How Languages Work

An Introduction to Language and Linguistics

Second Edition

Edited by CAROL GENETTI

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An Introduction to Language and Linguistics

Language is a sophisticated tool which we use to communicate in a multitude of ways.

Updated and expanded in its second edition, this book introduces language and linguistics – presenting language in all its amazing complexity while systematically guiding you through the basics. You will emerge with an appreciation of the diversity of the world's languages, as well as a deeper understanding of the structure of human language, the ways it is used, and its broader social and cultural context.

Part I is devoted to the nuts and bolts of language study – speech sounds, sound patterns, sentence structure and meaning – and includes chapters dedicated to the functional aspects of language: discourse, prosody, pragmatics, and language contact. The fourteen language profiles included in Part II reveal the world's linguistic variety while expanding on the similarities and differences between languages. Using knowledge gained from Part I, you will explore how language functions when speakers use it in daily interaction.

With a step-by-step approach that is reinforced with well-chosen illustrations, case studies, and study questions you will gain understanding and analytical skills that will only enrich your ongoing study of language and linguistics.

Carol Genetti is a Professor of Linguistics and the Anne and Michael Towbes Graduate Dean at University of California, Santa Barbara.

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CONTENTS

FIGURES

PRIMARY CHAPTERS

LANGUAGE PROFILES

TABLES

PRIMARY CHAPTERS

LANGUAGE PROFILES

PREFACE

How Languages Work is designed to be the primary text for a university-level introductory course in linguistics. The audience for the book includes:

- undergraduates taking an introductory linguistics course as a general education requirement;
- beginning linguistics students with limited background in the field;
- linguistics graduate students seeking a helpful reference and introductory discussions of a wide range of sub-disciplines and a range of languages;
- students in related disciplines (such as education, anthropology, writing, or communication) that seek grounding in linguistics; and
- general readers with an avid love of languages.

In addition to courses offered within departments of linguistics, the book might be used in departments of anthropology, education, psychology, communication, applied linguistics, English, or other languages. It introduces the field of linguistics through its subfields, and prepares students for more advanced and specialized coursework.

ACKNOWLEDGMENTS

This book has been the work of many hands over many years. My sincere thanks go out to the contributing authors, whose combined experience in linguistics can be counted in centuries and whose deep insights into language enrich every page of this book. They have been extraordinarily patient with me as I've pursued this project simultaneously with many others and have graciously accepted deeper editing than they are typically accustomed to as I've strived to bring unity and a consistent voice to these pages. I have greatly appreciated their wisdom, patience, good humor, and sheer hard work.

This book would never have come into existence without the dedicated energy of numerous graduate students – former and current – in the Department of Linguistics at the University of California, Santa Barbara. First and foremost, it is my pleasure to acknowledge Allison Adelman, whose meticulous attention to detail and love of good writing have served to improve this book greatly. I strongly doubt that I would ever have brought this to completion if I hadn't had her partnership, flexibility, and cheerful persistence to rely on, and for this she will have my unending gratitude. For the website materials, especially the interactive elements, I enthusiastically thank Carlos Nash for visioning and revisioning what might be possible and bringing them to fruition. I'm also grateful for the early partnership of Kobin Kendrick, who helped to shape and creatively transform and extend my initial ideas. Other graduate students who have contributed in ways too numerous to mention include Dibella Caminsky, Onna Nelson, Nicholas Lester, Rebekka Siemens, Kira Griffitt, Veronica Muñoz LedoYañez, Jennifer Garland, and Mara Henderson. UC Santa Barbara undergraduates have also commented, corrected, and test-run these materials; I especially note the careful work of Kristin Dunkinson, Kaveh Vee, and David Prine.

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The first edition of this book was partly written when I was in residence as a Distinguished Visiting Fellow at the Cairns Institute, James Cook University, in Cairns, Australia. My thanks to Sasha Aikhenvald and R. M. W. Dixon for their contributions, friendship, and support. UC Santa Barbara has been the home of this book, both intellectually and in financial support. I am grateful to the Division of Humanities and Fine Arts and the Office

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Finally, I thank Paul, Olivia, and Marcus for their love, support, uncomplaining patience, and constant inspiration.

I dedicate this book to the UC Santa Barbara Linguistics graduate students: past, present, and future.

CAROL GENETTI
Santa Barbara

GLOSSING CONVENTIONS

Convention	Meaning
1	first person
2	second person
3	third person
A	agentive argument of transitive verb
ABL	ablative
ABS	absolutive
ACC	accusative
AD	adessive (“onward”)
ADJ	adjective
ADV	adverbial
ADV.DS	adverbial, different subjects
ADV.SS	adverbial, same subjects
AFFIRM	affirmed evidential knowledge
AGT	agentive
ALL	allative
ALREADY	already
ANT	anterior
APPL	applicative
APUD	next-to locative
ASP	aspect marker
ASSOC	associative plural
AUX	auxiliary
AV	active voice
AWAY.FROM.RIVER	directional affix
BRIEF	brief duration
CAUS	causative
CLF	classifier
CLT	clitic
COM	comitative
COMPAR	comparative
COMPL	completive

COND	conditional
CONJ	conjunctive
CONJECTURE	evidential
CONS	mutual consent
CONT	continuous
COP	copula
DAT	dative
DECL	declarative
DEF	definite
DEM	demonstrative
DESIDERATIVE	desiderative
DET	determiner
DIM	diminutive
DIST	distal
DISTR	distributive
DLOC	dislocative
DM	discourse marker
DS	different subject
DU	dual
DUPLICATIVE	duplicative
DUR	durative
EMPH	emphatic
ERG	ergative
ESS	essive
EVEN	additive
EVENT	event
EVID	evidential
F	feminine
FACTUAL	factual
FOC	focus
FUT	future
FUT1>2	future tense for first-person subject with a second-person object
GEN	genitive
HABITUAL	habitual
HON	honorific
I/II/III/IV	gender classes
IE	informal ending
ILL	illative
IMP	imperative
IMPRS	impersonal
INC	inceptive

INCL	inclusive
IND	indicative
INDF	indefinite
INE	inessive
INF	infinitive
INST	instrumental
INTENSIFIER	intensifier
INTR	intransitive
IO	indirect object
IPFV	imperfective
IRR	irrealis
ITR	iterative
JUST	delimitative
LAT	lative
LINKER	linking morpheme
LOC	locative
M	masculine
MANIP	manipulative
MIDDLE	middle voice
MUTUAL	evidential
N-	non-
NEAR.FUT	near future
NEG	negative, negation
NF	non-Feminine
NMLZ	nominalizer
NOM	nominative
NP	noun phrase
NPST	non past tense
NSG	non singular
NUM.CLF	numeral classifier
OBJ	objective
OBL	oblique
OBLIGATE	obligation
P/O	patientive argument of transitive verb
PASS	passive
PFV	perfective
PL	plural
POSS	possessive
POSSEE	possessee
PREP	preposition
PRF	perfect

PROG	progressive
PROX	proximal
PRS	present
PRT	partitive
PST	past
PST.PTCP	past participle
PTC	particle
PTCP	participle
PURP	purposive
Q	question marker
QUOT	quotative
REC.PST	recent (past)
REDUP	reduplication
REM.PST	remote (past)
REP	repetitive
REPORT	non-personal knowledge
S	intransitive subject
SBJ	subject
SEMBL	semblative
SEQ	sequential
SG	singular
SPEC	specific-indefinite article
SS	same subject marking
STAT	stative
SUB	below locative
SUPER	above locative
TO	directional affix
TOP	topic
TR	transitive
UNW	unwitnessed
UP	up(stream) directional
VERBAL.ADJ	verbal adjective
WIT	witnessed
YET	yet

THE BOOK'S APPROACH

This textbook explores how languages work: the "pieces" of languages and the principles governing their nature and how they fit together; the ways in which language conveys meaning; how humans use language as the substance of everyday interaction; the role of language in society and culture; how languages adapt and change over time; and how they are learned by children and adults. It presents language as a quintessentially human activity, showing how languages are grounded in human physiology and cognition, and are both reflective and creative of human societies and cultures. It emphasizes the dynamic and constantly changing nature of language. Teaching students this broader context allows them to understand the forces that shape language, hence to gain a deeper understanding of linguistic principles and structures.

The book does not introduce any particular "formalist" theoretical paradigm (such as Generative Grammar) but describes grammatical structures from the perspective of linguistic typology. It thus follows a broad international consensus on the nature of linguistic categories and structures. It is an appropriate choice for faculty members who wish to provide their students with a rigorous orientation to language and linguistics without introducing formal models. This book is highly technical and analytical, and requires exacting attention to structural detail. Grammar is presented in significant depth and the material may at times be challenging. However, a major focus of the text is to provide students with explicit direction that will help them acquire analytical skills. In addition, the associated website includes numerous learning aids (such as interactive tutorials) that support this process. The password-protected instructor materials on the website include suggestions for sections to assign (and not assign) for classes with a less technical emphasis.

Importantly, this book is strongly cross-linguistic in its orientation; the focus is not just on ***language*** but also on ***languages***. In exposing readers to languages from across the globe, it serves as an introduction to the world's linguistic diversity. Cross-linguistic comparisons are important not only because they allow us to classify languages but also because they reveal what a language is or might be. Understanding the similarities and differences between languages is essential to the development of empirically justifiable theories about language. In addition, linguistic variety is simply fascinating and fun; it reveals much about humankind, and the thousands of ways that particular communities of speakers have

categorized and represented the world around them. For that reason, this book contains a special feature: a set of ***Language Profiles***, each written by a linguist who has conducted extensive fieldwork in the community that they write about (with the exception of Guy Deutscher, whose profile is on the long-extinct language Akkadian, which is attested on excavated clay tablets). After a brief introduction to the language and the community in which it is spoken, each language profile provides an overview of the basic structures and then goes into depth on one or more topics that tie in with the primary chapters. The profiled languages were selected to represent languages of diverse locations, families, and types. Together, these fourteen short studies serve not only to reinforce and illustrate the main points of the primary chapters but also to expose the reader to the world's linguistic diversity.

The Book's Structure

The book contains fifteen primary chapters and fourteen language profiles. These can be fit into academic programs in a number of ways. The book provides more than sufficient material for a semester-long introductory course. It can also be used in a shorter academic quarter, with instructors selecting the topics they deem the most crucial for students within their programs. It can also be used across multiple courses; for example, the language profiles can be used in subsequent courses on linguistic analysis, morphosyntax, or languages of the world. Chapters not covered in an introductory course can serve as initial readings in more specialized topic-specific courses (such as on language acquisition). The material could also be expanded to a two-quarter or year-long course, although in the latter case some supplementary readings may be desirable. Further discussion on different ways to structure courses and how to incorporate the language profiles are available on the instructor's portion of the website.

The chapters in this book follow the traditional format of tracing linguistic structure, beginning with the smallest units (sounds), building up to successively larger units, and ending with discourse. Chapters on orthogonal topics – such as semantics, language change, and language acquisition – follow the structural chapters. Several chapters are included on a variety of topics that are not typically found in introductory textbooks. These include prosody, discourse, pragmatics, and language contact.

The theoretical perspective and broad coverage of this book allow it to fill a niche in the market that is currently not covered by other texts. The contributing authors are practicing linguists and distinguished leaders in their given fields. The editor and each author, while not losing their individual voice, maintain a consistent chapter structure and level throughout, to ensure a smooth reading experience for the student. The text is contemporary and up to date. Most importantly, it presents language in the full richness of its context, as a complex dynamic tool shaped by generations of speakers through discourse interactions, adaptive to the broader social and cultural context in which it is embedded. Readers will develop a deep appreciation of the beauty, complexity, and sheer genius of language, and of humankind to whom it belongs.

Changes to the Second Edition

The Second Edition contains a number of enrichments and improved features. Most substantively, this edition contains a new language profile on African-American English that is well integrated with Chapter 11: Language in the Social World. The latter has been restructured and updated. In addition, Chapter 2, Phonetics: the Physical Dimensions of Speech Sounds, has been expanded to include a description of British English, and both British and American English are represented in the examples, exercises, and associated sound files. This will make it easier for the text to be used in classrooms in the United Kingdom. It also allows for direct comparison between these two major English dialects.

Other changes include:

- a significant increase in the number of exercises in the primary chapters;
- increased examples from English and other major world languages in the main text and the exercises;
- clarification of the distinction between Textboxes and Sidebars, and the addition of a distinct category of "Stop and Reflect" boxes;
- greater integration of website materials and Language Profiles through increased cross-referencing;
- reduction of highlighted text to better emphasize primary points;
- updated suggestions for further readings;
- overall streamlining of prose.

www.cambridge.org/genetti2

The website materials are important companions to the book. The website contains a range of materials that will help instructors teach the course and help students engage with and master the skills of linguistic analysis.

Online resources for students include:

- sound files associated with particular examples in the text;
- interactive tutorials on problem solving;
- online flashcards;
- "how-to" guides that take students through steps of linguistic analysis;
- explicit instruction in writing for linguistics;
- study guides;
- self-administered online quizzes on vocabulary and key concepts;
- enriched material about the profiled languages, including interesting cultural information and profiles of speakers.

Online resources for instructors include:

- PowerPoint slides for each chapter;
- suggested exam questions;
- sample assignments;
- answer keys;
- suggestions on how to structure courses, depending on class goals;
- guide to the Language Profiles and suggestions on how to incorporate them into classes.

FOR STUDENTS: HOW TO USE THIS BOOK

Linguistics is a highly diverse and interdisciplinary field, encompassing phenomena as varied as the concrete details of physical acoustics, abstract logical argument, concise grammatical structures, and rich observations on culture and society. There are few people for whom all of it comes easily – everyone has their favorite subfields – but it is all essential; every subfield deeply interacts with all others. This book has been designed with students in mind and has many features to facilitate acquisition of the skills necessary to fully appreciate the complexity of language.

It is important in linguistics to engage with the text. Linguistics is not a field where you read quickly and lightly. It is better not to plan to cover too much at one time and not to hurry through it; take adequate time to fully work through a couple of sections, and then take a break. Throughout the primary chapters, you will find that ***key points have been put in bold italics***. Of course, there are many other important points that you will want to note as well.

Be sure to really think about the discussion and make it your own; take time to reflect on your own lifelong experience of language and connect it to what you are learning, and try to become conscious of language use as you are immersed in it daily. This practice will take your understanding to an entirely new level.

Textboxes contain case studies and important related points and should always be read. "Stop and Reflect" boxes give you the opportunity to consider important questions or try your hand at linguistic analysis; taking time to work through these will facilitate your learning. Sidebars provide information on online resources as well as cross-references to related discussions in other parts of the book. Wireless icons () direct you to specific online resources that are relevant at particular points in the text.

You will find that the pages are filled with examples taken from languages throughout the world. Most of these are numbered and set off from the text. It is critical that you spend time looking at these in detail, even if you are tempted to skip over them to continue with the main text. They are as important as the text itself: each informs the other and neither can be fully understood in isolation. You will find that words from other languages are usually broken into their component parts and that translations of the meanings of each part are provided. Often these translations are abbreviated and put in small caps, for example,

SG for singular. Each chapter has a list of the glossing conventions used within it positioned just before the exercises. A full list of all glossing conventions in the book can also be found on pages xviii–xxi.

One of the essential features of this book is its focus on linguistic analysis. This is the process by which you take a linguistic expression (a word, a sentence, a stretch of discourse) and figure out all of its parts and subparts and how they contribute to the whole. This fine-grained analysis then leads us to a broader understanding of how languages work, the underlying principles, and how the design of languages both serves and reflects their functions as tools of human communicative interaction.

There are many methods of linguistic analysis, depending on which aspects of language are being studied. For example, determining which aspects of phonetic articulation are meaningful in a language is a very different (though surprisingly not unrelated) exercise from determining whether two languages are members of the same language family, or whether a language differentiates active voice from passive voice. Learning how to apply these methods is central to learning linguistics. In order to make this as easy as possible, methodologies are presented in step-by-step fashion. "Stop and Reflect" boxes prompt you to apply the methods to further data sets. Each chapter has a set of exercises that allow you to analyze new data. In addition, there are many resources on the companion website that serve as aids for improving your analytical skills. These include interactive tutorials, step-by-step instructions, guides to writing in linguistics, and other chapter-specific resources.

Linguistics has extensive terminology that must be learned to understand the field successfully. The Glossary in the back of the book provides simple definitions and is an important reference tool. All words in the Glossary are presented in **bold** at first mention (as well as later in the book if they haven't been mentioned for a while, as a reminder that a glossary entry is available). Chapter-specific glossaries are available on the website. There are also online flashcards for each chapter to help you memorize terms.

Another important component of the website is the addition of sound files. The majority of instances of language use are spoken, and sound is an integral part of most languages (sign languages being the exception). Throughout this book (and others) you will see speech sounds represented by letters and other two-dimensional symbols, but keep in mind that these are only *representations* of sounds, not sounds themselves. In moving to the abstraction of representation, considerable richness is lost. To partially address this, especially for those chapters that focus on sound (phonetics, phonology, and prosody), many of the examples are accompanied by sound files accessible on the *How Languages Work* website; these are indicated by the wireless icon. Take the time to listen to them carefully. Most of the language profiles also have sound files, typically of recorded texts. These provide a tangible sense of the language and its speakers that cannot be otherwise replicated.

One of the most fascinating aspects of studying linguistics is learning about the tremendous variety – and ingenuity – of human languages. Linguistic diversity is both captivating and fun. In addition, understanding linguistic diversity is critical to understanding the broader principles that underlie languages, i.e., how languages work, and what languages do. The primary chapters in the book are replete with examples taken from languages across the globe. In addition, the book contains fourteen language profiles, which are case studies

in shorter chapters that focus on particular languages. Your instructor may assign these, or you may just want to explore languages of particular regions or particular types on your own. Reading the whole set of language profiles will serve to significantly advance your understanding of linguistics. Not only do they allow the widespread application of linguistic concepts to many different languages, but they also illustrate the diversity of language types, especially as regards their grammatical structures. Textbox 0.1 provides a list of the language profiles in relation to the chapters to which they correspond; it is best to read the relevant chapter first.

TEXTBOX 0.1 **WHEN TO READ WHICH LANGUAGE PROFILES**

After Chapter:	**Read:**
3	Kabardian
6	Goemai, Manange, Nuuchahnulth, Finnish, Quechua, Bardi, Tsez
7	Lowland Chontal
11	African-American English, Indonesian
12	Seneca, Akkadian
13	Manambu

My own experience with linguistics is that the farther I climb, the greater the vistas I behold. I hope that students will find their own vistas by exploring the field far beyond this book. To encourage this, every chapter and language profile contains a list of suggested readings with a brief note about each entry; these can provide some potential next steps toward a deeper understanding of this quintessential aspect of our humanity.

PART I

PRIMARY CHAPTERS

1 Introduction

Language, Languages, and Linguistics

KEY TERMS

- Linguistics
- Linguist
- Linguistic structure
- The functional nature of language
- Language versus dialect
- Language change
- Linguistic analysis
- Language endangerment
- Language documentation and conservation
- The fields of linguistics

CHAPTER PREVIEW

Language plays a crucial role in our lives as a functional system of human communication. It is central to our cultures and societies, and has played a significant role in Western intellectual history of the study of philosophy, mind, ancient history, and culture. Linguistics is the scientific study of language. This chapter provides an orientation both to language and to the field of linguistics. It introduces the languages of the world, their distribution and demographics, the important issue of language endangerment and death, and the worldwide effort to document and conserve the world's languages. It then provides an orientation to the field of linguistics and an overview of the major subfields of the discipline.

LIST OF AIMS

At the end of this chapter, students will be able to:

- **articulate the importance of language to human lives and society;**
- **discuss the ways in which language is a functional system of human communication;**
- **take an objective, descriptive approach to discussion of language-related issues;**
- **begin to identify fine details of linguistic structure;**
- **state basic demographic facts about the world's languages, including issues of language vitality and endangerment;**
- **state in what ways linguistics is scientific and objective;**
- **provide a brief overview of the major subfields of linguistics.**

1.1 Language

1.1.1 Language and You; Language and Us

Language ***is an essential and ubiquitous component of our lives.*** To see that this statement is true for yourself, take a moment to think about your day. Cast your mind back to when you first awoke. What were your thoughts and how were they expressed? Trace the day in your mind and try to count how many people you spoke with, even if it was just a quick "hi" or "thank you." Did you listen to a lecture? Watch television? Talk on the phone? Make an appointment? Sing a song? All of these activities centrally involve language. Now think about what you read today. Perhaps a newspaper, pages on the Internet, email, advertisements, labels, signs, homework assignments? Now move on to thought itself. What thoughts and ideas have passed through your mind? Have you made explicit plans, imagined conversations, debated with yourself? If you are like most people, this brief exercise has revealed that language is both within and around you, a constant part of your internal and external existence. Language is the primary medium which you use to interact with people and institutions in our society. Your particular use of language is also a reflection of who you are as an individual; all of us use language as a means to build and portray our identities in the world around us. We also use language to shape and interpret the great and small experiences of our lives.

SIDEBAR 1.1

You can find definitions for key terms and bolded terms throughout this chapter in the Glossary (at the back of this book or on the student resources website: www.cambridge.org/genetti2; the Glossary is located under "Tools"). Check your mastery of the vocabulary with the online vocabulary quizzes: one tests you from term to definition and the other from definition to term.

These vocabulary resources are available for every chapter in the book. The website also provides a study guide for each chapter, as well as chapter-specific materials, such as audio and video clips, how-to guides, and other useful tools. References to these resources and other useful websites will be indicated with a wireless icon: 

Think about the broader world in which we live. Language is the principal means by which societies are constructed and cultures are developed. Think of the size of our society's great libraries, and how the majority of the volumes in those vast collections (14.6 million volumes in the Harvard University Library alone) are language in its written form. The intellectual achievements of humankind are essentially embodied in language. Not only is this true of the written works that formally encapsulate our knowledge, but it is also true of the huge body of indigenous knowledge held by the speakers of thousands of languages across the globe, from the Brazilian Amazon to the Mongolian steppes. Some may argue that music and art are non-linguistic, but note that they often incorporate language, as with lyrics. Even works that do not contain language are interpreted and understood through verbal thought, discussion, and critical analysis. Similarly, mathematics could be argued to be non-linguistic, but again language is used to teach, understand, and interpret it.

Beyond the modern world, consider that language has been used by humans for at least 30,000 years, by thousands of groups across the globe, wherever humans have ventured. Speakers of each generation endow their language with their own unique mark, their own contribution, changing it in myriad subtle ways. As language passes from

generation to generation, it shifts and adapts to the ever-changing world in which it is embedded.

The preceding paragraphs emphasized that ***language is a pervasive and essential part both of your own life and of who we are as humankind***. The goal of this book is to begin to address the question: *How does language work?* It is a simple question, and one that most people never think to ask. Language is so automatic – almost like breathing – that most people don't realize the complexity that underlies it and the subtle and effortless skill with which they wield it.

The question *How does language work?* may itself be simple, but the answer is highly complex. It can be broken down into many smaller questions. To begin with, one must ask: *How do individual languages work?* We really can't understand the nature of language in its broad sense if we don't understand the mechanisms underlying particular languages, preferably of many and diverse kinds. Other key questions include: What are all the pieces of a language? How do the pieces combine and work together to allow for communication to occur? How are languages learned and transmitted? How do languages influence each other? How do languages change over time? These are but a small number of the many questions that define the field of **linguistics**, the scientific study of language. But before discussing the field in more detail, it is important to continue with our exploration of the nature of language.

1.1.2 Language Is Human and All That Implies

Language is a defining trait of humankind. Language is tied up with our thought processes, our ability to reason, to self-reflect, and to develop advanced civilizations. Other animal species have developed communication systems, but they pale in comparison to human language. A simple illustration of this is the fact that no system of animal communication appears to be able to communicate events that occurred in the past or events that are imaginary. Neither are there animal communication systems that have adverbs or other devices that allow for detailed descriptions of actions. Animals have nothing comparable in scale, complexity, subtlety, or adaptability to human language.

The fact that language is human has a number of important implications for the nature of language. Language is embedded into our physiology, our cognition, and our thought processes. Many of the details of linguistic structure are directly dependent on this. For example, the fact that no language makes sounds by curling the tip of the tongue back to touch the uvula (the small appendage hanging down in the middle of the back of the mouth) is directly explainable by the details of human anatomy. Less trivially, anatomical facts are also responsible for a number of features of sound systems, such as the common trend to pronounce a sequence of *t* and *y* as "ch" (e.g., *gotcha* from *got you*). More importantly, language processes are largely resident in the brain and so language shares characteristics with other cognitive functions; for example, language is both learnable and adaptable.

Humans use language for a wide variety of purposes. We communicate everything from urgent warnings to random thoughts, proposals of marriage to complaints. We use it to cajole, threaten, placate, inform, entertain, and command. In other words, language is

functional; it is a tool of human communication. The fact that language is used for a wide variety of tasks has direct implications for how it is structured. Linguistic structures are flexible and adaptable, able to express all that humans convey to each other in the course of a conversation, a day, a lifetime, a civilization.

Language is also human in that language is a form of human social behavior. It can be used to build or break social bonds. It serves as a social cue to the formality or informality of a situation, and to the degree of social intimacy or distance among the people speaking. When children acquire language, they do so by using it as a tool of social interaction within particular social settings. The social component of human language is also reflected in how language is used and structured.

Humans use language to interact, and using language is an inherently interactional task. Not only are we listening to our conversational partner and picking up on the many subtleties of word choice, sentence structure, rate of speech, and intonation, we are also constantly assessing when and how to take a turn, and how to communicate our message so that the person to whom we are speaking (the **addressee**) will correctly interpret what we are saying. To take a simple example, I wouldn't say *He is coming for dinner tonight* if I didn't think that the addressee had in mind the person I refer to as *he*. Otherwise, I could use a proper name like *Mike* or a more elaborate phrase like *the guy from across the hall*. I could also start off with an introduction, such as *You know that guy I was telling you about that owns the cocker spaniels?* All three of these strategies accomplish a similar end of introducing the idea of the person I wish to discuss into the mind of the addressee. Once I am confident that the addressee can identify the correct individual, I can communicate the primary message *He's coming to dinner tonight*. Thus, we see that the interactional component of language is both deep and subtle. The structures of human language reflect our interactional needs.

Humans are creative and language is structured to take advantage of human creativity. All languages are constructed in a way that allows for the creation of novel utterances; any language can produce an infinite number of sentences. Therefore we cannot describe a language by simply making a list of all the possible sentences it contains. Instead, our task is to describe the design principles underlying language that make that infinite number of sentences possible. Obvious instances of human creativity with language include word games, puns, and puzzles. Humans also use language creatively when they innovate new expressions or use one or more words in a new way. For example, the English word *way* has been used for some time to intensify the meaning of certain types of quantifiers (*way too much, way more than necessary*) or prepositions (*way up, way over*). Younger speakers of some English dialects can now use this intensifier with adjectives; e.g., *way cool*. The use of *way* with adjectives can have specific affective (emotional) implications, e.g., *way unfair*. We don't know who first used *way* to intensify an adjective, but in doing so that person was performing a creative act, using the word in a new grammatical environment. People do this every day. Most of the time grammatical innovations are not repeated, but sometimes particular innovations catch on. Other speakers hear the innovation and use it themselves, spreading it wave-like across a significant portion of the **speech community**, a group of people who share a common language or dialect and cultural practices. If an innovation continues to spread, it could become a regular feature of the language and constitute a

language change. Many instances of language change are direct reflections of human creativity.

To summarize, just as language is deeply a part of humankind, the human element is deeply a part of language. The structures of language take the form they do because language is instantiated by the human body, as a tool of human communication, and is embedded in human interaction within societies and cultures. Language is at the core of what it is to be human, and humanity is at the core of language.

1.1.3 Language Is Dynamic and Adaptable

Language is in a constant process of change. The language you speak with your friends today is somewhat different from the way your grandparents spoke to their friends when they were your age. Chances are good that your own grandchildren will probably think that your speech sounds a little old-fashioned. While the difference between grandparents and grandchildren may not be dramatic, over a longer time span, for example, that between oneself and one's grandchildren's grandchildren's grandchildren, the cumulative effect of those generations becomes more noticeable. We can see this in the history of English. Consider the following passage, written by William Shakespeare just over three hundred years ago, and taken from the play *King Henry V*:

> Now, fie upon my false French! By mine honour in true English, I love thee, Kate: by which honour I dare not swear thou lovest me; yet my blood begins to flatter me that thou dost, notwithstanding the poor and untempering effect of my visage.

While educated English speakers will be able to understand this passage, children and adults with less formal education will find it difficult. It is easy to identify the linguistic features that mark this as archaic: the use of the old second-person familiar pronouns, *thee* and *thou*; the inflected verb forms *lovest* and *dost*; and the use of now antiquated words and expressions, such as *fie upon* and *visage*. When we look further back, for example at *The Canterbury Tales*, written by Geoffrey Chaucer more than six hundred years ago, the language becomes even harder to decipher. Consider these lines from "The Wife of Bath's Tale":

SIDEBAR 1.2

There are a number of websites that provide translations of Shakespeare into Modern English, including *No Sweat Shakespeare* (www.nosweatshakespeare.com). If you want to look up this passage, it is in Act V, Scene II.

> And if thou kanst nat tellen it anon
> Yet shal I yeve thee leve for to gon
> A twelf-month and a day to seche and leere
> An answere suffisant in this mateere;
> And suretee wol I han, er that thou pace,
> Thy body for to yelden in this place.

While some of it seems familiar and suggestive of meaning, much is unclear to the eye of the untrained modern English speaker. The passage is easier to decipher if one learns that *yeve* means 'give,' *seche and leere* means 'search and learn,' *suretee* means 'certainty,' and *yelden* means 'surrender.'

STOP AND REFLECT 1.1 **TRANSLATING OLD ENGLISH TO MODERN**

Try providing a modern English translation of the lines from "The Wife of Bath's Tale," and compare it with that given in Textbox 1.1.

TEXTBOX 1.1 **MODERN ENGLISH TRANSLATIONS OF *THE CANTERBURY TALES***

Here is one translation of the excerpt from "The Wife of Bath's Tale," provided by the online bookshop *Librarius* (www.librarius.com/canttran/wftltrfs.htm):

> And if you cannot tell it me anon, then will I give you license to be gone a twelvemonth and a day, to search and learn sufficient answer in this grave concern. And your knight's word I'll have, before forth you pace, to yield your body to me in this place.

Of course, you would never speak this way to someone in a conversation today. A more colloquial current translation might be "And if you can't tell me soon, then I'll give you permission to be gone for a year and a day, to find the right answer to this important question. I'll have you promise as a knight, before you leave, that you will give me your life in this place."

All aspects of language can undergo change. Sounds can enter a language or fall out of use. Sentence structures can shift in interesting ways. Words can develop into prefixes, suffixes, or other small linguistic units. Word meanings can be broadened, narrowed, or otherwise shifted. The social implications of using particular words and phrases can change over time, as can larger patterns, such as how we structure and present information.

Language adapts to the world around it. Think of all the vocabulary you use in daily life that your grandparents did not use when they were your age. The words *email, nanotechnology, cell phone*, and *internet* are just a few of the terms that reflect the technological changes that swept over us in the late twentieth century. In the meantime, words like *hogshead* (a large cask or barrel) and *demijohn* (a narrow-necked bottle enclosed in wicker) are not part of the vocabulary of most people living today (although they might persist in certain subgroups of the population). Changes in vocabulary can reflect social changes as well. The English word *spinster*, meaning an unmarried woman past the age of marrying, has vanished from everyday vocabulary in most of modern society, together with the idea that there is an age of marrying and that marriage and family are the primary goals of a woman's life.

While changes in vocabulary reflecting innovations or social change are probably the most obvious examples of the adaptability of language, languages also undergo adaptations under the influence of **language contact**. When speakers of two distinct languages interact with each other in large numbers over a period of time, one or both languages generally undergo change. An example of a language affected by language contact is English, which adopted huge numbers of words from French after the Norman invasion. Indeed, in the sentence you just read, the words *example, adopt, huge, number, French, Norman*, and *invasion* all came into English from French!

Language contact can have a much greater effect than simply adding new vocabulary. Sounds, word structures, and sentence structures can also take on qualities of adjacent

languages. For example, in the Tibeto-Burman language family (comprising over three hundred related languages distributed over Southeast Asia, Tibet, and the Himalayan region), the majority of languages place the verb at the end of the sentence. A simplified and translated version of a sentence with this word order might be, for example, *John apple ate*. However, there is one group of Tibeto-Burman languages, the Karenic group, which places the verb in the middle of the sentence. Thus, they would say *John ate apple*. Interestingly, speakers of the Karenic languages have been interacting for centuries with the Thai and the Chinese, and both groups speak languages that put the verb in the middle. It is clear that over the centuries, **bilingual** Karenic speakers matched their sentence structures to those of their neighboring languages. Thus, a significant change to Karenic grammar resulted from language contact through the medium of bilingualism. We see that languages adapt not only to the changing technological world but also to the broader social environments in which they are embedded.

1.1.4 Language Is Structured and Systematic

When one begins to look closely at language, one is immediately struck by the fact that ***regular and recurring patterns form the basis of linguistic structure***. To begin to explore this aspect of language, take a moment to work through the following small exercise on English grammar:

Regular Patterning of the English Past-Tense Suffix

In English most verbs have a predictable past-tense form. It is written as *-ed* but has different pronunciations. You can discover this in your own speech very easily. Pronounce the following lists of words and listen closely to the sound at the end of each word:

List A: *baked, blessed, heaped, puffed, crashed*
List B: *rubbed, waved, lagged, billed, hummed*
List C: *waited, faded, booted, coded, righted*

If you are a native English speaker and have a sensitive ear, you will have noticed that the words in List A end in <t>, the words in List B end in <d>, and the words in List C end in <ed>. We can now refer to these as the T-List, the D-List, and the ED-List.

Now try pronouncing the following three nonsense words, again listening carefully to how the suffix is pronounced in each word:

Word 1: *smipped*
Word 2: *croomed*
Word 3: *pluted*

Notice that you don't have to think for an instant which sound to put at the end, but that you automatically end Word 1 with <t>, Word 2 with <d>, and Word 3 with <ed>, even though these are nonsense words which you are unlikely to have ever heard or pronounced before.

Take a minute to examine the consonants that directly precede the suffix (i.e., the "pre-suffixal" consonants) in the T-List words. Now compare the pre-suffixal consonants in the D- and ED-List words. Notice that the lists are distinct; you don't find any of the T-List

pre-suffixal consonants in D-List words, etc. Now determine which lists Words 1–3 fall into, based on their pre-suffixal consonants.

You will see that Word 1 has a T-List consonant (p) and the suffix is pronounced as <t>, Word 2 has a D-List consonant (m) and the suffix is pronounced as <d>, and Word 3 has an ED-List consonant (t) and the suffix is pronounced as <ed>. You have discovered a systematic fact of English: the pronunciation of the past-tense suffix depends upon the pre-suffixal consonant. Even though Words 1–3 are nonsense words, they still follow the systematic patterns of pronunciation that form a significant part of the English language. We can state this pattern as follows:

(1) In English, the past tense *-ed* will be pronounced: as <t> following the consonants <k, s, p, f, sh>, as <d> following <b, v, d, l, m>, and as <ed> following <t> or <d>.

STOP AND REFLECT 1.2 **ALTERNATE PRONUNCIATIONS OF THE ENGLISH PAST-TENSE SUFFIX**

The statement in (1) is only part of the pattern, as not all possible consonants are exemplified. The lists for two of the groups are actually much larger than shown here. Can you determine which two groups these are?

This is a statement of a pattern or systematic fact of English (sometimes referred to as a rule). One can predict how the past tense *-ed* will be pronounced on any English verb as long as one knows the pre-suffixal consonant.

Once we have observed a regular pattern in language, we ask the question: *Why should this pattern occur?* This question is critical, because it takes us from recognition and description of a pattern to a search for an explanation of the observed facts. In this case, the explanation is physiological, based on how we produce sounds in our vocal tracts. Since this is a topic covered in the next chapter, we will not go into detail here. The important point is that ***patterns in language can be explained by the function of language as a system of human communication***. In this case, the explanation comes from the embedding of language in our human physiologies; in other cases, other aspects of the functional role of language explain linguistic patterns.

Regular patterns such as this occur in every language many times and at many levels. Some patterns are concerned exclusively with sounds, other patterns are found at other levels, such as word structure or sentence structure. One of the fascinating aspects of language is the interaction of these patterns, which at times can be quite complex. All the patterns in a language that explicitly involve sounds make up the "sound system" or **phonology** of a language; the patterns which involve word structure make up the **morphology**, while the patterns which involve sentence structure make up the **syntax**. Each of these subsystems of language is independent, but each is also interwoven with the others. In the example above, both the phonology (in this case, which sound is pronounced where) and the morphology (the past-tense suffix *-ed*) are involved. The morphology and syntax of a language are together referred to as the language's **grammar**. For further discussion of the sub-areas examined in linguistic analysis, see Textbox 1.2.

TEXTBOX 1.2 **LINGUISTIC ANALYSIS**

Many examples of systematicity in language will be presented throughout the following chapters. One of the goals of this book is to teach you how to recognize and analyze systematic patterns in a wide variety of languages, that is, how to perform **linguistic analysis**. This requires learning the common – and sometimes the rare – linguistic categories that are found in the languages of the world, the terminology that accompanies those categories, and the theories underlying them. Linguistic analysis requires logical thought, a clear understanding of linguistic concepts, and concise description and argumentation.

Once linguistic structures are accurately described, the analysis is completed by explanation. The critical question is: *What motivates the linguistic structures to be formed in precisely that way?* This question goes to the very core of linguistic theory. The answer will depend crucially upon the particular structure being explained. There are a number of distinct domains that may contribute to it, including meaning (**semantics**), how the structure is used in context (**function**), factors related to history (**language change**), the physical properties of sound (**phonetics**), and the structure of the human brain and how we learn and process knowledge (**neurology**, **cognition**).

On the other hand, no language is perfectly systematic. Although there are sometimes patterns within patterns within patterns, there are often pieces that don't fit into any regular pattern, but which have idiosyncratic, or irregular, behavior. This is in large part due to language change. The irregularities are leftovers from older patterns that have been obliterated, as new structures emerge and spread through the language.

As an example, consider the English verb *shine*. This verb is a bit irregular as it has two forms of the past tense, *shined* and *shone*. The form *shined* is constructed by adding the regular past-tense suffix to the verb stem and following the rule of past-tense formation we just discovered (*shine* ends in a D-List consonant). The form *shone* is a reflection of an old pattern where past tense was indicated by changing the vowel in a verb's root. This pattern was inherited from an earlier stage in the language. It has largely died out, but traces of it remain in a handful of verbs, especially those that are used frequently and are therefore resistant to change (for example, *take/took, drive/drove*). In the development of English, the marking of past tense by *-ed* gradually spread through the vocabulary, supplanting the older forms. This process has not been completed with the verb *shine*, and both past-tense forms coexist in the modern tongue. Thus, this irregularity of the language has a historical explanation. Irregularities in language usually result from language change.

1.2 Languages

1.2.1 Languages of the World Today

Languages are spoken – and signed (see Textbox 1.3) – across the globe. People are spread over the earth from the tip of Tierra del Fuego to the Arctic North, and wherever there are people, there are languages. Think for a minute about each of the continents and their communities. How many languages do you think there are in the world?

TEXTBOX 1.3 **SIGN LANGUAGES**

Sign languages are natural languages that have arisen wherever deaf people have come together to form a community. *Ethnologue* (2016) lists 138 sign languages in the world. Like spoken languages, sign languages are structured, systematic, change over time, and can be used to communicate all the complex concepts that people convey to one another over the course of a lifetime. Like spoken languages, many sign languages are endangered and need people to document them.

The question is more difficult than it first appears. The truthful answer is that we don't have an exact count, although we are able to make an educated guess. There are two primary reasons why counting up languages is tricky. One is that linguists haven't identified all the languages of the world yet. There are still speech (and sign-language) communities that follow their traditional ways of life and who have had little interaction with larger population groups or researchers. The languages of these groups are still undescribed. However, there is also a more fundamental problem in counting up languages, which is that it is difficult to decide which speech varieties should be counted as languages and which should be counted as dialects of a single language.

Let's consider possible criteria for distinguishing languages from dialects. One obvious place to start is **mutual intelligibility**: Can the speakers of the two language varieties understand each other? The criterion of mutual intelligibility, taken to its logical conclusion, suggests that if they can understand each other, the two varieties are to be considered dialects of a single language; if they cannot understand each other, the varieties are to be considered distinct languages. One problem with this criterion is that there are often multiple varieties of a language, and while speakers of adjacent varieties can understand each other, speakers of geographically separated varieties have a much harder time. This situation is schematized in Figure 1.1:

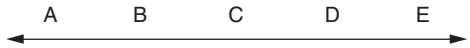

Figure 1.1 Schematization of language varieties

In Figure 1.1, each letter represents speakers of different varieties and the arrow represents geographic distance. While speakers of A might easily understand speakers of B and C, it might take effort to understand speakers of D, and it might be quite difficult to converse with speakers of E. Similarly, speakers of E might have no problem speaking with those of D and C but might have more difficulty with speakers of A. So, are A and E different languages? If so, where does one draw the dividing line? This situation is known as a **dialect continuum**, and it represents a common situation throughout the world.

SIDEBAR 1.3
For an example of a dialect continuum, see the Seneca Language Profile, Section LP13.1.

Of course, Figure 1.1 is highly idealized. Communities aren't usually ranged along a straight road with distinct boundaries, and there is often movement and intermarriage

between the various groups. However, the problem remains of whether mutually unintelligible A and E should be counted as one or two languages. We can see that the question itself is overly simplistic and obscures the more complex reality of the dispersion of language varieties and their speakers.

Another problem with the criterion of mutual intelligibility is the word "mutual." This implies that speakers of both speech communities are equally at ease or equally perplexed when hearing the speech of the other. However, there are many cases of unidirectional intelligibility, that is, speakers of Group A can understand the speech of Group B, but not the other way around. This situation especially occurs when the Group A variety is spoken by a minority group and the Group B variety is a **standard language**, taught in schools and used in print and broadcast media. In this situation, the Group A speakers have repeated exposure to the B variety and so can understand it. The Group B speakers, on the other hand, may never have heard the speech of Group A, so they find it surprising and difficult. It is not always clear whether these varieties are different dialects or different languages.

Another reason for the difficulty in counting up languages is that there is a complex relationship between language and ethnic identity. Consider the case of the Newars, an ethnic group which traditionally ruled the Kathmandu Valley in Nepal. While the largest concentration of Newars is in the Kathmandu Valley itself, there are other Newar communities scattered throughout the country. One variety of Newar is spoken in a village called Dolakha, quite a distance to the east. The Dolakha and Kathmandu speech varieties are truly mutually unintelligible. People from these two Newar communities cannot speak to each other in Newar but must use the national language Nepali to converse. If the question of language versus dialect were to be based solely on mutual intelligibility, then these two varieties would count as separate languages. However, the Dolakha Newars are ethnically Newars in every sense of the word. They have the same customs, social structures, festivals, and traditions, and they intermarry with Newars from other parts of Nepal. Crucially, their language, even though mutually unintelligible with the other varieties, still serves to distinguish the group ethnically from non-Newars, so it is a marker of Newar ethnic identity. The language is thus Newar in a very real and relevant sense to the speakers of the language itself. The function of the language as a marker of ethnic identity would suggest that the Dolakha variety is a Newar dialect, not an independent language. The criteria of mutual intelligibility and ethnic identity thus lead us to different conclusions on the question of language versus dialect.

The opposite situation can be found with Swedish and Norwegian, two of the Scandinavian "languages." These two speech varieties are easily mutually intelligible. However, a national boundary and ethnic identity divide the two groups; hence, they are considered to speak distinct languages rather than dialects of a single language. Such circumstances motivated the famous quip by the Yiddish linguist Max Weinreich: "A language is a dialect with an army and a navy." Sociopolitical and ethnic considerations clearly have significant weight in the language/dialect debate.

SIDEBAR 1.4
For more discussion of the terms **dialect** and **language**, see Section 11.2.2.

While acknowledging that there are inherent difficulties in counting up the languages of the world, we still want to know roughly how many there are. The most current compilation

Figure 1.2 Newars at the temple complex in Patan, Nepal

TABLE 1.1 Distribution of languages across continents

Area	Number	Percentage
Africa	2139	30.1
The Americas	1062	15.0
Europe	287	4.0
The Pacific	1313	18.5
Asia	2296	32.4
Total	7097	100.0

of statistics on the world's languages is found in *Ethnologue: Languages of the World* (available online at www.ethnologue.com). My source for the statistics in the following discussion is the internet version of the nineteenth edition (Lewis et al. 2016), which puts ***the total number of known languages at 7,097***. How close was that to your own estimate?

The distribution of languages across continents is given in Table 1.1 (note that "the Americas" include North, South, and Central America, and "the Pacific" includes Australia,

TABLE 1.2 Number of languages by size of speech community

Number of speakers	Number of languages	Percentage
100 million to 1 billion or more	8	0.1
10 million to 100 million	84	1.2
1 million to 10 million	306	4.3
100,000 to 1 million	944	13.3
10,000 to 100,000	1808	25.5
1,000 to 10,000	1979	27.9
100 to 1,000	1070	15.1
10 to 99	337	4.7
1 to 9	132	1.9
0	220	3.1
Unknown	209	2.9

New Zealand, and the Pacific Islands). Table 1.1 shows the number and percentage of the world's languages spoken or signed on each continent.

Note that the languages of Europe account for only 4 percent of the total number of languages of the world, while Asia and Africa have more than 30 percent each.

Table 1.2 presents statistics on the world's languages in relation to the size of the speech communities of native speakers.

Table 1.2 shows that there are very few languages with very large numbers of speakers; only 5.6% of the world's languages have more than a million speakers. On the other hand, 53% of the world's languages have fewer than 10,000 speakers. When we combine these numbers with population statistics, the results are quite striking. ***Roughly 94% of the world's population speaks only 6% of its languages. The remaining 94% of the languages are spread over only 6% of the population.*** Thus, we have a handful of languages with enormous speech communities and a very large number of languages with quite small speech communities.

1.2.2 Languages of the World Tomorrow

While there are around 7,000 languages spoken or signed on the globe today, not all languages are equally robust. Over time patterns of language use in multilingual communities can shift so that a socially dominant language comes to be used more frequently and less-dominant languages are used in fewer social contexts and among fewer people. Such languages are described as **endangered**, at risk of ceasing to be spoken in the absence of conscious efforts to keep them vital. According to *Ethnologue*, ***about 35 percent of the***

world's languages can be classified as losing speakers or being further along the endangerment process.

The endpoint of the language endangerment process is **language death**, which occurs when a language ceases to have speakers and no longer serves as a symbolic marker of identity for the community. Normally the process of endangerment occurs gradually, over three or more generations. It involves a cessation in **language transmission**, the passing on of a language from one generation to the next. When children don't learn the language, the only remaining speakers are adults. That population naturally ages and declines until only a handful of speakers remains. In the absence of community efforts to reverse the trend, the language can cease to be spoken. If it ceases to be a cultural resource for the community, it is classified as extinct. (For a discussion on what is lost when a language ceases to be spoken, see Textbox 1.4.)

TEXTBOX 1.4 **WHAT IS LOST WHEN WE LOSE A LANGUAGE?**

Does language death matter? Linguists and members of many speech communities answer with a resounding "yes." Each language is a testament to the ways in which a unique group of people has understood and interacted with their environment and has come to terms with the human condition. Each is a unique inheritance from countless generations of forebears, the encapsulation of their wisdom and knowledge. Each language reflects and instantiates the culture of the speakers. Each contains knowledge, traditions, and history. Each represents what a language can be and so enriches our understanding of this central aspect of our humanity.

"Surely, just as the extinction of any animal species diminishes our world, so does the extinction of any language. Surely we linguists know, and the general public can sense, that any language is a supreme achievement of a uniquely human collective genius, as divine and endless a mystery as a living organism. Should we mourn the loss of Eyak or Ubyky any less than the loss of the panda or California condor?"

(Professor Michael Krauss, Alaska Native Languages Center)

There are a number of reasons why languages become extinct. Sometimes the process of language death has been brought about by explicit government policies designed to keep children from learning their native language. However, language extinction is not limited to communities targeted by such policies. Language endangerment and death appear to be primarily fueled by the broader process of globalization, including a shift from agrarian to urban lifestyles, and the increasing dominance of a small number of languages for the purposes of commerce, education, and the media. These include both the truly widely spoken languages, like Mandarin Chinese, English, Spanish, Hindi-Urdu, and Arabic, and smaller national languages, like Nepali, Greek, Georgian, and Thai. Often acquisition of such languages is necessary for anyone wanting to pursue an advanced education or a career in modern society. Thus, parents are under pressure to have their children educated in these languages and therefore choose to transmit these languages as opposed to those of the heritage communities.

Another element that can contribute to the loss of a language is the loss of the coherence and vitality of the speech community. If the members of a small speech community become

Figure 1.3 Members of the Gusii community in Kenya record traditional songs and dances as a component of their documentation of the Ekegusii language and Gusii culture (photo by Kennedy Bosire)

absorbed into a larger group through intermarriage, the community can become dispersed. Where there is no viable speech community, there is little reason to pass the language on to the children; neither will the children hear the language spoken with sufficient frequency to acquire it.

The recognition of the scope of the problem of language endangerment has led to significant work by members of endangered-language speech communities and linguists to record, preserve, and revitalize languages. **Language documentation**, the creation of an extensive record of a language and its community, is an important part of this process. **Language conservation** is also being undertaken in many communities, which are developing materials to be used in the education of children and to promote language use in the speech community. **Language revitalization** is undertaken by speech communities whose language has been entirely lost or significantly reduced. Such projects can do much more than simply teach the language; they can play significant roles in strengthening communities and in promoting the preservation of traditional knowledge, practices, cultural values, and institutions.

1.3 Linguistics

1.3.1 The Scientific Study of Language

Now that we have learned a bit about language and about the world's languages, we turn at last to the topic of linguistics. ***Linguistics is the scientific study of language***. By

"scientific," we mean that the study is both **empirical** (based on observable data) and **objective**. Empirical data is critical for any scientific discipline, as it ensures that others can verify or replicate the findings. The term **linguist** refers to a person who examines the structures and principles underlying languages. Note that this is different from a **polyglot**, a person who speaks many languages. For more on this distinction, see Textbox 1.5.

TEXTBOX 1.5 **LINGUIST VERSUS POLYGLOT**

The longer you study linguistics, the more likely it is that someone will ask you the question: "How many languages do you speak?" This question illustrates the commonly held misconception that linguists are polyglots. It is important to distinguish between the two. A linguist is a person who examines the structures of languages and the principles underlying those structures. A polyglot is a person who speaks many languages. Many linguists are, indeed, polyglots, but you don't have to be a polyglot to study linguistics. A nice analogy can be made to pilots and airplane mechanics. A pilot knows how to fly an airplane, based both on training and on an instinctive sense of flight and how a plane responds to a particular manipulation of the controls. An airplane mechanic looks inside a plane and knows how each part contributes to the workings of the whole. One doesn't need to be an airplane mechanic to be a pilot. Neither does one need to be able to fly a plane in order to be a mechanic. A linguist is like a mechanic, looking inside to see how the parts of the language fit together so that the language can function in human communication. The speaker is the pilot, able to use the language efficiently and effectively, but without necessarily knowing how it works.

Probably the best airplane mechanics are also pilots, and in the same way, the most insightful analysis of the language will come from someone who speaks it, but a linguist can make a tremendous amount of headway on the analysis of a language without speaking it.

In linguistics, empirical data are recordings of spoken or written language, collected into a corpus. The nature of the recordings and how they are collected will depend on the goals of the study. For example, if one wishes to study the physical properties of sounds, the best recordings might be those produced in the isolation of a sound booth. If one wishes to study sentence structures and how they are used, the best recordings are likely to be natural conversations or narratives, supplemented by the comments of native speakers that reflect their intuitions about the structures and their meanings in that particular context. If one is studying language and society, one might choose to make video recordings of authentic interactions. In any case, recorded data, preferably of speech or writing produced in a natural setting, and not constructed by or for a linguist, are the most highly empirical and can be verified by subsequent researchers. This is not to say that this is the only type of useful data in linguistics. Speakers' intuitions about their language, particularly regarding subtle distinctions in meaning, add a depth to our understanding that we could not possibly obtain otherwise.

SIDEBAR 1.5
Not all languages have writing systems; see the brief discussion of the status of unwritten languages in the Seneca Language Profile, Section LP13.2.

When we say that a science is objective, we mean that our analysis is not biased by any preconceived notions, or judgments of "good" and "bad." Human beings are prone to prejudice, and this can be directed at speakers of languages just as it is directed at ethnicities,

religions, sexualities, styles of dress, or any other characteristic by which people are subgrouped. It is not uncommon to find languages described as "primitive," "corrupt," "illogical," "ugly," or just plain "bad." By contrast, other languages can be described as "perfect," "logical," or "beautiful." To take an example from the United States, some speakers of American English believe that the dialect of English spoken in certain African-American communities (referred to as African-American English, or AAE) is "corrupt" or "ungrammatical." People with this view cite AAE sentences like *She sick* and *She be sick*, and claim that they are "incorrect," since they differ from the Standard American English sentence *She is sick*. In actuality, AAE is making a grammatical distinction in these two sentences that is not marked in the grammar of Standard American English. The sentence *She sick* refers to a present situation; it simply states that the person is sick now. This sentence could be used, for example, to explain why someone is unexpectedly absent. The sentence *She be sick* means that she is often sick or has a long-term illness. The implication is that the illness is ongoing and lasts for an extended period of time. This meaning distinction between a present state and an ongoing state is systematically made by the grammar of AAE (as well as by many other languages in the world). Of course, speakers of Standard American English can still signal this meaning if they want to, for example, by using an adverb such as *always*, but its use is not grammatically required. This doesn't mean that AAE is any "better" than Standard American English; the two dialects are just different. ***Every language or dialect is unique in the types of distinctions it makes. Every language is equally able to convey all of the complex meanings that humans communicate to each other in the course of a lifetime***. Languages differ in which distinctions they grammatically require their speakers to make, and in which meanings can be expressed by other, non-grammatical, means.

SIDEBAR 1.6
See the African-American English Language Profile (LP11) for an extensive discussion of this dialect.

An important distinction can be made between prescriptive and descriptive approaches to language. A **prescriptive** approach to language is one that teaches people the "proper way" to speak or write. Many children are exposed to prescriptive grammar in school, where they are taught, for example, not to split infinitives (e.g., *to boldly go*) or to end a noun phrase with a preposition (e.g., *the man I saw you with*). Prescriptive grammarians choose a set of forms that they enjoin others to adhere to. These forms represent a (slightly) older stage of the language when the rules were regular, so the establishment of prescriptive rules reflects a resistance to the natural forces of change. In actuality the set of forms chosen for prescription are ultimately arbitrary; there is no logical reason why one should not split an infinitive or end a sentence with a preposition. Prescriptive rules may still have social ramifications, however, and there are environments (such as academic writing) where ignoring these conventions can have negative social consequences (such as lower grades).

A **descriptive** approach to language is one that describes how people actually use language. Descriptivists are not interested in telling people what is right or wrong, but in observing, describing, and explaining actual linguistic behavior. In line with the objective nature of linguistic science, linguistics is a descriptive enterprise.

1.3.2 Fields of Linguistics

The field of linguistics is as broad and multifaceted as language itself. The following paragraphs provide a very brief orientation to the primary subfields of the discipline. As in the rest of this book, this presentation will take the traditional hierarchical approach to language, beginning with the smallest units and working up to larger and larger levels.

We will begin with the study of speech sounds. The physical properties of sounds – how they are articulated and perceived, and the acoustic signatures of the sounds themselves – are the subject of study in the field of **phonetics**. We will then examine the systematic use of speech sounds in language, or **phonology**.

STOP AND REFLECT 1.3 **VOWEL-LENGTH DIFFERENCES**

Try saying the English words *lack* and *lag*. If you pay attention to your mouth and listen carefully, you will notice that the vowels in these words are produced with the same tongue position, but that the vowel in *lack* is a bit shorter than that in *lag*. This is a phonetic observation, which could be verified by measuring the vowel durations in an acoustic display on a computer screen. Now say *lake/leg, pick/pig*, and *lock/log*; you will find that the vowel is always shorter before /k/ and longer before /g/. The same pattern is found before /p/ and /b/ (*lap/lab*) and /t/ and /d/ (*fat/fad*). We see that these sounds pattern in a systematic way. Such systems of sounds form the **phonology** of a language.

From the study of sounds we move to the study of words themselves. The ways in which words are structured and created are the purview of the field of **morphology**. Morphologists look at all the pieces of words (roots, prefixes, suffixes, etc.), their sounds and meanings, and the principles of their combination. The study of how words combine into phrases, clauses, and sentences is the study of **syntax**. Morphology and syntax are tightly integrated and are often referred to as **morphosyntax** or (in some uses) **grammar**.

STOP AND REFLECT 1.4 **MARKERS OF NEGATION**

Languages differ in how they mark negation. In some languages, markers of negation are independent words (English *not*, Italian *non*), while in others they are prefixes (Dolakha Newar *ma-na* 'didn't eat'), suffixes (English *didn't*), or a combination (French *n'est pas*). Think of another language that you are familiar with. Is negation marked by an independent word or an affix?

Languages also differ in the number of negation markers they have. Wayampi, a language of northern Brazil, has four markers of negation. The study of the forms, meanings, and uses of these markers falls under the field of morphology.

A critical aspect of language that interacts with all of these levels is **semantics**, meaning in language. The study of semantics includes the study of word meanings (**lexical semantics**) and the study of how meanings combine in clauses and sentences (**propositional semantics**).

When we look at how speakers use linguistic structures in larger stretches of speech, we are studying **discourse**. This field takes into account the interactional nature of language, for example, how speakers need to present their ideas in a way that allows hearers to understand them. With the help of computers, linguists can now look at statistically significant

patterns over very large sets, or **corpora**, of discourse data; this methodology is referred to as **corpus linguistics**. The role of the broader context in interpreting linguistic form and meaning is examined in the field of **pragmatics**. A large part of the context of speech comes from its embedding in the society and culture of its speakers. This field of study is **sociocultural linguistics**.

STOP AND REFLECT 1.5 **CONVEYING AND INTERPRETING SOCIAL MEANINGS**

You are studying in the library. Two people come in talking loudly. They sit at the table next to you and continue to talk loudly about the party they went to. They ignore your glares and those of other people in the room. Finally you say, *"Hey, could you speak up? I missed that last part."* How is it that the people can interpret this as a request to be quiet? The answer lies in the field of pragmatics.

The field of **historical linguistics** examines how languages change over time. This historical perspective can be applied to all levels of language: sounds, words, structures, and meanings. Historical linguists are also interested in determining which languages are related and how they have descended from a mother language, which was spoken in the distant past (see Textbox 1.6 for one such example). But languages don't evolve in isolation. Instead, they often influence each other as their speakers interact over time. The study of such **language contact** is a subfield of historical linguistics.

TEXTBOX 1.6 **HISTORICAL LINGUISTICS SHEDS LIGHT ON PREHISTORIC MIGRATIONS**

Historical linguistics can tell us much about human prehistory. In many cases, we can trace how populations have migrated across the globe. For example, most of the languages of the Athabascan family are spoken by native communities located between the Yukon region of Alaska down the Pacific coast of North America to northern California. However one branch of the family, which consists of Apache and Navajo, is spoken in the southwest of the United States. Linguists were able to use principles of historical linguistics to discover that the Apachean languages are, indeed, members of the Athabascan family, and to therefore deduce that speakers migrated from the Pacific Northwest to the American Southwest in a prehistoric time period.

Our linguistic capabilities are critically embedded in our neurology and our ability to think. The field of **language and the brain** examines the physical and neurological basis of language, while **cognitive linguistics** looks at how language is instantiated by our broader cognitive processes. A related field is **language acquisition**, which studies how language is learned by children (**first language acquisition)** and by adults (**second language acquisition**).

Computational linguistics is a field at the intersection of linguistics and computer science that deals with the statistical or rule-based modeling of natural language. It is concerned with applying methods from artificial intelligence and machine learning to problems involving language. The recent acceleration of our technological abilities has led to a greater application of computational methods to a wide range of linguistic questions, such as how languages are learned.

TEXTBOX 1.7 ORDERINGS OF SUBJECTS, VERBS, AND OBJECTS ACROSS THE GLOBE

When we look at sentence structures across languages, we notice that languages differ in the relative ordering of the subject (*Chris* in *Chris ate the apple*), the object (*the apple*), and the verb (*ate*). There are six logically possible orderings of these three categories:

Subject-Object-Verb
Object-Subject-Verb
Verb-Subject-Object
Subject-Verb-Object
Object-Verb-Subject
Verb-Object-Subject

However, all six orderings are not equally instantiated in the world's languages. A famous study of these orderings found that languages which put the subject first are very common, those that put the verb first are much less common, and those that put the object first are very few indeed. Why this should be, and the theoretical implications of this fact, is a question addressed in linguistic typology.

We find languages throughout the world. The field of **linguistic typology** looks at how the world's languages are similar and different. See Textbox 1.7 for an example of this. Typologists are interested in developing a classification of languages based on how they are structured, and in looking for relationships between certain structural language types.

There are many applications of linguistics to situations in the world around us. The field of **applied linguistics** includes a number of subfields, including language teaching and **forensic linguistics**. Recently, there has been a strong move toward **language documentation**, the creation of a record of a language that can be used by speech communities and others in the face of possible endangerment or language death. Of course, linguistics is also a key part of the field of **speech pathology** and **speech and hearing sciences**. Thus, the study of linguistics can lead to a wide range of careers, as discussed in Textbox 1.8.

This list of subfields of linguistics is fairly representative but is certainly not exhaustive. While we will not be able to touch on all of these fields in this book, we will cover most of them. The fields are diverse enough that there is usually something to interest everyone, and some readers will find that they are interested in everything.

TEXTBOX 1.8 LINGUISTICS AS A GATEWAY TO CAREERS

Because language is a pervasive aspect of human life, a degree in linguistics can lead to a wide variety of careers. Linguistics majors develop important professional skills that would be valued by any employer: data analysis, reasoning, argumentation, communication, writing, cultural sensitivity, and an appreciation of diversity. Many linguistics students also gain experience in teamwork, collaboration, and leadership, and many speak multiple languages.

A background in linguistics is especially well suited for speech pathology (which trains speech therapists to work with children or adults with speech disorders), language teaching, and speech technologies. Linguistics students also go on to careers in translation, education, law, government, journalism, publishing, lexicography, and a wide variety of industries, including marketing and data analytics. Many students also go on to doctoral study in linguistics, anthropology, psychology, or related fields, which opens the door to research and teaching at the college and university level, in addition to the careers listed above.

CHAPTER SUMMARY

Human languages are complex, structured, and dynamic systems of human communication, which change over time under a variety of influences. While it is impossible to exactly count the number of languages of the world, our current estimate is in the range of 7,000. However, these are not evenly distributed, as most of the world's population speaks one or more of a small number of dominant languages, while a small percentage of the population speak one of many languages with comparatively few speakers, many of which are endangered.

Linguistics is the scientific study of language. It is empirical and objective. Linguists seek to describe succinctly the structural properties of languages, and to understand their interactions, how they change, and how they serve the broader functions of language as a tool of communication that is embedded in human physiology, cognition, interaction, society, and culture. Explaining how individual languages work and how language works more broadly constitutes the aim of linguistic theory.

SUGGESTIONS FOR FURTHER READING

Baker, **Anne**, **Beppie van den Bogaerde**, **Roland Pfau**, and **Trude Schermer** (eds.). 2016. *The linguistics of sign languages: An introduction*. Amsterdam and Philadelphia: John Benjamins.

This is an introductory textbook that introduces the linguistics of the sign languages of the world. It provides a comprehensive overview, from phonetics and phonology through syntax, discourse, psycholinguistics, language change, and bilingualism.

Deutscher, **Guy**. 2005. *The unfolding of language*. New York: Metropolitan.

This book is an entertaining exploration of how languages change and evolve through the forces that shape human language.

Evans, **Nicholas**. 2010. *Dying words: Endangered languages and what they have to tell us*. Chichester, West Sussex: Wiley-Blackwell.

This book illustrates the richness of knowledge inherent in human languages, the implications of diverse linguistic systems for our understanding of the mind, and what is lost when a language becomes extinct.

Lewis, **M. Paul**, **Gary Simons**, and **Charles D. Fennig** (eds.). 2016. *Ethnologue: Languages of the world*, 19th edn. Dallas, TX: SIL International. (Online version: www.ethnologue.com)

An excellent reference tool, this is a comprehensive catalog of the known languages of the world, their geographic distribution, demographics, vitality, and status.

Sapir, **Edward**. 1921. *Language: An introduction to the study of speech*. New York: Harcourt, Brace and Company.

A classic and accessible introduction to the study of language by one of the great linguists of the twentieth century.

EXERCISES

1. For each of the following statements, determine whether the facts stated are diachronic (indicating how language has changed over time) or strictly synchronic (true of a language now).

   a. To negate a sentence in English, the word *not* is used.
   b. Many words in English were borrowed from French, then adapted to the English sound system.
   c. Chinese differentiates words by changing the pitch.
   d. In Mexican Spanish, the word *pollo* 'chicken' has a "y" sound represented by the letters ll; this developed from an "ly" sound that is still present in other dialects.
   e. The word *silly* in the twelfth century had a meaning of 'happy,' 'blessed,' 'pious,' and 'innocent,' which over time was extended to 'pitiable,' 'weak,' and its current meaning.
   f. The word *fie* is rarely used in contemporary English.

2. Provide an example of each of the following:

   a. arbitrariness in language
   b. mutually intelligible dialects
   c. an endangered language
   d. a factor which might contribute to language endangerment
   e. an example of language change
   f. a systematic fact of English that is not discussed in Chapter 1

3. Which of the following statements are descriptive and which are prescriptive?

   a. The sentence *Who did you give it to?* is incorrect since it ends with a preposition.
   b. The sentence *Who did you give it to?* ends with a preposition.
   c. Always say *John and I*, never *John and me*.
   d. In English, numerals are never placed between an adjective and a noun, so *black three dogs* is ungrammatical.
   e. *Ain't* is used in a variety of English dialects.

4. Go to the website *International Dialects of English Archive* (www.dialectsarchive.com) and click on the global map. Each of the pointers indicates a profile of a speaker of English; click on the pointer to bring up a box with metadata on the profile: title, speaker age, location, etc. Click on the title in this box (e.g., "Russia 13") to bring up the full profile page. Each profile includes a sound file, beginning with the speaker reading a short passage and then transitioning to talking informally about themselves.

   Explore the site and choose six profiles, one from each of the following countries: Canada, the United Kingdom, China, Jamaica, Mexico, and Zimbabwe. For each profile, list the following: the title of the profile and the gender, age, birthplace, and educational background of the speaker. Listen to each sound file in full and record any observations you can make on the sounds, words, or grammatical features.

5. Go to the website of the *UNESCO Atlas of the World's Languages in Danger*. (www.unesco.org/languages-atlas) The top left box of the search tools allows you to select a country or area. The number of endangered languages in each country or area is given in parentheses. When you choose one and click on "Search Languages," a map of the country will be displayed with the location of the endangered languages indicated by markers. The color of the marker indicates the endangerment status of the language, as indicated by the key to the right above the map. The particular languages are given in alphabetical order to the right of the map.

   a. Using the dropdown menu, provide the number of endangered languages in each of the following countries: Australia, Canada, China, Denmark, France, Guatemala, India, Iran, Kenya, Mexico, Panama, Portugal, the Russian Federation, Senegal, the United Kingdom, and the United States.
   b. Click on the United States and "Search Languages" to bring up a map and list of endangered languages on the right. Click on each of the following languages in the alphabetical language list to bring up a box with basic information about the language. List the number of speakers and the given endangerment status for each of the following languages: (i) Nez Perce, (ii) Central Alaskan Yup'ik (not the one on Nunivak Island), (iii) Cherokee, (iv) Barbareño (Chumash), (v) Hawai'ian, and (vi) O'Odham (Tohono).
   c. Using the map, choose four other languages of varying endangerment statuses. List their names, populations, and statuses.

6. Find a speaker of a language with which you are unfamiliar. Ask this person to translate the following sentence. Be sure to ask for the most natural way to express the meaning, rather than a word-by-word translation of the English.

   My two aunts will fly back tomorrow and I will meet them at the airport.

   a. Ask the speaker to help you sound out the sentence and write it down (you don't have all the skills you need for this yet, but just do your best).
   b. Compare the English sentence with the sentence in the language of your study. Make a list of any differences that you find between the two languages. For example, they may differ in the number of words used, the order in which they appear, in how they signal future tense, in which words have prefixes or suffixes and what those mean, in the meanings of specific words, in whether or not they use "and" to join sentences, etc.
   c. In submitting your answer, state the language of study and where it is spoken, include your transcription of the sentence in the other language, and list as many differences as you can find.

7. Assume you were enrolled in a class that you found frustrating and in which you were not doing well. Write down how you would express this in one or two sentences to your best friend, to your parents, and to your college dean (e.g., on a petition to drop the course). Note down any differences in your choice of words. How is this illustrative of the relationship of language and societal structure?

8. Go to the website of the *Endangered Languages Project* (www.endangeredlanguages.com); you can also find the video on YouTube. In the search box, type in North Sami, click on the 'Resources' tab, and then select the short video entitled "Samigiella – An Arctic Nature Language." Watch the video (be sure to choose the English language version) and answer the following questions:

   a. Where is Sami spoken?
   b. What languages is Sami related to?
   c. Does Sami have distinct dialects?
   d. What does the author mean when she describes Sami as a "nature-based" language? What might be the value of documenting a language of this type?
   e. What percentage of Sami speakers now speak the language?
   f. Why has the vitality of the language declined?
   g. Why is it important to focus revitalization activities on Sami children?

2 Phonetics

Physical Dimensions of Speech Sounds

KEY TERMS

- Subglottal system
- Voicing
- Voiced vs. voiceless consonant
- Orthography
- Fundamental frequency vs. pitch
- Supralaryngeal vocal tract and its subparts (lips, alveolar ridge, etc.)
- Places of articulation (bilabial, labiodental, etc.)
- Manners of articulation (stop, fricative, etc.)
- Obstruent vs. sonorant
- International Phonetic Alphabet (IPA)
- Vowel
- Co-articulation
- Suprasegmental

CHAPTER PREVIEW

Phonetics is the branch of linguistics that is concerned with the scientific study of speech sounds. The study of phonetics can provide answers to many questions that you might have wondered about at one time or another. For example, what does it mean to say that someone has a higher-pitched voice than someone else? What makes a tone language like Mandarin Chinese different from a non-tonal language such as English or Spanish? How do English pairs of words such as the verb *import* and the noun *import* differ?

Several areas of phonetics have been the focus of research into the features of speech. **Articulatory phonetics** is concerned with how the vocal organs produce speech. **Acoustic phonetics** deals with the physical characteristics of speech, such as the duration, frequency, and intensity of sounds. **Auditory phonetics** examines the perception of speech by the auditory system. Acoustic, articulatory, and auditory phonetics are all interrelated, since changing the articulatory configuration of the vocal tract results in acoustic changes which in turn potentially influence the perception of a sound. In this chapter, we will consider the first of these areas of phonetic research, providing an overview of the field as well as answers to the questions posed above. Students will be introduced to the tasks of discerning different speech sounds, describing them in phonetic terms, and accurately recording them using the International Phonetic Alphabet.

LIST OF AIMS

At the end of this unit, students will be able to:

- **identify the parts of the vocal tract responsible for producing different sounds;**
- **describe the manner and places of articulation of consonants and vowels;**
- **produce the phonetic symbols for English sounds;**
- **transcribe English words using the IPA;**
- **read English words and passages written in the IPA;**
- **use the IPA chart as a reference for sounds in languages other than English.**

2.1 The Speech Organs

The physical production of speech requires intricate coordination between several parts of the upper body, from the stomach all the way up to the nose. It is common to divide the speech organs into three subsystems (see Figure 2.1): the subglottal system, the larynx, and the supralaryngeal (or supraglottal) system.

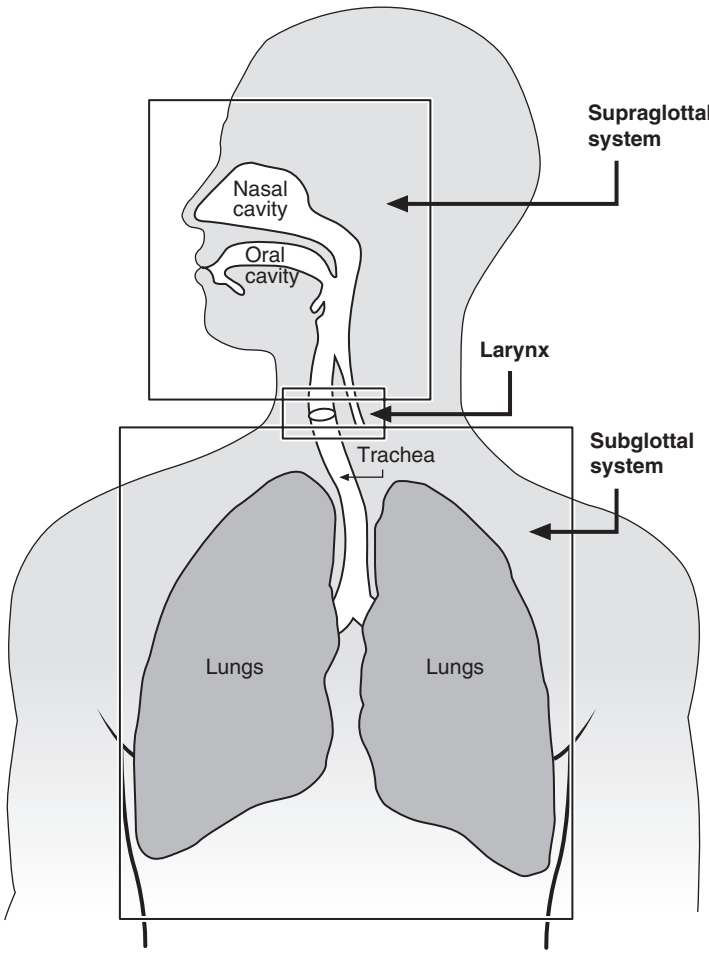

Figure 2.1 Three subsystems of speech articulation

2.1.1 The Subglottal System

The **subglottal system** includes the lungs and the trachea (or windpipe), which provide the air that the upstream articulators manipulate to produce sound. The lungs function like balloons, recoiling after inspiration and setting the air molecules in the vocal tract in motion.

2.1.2 The Larynx

Moving up from the lungs and trachea, the **larynx** is the source for many of the sounds produced in speech. It is located behind the thyroid cartilage (or Adam's apple), which is the bump you can feel on the front of the neck if you lean your head back. ***The larynx contains two vocal folds that vibrate during voiced sounds such as z or v***. To feel the vocal folds vibrate, try placing your fingers on the thyroid cartilage in the front of your neck while making a prolonged [zzzzzz] sound. You will feel the cartilage vibrating. Compare this to what happens when you make a long [ssssss] sound. There is no vibration. Vocal fold vibration, otherwise known as **voicing**, does not require any active motion beyond positioning the vocal folds close enough together that the passage of air between them causes them to vibrate. As long as the air pressure below the larynx is less than the pressure above the larynx, you can sustain a voiced sound. When you produce the sound [zzzzz], you are producing a **voiced consonant**.

As you have already learned when you made the [ssssss] sound, it is also possible to make the same sounds without vocal fold vibration, in which case, you produce a **voiceless consonant**. For example, by turning off voicing in *z* you get *s* and by turning off voicing during *v* you get *f*. (See Sidebar 2.3.) Physically, devoicing of these sounds is achieved by opening the larynx wider than for their voiced counterparts.

In English there are two sounds that only involve the larynx and not any articulators above the larynx. One is the *h* sound in words like *hat* or *ahead*. The other is the glottal stop found in the middle of the expression *uh-oh*. Try saying *uh-oh* emphatically while your hand is on your larynx and your head is leaned back. You will feel an abrupt

SIDEBAR 2.1

You can find definitions for key terms and bolded terms throughout this chapter in the Glossary (at the back of this book or on the student resources website). Additional online resources for this chapter include a study guide, accompanying audio files, a review quiz, an articulators quiz, vocabulary quizzes, IPA flashcards, an interactive IPA chart with audio, and a phonetic transcription exercise.

SIDEBAR 2.2

For a description of some of the ways people can modify a normal speaking voice, most often with effects produced in the larynx, see Section 10.3.

Note: Throughout the rest of the book, sidebars like this one will cross-reference sections or textboxes in other chapters or language profiles. For example, "Section 10.3" refers to the third section in Chapter 10 (Prosody). Other sidebars might mention a section number that starts with "LP" (Language Profile), e.g., "Section LP8.1" refers to the first section of the Bardi Language Profile (LP8), and "Textbox LP8.4" refers to the fourth textbox in the Bardi Language Profile.

SIDEBAR 2.3

In phonetics (and other linguistic fields) it is important to distinguish between how a sound is spelled, the **orthography**, and how it is phonetically transcribed. In this chapter, we will initially use italics to represent words and sounds orthographically. Phonetic transcription, which is written between square brackets, is introduced later in the chapter.

stoppage of voicing during the glottal stop between the two vowels as the vocal folds come together to block off all airflow through the larynx. This is called a **glottal stop**, as you stop the airflow by closing the **glottis** (the space between the vocal folds).

By adjusting the tension of the vocal folds during voicing, you can change the fundamental frequency, and hence the pitch, of a sound. The fundamental frequency of a sound is commonly referred to as pitch, though the two terms are technically not synonymous. **Fundamental frequency** refers to the physical property of rate of vocal fold vibration, whereas **pitch** refers to the perception of the sound on a scale of low to high. Increasing fundamental frequency also typically increases the pitch. Someone with a relatively high-pitched voice thus has a relatively high fundamental frequency or a fast rate of vocal fold vibration. Conversely, someone with a low-pitched voiced has a relatively slow rate of vocal fold vibration. Try making the sound [ahhhhhh]. Now try raising the pitch of the sound while your fingers are on your larynx. You will feel the larynx tense up and rise. Now try lowering the pitch of the sound. You will feel the larynx relax and lower. In this way, you can see how an individual can easily change the fundamental frequency of his or her voice.

2.1.3 The Supralaryngeal Vocal Tract and Place of Articulation

Above the larynx is the **supralaryngeal vocal tract**, which contains most of the structures that are manipulated in speech. The articulators of the supralaryngeal vocal tract are shown in Figure 2.2. When you use different articulators to produce speech sounds, you are changing the **place of articulation** of the sound.

In discussing different places of articulation, it is useful to move from the front to the back of the mouth (see Figure 2.2), starting with the most visible organs. The lips play an important role in producing many sounds, including *p, b, m, w, f,* and *v* in English. Sounds that involve a narrowing or a complete closure of the upper and lower lip are called **bilabials**. The bilabial sounds of English include *p, b, m*, and *w*. Sounds involving the upper teeth and the lower lip are referred to as **labiodentals**. These include *f* and *v*. For labiodentals, the lower lip is the **active articulator**, since it moves to meet the upper teeth. The upper teeth are thus the **passive articulator**, since they are stationary. Most consonant articulations involve both an active and a passive articulator. As we will see, for most consonants, the tongue is the active articulator, while the upper surface of the mouth is the passive articulator.

The structures just behind the lips are relatively immobile compared to the lips. These rigid structures include the teeth, the **alveolar ridge** (the hard ridge just behind the teeth before the upper surface of the mouth becomes more domed in shape), and the **hard palate** (the domed part of the roof of the mouth). The teeth are involved in the production of the English *th* sounds in the words *think* and *this*. These sounds are produced by either sticking the tip of the tongue between the upper and lower teeth, in which case the sounds are said to be **interdental**, or placing the tip of the tongue against the back of the upper teeth, in which case the sounds are simply called **dentals**. Try saying *think* with an interdental *th* and then with a dental *th*. In order to make the comparison fair, be careful that you are not completely blocking air from leaving the mouth when making the dental *th*.

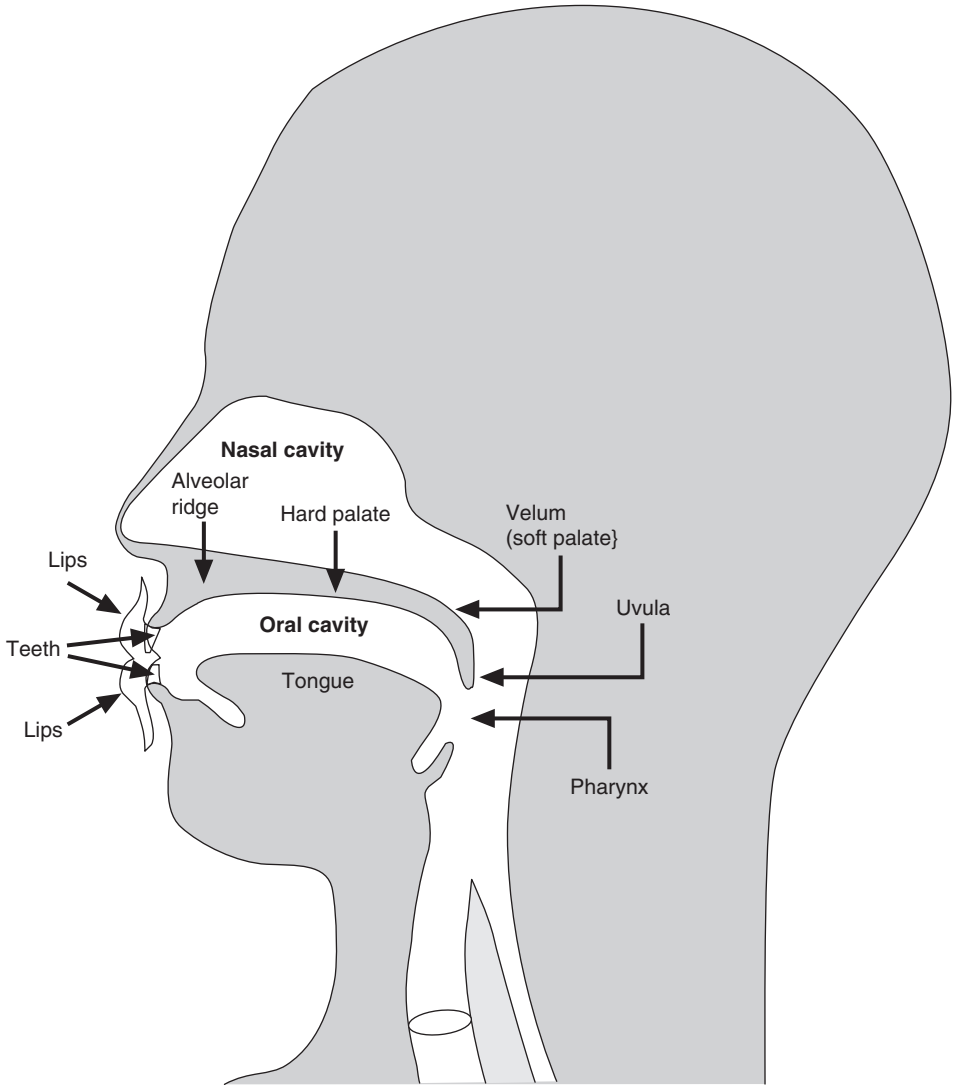

Figure 2.2 The supralaryngeal vocal tract

You will not notice much of a difference in the sound from making this small articulatory adjustment.

You may notice that the first sounds of *think* and *this* are different even though they are both spelled as *th*. The two versions of *th* differ in voicing, just as *z* and *s* were shown earlier to do: the *th* in *think* is voiceless, whereas the *th* in *this* is voiced. We will see shortly that there is a system for transcribing speech in which the voiceless and the voiced *th* are represented differently.

STOP AND REFLECT 2.1 **TONGUE POSITION AND ALVEOLAR SOUNDS**

You may note that not all of the **alveolar** sounds have the exact same point of contact for your tongue. This type of variation is quite common; in particular, *l* often involves quite a bit of contact with the back of the upper teeth, at least for many speakers of American English. Try making an extended [llll] sound and feel where the tip of the tongue is contacting the upper surface of the mouth. Now try making a [nnnnnn] sound and feel where the contact is. Does it occur at the same place as for the [llllll] sound? Even if there is a difference, you should be aware that it is common for *t, d, n*, and *l* to all be treated as alveolars in discussing the sounds of English.

Just behind the teeth is the alveolar ridge, which is the contact point between the tongue and the roof of the mouth for several sounds, including *t* (a voiceless sound), *d* (voiced), *s* (voiceless), z (voiced), *n* (voiced), and *l* (voiced). Another sound *r* (voiced) is also typically assigned to this same group, since *r* is produced with a narrowing in the vocal tract below the alveolar ridge, even though the tongue may be raised only slightly toward the roof of the mouth without touching it. See Stop and Reflect 2.1 for more discussion of alveolar sounds.

There are also sounds that are produced with the tongue contacting the area just behind the alveolar ridge. These are the **postalveolar** (or **palato-alveolar**) sounds, which include the *sh* sound in *ship* (which is a voiceless postalveolar) and the last sound in *rouge* (which is a voiced postalveolar), as well as the first sounds in *jug* (voiced) and *chug* (voiceless). To understand the relationship between alveolars and postalveolars, make an *sss* sound and then switch to a *shh* sound. You will feel the tongue sliding backwards along the upper surface of the mouth as it moves from an alveolar to a postalveolar place of articulation.

Sounds involving contact with the roof of the mouth in the center of the hard palate are simply termed **palatals**. English has a single palatal sound: the *y* sound in words like *yellow* and *young*.

Now drag your tongue backwards from the hard palate. You will notice that the upper surface of the mouth becomes softer. This area of the mouth is called the **soft palate**, or **velum**. Sounds produced by contacting the tongue and the soft palate are termed **velars**. These include the *k* (a voiceless velar sound) in words like *cat, bucket*, and *crib*, the *g* (a voiced velar) in words like *gas, go*, and *bag*, and the final *ng* sound (voiced) in words like *sing* and *lung*. The sound *w* also involves some raising of the back of the tongue toward the soft palate in addition to rounding of the lips; for this reason *w* is often labeled a labial-velar.

The soft palate, or velum, is important for distinguishing sounds involving airflow through the nose and those lacking nasal airflow. Try looking in the mirror while saying *ah* and you will see the velum rise. This raising of the velum ensures that no air escapes through the nose while you are producing the vowel. To see this, hold your finger under your nose while saying *ah*. Now try lowering the velum, holding the same tongue position for *ah* while your finger is still in place under your nose. You will feel air passing through your nose and will hear a nasal-sounding *ahn*, which is found in many languages of the world, such as French.

English also has **nasal** sounds, but they are consonants rather than vowels. Place your finger under your nose while you are making the sounds *m, n,* and the *ng* sound in *sing* and *lung*. You will feel air passing through your nose. Nasality is a separate dimension from place of articulation, since sounds can have the same place of articulation but differ in whether they are nasal or non-nasal (i.e., **oral**). The sounds *m* and *b* differ in nasality; both are voiced and both are bilabial, but only *m* is nasal. Try saying an [m] with your finger under your nose and then immediately switch to a [b]. You will feel airflow through the nose during the [m] but not during the [b] even though the lips remain closed throughout both sounds. The sounds *n* and *d* also differ only in nasality; *n* is nasal and *d* is oral. Similarly, *ng* and *g* differ in nasality; *ng* is the nasal member of the pair. Note that it is common to omit the term oral when describing oral sounds, since oral is assumed to be the default case. (See also Stop and Reflect 2.2 for a brief discussion of nasals and voicing.)

STOP AND REFLECT 2.2 **NASAL SOUNDS**

In most languages all nasals are voiced, since it is difficult to produce a voiceless nasal that is clearly audible. Try making an [m] sound and then turning off vocal fold vibration. You will wind up with a voiceless nasal, which sounds identical to the sound made when breathing through your nose.

Practice producing voiced and voiceless nasals and listen to how they sound. You will notice that it is much harder to hear a voiceless nasal than a voiced nasal. Although they are rare in the world's languages, voiceless nasals are found as consonants in some languages, such as Burmese.

Audio recordings of voiceless nasals in Burmese

2.2 Manner of Articulation

Thus far we have discussed three dimensions relevant for describing speech sounds: the voicing dimension (voiced vs. voiceless), the place of articulation dimension, and the nasality dimension (nasal vs. oral). There is one other dimension that we must consider: the narrowness of the constriction in the vocal tract. Differences in constriction narrowness are referred to as differences in **manner of articulation**.

Some sounds involve a complete closure of the vocal tract. These are called **stops**. English stops include *p, b, m, t, d, n, k, g,* and the *ng* sound. Of these sounds, *p, b, t, d, k,* and *g* are oral stops since there is no nasal airflow, while *m, n,* and *ng* are nasal stops. All stops involve two phases: a closure phase, during which the airflow through the mouth is completely blocked, and a release phase, when the constriction is released. To see this, produce just the closure for the voiceless stop *t* without releasing the tongue from the alveolar ridge. You will notice that there is complete silence, since there is no voicing. This means that voiceless stops are only identifiable through their release, which provides crucial information about place of articulation. There is another type of sound found in certain varieties of English, including for most speakers of American and Australian English, that resembles an alveolar stop in that it is produced with a complete closure at the alveolar ridge. This sound is called a **flap** and occurs in the middle of words like *pity, butter, lady,* and *ladder*. The key difference between a stop and a flap (sometimes also referred to as a **tap**) is the extreme

shortness of the closure for the flap. The tongue briefly taps the roof of the mouth before rapidly returning to position for the following sound.

It is also possible to produce sounds in which the two articulators are close together, but not so tightly occluded that no air can escape through the mouth. Sounds produced by a tight narrowing of articulators are termed **fricatives**. Fricatives are characterized by turbulence created through the random collision of air molecules either at the constriction location or, in the case of alveolar or postalveolar fricatives, by funneling air to hit the back of the teeth. Try making an emphatic [ssssss] sound while holding your hand palm down against your chin. You will feel air striking the back of your hand because the air is being directed downward after it hits the back of your upper teeth. You will also feel air striking your hand if you produce a prolonged and emphatic *sh* sound. Now try making a [hhhhhh] sound while holding your hand in the same position. You will not feel any air striking your hand. This is because the noise in [hhhhhh] is being produced directly in the larynx and not by directing air against the back of the teeth. You will also notice that the noise of *h* is much quieter than that associated with *s* or *sh*. Sounds like *s* and *sh*, which involve funneling of air against the back of the teeth are particularly noisy. These sounds are called **stridents**.

There are two sounds in English that are produced by combining a stop with a following fricative in rapid succession. These are the **affricates**, which include the *j* sound in *jug* (which is voiced) and the *ch* sounds word-initially and word-finally in *church* (which are voiceless). Since affricates have a stop phase, they are often grouped together with other stops.

Additionally, ***sounds can be produced through a slight narrowing of the vocal tract, but not enough to cause noise or a complete obstruction***. These sounds are called **approximants**. Approximants in English include the *y* sound in *yellow* and the *w* sound in *water*. Also included in the class of approximants in English is the *r* sound in words like *red, brick*, and *car*.

A final approximant to consider is the sound *l*, which resembles *t* and *d* in involving a complete closure in the middle of the alveolar ridge. There is, however, a crucial difference between *l* and these other sounds (besides the fact that *l* differs from *t* in being voiced). ***The l sound is produced with a closure only in the center of the mouth***. At least one side of the tongue (if not both, depending on the speaker) is pulled down slightly, away from the roof of the mouth. The lowering of the side part of the tongue allows air to escape the mouth, whereas the true stops *t* and *d* have a complete closure around the upper surface of the mouth. Try making an [llllll] sound and put your hand first on the left side of the mouth and then on the right side. Is the air escaping from just one or both sides of the mouth? The sound *l* has a **lateral** articulation in opposition to all of the other sounds of English, which have **central** articulations. Note that it is common to omit the term central when describing central sounds, since central is assumed to be the default case.

There are a couple of additional useful terms for grouping together certain types of sounds. One of these is the term **liquids**, which includes lateral approximants and *r*-type sounds. Another common descriptor is the term **obstruent**, which refers to the combined

set of oral stops and fricatives. Sounds that are not obstruents are the **sonorants**, which include the nasals and all of the approximants, both lateral and central.

It is important to recognize that our discussion of places and manner of articulation has focused on sounds occurring in English. In reality, there are many more sounds found in languages other than English, as you know already if you speak or have studied other languages. Some of these sounds are discussed below.

2.3 The International Phonetic Alphabet

Up to now, we have referred to the different sounds of English using the traditional symbols used in English spelling. While this strategy has worked for the most part, ***there are some limitations of using spelling (orthographic) characters to represent sounds***. One problem we have already encountered concerns the English letters *th*, which can represent either a voiceless dental fricative as in *think* or a voiced dental fricative as in *this*. Another issue is the use of two letters to represent a single sound in English. For example, the voiced velar nasal at the end of *sing* is represented by the combination *ng*. Similarly, the voiceless postalveolar fricative is written as the sequence *sh*. While it is possible to use two letters to represent a single sound, it is more efficient to use a single symbol to represent a sound that behaves phonetically as a single entity. Furthermore, there is the potential for confusion between a single phonetic sound written with two letters and a sequence of two phonetic sounds also written with two letters. For example, if one sees *ng*, how can one be sure without listening to the word, whether *ng* refers to a single voiced velar nasal, or the phonetic sequence *n* (voiced alveolar nasal) plus *g* (voiced velar oral stop), as occurs in a careful pronunciation of the compound *rain gauge*?

There is an even more serious problem with the use of English spelling to represent phonetic sounds. Many individual English letters or combinations of letters represent multiple phonetic sounds depending on the particular word. For example, the letter *x* can represent either a voiced alveolar fricative, *z*, as in *xylophone*, or the phonetic sequence of voiceless velar stop, *k*, plus voiceless alveolar fricative, *s*, as in *ox*. Similarly, the letter *o* has three different qualities in the words *ton*, *pond*, and *drone*. Using orthography to represent phonetic pronunciation is thus bound to cause confusion.

SIDEBAR 2.4
For a more detailed discussion of orthographic systems, see the Indonesian Language Profile, Section LP12.4.1 and Textbox LP12.4.

Fortunately, this problem is remedied by the existence of a special phonetic alphabet designed to reflect pronunciation: the International Phonetic Alphabet, abbreviated IPA. ***A crucial principle guiding the International Phonetic Alphabet is its universal one-to-one correspondence between symbols and pronunciation***. Thus, whenever you see an IPA symbol, you can be sure of its pronunciation, regardless of the language being transcribed. For example, whenever you see an IPA *m*, it will refer to a voiced bilabial nasal stop in any language. The IPA thus provides a useful tool for linguists who are transcribing words and who plan to share these transcriptions with other researchers. It is not the case, however, that all linguistic data are transcribed in IPA at all times; see Textbox 2.1.

TEXTBOX 2.1 THE IPA AND REGIONAL TRANSCRIPTION PRACTICES

As noted, the IPA has been designed to transcribe the sounds of every spoken language. However, it is not the case that all linguists use the IPA at all times. In many parts of the world, the transcription practices of linguists reflect the orthographic practices of the local region. In some cases, particular orthographic practices are widespread in a given region, such as the use of the symbol *š* in the transcription of North American Indian languages for the sound written with "sh" in English spelling and transcribed as [ʃ] in IPA.

In this volume, which takes data from many sources – historical and contemporary – from all over the world, the transcription system of the original source is used. Interpreting transcriptions requires careful attention; transcription notes are provided throughout the book to aid readers in this task. Learning these different systems, and how to interpret a variety of transcription practices, is part of the task of learning linguistics.

As it happens, the IPA bears close resemblance to English orthography in many respects. There are only a few major points of departure between the two systems. First, the IPA symbol for a voiceless (inter)dental fricative (as in *think*) is [θ] (IPA symbols will henceforth be written in brackets), while the symbol for its voiced counterpart (as in *this*) is [ð]. The IPA symbol for a voiceless postalveolar fricative (as in *ship*) is [ʃ], while the symbol for its voiced counterpart (as in *rouge*) is [ʒ]. The IPA represents the voiceless postalveolar affricate (as in *church*) as [tʃ] and the voiced postalveolar affricate (as in *jug*) as [dʒ]. The IPA symbol for a voiced velar nasal stop (as in *sing*) is [ŋ]. The IPA symbol for glottal stop (as in *uh-oh*) looks like a question mark but with a horizontal base rather than a period [ʔ]. In addition, the IPA symbol for a voiced palatal approximant (as in *young*) is [j], while the symbol for a central alveolar approximant (as in *red*) is an upside-down [ɹ]. Finally, the flap occurring in American English in the middle of words like *city* and *buddy* is represented with the symbol [ɾ].

SIDEBAR 2.5
See also the Nuuchahnulth Language Profile, Textbox LP5.1, about transcription conventions and the IPA.

SIDEBAR 2.6
The full chart of consonants and vowels in the International Phonetic Alphabet can be found at the back of this book. This will be a useful reference as you explore the wide variety of languages discussed in the book. An interactive IPA chart, including audio, is also available on the student resources page of the website.

Tools > Interactive IPA Chart

We are now ready to see the entire list of IPA consonant symbols relevant for describing English in Table 2.1.

In the chart, places of articulation appear as columns across the top of the chart, while manner, nasality, and lateralness are captured in rows. Sounds differing only in voicing are adjacent with the voiceless sound on the left and the voiced counterpart on the right. There are many possible combinations where no consonant is represented; this reflects the lack of such sounds in English, but does not mean that they are unattested in other languages. Note that [w] appears in both the bilabial and the velar columns, since, as we have seen, it involves constrictions simultaneously at the lips and at the velum. The flap [ɾ] appears in parentheses reflecting the fact that it is present for only certain varieties of English, such as American and Australian English.

TABLE 2.1 IPA chart for English consonants

	Bilabial	Labiodental	Dental	Alveolar	Postalveolar	Palatal	Velar	Glottal
Oral stops	p b			t d			k g	ʔ
Affricates					tʃ dʒ			
Nasal stops	m			n			ŋ	
Flap (tap)				(ɾ)				
Fricatives		f v	θ ð	s z	ʃ ʒ			h
Central approximants	w			ɹ		j	w	
Lateral approximants				l				

There are also IPA symbols for vowels. ***Vowels fundamentally differ from consonants in being produced with a relatively open vocal tract***, though of course there is some movement of the tongue necessary to make different vowel sounds. The IPA chart for American English appears in Table 2.2 followed, in Table 2.3, by its counterpart for the variety of British English commonly referred to as BBC English.

STOP AND REFLECT 2.3 **VOWELS IN ENGLISH VARIETIES**

Recordings of the words in Tables 2.4 and 2.5 can be found on the *How Languages Work* website. For consistency, all transcriptions in this chapter will be based on recordings from these, as are the exercises and online resources. You should learn to hear the distinctions these speakers make and transcribe them accurately.

Accompanying Sound files for Chapter 02: Tables 2.4 and 2.5.

Your pronunciation of English might be different from these in some respects. Try pronouncing the words in Tables 2.4 and 2.5. Are your vowels the same as these or different? If different, you can find the full IPA chart online and determine which vowels you have in your own speech (your instructor can help you with this). Textboxes 2.2 and 2.3 discuss some of the variation in vowels found across English dialects.

As the tables show, the dimensions used to describe vowels differ from those used to classify consonants. ***Vowels can be described in terms of three core dimensions: backness, height, and tenseness***. In addition, vowels can differ in whether they are produced with lip rounding, as with the vowel in *boat*, or not, as with the vowel in *beet*.

There are three degrees of **height** in English: high, mid, and low. Example words illustrating the vowels of American and British English are shown in Tables 2.4 and 2.5, respectively. The mid-central vowel [ə], also known as **schwa**, is confined to unstressed syllables in English. It is pronounced with a higher tongue position than the mid-central vowel [ʌ], which is only found in stressed syllables (you can hear both of these vowels in the word *above*; the first is [ə] and the second is [ʌ]).

TABLE 2.2 IPA chart for American English vowels

		Front	Central	Back
High	Tense	i		u
	Lax	ɪ		ʊ
Mid	Tense	e		o
	Lax	ɛ	ə	
			ʌ	
Low	Lax	æ	a	

TABLE 2.3 IPA chart for British English vowels

		Front	Central	Back
High	Tense	i		u
	Lax	ɪ		ʊ
Mid	Tense	e	ɜ	o
	Lax	ɛ	ə	ɔ
			ʌ	
Low	Lax	æ		ɑ ɒ

TEXTBOX 2.2 [ɔ] AND [a] IN AMERICAN ENGLISH

Many speakers of American English, including most from California, lack the vowel [ɔ]. For speakers who do not have [ɔ], it is because it has merged with the low vowel [a]. Speakers who have undergone this merger typically (at least in California) produce a low central vowel in words like *caught, dawn*, and *law*. Speakers who have a contrast between [ɔ] and [a] have pairs of words differing only in the vowel, e.g., *caught* with [ɔ] versus *cot* with [a] and *dawn* with [ɔ] versus *don* with [a]. Try asking several Americans to say the words *cot* and *caught*. Do any of them have a different vowel in the two words? Now try asking a speaker from Great Britain how they pronounce these words. How does their pronunciation compare with yours?

Sound files for low vowels in American English: *caught/cot*

Vowels can also be described in terms of **backness**. The front vowels of English are [i, ɪ, e, ɛ, æ]. The back vowels of English (both dialects combined) are [u, ʊ, o, ɔ, ɑ, ɒ], while the central vowels are [ə, ɜ, ʌ, a]. Several of the back and central vowels vary considerably between dialects and between speakers in their pronunciation (Textbook 2.2). The vowel [a] for American English speakers varies widely in its backness from speaker to speaker, so you may note that you have a somewhat backer pronunciation than central [a]. British English

TABLE 2.4 Example words illustrating the vowels of American English

Vowel height	Vowel	Description	English words
High	[i]	High, front, tense, unrounded	*beet, bleed, see*
	[ɪ]	High, front, lax, unrounded	*sit, fin, lip*
	[u]	High, back, tense, rounded	*boot, mood, soon*
	[ʊ]	High, back, lax, rounded	*foot, could, hood*
Mid	[e]	Mid, front, tense, unrounded	*late, rain, paid*
	[ɛ]	Mid, front, lax, unrounded	*red, send, peck*
	[ə]	Mid, central, lax, unrounded	*about, ago*
	[ʌ]	Lower-mid, central, lax, unrounded	*rut, mud, up*
	[o]	Mid, back, tense, rounded	*mode, loan, sew*
Low	[a]	Low, central, lax, unrounded	*hot, mop, rock*
	[æ]	Low, front, lax, unrounded	*cat, man, trap*

TABLE 2.5 Example words illustrating the vowels of British English

Vowel height	Vowel	Description	English words
High	[i]	High, front, tense, unrounded	*beet, bleed, see*
	[ɪ]	High, front, lax, unrounded	*sit, fin, lip*
	[u]	High, back, tense, rounded	*boot, mood, soon*
	[ʊ]	High, back, lax, rounded	*foot, could, hood*
Mid	[e]	Mid, front, tense, unrounded	*late, rain, paid*
	[ɛ]	Mid, front, lax, unrounded	*red, send, peck*
	[ɜ]	Mid, central, tense, unrounded	*purr, learn, sir*
	[ə]	Mid, central, lax, unrounded	*about, ago*
	[ʌ]	Lower-mid, central, lax, unrounded	*rut, mud, up*
	[o]	Mid, back, tense, rounded	*mode, loan, sew*
	[ɔ]	Mid, back, lax, rounded	*dawn, bought, north*
	[ɒ]	Low, back, lax, rounded	*hot, mop, rock*
	[ɑ]	Low, back, lax, unrounded	*half, father, hard*
Low	[æ]	Low, front, lax, unrounded	*cat, man, trap*

has a low back unrounded [ɑ] that corresponds to American English [æ] in words like *half* and to American English [a] in words like *father*. British English also has a low back rounded [ɒ] that corresponds to American English [a] in words like *hot* and *pot*. And British English has an additional central vowel in words like *purr* and *learn* that corresponds to a syllabic [ɻ] or rhotacized (i.e., r-colored) schwa [ɚ] (see Textbox 2.3) in American English.

Vowels can also differ in terms of their **tenseness**. There are several pairs of vowels in English differing only in tenseness. For example, the pair of vowels [i] as in *seat*, and [ɪ] as *sit* differ along this dimension; [i] is a tense vowel and [ɪ] is a lax vowel. Similarly, [e] is tense and [ɛ] is lax, [u] is tense and [ʊ] is lax, [o] is tense and [ɔ] is lax, and [ɜ] is tense and [ə] is lax. Tense vowels in English are longer than their lax counterparts and, for front and back vowels, also typically have a slightly more peripheral tongue position (i.e., higher and fronter in the case of front vowels, and higher and backer in the case of back vowels). You can verify this by producing an [i] sound and then changing it to an [ɪ]. You will feel the tongue lowering slightly and retracting. Now try the same exercise by switching from [e] to [ɛ]; you will once again notice the tongue lowering and retracting.

The final parameter along which English vowels can be described is whether they are produced with **lip rounding** or not. The rounded back vowels of English are [u, ʊ, o, ɔ, ɒ], whereas [ɑ] is unrounded. All the front and central vowels in English are unrounded. To see that ***rounding is a separate parameter from tongue height and backness***, try making an [i] sound while looking in the mirror. You will notice that the corners of the mouth are drawn back and that there is no lip rounding. Now without moving your tongue, round your lips by protruding them. The sound you wind up producing is a high tense front rounded vowel, a sound that does not occur in English but that is found in many languages of the world, such as German and French. As a point of interest, this sound is transcribed as [y] in the IPA. This is why we use [j] and not the [y] symbol to transcribe the palatal approximant found in English words like *yam* and *yellow*.

TEXTBOX 2.3 VOWELS BEFORE "r" IN ENGLISH

Combinations of vowels plus "r" in English tend to be pronounced very differently from other vowel-plus-consonant sequences. Speakers of many dialects drop the "r" entirely at the end of a word or syllable, as in the stereotypical pronunciation of the phrase [pak ðə ka ɪn ˈhavəd jad] 'Park the car in Harvard Yard' by speakers of Boston or British English. After certain vowels, as we have seen, the "r" may leave a residual schwa-like vowel that combines with the preceding vowel to form a diphthong as in the words *peer, pear*, and *poor*, as produced by speakers of British English. The number of vowels occurring before "r" (where it survives) is also typically reduced. Many speakers of American English thus have only one or two of the vowels [e, ɛ, æ] before "r". The words *Mary, merry*, and *marry* are homophonous for many people, as are the names *Karen* and *Keren*. Likewise, the words *pour* and *poor* are identical for many speakers.

In addition to the English vowels in Tables 2.2 and 2.3, ***there are also combinations of vowels in English that function as a single unit in the sound system***. These vowel sequences are called ***diphthongs***, in contrast to ***monophthongs***, which are produced with a single articulatory configuration. Diphthongs may be regarded as the vocalic equivalent

to affricates, since they involve two phases. There are three clear diphthongs in American English. One is [aɪ], which starts off as [a] and then rapidly sequences into [ɪ]. The diphthong [aɪ] is found in many words in English including *write, lie*, and *mine*. The second diphthong is [aʊ], which is found in words like *cow, town*, and *bout*. Finally, the diphthong [ɔɪ] occurs in words like *boy, soy*, and *toil*. British English has a few additional diphthongs corresponding to sequences of vowel plus [ɹ] for most speakers of American English. These diphthongs, which all end in schwa, include [ɪə] in words like *peer* and *fear*, [eə] in words like *pear* and *care*, and [ʊə] in words like *poor* and *tour*. Textbox 2.4 describes some of the other diphthongs that occur in English, which are a little less clear.

TEXTBOX 2.4 DIPHTHONGS IN BROAD AND NARROW PHONETIC TRANSCRIPTIONS

Students with a careful ear will notice that most pronunciations of the English tense mid vowels [e] and [o] are actually diphthongs, with the tongue moving from the position of [e] to the position of [ɪ] in a word like *lay* or either [o] to [ʊ] (American English) or [ə] to [ʊ] (British English) in a word like *show*. A **broad phonetic transcription** would transcribe these words as [le] and [ʃo]. A **narrower phonetic transcription**, one which seeks to record as much detail as possible, would transcribe them as [leɪ] and either [ʃoʊ] or [ʃəʊ].

2.4 Using the IPA to Transcribe Words

Phonetic transcription exercise

Now that you are familiar with the IPA, we can try using it to transcribe English words. ***One of the most important aspects of doing phonetic transcription is not to be biased by the spelling of a word***. Since spelling symbols often differ from IPA symbols, as we have seen, blindly following the English orthography can lead to transcription mistakes. In doing transcription, you may find it useful to first think about how many sounds are in the word you are transcribing. To take a simple example, the English word *do* has two sounds. The first sound is a voiced alveolar stop [d], while the second sound is a high back rounded vowel [u]. (Don't be influenced by the spelling of the vowel as "o.") If we put the two sounds together, we get [du] as the phonetic transcription. Let's take a slightly trickier example now. In the spelling of the word *checks*, there are six letters. In terms of phonetic transcription, however, there are only four sounds. The first sound is the voiceless postalveolar affricate [tʃ]. The vowel is the lax mid-front vowel [ɛ]. The final consonant sequence consists of a voiceless velar stop [k] and a voiceless alveolar fricative [s]. (Note that these are only two sounds [k] and [s], even though there are three letters, "cks," in the spelling.) With a little practice, you should be able to phonetically transcribe any English word, or even words in other languages containing sounds that have been introduced in this chapter. It is also possible to go in reverse and sound out the word from the phonetic transcription. For

SIDEBAR 2.7

Your understanding of phonetics, phonology (the subject of the next chapter), and linguistics more generally will be easier if you spend time now memorizing the IPA: what each symbol means and how it is described. To help you with this, two sets of online flashcards are available on the website: one takes you from standard description to symbol and the other from symbol to description.

IPA flashcards

example, if you saw the IPA transcription [tʌf], you would know that it was the transcription for the English word *tough*. Try out the transcriptions in Stop and Reflect 2.4, then check your answers on the following page.

STOP AND REFLECT 2.4 **IPA TRANSCRIPTION PRACTICE**

Try transcribing the following English words in the IPA, then check your transcription against the answers in Sidebar 2.8 on the next page.

1. yellow
2. lamb
3. wreath
4. beige
5. mission
6. sixth
7. xylophone
8. judge

2.5 Co-articulation

So far we have been considering sounds in isolation, but it is important to recognize that there is overlap between sounds in actual speech. ***While one sound is being pronounced, the speech organs are preparing to produce the next sound***. This articulatory overlap between sounds is termed **co-articulation**. It is easiest to observe co-articulation between adjacent sounds that have different articulators. For example, during the production of a bilabial consonant like [b], the tongue is free to move into position from the preceding vowel into the following vowel, as in the word *reboot*, in which the tongue must move backer to transition from the high front vowel /i/ to the high back vowel /u/. Consonants other than bilabials may even be subject to co-articulation with adjacent vowels. For example, the body of the tongue is relatively free to transition between vowels during alveolar consonants, since alveolars primarily involve the tongue tip but do not involve posterior parts of the tongue, which play a crucial role in producing vowels.

Figure 2.3 contains a sequence of MRI images showing co-articulation between adjacent sounds in the word *leap*, extracted from the phrase *pea leap*. During the first three images, the tongue tip is raised toward the alveolar ridge and the back of the upper teeth to produce the lateral approximant /l/. Already by the fourth image, the middle part of the tongue has begun to rise in preparation for the high vowel /i/ even as the tongue tip is still curled upward for the /l/. (It may be noted that the tongue body is already in a relatively high position for the high vowel preceding the /l/.) The tongue body continues to rise through the fifth frame, reaching its target position by the sixth frame, as the tongue tip gesture for /l/ completely ends. In the seventh frame, while the /i/ is still being articulated, the lips are already starting to close in preparation for the final bilabial stop /p/. The lips make a complete closure by the eighth frame, before gradually opening in the tenth and eleventh frames.