An Introduction to Language

Victoria Fromkin • Robert Rodman • Nina Hyams

11TH EDITION

An Introduction to Language 11e

VICTORIA FROMKIN
Late, University of California, Los Angeles

ROBERT RODMAN
North Carolina State University, Raleigh

NINA HYAMS
University of California, Los Angeles

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Victoria Fromkin, Robert Rodman, Nina Hyams

Product Team Manager: Laura Ross

Product Manager: Vanessa Coloura

Project Manager: Julia Giannotti

Content Developer: Melissa Sacco, Lumina Datamatics, Inc.

Product Assistant: Shelby Nathanson

Marketing Manager: Heather Thompson

Content Project Manager: Samantha Rundle

Manufacturing Planner: Marcia Locke

IP Analyst: Ann Hoffman

IP Project Manager: Betsy Hathaway

Production Service/Compositor: SPi Global

Art Director: Marissa Falco

Cover Designer: NYMDesign

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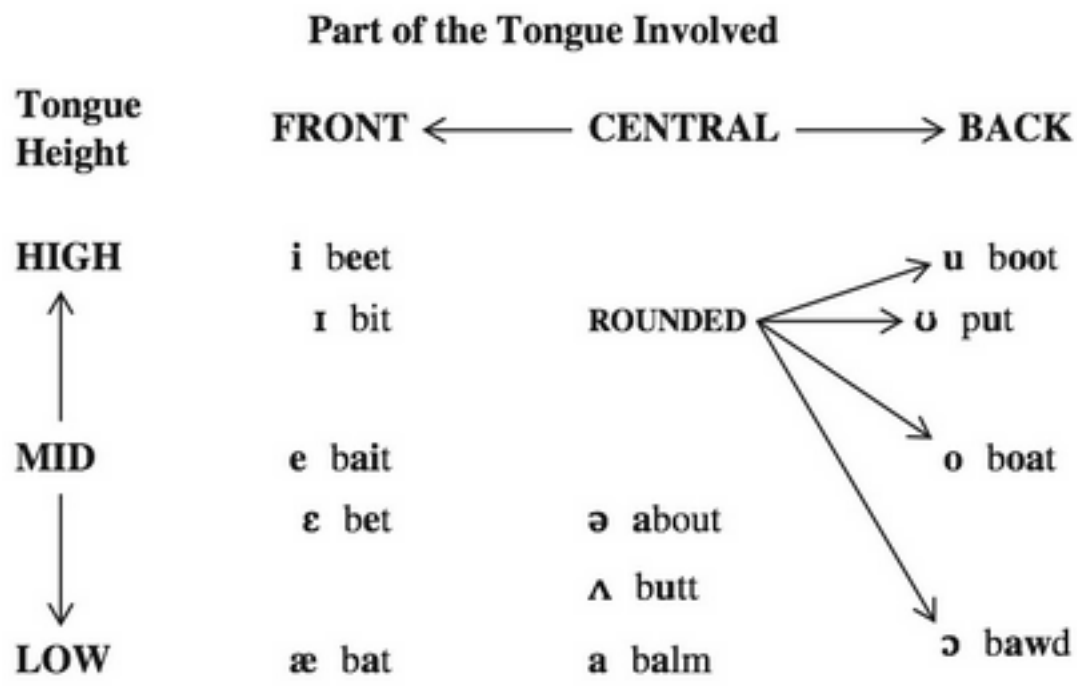
Classification of American English Vowels



A Phonetic Alphabet for English Pronunciation

Consonants						Vowels			
p	**p**ill	t	**t**ill	k	**k**ill	i	b**ee**t	ɪ	b**i**t
b	**b**ill	d	**d**ill	g	**g**ill	e	b**ai**t	ɛ	b**e**t
m	**m**ill	n	**n**il	ŋ	ri**ng**	u	b**oo**t	ʊ	f**oo**t
f	**f**eel	s	**s**eal	h	**h**eal	o	b**oa**t	ɔ	b**o**re
v	**v**eal	z	**z**eal	l	**l**eaf	æ	b**a**t	a	p**o**t/b**a**r
θ	**th**igh	ʧ	**ch**ill	r	**r**eef	ʌ	b**u**tt	ə	sof**a**
ð	**th**y	ʤ	**g**in	j	**y**ou	aɪ	b**i**te	aʊ	b**ou**t
ʃ	**sh**ill	ʍ	**wh**ich	w	**w**itch	ɔɪ	b**oy**		
ʒ	mea**s**ure								

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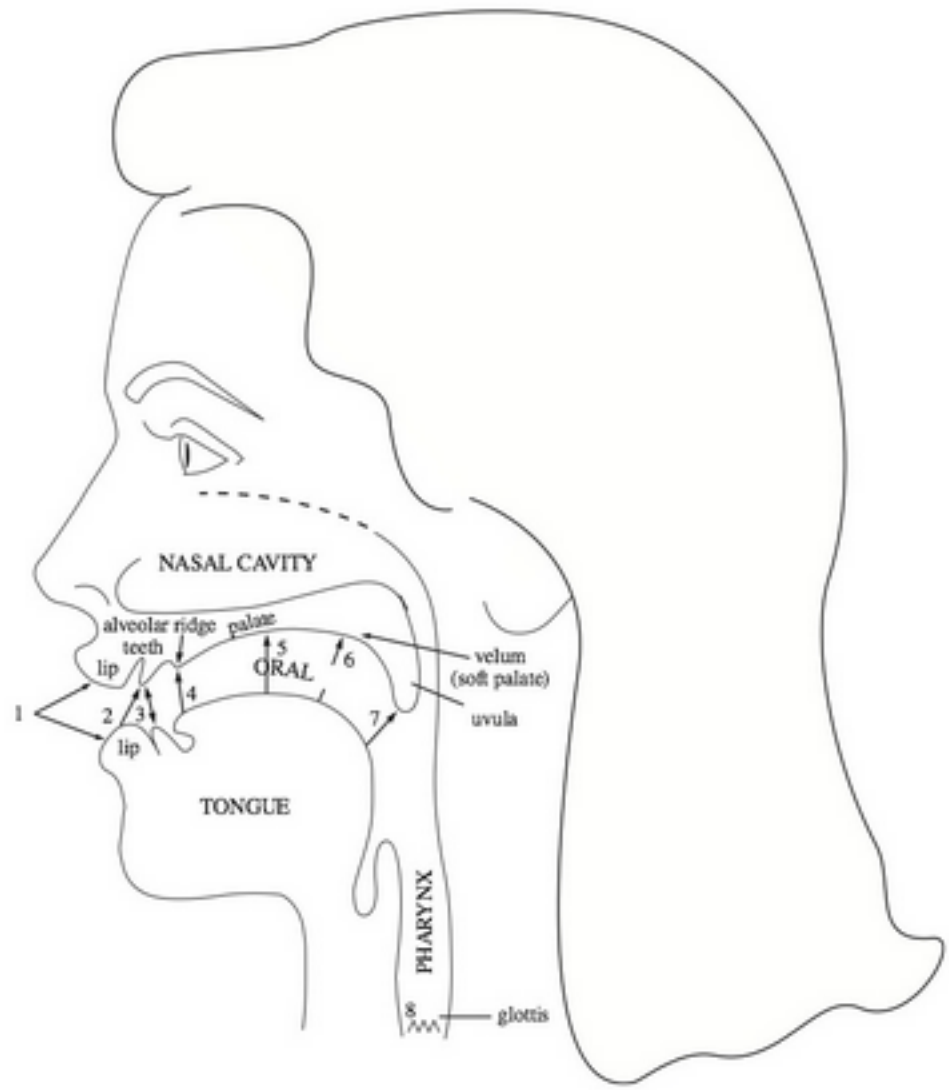
The Vocal Tract. Places of articulation: 1. bilabial; 2. labiodental; 3. interdental; 4. alveolar; 5. (alveo)palatal; 6. velar; 7. uvular; 8. glottal.



Some Phonetic Symbols for American English Consonants

	Bilabial	Labiodental	Interdental	Alveolar	Palatal	Velar	Glottal
Stop (oral)							
voiceless	p			t		k	ʔ
voiced	b			d		g	
Nasal (voiced)	m			n		ŋ	
Fricative							
voiceless		f	θ	s	ʃ		h
voiced		v	ð	z	ʒ		
Affricate							
voiceless					ʧ		
voiced					ʤ		
Glide							
voiceless	ʍ					ʍ	
voiced	w				j	w	
Liquid (voiced)							
(central)				r			
(lateral)				l			

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In memory of Robert David Rodman and Joseph Hyams

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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)

Robert Rodman passed away on January 15, 2017, shortly after the completion of the eleventh edition of *An Introduction to Language*. His breadth of knowledge, charm, and wit touch every page of this new edition, and will be sorely missed in future editions. Robert and Vicki Fromkin published the first edition of *An Introduction to Language* in 1974. Their goal was to share with students their love of language and linguistics by presenting complex material in a lighthearted and personal way that included witty quotations (A. A. Milne was one of Vicki's favorites) and cartoons (Robert kept a huge file of them, which he regularly updated). This edition continues in the style and spirit of my friends, colleagues, and co-authors, Robert Rodman and Victoria Fromkin.

The first ten editions of *An Introduction to Language* succeeded, with the help of dedicated teachers, in introducing the nature of human language to hundreds 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 has been rewritten for improved clarity, conciseness, and currency. It includes **new developments in linguistics and related fields** that will strengthen its appeal to a wider audience. Much of this information will enable

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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.

The eleventh edition has been reduced to ten chapters from the original twelve of earlier editions. The chapters on Computer Processing of Human Language and Writing have been eliminated, with some of the material on the history of writing incorporated into Chapter 8 (Language Change). This more streamlined edition will enable teachers and students on a quarter system to more fully utilize the material, and for those on the semester system, it allows extra time for the more challenging chapters such as phonology and syntax.

Exercises (more than 200) continue to be abundant in this edition, and additional research-oriented exercises have been added for those instructors who wish their students to pursue certain topics more deeply. Some exercises continue to be 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 as a concise introduction to the general study of language. It contains many "hooks" for engaging students, including "Language and Thought," which takes up the Sapir–Whorf hypothesis; 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. New to this edition is a section on "Can computers learn human language."

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 and intuitive aspect of grammar to most students. The subject is treated with clarity and an abundance of simple illustrations from non-English languages emphasize the universality of word structure, including the essentials of derivational versus inflectional morphology, free and bound morphemes, and the hierarchical structure of words. The section on compounds words has been expanded to include a detailed discussion of their internal structure.

Chapter 3, "Syntax: The Sentence Patterns of Language," is the most heavily revised chapter from the previous edition. The first half of the chapter introduces the universal and easily understood notions of constituency, syntactic categories (parts of speech), phrase structure trees and rules, structural ambiguity, and the infinite scope of language. Phrase structure trees are painstakingly built up, level by level, using traditional (pre-X-Bar) notation. The second half of the chapter delves into the internal structure of phrases, including the concepts of heads, complements, and selection. Current X-bar notation is introduced at this point, in a very restricted and clear way, to describe some of the deeper and more subtle syntactic structures of English and other languages. The chapter ends with a basic introduction to grammatical dependencies, including agreement rules and the transformational analysis of questions, carefully explained and illustrated. Formalisms are held to the bare minimum required to enhance clarity. Non-English examples abound in this chapter as in the rest of book,

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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, is finely structured so that the challenging topics of this complex subject can be digested in smaller pieces. The chapter first introduces students to truth-conditional semantics and the principle of compositionality. Following are discussions of what happens when compositionality fails, as with idioms, metaphors, and semantically anomalous sentences. Lexical semantics take up various approaches to word meaning, including the concepts of reference and sense, semantic features, argument structure, and thematic roles. The most heavily revised parts of this chapter are the sections on argument structure, thematic roles, and semantic features, the latter now containing a discussion of how these features affect the syntax. In the final section on pragmatics, 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," 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. In this spirit, we have eliminated the section on Optimality Theory, which we now feel is beyond the scope of an introductory text. The chapter covers central concepts in segmental and prosodic phonology, and contains numerous exercises structured to guide students through the basics of phonological analysis.

Chapter 7, "Language in Society," retains its forward position in the book from earlier editions reflecting its growing importance as a major sub-field of linguistics. The chapter presents 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"), and African American English. Included in this edition a discussion of Black American Sign Language (BASL), a dialect of American Sign Language (ASL). In addition, included are sections on contact languages 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. In addition, in response to reviewers' requests, a detailed and more complex illustration of the application of the comparative method to two contemporary

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dialects to reconstruct their ancestor—often called "internal reconstruction"—is now part of this chapter. The thematically related section on the history of writing is also included, moved from its previous location in a separate chapter.

Chapter 9, "Language Acquisition," has been heavily revised for clarity and conciseness. It covers the basic stages and data from childhood language development including sections on bilingual language acquisition and child second language acquisition, all couched in the more general theoretical question of how children accomplish the complex task of learning a language. In addition, much of what has been learned about adult second language acquisition included in this chapter along with a 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.

As in the tenth edition, language and brain is discussed at the end of the book so that we may report on recent advances in neurolinguistic research of interest to beginning linguistics students, but which require an understanding of the different components of grammar, discussed in earlier chapters.

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 Eleventh 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.

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Additional Resources

MindTap: Empower Your Students

MindTap is a platform that propels students from memorization to mastery. It gives you complete control of your course, so you can provide engaging content, challenge every learner, and build student confidence. Customize interactive syllabi to emphasize priority topics, then add your own material or notes to the eBook as desired. This outcomes-driven application gives you the tools needed to empower students and boost both understanding and performance.

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Get a Dedicated Team, Whenever You Need Them

MindTap isn't just a tool, it's backed by a personalized team eager to support you. We can help set up your course and tailor it to your specific objectives, so you'll be ready to make an impact from day one. Know we'll be standing by to help you and your students until the final day of the term.

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

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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. Vicki 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. Vicki 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 was 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. His research areas included forensic linguistics and computer speech processing. In 2009, he was elected into the American Academy of Social Sciences as an Associate Fellow for his achievements in computational forensic linguistics. Robert Rodman passed away on January 15, 2017, at the age of 76.

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 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.

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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 friends, associates, wives and husbands, lovers, teachers, parents, rivals, and even 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 our dreams are filled with talk. 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 capacity for language, perhaps more than any other attribute, distinguishes humans from other animals. According to the philosophy expressed in many myths and religions, 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?

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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 also 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 such as 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 such as *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.

[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.

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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, 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 already 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 have specific meanings and which do not.

Arbitrary Relation of Form and Meaning

> What's in a name? That which we call a rose
>
> By any other name would smell as sweet;
>
> WILLIAM SHAKESPEARE, *Romeo and Juliet*, Act II, Scene II

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 Hindi–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 a penchant that biologists have for Greek roots, a pterodactyl could have been called *ron, blick*, or *kerplunkity*.

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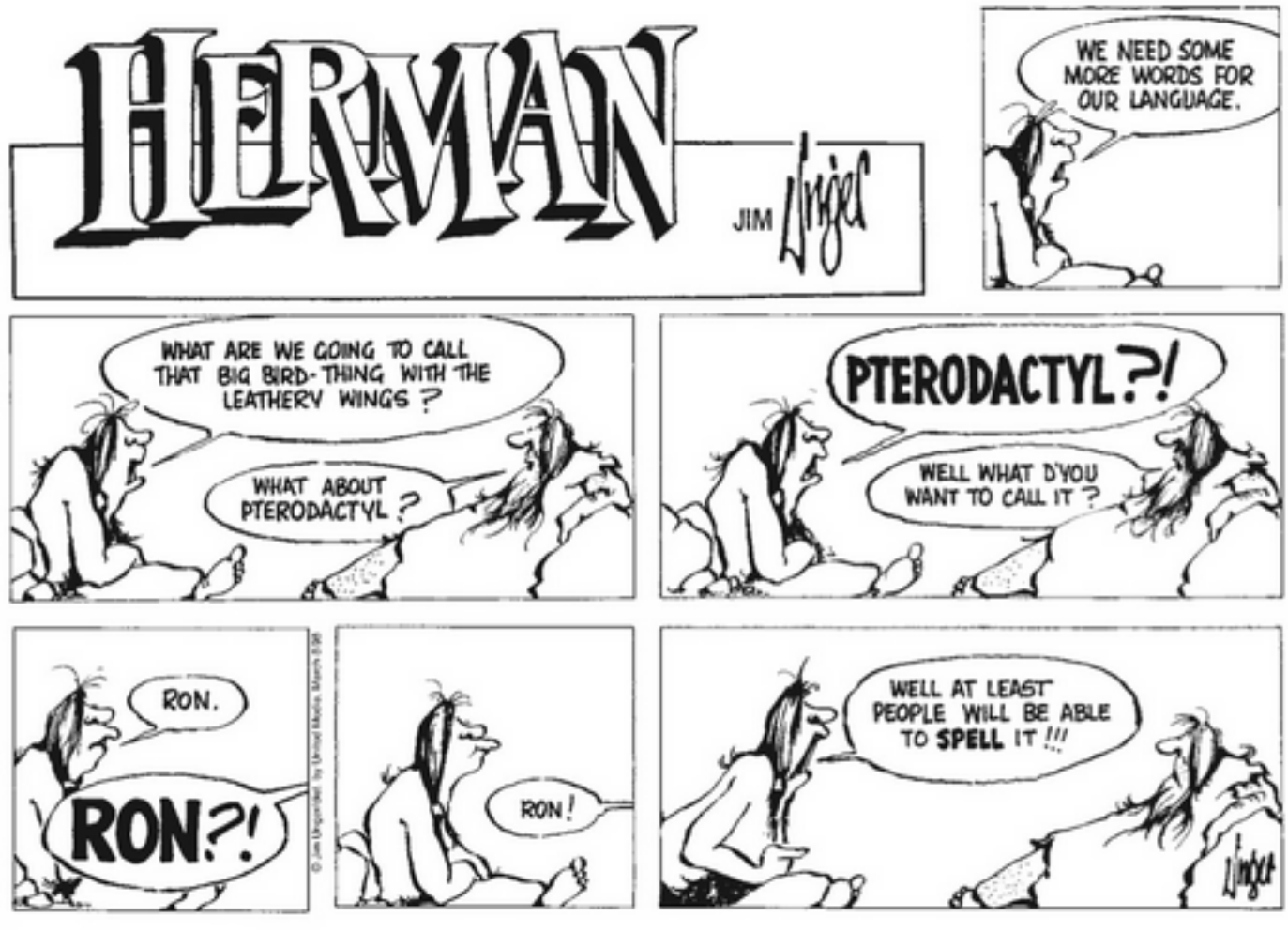

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This **conventional** and arbitrary relationship between the **form** (sounds) and **meaning** (concept) of a word is also true in sign languages. If you see someone using a sign language you do not know, it is doubtful that you will understand the 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

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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,* and *globe*.

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 from an online dictionary. However, many words you learned, you would not be able to form nor understand very many phrases. And even if you could manage to get your message across using a few words from a traveler's dictionary, such as "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?
>
> ANDRÈ: 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. No matter how smart your smartphone is, it cannot contain all the sentences of a language because the number 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 novel sentences.

That language is creative and sentences potentially infinite in length and number is shown by the fact that any sentence can be made indefinitely longer. 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.

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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.

The longer these sentences become the less likely we are to hear or say them. A sentence such as "The old, old, old, old, old, old man fell" with half-dozen 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 to a noun, and any number of clauses to a sentence, 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. It's true that 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 such as "ouch" change according to the language we speak. Step on an Italian's toes and he will cry "ahi." French speakers often fill their pauses with the vowel sound that starts their word for "egg"—*oeu(f)*—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

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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 "not 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 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.

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

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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 accounts for 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 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 unlikely, the verbose federal judge's ruling 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** such as saying *preach seduction* when *speech production* is meant (discussed in Chapter 10).

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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 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 that exist in the minds of the speakers of the language. 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 a speaker's 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 tells you how you *do* speak. It explains how it is possible for you to speak and understand and make judgments about well-formedness, and it describes 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. That's okay. 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. (We will have more to say about dialects in Chapter 7.)

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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 using double negatives in a sentence is a sign of inferiority cannot be justified unless you want to lose an argument with your French or Italian teacher. In both of those languages double negatives are "good grammar":

French:	Je	ne	veux	parler	avec	personne.
	I	not	want	speak	with	no-one.

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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 that linguists develop. 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."

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Even today language purists write books and blogs attempting to "save the English language." For example, they criticize the use of *enormity* to mean "enormous" instead of "monstrously evil", its original meaning. 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* has been used increasingly used to mean "enormous," and now that former U.S. President Barack Obama has used it that way (in his victory speech of November 4, 2008), and that British author 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 TV, the Internet, and especially texting for corrupting the English 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.

[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.

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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 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. Writing follows certain prescriptive rules of grammar, usage, and style that the spoken language does not. Moreover, and importantly, writing must be taught and is not acquired naturally through simple exposure to the spoken language (see Chapter 9).

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 may also make reference to the learner's knowledge of his 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

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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 overlook the universal laws of language. Yet, there is much 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. Learners will expect to find verbs and nouns—as these are universal grammatical categories; they 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 them to produce and understand an infinite number of sentences.

The more linguists explore the intricacies of human language, the more evidence we find 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.

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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 in the Child

> 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 adult speakers have of their 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 four-year-old 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 competence 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.

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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 based in human biology. 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.

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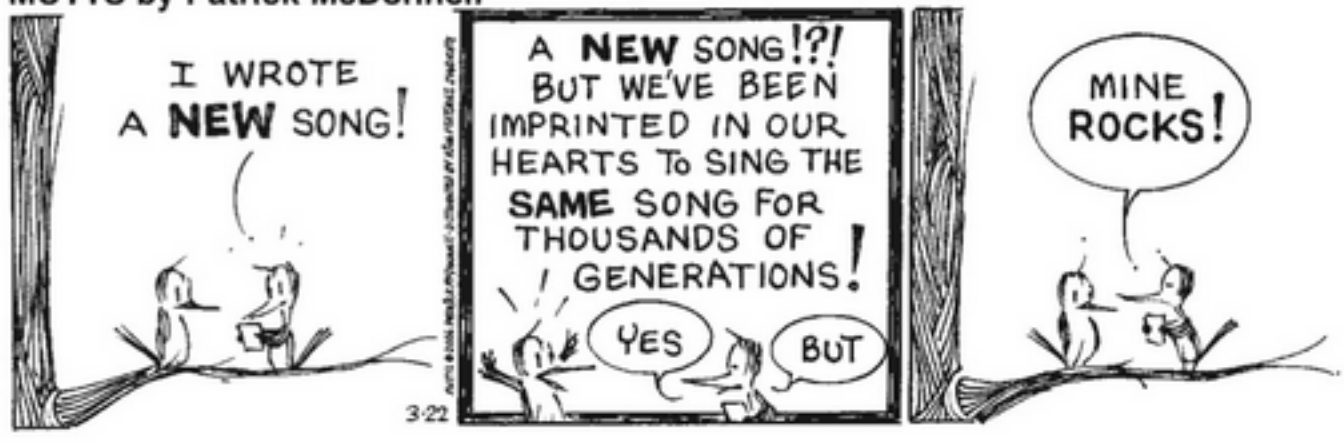
What Is Not (Human) Language

> 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*

MUTTS by Patrick McDonnell



Patrick McDonnell/King Features Syndicate

All languages share certain fundamental properties, and children naturally acquire these languages 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

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.

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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 bird-songs 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 Percy Bysshe Shelley's *To a Skylark*:

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.

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. 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, Facebook, your plans for the weekend, or most interesting of all, your linguistics class.

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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 in 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.

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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 so cannot produce utterances that have not been directly taught. A parrot—even a very chatty one—cannot produce an unlimited set of sentences from a finite set of units. The imitative utterances of talking birds mean nothing to the birds; these utterances have no communicative function. 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,* and *fetch* and even seem to understand object words such as *ball* and *toy*. 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 percent of the time. When told to fetch a toy whose name he had not

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been previously taught, Rico could match the novel name to a new toy among a pile of familiar toys about 70 percent 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 three-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) understand the *meanings* of words or have 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 a 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 number and kind 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 determine 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), 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.

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Similar results were obtained in attempts to teach primates artificial languages designed to resemble human languages in some respects. Chimpanzees Sarah, Lana, Sherman, Austin, and 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.

But these experiments, like previous ones, were subject to scientific 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 underscore how remarkable it is that all human children are able to create new and complex sentences never spoken or heard before within just a few short years, without the benefit of explicit guidance.

Can Computers Learn Human Language?

"Zits", 2001 Zits Partnership. Reprinted with permission of King Features Syndicate

> Man is still the most extraordinary computer of all.
>
> JOHN F. KENNEDY (1917–1963)

Computers are prolific. If you are reading this book, there is a high likelihood that you use a computer, be it as large as a desktop or as small as an Apple Watch. You may also be able to speak to your computer and it may speak back. Your computer may take dictation, translate between languages, read an electronic newspaper out loud and give you the definition of *eleemosynary*. These are the trappings of human language, but does your computer, or any computer, have human language competence?

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We saw earlier that two key properties of human language are discreteness and displacement. Computer speech has both these properties. Spoken words are assembled from discrete, prestored units of sound; and sentences from a prestored lexicon of words. Moreover, computer speech may refer to the past, present, or future and to its current location or another place.

Unlike talking birds, computers have no trouble generalizing sentences such as "Polly wants a cracker" to "Polly wants some whiskey" or even to "Hedwig likes mice." Forming plurals or past tenses are also easily programmable. A computer could associate one million spoken names of objects to pictures of those objects, putting poor Chaser (and all of us) to shame. As to the lack of creativity among nonhuman primates, computers suffer from no such drawback. Computers have been programed to write poetry, learn new words, and even provide psychological counseling.

Even the best of language-using computers have distinctly nonhuman-language traits. While humans never pronounce the same word twice identically, computers always do. Humans suffer from slips of the tongue, fumbled pronunciations, and convoluted phrasing. Humans often speak in fits and starts, hemming and hawing, inserting filler sounds such as "um" and "you know." Humans repeat words in a sentence such as "I . . . I . . . I don't want to paint uh I mean stain . . . stain my floor, no, I mean the decking." Humans bollix their syntax and realize it after they may have said "The horses away ran from the barn jumped the fence over." Computers never do any of this unless they are purposefully programmed to do so, and even when they are, the "mistakes" sound disingenuous.

Nonetheless, it may be argued that these are issues of linguistic performance. The toughest test of linguistic competence is a version of one first suggested by Alan M. Turing (1912–1954), the British mathematician who is considered the founder of modern computer science. Behind two screens are placed a computer and a human. An interrogator engages both voices behind the screens in conversation. If based on language usage, the interrogator is unable to determine which is the human and which is the computer, then one might argue that the computer has attained human linguistic competence.

No computer has come close to passing this "Turing test," fictional computers and robots to the contrary notwithstanding. Indeed, the test has never been seriously administered. Moreover, if in an unforeseeable future a computer was programmed to pass this test, it would be the ingenuity and linguistic competence of the programmers on display, not the computer nor its software. Despite the intelligence of animals and machines, none has achieved the linguistic competence of any healthy human being.

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

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> 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 languages differ in the categories they encode and therefore speakers of different languages 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

[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.

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(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 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 would learning 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 humans could not think about something for which we don't have a word, 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, and so on. 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. However, some experiments have shown that speakers are better at discriminating two colors when their language has different words for each, supporting a weaker version of the Whorfian hypothesis.

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One Whorfian claim that has taken on the cast of an urban legend is that the Inuit language, spoken in the Canadian Arctic, has many more words for snow than English, 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. Rather, it suggests 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.

Politicians and marketers certainly believe that language can influence our thoughts and values. One political party may refer to "assisted suicide" while another "compassion and choices." 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*, which was then replaced by yet another euphemism, *challenged*, and most recently, *person with a disability*. Nonetheless, in all such cases, changing language has not resulted in a new worldview for the speakers. Rather, it is changing sensibilities that drive the changes in language.

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Some language changes inspired by political correctness can be quite extreme. For example, a local council in Britain banned the term *brainstorming* and replaced it with *thought showers* because local lawmakers worried that the original term might offend people with epilepsy. Or the instruction to newly recruited holiday Santa Clauses in Sidney, Australia, to not say *Ho Ho Ho* deemed too close to the American slang for prostitute and therefore degrading to women.

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 (often unconscious) linguistic knowledge 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 there.

A grammar that attempts to legislate what your grammar should be is called a **prescriptive grammar**. It specifies a standard of usage. It does not describe, except incidentally. **Teaching grammars**, while prescriptive in nature, are written to help people learn a foreign language or a dialect of their own language.

The more linguists investigate the nearly 7,000 languages of the world and describe the ways in which they differ from one another, the more they discover that these differences are limited. There are linguistic universals that pertain

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to the components of the grammar, the ways in which these components are related, and the forms of rules that govern them. These principles compose **Universal Grammar (UG)**, 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 among themselves as much 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.

Computer scientists have labored for decades to program computers with the linguistic competence of a human. While the results are impressive, and computers appear to be able to talk, listen, and understand, there is little evidence that human linguistic competence has been achieved.

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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 certain aspects of cognition such as memory.

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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 sentence is 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.

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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

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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

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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 to 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 Piraha is said to lack numbers beyond two and distinct words for colors. Research this language using the Internet with regard to whether Piraha 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.

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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 Piraha—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. 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. *Google Books Ngram Viewer* may prove useful as well.

22. In his book *1984*, George Orwell proposed that if a concept does not exist, it is nameless. In the passage quoted below, he suggests that if a crime were nameless, it would be unimaginable, hence impossible to commit:

    > A person growing up with Newspeak as his sole language would no more know that . . . *free* had once meant "intellectually free," than, for instance, a person who had never heard of chess would be aware of the secondary meanings attaching to *queen* and *rook* and *checkmate*. There would be many crimes and errors which it would be beyond his power to commit, simply because they were nameless and therefore unimaginable.

    Critique this notion.

23. In the sci-fi movie *Arrival* (based on Ted Chiang's novella *Story of Your Life*), linguist Louise Banks learns the language (Heptapod B) of aliens visiting the Earth and then realizes she can see the future. Watch the movie and explain how the Sapir–Whorf hypothesis shapes the story.

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