We see there are three base meanings: *house*, *dog*, and *cornfield*. Starting with *house* we look for commonalities in all the forms that refer to 'house.' They all contain *kali* so that makes a good first guess. (We might, and you might, have reasonably guessed *kal*, but eventually we wouldn't know what to do with the *i* at the end of *nokali* and *mokali*.) With *kali* as 'house' we may infer that *no* is a prefix meaning 'my,' and that is supported by *nopelo* meaning 'my dog.' This being the case, we guess that *pelo* is 'dog,' and see where that leads us. If *pelo* is 'dog' and *mopelo* is 'your dog,' then *mo* is probably the prefix for 'your.' Now that we think that the possessive pronouns are prefixes, we can look at *ikali* and deduce that *i* means 'his.' If we're right about the prefixes then we can separate out the word for 'cornfield' as *kwahmili,* and at this point we're a-rockin' and a-rollin'. The only morpheme unaccounted for is 'plural.' We have two instances of plurality, *nokalimes* and *mopelomes*, but since we know *no*, *kali*, *mo*, and *pelo*, it is straightforward to identify the plural morpheme as the suffix *mes*.

The end results of our analysis are:

kali	'house'
pelo	'dog'
kwahmili	'cornfield'
no-	'my'
mo-	'your'
i-	'his'
-mes	'plural'

Case study 4

Here is a final example of morphological analysis complicated by some changes in spelling (pronunciation), a bit like the way we spell the indefinite article "a" as either *a* before a consonant or *an* before a vowel in English.

Often the data you are given (or record in the field) are a hodgepodge, like these examples from a Slavic language:

gledati	'to watch'	nazivaju	'they call'
diram	'I touch'	sviranje	'playing (noun)'
nazivanje	'calling (noun)'	gladujem	'I starve'
dirati	'to touch'	kupuju	'they buy'
kupovanje	'buying (noun)'	stanovati	'to live'
sviraju	'they play'	kupujem	'I buy'

gledam	'I watch'	diranje	'touching (noun)'
stanovanje	'living (noun)'	stanujem	'I live'
diraju	'they touch'	gladovanje	'starving (noun)'
nazivati	'to call'	stanuju	'they live'
kupovati	'to buy'	gledaju	'they watch'
gladuju	'they starve'	svirati	'to play'
gladovati	'to starve'	sviram	'I play'
gledanje	'watching (noun)'	nazivam	'I call'

The first step is often merely to rearrange the data, grouping commonalities. Here we see, after (possibly considerable) perusal, that the data involve seven stems, which we group by meaning. We also note that there are exactly four forms for each stem (infinitive, I (1st person singular), they (3rd person plural) and the noun form or gerund) and we fold that into the reorganization. We even alphabetize to emphasize the orderliness. Thus rearranged the data appear less daunting:

	touch	starve	watch	buy	call	live	play
Infinitive	dirati	gladovati	gledati	kupovati	nazivati	stanovati	svirati
1st, Sing.	diram	gladujem	gledam	kupujem	nazivam	stanujem	sviram
3rd, Plur.	diraju	gladuju	gledaju	kupuju	nazivaju	stanuju	sviraju
Noun	diranje	gladovanje	gledanje	kupovanje	nazivanje	stanovanje	sviranje

Now the patterns become more evident. We hypothesize that in the first column *dir-* is a stem meaning 'touch' and that the suffix *-ati* forms the infinitive; the suffix *-am* is the first-person singular; the suffix *-aju* is the third-person plural; and finally that the suffix *-anje* forms a noun, similar to the suffix *-ing* in English. We need to test our guess and the second column belies our hypothesis, but undaunted we push on and we see that the columns for 'watch,' 'call,' and 'play' work exactly like the column for 'touch,' with stems *gled-*, *naziv-*, and *svir-*.

But columns 'starve,' 'buy,' and 'live' are not cooperating. They follow the pattern for the infinitive (first row) and noun formation (fourth row), and give us stems *gladov-*, *kupov-*, and *stanov-*, but something is awry in the second and third row for these three verbs. Instead of *-am* meaning 'I' it appears to be *-em*. (Yes, it could be *-ujem* or even *-jem*, but we stay with the form that's nearest to *-am*.) So the suffix meaning 'I' has two forms, *am/em*, again analogous to the English *a/an* alternation.

But horrors, something is going haywire with the stems in just these three cases and now our effort to rearrange the data pays off. We see fairly quickly that the misbehaving cases are all verbs ending in *ov*. And if we stick with our decision that *-am/-em* means 'I,' then we can hypothesize that the stem alternates pronunciation in certain cases when it ends in *ov*, kind of like English *democrat/democracy*. If we accept this we are forced into the decision that the third-person plural morpheme also has an alternate form, namely *u*, so its two forms are *-aju/-u*.

We may sum up our analysis as follows:

Stems *dir-*, *gled-*, *naziv-*, *svir-* take suffixes *-ati*, *-am*, *-aju*, *-anje*. The verbs ending in *ov* have stems *gladov-*, *kupov-*, *stanov-* when expressed as infinitives with *-ati*, and noun-forms with *-anje*; and stems *gladuj-*, *kupuj-*, *stanuj-* when expressed as 'I' with *-em* or as 'they' with *-u*.

Finally, if we discover in our field work, for example, that *razarati* means 'to destroy' then we immediately know that 'I destroy' is *razaram*, 'they destroy' is *razaraju*, and 'destruction' is *razaranje*. Or if we're told that *darujem* means 'I gift' then we deduce that the noun 'gift' is *darovanje*, the infinitive 'to gift' is *darovati*, and 'they gift' is *daruju*.

In chapter 6 we'll see *why* the "same" morpheme may be spelled or pronounced differently in different contexts, and that the variation, like most grammatical processes, is rule-governed. By following the analytical principles discussed in the preceding four case studies you should be able to solve the morphological puzzles that appear in the exercises.

Summary

Knowing a language means knowing the **morphemes** of that language, which are the elemental units that constitute words. *Moralizers* is an English word composed of four morphemes: *moral* + *ize* + *er* + *s*. When you know a word or morpheme, you know both its **form** (sound or gesture) and its **meaning**; these are inseparable parts of the **linguistic sign**. The relationship between form and meaning is **arbitrary**. There is no inherent connection between them (i.e., the words and morphemes of any language must be learned).

Morphemes may be free or bound. **Free morphemes** stand alone like *girl* or *the*, and they come in two types: **open class**, containing the content words of the language, and **closed class**, containing function words such as *the* or *of*. **Bound morphemes** may be **affixes** or bound roots such as *-ceive*. Affixes may be **prefixes**, **suffixes**, **circumfixes**, or **infixes**. Affixes may be derivational or inflectional. **Derivational affixes** derive new words; **inflectional affixes**, such as the plural affix *-s*, make grammatical changes to words. Complex words contain a **root** around which **stems** are built by affixation. Rules of morphology determine what kind of affixation produces actual words such as *un* + *system* + *atic*, and what kind produces nonwords such as **un* + *system*.

Words have hierarchical structure evidenced by ambiguous words such as *unlockable*, which may be *un* + *lockable* 'unable to be locked' or *unlock* + *able* 'able to be unlocked.'

Some morphological rules are **productive**, meaning they apply freely to the appropriate stem; for example, *re-* applies freely to verbal stems to give words like *redo*, *rewash*, and *repaint*. Other rules are more constrained, forming words like *young* + *ster* but not **smart* + *ster*. Inflectional morphology is extremely productive: the plural *-s* applies freely even to nonsense words. **Suppletive forms** escape inflectional morphology, so instead of **mans* we have *men*; instead of **bringed* we have *brought*.

There are many ways for new words to be created other than affixation. **Compounds** are formed by uniting two or more root words in a single word, such as *homework*. The **head** of the compound (the rightmost word) bears the basic meaning, so *homework* means a kind of work done at home, but often the meaning of compounds is not easily predictable and must be learned as individual lexical items, such as *laughing gas*. **Back-formations** are words created by misinterpreting an affix look-alike such as *-er* as an actual affix, so, for example, the verb *peddle* was formed under the mistaken assumption that peddler was *peddle* + *-er*.

The grammars of sign languages also include a morphological component consisting of a root, derivational and inflectional sign morphemes, and the rules for their combination.

Morphological analysis is the process of identifying form-meaning units in a language, taking into account small differences in pronunciation, so that prefixes *in-* and *im-* are seen to be variants of the "same" prefix in English (cf. *intolerable*, *impeccable*) just as *democrat* and *democrac* are stem variants of the same morpheme, which shows up in *democratic* with its "t" and in *democracy* with its "c."

References for Further Reading

Anderson, S. R. 1992. *A-morphous morphology.* Cambridge, UK: Cambridge University Press.
Aronoff, M. 1976. *Word formation in generative grammar.* Cambridge, MA: MIT Press.
_____, and Fudeman, K. 2005. *What is morphology?* Malden: MA: Blackwell Publishing.
Bauer, L. 2003. *Introducing linguistic morphology, 2nd ed.* Washington, DC: Georgetown University Press.
Haspelmath, M. and Sims, A. 2010. *Understanding morphology, 2nd ed.* USA: Oxford University Press.
Jensen, J. T. 1990. *Morphology: Word structure in generative grammar.* Amsterdam/Philadelphia: John Benjamins Publishing.
Katamba, F. 2004. *Morphology: Its relation to semantics and the lexicon.* Oxford, UK: Taylor and Francis.
Matthews, P. H. 1991. *Morphology: An introduction to the theory of word structure, 2nd ed.* Cambridge, UK: Cambridge University Press.
Pinker, S. 2000. *Words and rules: the ingredients of language.* New York: Harper Collins.
Stockwell, R., and D. Minkova. 2001. *English words: History and structure.* New York: Cambridge University Press.
Winchester, S. 2003. *The meaning of everything (The story of the Oxford English Dictionary).* Oxford, UK: Oxford University Press.
_____. 1999. *The professor and the madman.* New York: HarperCollins.

Exercises

1. Here is how to estimate the number of words in your mental lexicon. Consult any standard dictionary. (Note that Internet dictionaries may not work for this exercise.)
   - **a.** Count the number of entries on a typical page. They are usually boldfaced.
   - **b.** Multiply the number of words per page by the number of pages in the dictionary.
   - **c.** Pick four pages in the dictionary at random, say, pages 50, 75, 125, and 303. Count the number of words on these pages.
   - **d.** How many of these words do you know?
   - **e.** What percentage of the words on the four pages do you know?
   - **f.** Multiply the words in the dictionary by the percentage you arrived at in (e). You know approximately that many English words.
2. Divide the following words by placing a + between their morphemes. (Some of the words may be monomorphemic and therefore indivisible.)

Example: replaces = re + place + s

a. retroactive
b. befriended
c. televise
d. margin
e. endearment
f. psychology
g. unpalatable
h. holiday
i. grandmother
j. morphemic
k. mistreatment
l. deactivation
m. saltpeter
n. airsickness
o. bureaucrat
p. democrat
q. aristocrat
r. plutocrat
s. democracy
t. democratic
u. democratically
v. democratization
w. democratize
x. democratizer
y. democratizing
z. democratized

3. Match each expression under A with the one statement under B that characterizes it.

A	B
a. noisy crow	**(1)** compound noun
b. scarecrow	**(2)** root morpheme plus derivational prefix
c. the crow	**(3)** phrase consisting of adjective plus noun
d. crowlike	**(4)** root morpheme plus inflectional affix
e. crows	**(5)** root morpheme plus derivational suffix
	(6) grammatical morpheme followed by lexical morpheme

4. Write the one proper description from the list under B for the italicized part of each word in A.

A	B
a. terroriz*ed*	**(1)** free root
b. unc*ivil*ized	**(2)** bound root
c. terror*ize*	**(3)** inflectional suffix
d. *luke*warm	**(4)** derivational suffix
e. *im*possible	**(5)** inflectional prefix
	(6) derivational prefix
	(7) inflectional infix
	(8) derivational infix

5. Part One

Consider the following nouns in Zulu and proceed to look for the recurring forms.

umfazi	'married woman'	abafazi	'married women'
umfani	'boy'	abafani	'boys'
umzali	'parent'	abazali	'parents'
umfundisi	'teacher'	abafundisi	'teachers'
umbazi	'carver'	ababazi	'carvers'
umlimi	'farmer'	abalimi	'farmers'
umdlali	'player'	abadlali	'players'
umfundi	'reader'	abafundi	'readers'

a. What is the morpheme meaning 'singular' in Zulu?
b. What is the morpheme meaning 'plural' in Zulu?
c. List the Zulu stems to which the singular and plural morphemes are attached, and give their meanings.

Part Two

The following Zulu verbs are derived from noun stems by adding a verbal suffix.

fundisa	'to teach'	funda	'to read'
lima	'to cultivate'	baza	'to carve'

d. Compare these words to the words in section A that are related in meaning, for example, *umfundisi* 'teacher,' *abafundisi* 'teachers,' *fundisa* 'to teach.' What is the derivational suffix that specifies the category verb?
e. What is the nominal suffix (i.e., the suffix that forms nouns)?
f. State the morphological noun formation rule in Zulu.
g. What is the stem morpheme meaning 'read'?
h. What is the stem morpheme meaning 'carve'?

6. Sweden has given the world the rock group ABBA, the automobile Volvo, and the great film director Ingmar Bergman. The Swedish language offers us a noun morphology that you can analyze with the knowledge gained reading this chapter. Consider these Swedish noun forms:

en lampa	'a lamp'	en bil	'a car'
en stol	'a chair'	en soffa	'a sofa'
en matta	'a carpet'	en tratt	'a funnel'
lampor	'lamps'	bilar	'cars'
stolar	'chairs'	soffor	'sofas'
mattor	'carpets'	trattar	'funnels'
lampan	'the lamp'	bilen	'the car'
stolen	'the chair'	soffan	'the sofa'
mattan	'the carpet'	tratten	'the funnel'
lamporna	'the lamps'	bilarna	'the cars'
stolarna	'the chairs'	sofforna	'the sofas'
mattorna	'the carpets'	trattarna	'the funnels'

a. What is the Swedish word for the indefinite article *a* (or *an*)?
b. What are the two forms of the plural morpheme in these data? How can you tell which plural form applies?
c. What are the two forms of the morpheme that make a singular word definite, that is, correspond to the English article *the*? How can you tell which form applies?
d. What is the morpheme that makes a plural word definite?
e. In what order do the various suffixes occur when there is more than one?
f. If *en flicka* is 'a girl,' what are the forms for 'girls,' 'the girl,' and 'the girls'?
g. If *bussarna* is 'the buses,' what are the forms for 'buses' and 'the bus'?

7. Here are some nouns from the Philippine language Cebuano.

sibwano	'a Cebuano'
ilokano	'an Ilocano'
tagalog	'a Tagalog person'
inglis	'an Englishman'
bisaja	'a Visayan'
binisaja	'the Visayan language'
ininglis	'the English language'
tinagalog	'the Tagalog language'
inilokano	'the Ilocano language'
sinibwano	'the Cebuano language'

a. What is the exact rule for deriving language names from ethnic group names?
b. What type of affixation is represented here?
c. If *suwid* meant 'a Swede' and *italo* meant 'an Italian,' what would be the words for the Swedish language and the Italian language?
d. If *finuranso* meant 'the French language' and *inunagari* meant 'the Hungarian language,' what would be the words for a Frenchman and a Hungarian?

8. The following infinitive and past participle verb forms are found in Dutch.

Root	Infinitive	Past Participle	
wandel	wandelen	gewandeld	'walk'
duw	duwen	geduwd	'push'
stofzuig	stofzuigen	gestofzuigd	'vacuum-clean'

With reference to the morphological processes of prefixing, suffixing, infixing, and circumfixing discussed in this chapter and the specific morphemes involved:

a. State the morphological rule for forming an infinitive in Dutch.
b. State the morphological rule for forming the Dutch past participle form.

9. Below are some sentences in Swahili:

mtoto	amefika	'The child has arrived.'
mtoto	anafika	'The child is arriving.'
mtoto	atafika	'The child will arrive.'
watoto	wamefika	'The children have arrived.'
watoto	wanafika	'The children are arriving.'
watoto	watafika	'The children will arrive.'
mtu	amelala	'The person has slept.'
mtu	analala	'The person is sleeping.'
mtu	atalala	'The person will sleep.'
watu	wamelala	'The persons have slept.'
watu	wanalala	'The persons are sleeping.'
watu	watalala	'The persons will sleep.'
kisu	kimeanguka	'The knife has fallen.'
kisu	kinaanguka	'The knife is falling.'
kisu	kitaanguka	'The knife will fall.'

visu	vimeanguka	'The knives have fallen.'
visu	vinaanguka	'The knives are falling.'
visu	vitaanguka	'The knives will fall.'
kikapu	kimeanguka	'The basket has fallen.'
kikapu	kinaanguka	'The basket is falling.'
kikapu	kitaanguka	'The basket will fall.'
vikapu	vimeanguka	'The baskets have fallen.'
vikapu	vinaanguka	'The baskets are falling.'
vikapu	vitaanguka	'The baskets will fall.'

One of the characteristic features of Swahili (and Bantu languages in general) is the existence of noun classes. Specific singular and plural prefixes occur with the nouns in each class. These prefixes are also used for purposes of agreement between the subject noun and the verb. In the sentences given, two of these classes are included (there are many more in the language).

a. Identify all the morphemes you can detect, and give their meanings.

Example: -toto 'child'
m- prefix attached to singular nouns of Class I
a- prefix attached to verbs when the subject is a singular noun of Class I

Be sure to look for the other noun and verb markers, including tense markers.

b. How is the verb constructed? That is, what kinds of morphemes are strung together and in what order?

c. How would you say in Swahili:
(1) "The child is falling."
(2) "The baskets have arrived."
(3) "The person will fall."

10. Part One

We mentioned the morphological process of reduplication—the formation of new words through the repetition of part or all of a word—which occurs in many languages. The following examples from Samoan illustrate this kind of morphological rule.

manao	'he wishes'	mananao	'they wish'
matua	'he is old'	matutua	'they are old'
malosi	'he is strong'	malolosi	'they are strong'
punou	'he bends'	punonou	'they bend'
atamaki	'he is wise'	atamamaki	'they are wise'
savali	'he travels'	pepese	'they sing'
laga	'he weaves'		

a. What is the Samoan for:
(1) 'they weave'
(2) 'they travel'
(3) 'he sings'

b. Formulate a general statement (a morphological rule) that states how to form the plural verb form from the singular verb form.

Part Two

Consider these data from M'nong (spoken in Vietnam) with some simplifications for this exercise: (The ʔ is a sound called a glottal stop.)

dang	'hard'	da dang	'a little hard'
kloh	'clean'	klo kloh	'a little clean'
ndreh	'green'	ndre ndreh	'light green'
guh	'red'	goʔ guh	'reddish'
duh	'hot'	doʔ duh	'lukewarm'
kat	'cold'	ka kat	'chilly'

1. What kind of morphological process do you observe to achieve the semantic effect of weakening an adjective?
2. If *thong* meant 'light,' how would M'nong express 'kind of light'?
3. If *khul* meant 'evasive,' how would M'nong express 'a little shifty'?
4. If *loʔ* luq meant 'a little paunchy,' how would M'nong express 'fat'?
5. If *kho khot* meant 'a little crazy,' how would M'nong express 'crazy'?
6. Formulate a general statement (a morphological rule) of how M'nong speakers weaken certain kinds of adjectives. To be completely accurate and account for the given data, you will have to take spelling (pronunciation) into account.

11. Following are listed some words followed by incorrect (humorous?) definitions:

Word	Definition
stalemate	'husband or wife no longer interested'
effusive	'able to be merged'
tenet	'a group of ten singers'
dermatology	'a study of derms'
ingenious	'not very smart'
finesse	'a female fish'
amphibious	'able to lie on both sea and land'
deceptionist	'secretary who covers up for his boss'
mathemagician	'Bernie Madoff's accountant'
sexcedrin	'medicine for mate who says, "sorry, I have a headache"'
testostoroni	'hormonal supplement administered as pasta'
aesthetominophen	'medicine to make you look beautiful'
histalavista	'say goodbye to those allergies'
aquapella	'singing in the shower'
melancholy	'dog that guards the cantaloupe patch'
plutocrat	'a dog that rules'

Give some possible reasons for the source of these silly "definitions." Illustrate your answers by reference to other words or morphemes. For example, *stalemate* comes from *stale* meaning 'having lost freshness' and *mate* meaning 'marriage partner.' When mates appear to have lost their freshness, they are no longer as desirable as they once were.

12. **a.** Draw tree diagrams for the following words: *construal*, *disappearances*, *irreplaceability*, *misconceive*, *indecipherable*, *redarken*.

b. Draw two tree diagrams for *undarkenable* to reveal its two meanings: 'able to be less dark' and 'unable to be made dark.'

13. There are many asymmetries in English in which a root morpheme combined with a prefix constitutes a word, but without the prefix is a nonword. A number of these are given in this chapter.

a. Following is a list of such nonword roots. Add a prefix to each root to form an existing English word.

Words	Nonwords
_____	*descript
_____	*cognito
_____	*beknownst
_____	*peccable
_____	*promptu
_____	*plussed
_____	*domitable
_____	*nomer
_____	*crat

b. There are many more such multimorphemic words for which the root morphemes do not constitute words by themselves. Can you list five more?

14. We have seen that the meaning of compounds is often not revealed by the meanings of their composite words. Crossword puzzles and riddles often make use of this by providing the meaning of two parts of a compound and asking for the resulting word. For example, infielder = diminutive/cease. Read this as asking for a word that means 'infielder' by combining a word that means 'diminutive' with a word that means 'cease.' The answer is *shortstop*. See if you can figure out the following:

a. sci-fi TV series = headliner/journey
b. campaign = farm building/tempest
c. at-home wear = tub of water/court attire
d. kind of pen = formal dance/sharp end
e. conservative = correct/part of an airplane

15. Consider the following dialogue between parent and schoolchild:

PARENT: When will you be done with your eight-page book report, dear?
CHILD: I haven't started it yet.