The Linguistic Structure of Modern English

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Preface to the second edition

The following text gives a full introduction to English sounds, grammar, and vocabulary. It begins with a study of the distinctive sounds of English (*phonology*). It turns next to an analysis of the structure of English words and their classification (*morphology*) as well as the classification of English words and their grammatical modification. This is followed by an exploration of the meaning of English words (*lexical semantics*). The next section is taken up with a detailed analysis of English sentence structure (*syntax*) from a generative perspective. The text then looks at the interaction of syntax and semantics (*sentence semantics*) and considers the functions and contexts of language use (*pragmatics*). Finally, it outlines the role of linguistics in first- and second-language teaching and learning (*pedagogy*).

This textbook is addressed to advanced undergraduate (and graduate) students interested in contemporary English, including those whose primary area of interest is English as a second language, primary- or secondary-school English education, English literature, theoretical and applied linguistics, or speech pathology. For this reason, this textbook, unlike many other introductory linguistics textbooks, emphasizes the empirical facts of English rather than any particular theory of linguistics. Furthermore, the text does not assume any background in language or linguistics. Students are required to learn the International Phonetic Alphabet as well as the technical vocabulary of grammar and linguistics, but all necessary terms and concepts are presented in the text.

New to the 2nd edition are the following:

1. the use of authentic spoken and written English examples taken from the Corpus of Contemporary American English (COCA) to exemplify features under discussion;
2. a full glossary of keys terms used in the text (indicated in text by bold-faced text);
3. an additional chapter (included in the first edition on the CD-ROM) on pedagogy;
4. new sections on cognitive semantics (Chapter 6) and politeness (Chapter 11);
5. completely updated print references;
6. web links to sites of special interest and relevance (given on the website); and
7. revised, more reader-friendly layout (including "hint" boxes and expanded "notes" on specific points)

Upon completion of this textbook and accompanying workbook, students will have acquired the following:

1. a knowledge of the sound system of contemporary English;
2. an understanding of the formation of English words and of their grammatical modification;

3. a comprehension of the structure of both simple and complex sentences in English;
4. a recognition of complexities in the expression of meaning, on both the word and sentence level;
5. an understanding of the effects of context and function of use upon the structure of the language; and
6. an appreciation of the importance of linguistic knowledge to the teaching of English to first- and second-language learners.

The textbook is divided into twelve chapters. Chapter 1 briefly examines the discipline of linguistics and the nature of human language and grammar. After a consideration of the means of production of human speech sounds, Chapter 2 studies the consonant and vowel sounds of English and methods of their phonetic transcription. Chapter 3 continues discussion of the English sound system, considering sound combinations, stress, intonation, and syllable structure; it also examines phonological rules in English and the concept of the *phoneme* (distinctive sound of a language). Chapter 4 explores the internal structure of words, the concept of the *morpheme* (meaningful unit of a language), and the varied processes of word formation in English. Chapter 5 begins by defining the grammatical categories and looking at the grammatical modification of English words and ends with a study of the means of word classification in the language. Chapter 6 surveys a number of traditional and structural approaches to word meaning and includes a discussion of figurative language and cognitive approaches to meaning. Chapter 7 treats the syntax of the simple sentence, looking at the internal structure of the noun, adjective, adverb, and prepositional phrase, complement structures in the verb phrase, verb types, and grammatical functions. Chapter 8 continues to treat the syntax of the simple sentence, including adverbial modifiers and verb specifiers, and then examines the structure of passive, interrogative, negative, and imperative sentences. The syntax of the complex sentence is dealt with in Chapter 9, including *that*-clauses, *wh*-clauses (*wh*-questions, relative clauses, and indirect clauses), and nonfinite clauses (infinitival and participial clauses). Chapter 10 turns to the question of sentence meaning, understood in terms of thematic roles and predication analysis. Chapter 11 looks at two quite different approaches to the question of the function of language in context: information structuring and speech act theory. Chapter 12 examines the pedagogical applications of the material presented in the textbook, including the changing role of linguistics in the teaching of English; it reviews arguments both in favor and opposed to explicit grammatical instruction for native and nonnative speakers and considers the importance of grammatical knowledge for both the teacher and the learner. At the end of each chapter, students are also directed to readings that provide more detailed or enriched content on certain topics or supplemental help in understanding the content of the chapter.

A website accompanies this textbook. It includes:

1. a complete workbook with self-testing exercises. Answers for all of the self-testing exercises are provided. At relevant points in each chapter in the text, students are directed

to complete specific exercises and are advised to do so before continuing with the chapter. The exercises should provide a check on students' understanding and progress.

2. a comprehensive list of web links that expand on the information presented in the text and allow students to explore the topics more broadly on their own.

The website can be found at the following address: http://dx.doi.org/10.1075/z.156.workbook

1. A note to the student on punctuation

Various punctuation conventions are used in this textbook with which you may not be familiar.

It is the practice to distinguish between words (or parts of words) which are "mentioned" rather than used. Using words is what we do whenever we speak, but mentioning words is what we do when we refer to words as words or to the forms of words, rather than evoking their meanings. For example, try reading the following sentences:

> The word paper has five letters. Court has several different meanings. The feminine suffix -rix is almost obsolete. The clause whatever you do is an indefinite relative clause.

You may have had some difficulty reading these sentences. The reason for your difficulties is that these sentences contain word forms which are mentioned rather than used. The convention in printed texts is to italicize these mentioned forms, as follows:

> The word *paper* has five letters. *Court* has several different meanings. The feminine suffix *-rix* is almost obsolete. The clause *whatever you do* is an indefinite relative clause.

Note that this convention makes these sentences much easier to read. (In handwriting, mentioned forms are underlined.) Italics also denote all linguistic forms which are set off as example sentences. For example, below are two structurally ambiguous sentences:

> *Visiting relatives can be tiresome.*
> *Flying planes can be dangerous.*

This use of italics differs from the use of quotation marks to repeat the exact words of a spoken or written text, e.g. "convention" occurs two times in the previous paragraph.

Single quotation marks are used to give the meaning or gloss for a word; e.g. the word *garrulous* means 'tiresomely talkative'.

When the actual sound of the word is being referred to, the International Phonetic Alphabet is used. To distinguish such representations from regular writing, they are enclosed in slashes (in the case of phonemes) or square brackets (in the case of allophones), e.g.:

> The word *read* is pronounced /rɛd/ or /rid/.
> The "t" sound in *top* is pronounced [tʰ].

Another convention in linguistic works is the use of capitals to denote all the forms of a single word, thus WORK stands for *works*, *work*, *working*, *worked*. Capitals are also used for phonological and semantic features. These usages will be explained in more detail within the text.

2. A note on the use of corpus examples

This text makes use of authentic examples from the Corpus of Contemporary American English (COCA): http://www.americancorpus.org/, the largest freely-available corpus of English containing over 400 million words and updated every 6–9 months. Examples in COCA come from a large variety of spoken and written text, equally divided among spoken texts (such as television), fiction, popular magazines, newspapers, and academic works. The corpus is easily searched electronically in a variety of ways, e.g. by individual words, phrases, or collocations or by genre (e.g. fiction, academic text). This corpus was compiled by Mark Davies of Brigham Young University, who designed its search engine and maintains the site.

A corpus lists all possible examples or "tokens" of a word as it occurs in source texts. For example, when searching for the term *linguistics*, one finds over 600 examples, including the following:

A month ago, he'd been finishing up his Ph.D. in Linguistics at UC Berkeley.	(COCA:FIC)
With the waning of Noam Chomsky's long dominance in linguistics, other scholars are increasingly applying the principles of evolution to the field.	(COCA:NEWS)
This is why researchers in applied linguistics are recommending new strategies to fill the gaps in vocabulary – for instance, massive rote word learning, guessing word meanings by context, and using graded textbooks.	(COCA:ACAD)
They're using lot more with the Internet, they're bringing in visiting instructors, and they're using professors from other fields like political science or history or linguistics who can also teach language courses.	(COCA:SPOK)

Note that the source of each citation is designated by the name of the corpus and the genre in which it occurs (e.g. COCA:FIC designates an example taken from a fictional text in COCA). Students are encouraged to explore the corpus on their own, which requires free registration. A tutorial on its use is included on the COCA website.

Chapter 1

The nature of language and linguistics

Chapter preview

The chapter begins by looking at the nature of human language, starting from certain fundamental beliefs concerning the naturalness, power, and function of language and moving towards a more scientific analysis of human language as a system of arbitrary vocal signs, having the qualities of universality, innateness, and creativity. Particular attention is given to the rule-governed nature of language. Language is also seen as uniquely human. The ambiguous term *grammar* is then defined and a number of fallacies concerning grammar are disputed, for example, that one type of grammar is simpler than another, or that changes in grammar involve deterioration in a language. Finally, the discipline of linguistics is examined, with its division in five components, corresponding to the levels of language: phonology, morphology, syntax, semantics, and pragmatics.

Commentary

1. The nature of human language

Linguists understand language as a system of arbitrary vocal signs. Language is rule-governed, creative, universal, innate, and learned, all at the same time. It is also distinctly human. We will look at what is meant by each of these terms in some detail, but before doing so, let's briefly examine some preconceptions about language that a student might bring to the study of language.

1.1 Fundamental beliefs about language

As speakers of language, we all have certain deep-seated notions concerning the nature of language. Like all such fundamental beliefs, these are often wrong, though they may contain a germ of truth. For example, as literate beings, we tend to equate language with writing. But there are significant differences, not only between oral sounds and written symbols, but also between spoken and written syntax or vocabulary. More importantly, we assume that there is some necessary, inevitable, or motivated connection between a word and the thing it names. This assumption lies behind the belief that names tell us something about the bearer of that name (for example, when one utters a statement such as "She doesn't look like a Penelope!") or that a change in status must entail a change in name (for example, the custom – now changing, of course – for a woman to adopt her husband's surname upon marriage). It also lies behind the thought, which we may all probably be guilty of having at times, that a foreign language is somehow perverse and idiotic, while our own language is natural and sensible.

Because we believe that there is an inevitable connection between a word and the thing it represents, the word is very powerful: names are extremely important (as we see in the Old Testament Genesis) and the possession of language can be very dangerous (as we see in the Old Testament story of the Tower of Babel). We avoid naming certain taboo objects explicitly because doing so might invoke the object named; in addition, we may avoid directly naming things which we fear or stand in awe of, such as God, our parents, or dangerous animals, and things which are unpleasant or unclean, such as birth, death, bodily parts and functions, or disease. Instead, we substitute euphemisms. Even if we recognize that names do not, in fact, invoke the objects they name, there is a sense in which language has the effect of action. That is, by means of language alone we can perform an action, as for example when we say, "I nominate Alex". We will examine this phenomenon in Chapter 11.

Finally, we think of language in terms of its various functions, for example:

- language gives expression to our thoughts;
- language is used to transmit information, also known as its "communicative function";
- language is used to maintain social intercourse (as in greetings or talk about the weather) – often referred to as its "phatic" function; and
- language provides the raw material for works of literature.

But language has many more functions, for example, to get others to do things, to express emotions or feelings, to make promises, to ask questions, to bring about states of affairs, to talk to oneself, and even to talk about language itself, or what is known as "metalanguage".[1]

1. Note that this function is common in everyday life, not just among linguists.

The misleading idea that language simply expresses thought is a result of the philosophical and logical tradition, which treats language as a collection of propositions consisting of referent(s) and a predication which have "truth-value" (are true or false). However, in normal language use, speakers are not always committing themselves to the truth of a proposition; in fact, they do so only in the case of assertions or statements. Likewise, the idea that language has a communicative function, that it conveys new information, derives from its use in fairly restricted contexts, such as in the classroom or the newspaper, or when gossiping. In fact, the most important and frequent function of language is its phatic function.

1.2 Linguistic signs

In the view of linguists, human language consists of **signs**, which are defined as things that stand for or represent something else. Linguistic signs involve sequences of sounds which represent concrete objects and events as well as abstractions. Signs may be related to the things they represent in a number of ways. The philosopher C. S. Peirce recognized three types of signs:

1. **iconic**, which resemble the things they represent (as do, for example, photographs, diagrams, star charts, or chemical models);
2. **indexical**, which point to or have a necessary connection with the things they represent (as do, for example, smoke to fire, a weathercock to the direction of the wind, a symptom to an illness, a smile to happiness, or a frown to anger); and
3. **symbolic**, which are only conventionally related to the thing they represent (as do, for example, a flag to a nation, a rose to love, a wedding ring to marriage).

It turns out that there is very little in language which is iconic. Onomatopoeic words, which resemble the natural sounds they represent, are a likely candidate. However, while *bow-wow* might represent the sound of a dog in English, for example, other languages represent the sound quite differently (for example, *guau* in Spanish or *amh-amh* in Irish). So even such words seem to be highly conventionalized. Certain aspects of word order are indeed iconic. In the following sentences, we would normally assume that the words, phrases, or clauses represent the temporal and/or causal order in which the events took place:

Susie went to New York, Montreal, and Toronto.
Sybil became ill and left the party.
She ate dinner, read the newspaper, and watched TV.

For example, in the second sentence, we assume that Sybil became ill before she left the party and/or she left the party because she became ill. Note the very different interpretation we give to *Sybil left the party and became ill*. Or in the sentence *If you do well on this exam, you will get a good grade in the course*, we know that the condition precedes the

consequence, both in the sentence and in real life. Iteration can also sometimes be iconic, as in *The car repairs became more and more expensive*, where the repetition of *more* has an intensifying effect.

A few aspects of language are indexical, such as the demonstrative pronouns *this* or *that*, which point to the things they represent as close to or far away from the speaker, or adverbs such as *now* and *then*, which denote the moment of speaking or after (or before) the moment of speaking, respectively.

Most language, however, is symbolic. Ferdinand de Saussure – a Swiss scholar whose work is often said to have been the beginning of modern linguistics – stated that the relation between the linguistic sign and what it signifies is conventional or **arbitrary**. By an arbitrary connection, he meant that the sequence of sounds constituting a word bears no natural, necessary, logical, or inevitable connection to the thing in the real world which it names. Speakers must agree that it names that thing. Speakers of English, for example, have entered into a social agreement that the word *apple* stands for a particular fruit; there is no resemblance between the sound of the word and the appearance or taste of the fruit. Since there is no motivation for the connection between the word and the fruit, speakers must simply learn it. However, like all social agreements, such as those concerning dress or manners, linguistic agreements can be changed. As an example, note that over time, as the invention originally known as a *grammaphone* evolved, it came to be referred to as a *record player* and later as a *turntable*. Similarly, reference to the *cellular* or *mobile phone* was quickly shortened to *cell phone* or *mobile* and as it acquired more features, to *smart phone*.

HINT: To understand how linguistic agreements are changed, consider how societal conventions dictate the replacement of words that are felt to have acquired derogatory or negative connotations: previous reference to individuals as *Oriental* has been replaced by the term *Asian*; *crippled* individuals are now referred to as *handicapped* or *disabled*; and the term *manic-depressive* has been replaced by *bipolar disorder*, etc.

Self-Testing Exercise: Do Exercise 1.1.

1.3 The rule-governed nature of language

Language consists of signs occurring not in a random collection, but in a system. A system consists of smaller units which stand in relation to each other and perform particular functions. These smaller units are organized on certain principles, or rules. For this reason, language is said to be rule-governed. The rules of a language, or its underlying system, are inferable from the observable patterns of the language. This underlying system constitutes what is called grammatical **competence**, which is part of native speakers' implicit knowledge, their "internalized grammar"; while grammatical competence is complete and

perfect, it should be remembered that speakers' actual use of language, what is called **performance**, may be quite incomplete and imperfect.[2]

> **HINT:** A helpful analogy that might be made is to the score of a symphony which, like competence, is perfect and unchanging – and to the orchestra's playing of the symphony – which, like linguistic performance, may be inexact or contain errors and which changes on each occasion of playing.

The rules of language act as a kind of constraint on what is possible in a language. For example, in the area of syntax, the rules of English permit *I like soap operas* or *Soap operas I like*, but not **Like soap operas I* (* means ungrammatical, not permitted by the rules of the language). In respect to word formation, *overnight* is a possible verb expressing a length of time (as in *The climbers overnighted on a rock ledge*), but *midnight*, since it expresses a point in time, is not a possible verb (as in **The revelers midnighted in the streets*). The phonological rules of English would permit the word *prace* (though it does not exist), but would not generate the word **psabr*. Furthermore, we know from the morphological rules of the language that if *prace* were a verb, the past tense would be *praced*, pronounced with a final "t" sound (not the "d" or "ed" sound that is found in other past tense forms), and if *prace* were a noun, the plural would be *praces*, pronounced with a final "ez" sound (not the "s" or "z" sound that is found in other plural forms).

1.4 Language universals, innateness, and creativity

A more general set of constraints on language is known as language **universals**. These are features of language which are not language-specific; that is, they would be found in all languages of the world. Because of the surface diversity of languages, however, the search for language universals has proceeded slowly. We do know, for example, that, if one considers the order of the three main sentence elements, the subject (Su), the verb (V), and the object (O), there are only three basic word orders that occur with any frequency among world languages, namely, SuVO, SuOV, and VSuO, even though logically three other orders would be possible (VOSu, OVSu, OSuV). It may turn out to be the case that certain grammatical categories (such as number), functions (such as subject), and processes (such as passive) are universal. One consequence of the notion of universals is that language appears to be more motivated (that is, iconic) than previously assumed.

To understand better what is universal in language, we can look at the notion of *principles* and *parameters*, as proposed by many linguists today. In terms of the syntax of a language, all languages vary significantly. However, at a deeper or more fundamental level

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2. The distinction between competence and performance corresponds roughly to what Ferdinand de Saussure (c. 1906) called *langue* and *parole* (see Saussure, 1986).

they share certain universals. The shared elements of language are referred to as their principles, while the differences that are displayed in their syntax are known as their parameters. For example, we know that in the syntax of all languages, a sentence has a subject (a principle). However, not all languages express this language universal in the same way. In some languages (e.g. English, German), the subject must be overtly expressed whereas in others (e.g. Japanese, Chinese), it is generally omitted and in yet other languages (e.g. Spanish, Italian, Portuguese, but not French), pronoun subjects tend to be omitted. The latter languages are known as "pro-drop" languages. Compare:

English	*Lili's going to the beach.*	*She's going to the beach.*	**Going to the beach.*
German	*Lili geht zum Strand.*	*Sie geht zum Strand.*	**Geht zum Strand.*
Spanish	*Lili va a la playa.*	*Ella va a la playa.*	*Va a la playa.*
French	*Lili va á la plage.*	*Elle va á la plage.*	**Va á la plage.*

This parameter specifies whether in a given language the subject can be omitted or not. Universal grammar thus encompasses both principles and parameters, which together explain the features that all language share and the syntactic differences which make each language unique.

Inherent in the notion of universals is the belief that human language is **innate**, that we are born with an inborn capacity for language acquisition and are genetically equipped to learn a language (not a specific language, but human language in general). This "genetic predisposition" to learn a language is thought to account for the speed and ease with which children learn their first language during a crucial period of language acquisition (birth to age four), despite the fact that the linguistic data that they hear is incomplete, that they receive no negative evidence, and that they are seldom explicitly "taught" or corrected. Of course, children must be exposed to a language in order to acquire it, so language is in part learned as well as innate. Universals are clearly a consequence of the genetic endowment of human beings for language. A child acquiring a language is innately equipped with both principles and parameters, but the parameters become "set" as language learning progresses. A current scholarly debate is whether this innate capacity for language is part of more general cognitive strategies, such as spatial perception, or is contained in a separate language faculty, or "module"; the answer is not yet in. (On the usefulness of speakers' innate knowledge in the teaching of English, see Chapter 12.)

Despite the general and language-specific constraints on the form of language, we also consider language to be **creative**, or infinite. Creativity in language has two aspects:

- The first aspect is that human beings can produce and understand novel sentences and sometimes even new words. In fact, it is likely that no sentence that you have read so far in this text is one that you have encountered before.
- The second aspect is that we can create sentences of (theoretically) infinite length (as in the nursery rhyme *This is the dog that worried the cat that killed the rat that ate the malt that lay in the house that Jack built*), although there are obviously practical limits on length.

Self-Testing Exercise: Do Exercise 1.2.

1.5 Animal communication codes

Finally, human language is uniquely human. Language is what distinguishes human beings from other animals. While many animals have codes of communication, these differ in important ways from human language. Most animal language is indexical and "stimulus-bound", depending on the necessary presence of concrete stimuli. The topic of conversation must be present in the immediate environment; it cannot be displaced in time or space. Animal communication codes may also be iconic and natural, but they are not symbolic.[3] Furthermore, although the codes may be structurally quite complex, they are finite, not infinite or creative; there is a closed repertory of utterances. The codes are acquired exclusively through genetic transmission, not learned, whereas, as we have seen, human language is both innate and learned. Animals always give primary responses, while human beings often give secondary responses, reacting to how something is said rather than what is said. Human beings may also use language to refer to abstractions or nonexistent entities; they can use language to lie, exaggerate, or mislead; and they can even use it to reflect about language itself (i.e. metalinguistically). None of these is possible within an animal communication code.

2. The nature of grammar

As well as having a number of misconceptions about the nature of language, students coming to the study of language for the first time often have a different definition of the term *grammar* than linguists do.

2.1 Definitions of grammar

It is important at the outset to be clear about the meaning of the ambiguous term *grammar*. In linguistics, the term is used to refer to the rules or principles by which a language works, that is, its system or structure. Speakers of a language all have an internalized grammar (their competence), whether they can articulate the rules of the language or not. And unless they have studied their language in a formal context, they probably can't. Throughout the ages, grammarians and linguists have been attempting to formulate the speakers' grammar in a set of rules, though it is probably fair to say that they have not yet been able to do so completely for any language. This sense of grammar is known as **descriptive grammar**.

3. Although some chimpanzees have been observed to use American Sign Language creatively, this may have been merely accidental.

You have probably been exposed to a different sense of grammar known as **prescriptive grammar**, which involves attempts to establish and maintain a standard of correctness in the language, to "prescribe" (dictate) and "proscribe" (forbid) certain ways of speaking; but this has little to do with the actual working of the language. It is only in a prescriptive sense that we can talk about "good" grammar or "bad" grammar; prescriptive grammar involves value judgments based on factors external to language – such as social class or level of education (a topic discussed in more detail in Chapter 12).

> **HINT:** A prescriptive approach to language is not restricted to grammar, but also extends to spelling, punctuation, written style, and even what is considered socially correct or acceptable. Thus being told by your writing teacher "Never use the first person pronoun 'I' when writing an academic essay" could be considered prescriptive just as could being advised that *isn't* is the grammatically correct form of *ain't* or that *any* should be substituted for *no* in the sentence *We don't need no education*. Other examples of prescriptive rules in writing include avoiding the passive voice, never ending a sentence with a preposition (*To whom were you talking?*, not *Who were you talking to*?), and not splitting infinitives (*to comprehend fully*, not *to fully comprehend*).

The difference between descriptive grammar and prescriptive grammar is comparable to the difference between **constitutive rules**, which determine how something works (such as the rules for the game of chess), and **regulatory rules**, which control behavior (such as the rules of etiquette). If the former are violated, the thing cannot work, but if the latter are violated, the thing works, but crudely, awkwardly, or rudely.

> **HINT:** To understand the difference between constitutive and regulatory rules, consider what happens if in a game of chess you move a pawn three spaces in a single move. In this case, you are violating the constitutive rules of chess and are therefore not considered to be playing the game. But if on the other hand you eat peas off your knife at dinner, you are violating regulatory rules of eating etiquette and may be considered rude or vulgar. Yet you nonetheless can manage to eat the peas (perhaps somewhat awkwardly).

If you say, for example, *Cat the the dog chased* you are not speaking English; the sentence violates the constitutive rules of the language and is thus considered ungrammatical. Hearers might well have trouble understanding you (Is the dog chasing the cat or the cat chasing the dog?). However, if you say *He did good on the exam*, your sentence is grammatical and would be understood by all, but many people would find your sentence unacceptable; they would consider it "bad", "nonstandard", or "incorrect" English. This sentence violates the regulatory rules of English but not its constitutive rules.

On the role of prescriptivism in language teaching, see Chapter 12.

2.2 Fallacies concerning grammar

There are some fallacies concerning the nature of grammar which are widely believed. One fallacy is that there are languages that have "no" grammar or "little" grammar. If grammar is defined as the principles by which a language operates, it must be recognized that every

language has a grammar and that each language's grammar is completely adequate. It is certainly true that there are different types of grammars – such as the widely divergent grammars of Chinese, German, Turkish, or Cree – but these are all equally operative.

A related fallacy is that certain types of grammars are simpler and hence more "primitive" than others, while other grammars (particularly grammars which make use of inflections, or word endings, to express distinctions) are more complex and hence more advanced. This view was widely held in the eighteenth and nineteenth centuries, but was dispelled by the discovery that supposedly primitive languages (for example the American Indian languages) had extremely complex grammars and that the earliest form of the Indo-European languages, which has been reconstructed, probably had a more elaborate inflectional system than classical languages such as Greek, Latin, and Sanskrit.

In fact, it is unclear how a concept such as grammatical "simplicity" would be defined: is it, for example, simpler to add an inflection to a word or to express the same concept with a separate word, as English often does? That is, is *the dog's tail* or *the tail of the dog* simpler? It also seems to be the case that if one area of the grammar of a language is "simple", other areas are usually more "complex" in compensation. The number of variant forms of the English verb, for instance, is quite small, usually only four (e.g. *work*, *works*, *worked*, *working*). Compared even with another so-called analytic language (one which has few inflections) such as French, then, the English verb is inflectionally very simple. But the auxiliary phrase in English balances matters out by being very complex: there may be as many as four auxiliaries preceding the main verb, and these must occur in a certain order and form (e.g. English can produce phrases as complex as *might have been being built*). Moreover, if one language makes a grammatical distinction that another language appears not to, further examination of the second language often reveals that it makes the same distinction, but in a different way. English native speakers learning Chinese, for example, are often initially confused by its lack of tense marking on the verb. Instead, they learn, Chinese indicates time quite differently from English, e.g. via the use of adverbials.

Another fallacy about the form of grammars, which was also current in the eighteenth and nineteenth centuries, was that grammars should be logical and "analogical" (that is, regular). So strong was this belief that there were a number of attempts to eliminate supposedly illogical features of English grammar, such as the use of two or more negatives for emphasis, which was common prior to the eighteenth century, but was then judged by principles of logic to make a positive. While some of this language engineering was successful, grammars do not naturally follow logical principles. There is some drive towards regularity in language, causing certain irregularities to be smoothed out over time, (as when *bōc* 'book' */bēc* 'books' in Old English was replaced by *book/books* in Modern English).[4]

4. This phenomenon of attempting to smooth out irregularities also occurs in child language acquisition (for example, a child using the regular past tense form *taked* for the verb *take* instead of the correct, irregular past tense form *took*).

However, other irregularities, for quite unpredictable reasons, have been retained (as in the irregular plural forms *goose/geese* or *mouse/mice*). And in some cases, especially in the area of pronunciation, new irregular forms are even introduced into the language, as in the change of vowels in *five* versus *fifteen* – a historical change introduced in Middle English in the fourteenth century.[5] This opposing drive, which serves to keep language irregular, helps to explain why no perfectly regular language exists.

A fallacy about changes in grammar is that they result in deterioration, or, alternatively, evolution. Again, it would be difficult to define what is meant by grammatical "evolution" or "deterioration". There is no doubt that languages change over time, sometimes in quite radical ways, but the changes do not seem to entail an advancement or a loss of any kind; the status quo is maintained. Furthermore, changes in language are not entirely random, but often proceed in certain predictable ways (known as "drift") and by a number of quite well-understood mechanisms.

It is often believed that people are taught the grammar of their native language, but in fact little conscious teaching of grammar occurs in the critical period of language learning, apart from rather sporadic corrections of wrong forms (as in, "it's not *tooken* but *taken*"). Children learn the language by hearing instances of it, and, it is now believed, constructing their own "internalized" grammar.

Three further fallacies concerning grammar which have already been touched on are that there are completely random differences among the languages of the world (the notion of language universals calls this view into question), that the sentences a person produces directly reflect his or her grammatical knowledge (the distinction between competence and performance underlines the incorrectness of this view), and that there is only one sense of the term *grammar* (we saw above that we need to recognize both prescriptive and descriptive grammars as well as the linguist's as opposed to the speaker's grammar).

A final fallacy involves equating the grammar of the spoken language with that of the written language. In fact, research into the grammar of these two distinct modes of language reveals that in a sense, they have entirely different "grammars". The grammar of written English tends to be more embedded (e.g. containing appositives or dependent clauses), with the independent clause often in second position. The grammar of spoken English is more fragmented, with phrases or clauses often "strung together" with conjunctions. Spoken language is also typically more disfluent, with false starts, repetitions, conversational fillers (e.g. *um*, *er, you know*), and abandoned thought units. The following transcript of a college composition instructor explaining the importance of class participation on the first day of class illustrates this very different grammar of the spoken language:

> *Don't come to class and keep your mouth shut. Come to class and participate. People that participate end up getting better grades in this class. I don't you know I … it just works*

5. Note that the vowels in *four/fourteen*, *six/sixteen*, *seven/seventeen*, *eight/eighteen*, and *nine/nineteen* remain the same.

out that way. It has a way of kind of generating its own energy. I really um suggest … I know that some people are more shy than others. But do what you can to um engage first in your group and eventually um in class, because by articulating your own ideas they become, doing it in public, they become more clear to you and you're better able to write about them later. So don't be afraid to speak up.

Self-Testing Exercise: Do Exercise 1.3.

3. Linguistics and the components of language

Linguistics is defined as the study of language systems. For the purposes of study, language is divided into levels, or components. These components are conventional and, to some extent, arbitrary divisions of linguistic investigation, and although they are interrelated in complex ways in the system of language, we treat them more or less separately. They constitute the framework which organizes this textbook.

The first component is **phonology** (from the Greek word *phōnē* meaning 'sound, voice'), the study of the speech sounds of a particular language. A subdivision of phonology is **phonetics**, the study of the speech sounds of human language in general, either from the perspective of their production ("articulatory phonetics"), their perception ("auditory phonetics"), or their physical properties ("acoustic phonetics"). Although speech is a continuum of sound, it is possible to break it into different types of sounds, known as consonants, vowels, and glides or semivowels; we will study how these different sounds are articulated, as well as how other features of sound, including stress and pitch, are superimposed over these sounds. Since the repertory of human speech sounds is quite large (but not unlimited – there are physical constraints on the sounds human beings are capable of producing), no language makes use of all possible speech sounds, but instead selects a limited set. Furthermore, within this limited set of sounds, certain sounds will be distinctive, that is, make a difference in meaning (such as the "t" and "k" sounds in *t̲ap* and *c̲ap*), while others will be nondistinctive and predictable variants (such as the slightly different "t" sounds in *st̲op* and *t̲op*).

Since the writing system of English does not provide us with a one-to-one correspondence between oral sound and written symbol, we need a tool for representing human sounds in an regular way when studying phonology; the International Phonetic Alphabet (the IPA) has been invented for this purpose. In it, each written symbol represents one, and only one, speech sound, while each speech sound is represented by one, and only one, written symbol. We will begin by learning this special alphabet.

The second component of language is **morphology** (from Greek *morphē* 'form'). Morphology is the study of the structure or form of words in a particular language, and of their classification. While the concept of a word is intuitively clear, it is not easy to define it objectively (is *ice cream* one word or two?), and morphology must begin by trying to

formulate such a definition. Morphology then considers principles of word formation in a language:

- how sounds combine into meaningful units such as prefixes, suffixes, and roots (as in *re-mind-er*),
- which of these units are distinctive and which are predictable variants (such as the different forms of the indefinite article, *a* and *an*), and
- what processes of word formation a language characteristically uses, such as compounding (as in *road-way*) or suffixing (as in *pave-ment*).

Morphology then considers how words can be grouped into classes, what are traditionally called "parts of speech", again seeking some objective criteria – either of form or of meaning – for sorting the words of a language into categories. We will study all of these questions in respect to the form of words in English.

The third component of language is **syntax** (from Greek *suntassein* 'to put in order'). Syntax is the study of the order and arrangement of words into larger units, as well as the relationships holding between elements in these hierarchical units. It studies the structure and types of sentences (such as questions or commands), of clauses (such as relative or adverbial clauses), and of phrases (such as prepositional or verbal phrases). Syntax is an extensive and complex area of language, and nearly one-third of the textbook is devoted to the study of English syntax. The two components of morphology and syntax are sometimes classified together as "grammar".

The fourth component of language is **semantics** (from Greek *sēmainein* 'to signify, show, signal'). Semantics is the study of how meaning is conveyed in words, phrases, or clauses. The study of semantics focuses either on meanings related to the outside world ("lexical meaning") or meanings related to the grammar of the sentence ("grammatical meaning"). In studying meaning, we consider both the meaning of individual words ("lexical semantics") and the meaning which results from the interaction of elements in a sentence ("sentence semantics"). Lexical semantics often involves the meaning relationships between words, such as the synonymity ('sameness of meaning') of *smart* and *intelligent* or the antonymity ('opposite of meaning') of *rough* and *smooth*. Sentence semantics involves the relationship between syntax and semantics, as in the different meanings of the subject of a sentence (as the agent of a change in the sentence *Jill closed the door* or the entity undergoing a change in the sentence *The door closed*). A further area of study, which is also treated here, is the meaning relationships holding among parts in an extended discourse ("discourse semantics").

A fifth component of language, not part of the traditional subdivision but added in recent years, is **pragmatics** (from Greek *pragma* 'deed, affair', from *prassein* 'to do'). Pragmatics is the study of the functions of language and its use in context. For example, in the context of a driver and a passenger in a car stopped at a traffic light, the phrase *The light is green* uttered by the passenger is not simply a description but performs the pragmatic function of advising the driver to step on the gas pedal and move into the intersection.

As was pointed out above, language, in addition to serving to communicate information, actually has a variety of functions, including the expression of emotion, the maintenance of social ties, and even the performance of action (a statement such as *I declare you guilty* uttered by a judge). Furthermore, in any context, a variety of factors, such as the age, sex, and social class of the interlocutors and their relationships of intimacy and power, influence the form of language used. We will consider this fairly wide-open field from two different perspectives.

4. Organization of the book

This book examines the linguistic structure of Modern English starting with the smallest units and working toward larger units. Thus, we begin with the phonological level (individual sounds), move to the morphological level (sounds combined into words and meaningful parts of words), and then to the syntactic level (words combined into phrases, clauses, and sentences). The relation of sentences within the larger discourse is the subject matter of pragmatics. Since meaning derives from aspects of phonological structure, from words and clauses, and from larger textual structures, we consider aspects of the semantic component as it relates to all of the levels. However, since meaning is most strongly associated with lexical items and syntactic structures, a section on word semantics follows the morphological section, and a section on sentence semantics follows the syntax section. This approach may be schematized as in Figure 1.1.

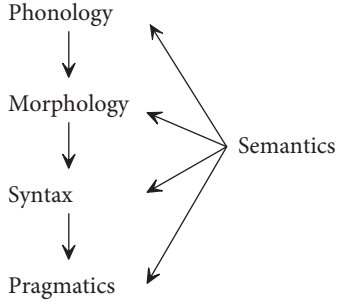


Figure 1.1. Organization of the Text

There are many different ways to study language, or different approaches, which can be termed "schools of linguistics". Each school has certain characteristics and certain strengths. In studying the different linguistic components, we use methods of analysis formulated within different schools of linguistics. Such an eclectic approach seems desirable because some theories are better suited to deal with certain areas than others. Traditional grammar (an approach to the study of language dating from Greek times)

underlies much of our treatment, but our approach to both phonology and morphology will be primarily structuralist (an approach to the study of language dating from the 1930s to the 1950s), and our approach to syntax will be overtly generative (an approach to the study of language dating from the late 1950s to the present).

Chapter summary

Now that you have completed this chapter, you should be able to:

1. describe the characteristics of human language;
2. differentiate between iconic, indexical, and symbolic signs;
3. distinguish between different senses of the word *grammar*;
4. describe common fallacies about language and grammar; and
5. define the study of linguistics and its subparts.

Recommended additional reading

The topics discussed in this chapter are generally addressed in introductory linguistics textbooks, such as O'Grady and Archibald (2009, Chapter 1), Fromkin, Rodman, and Hyams (2007, Chapter 1), or in treatments of English linguistics, such as Curzan and Adams (2009, Chapter 1), Klammer, Schulz, and Della Volpe (2010, Chapter 1), Leech, Deuchar, and Hoogenraad (2006, Chapter 1), and Finegan (2008, Chapter 1). For a wide-ranging discussion of language, see Crystal (2010).

You may find a dictionary of linguistics, such as Crystal (2008) or Trask (1993), a very useful reference while reading this textbook. Hurford (1994) is a dictionary/grammar, with extensive examples from English as well as exercises and answers.

A comprehensive resource on animal communication is Hillix and Rumbaugh (2004). For a more abbreviated treatment of chimpanzee language, see Fromkin, Rodman, and Hyams (2007, Chapter 8) and Crystal (2010).

The most complete contemporary grammars of English are Quirk, Greenbaum, Leech, and Svartvik (1985), Biber, Johansson, Leech, Conrad, and Finegan (1999) (this grammar pays particular attention to written vs. spoken English), and Huddleston and Pullum (with Bauer et al.) (2002). All three also exist in shorter students' forms: Greenbaum and Quirk (1990), Biber, Conrad, and Leech (2002), and Huddleston and Pullum (2005).

Older traditional grammars of English based on historical principles are those by Curme (1931, 1935; and a shorter form, 1947), Jespersen (1909–49; and a shorter form, 1933), and Poutsma (1904–26).

Very useful grammars of English that are primarily traditional in orientation are those intended for teachers of English as a second language, such as Celce-Murcia and Larsen-Freeman (1999) or Larsen-Freeman (2007).

A prescriptive (but very intelligent) approach to English usage can be found in Fowler (1965 [1926]). (For a humorous take-off on Fowler, see Thurber (1931).) For an amusing treatment of the prescriptive approach to punctuation, see Truss (2003). Two contemporary guides are Swan (2005) and Peters (2004); the latter is based on actual usage.

Structural accounts of English include Fries (1952), Francis (1958), and Strang (1968). Bloomfield (1933) and Sapir (1921) are classic – and very readable – structural accounts of language in general.

References to generative accounts of English may be found in later chapters on phonology and syntax.

If you would like to read the writings of Ferdinand de Saussure, they can be found in a modern translation (1986 [1983]). Very readable discussions of the human language capacity are Davis (1994) and Pinker (1994, 2007).

Chapter 2

Consonants and vowels

Chapter preview

This chapter begins with a discussion of some of the differences between writing and speech, including what each medium can and cannot express. It then examines the production of human speech sounds. The criteria for analyzing consonant sounds are explained. An inventory of the consonant sounds in English and explication of the method of their phonetic transcription follows. Vowels sounds are next classified, with a description of which vowel sounds English has and how they are transcribed. The chapter ends with discussion of formal versus functional means of distinguishing vowels and consonants.

Commentary

As defined in Chapter 1, phonetics is the study of speech sounds in general. It has three subdivisions:

1. the study of how sounds are made or the mechanics of their production by human beings ("articulatory phonetics");
2. the study of how sounds are heard or the mechanics of their perception ("auditory phonetics"); and
3. the study of the physical properties of the speech waves which constitute speech sound ("acoustic phonetics").

In this chapter, after briefly examining how speech sounds are made, we will turn to phonology, the study of the speech sounds in a particular language, in our case, the inventory of sounds constituting the sound system of English, including consonants, vowels, and glides. Our study of English phonology will continue in the next chapter with a consideration of the distinctive and nondistinctive sounds in English as well as of sound combinations and syllable structure in the language.

1. The spoken versus the written form of language

The initial step in the study of the sound system of a language is to distinguish between speech and writing. This is often a difficult distinction for literate people to make since we are tempted to consider the written form as equivalent to language. But speech and writing are, in fact, two quite distinct media of language. Speech is temporally prior, both in the history of humankind and in the history of the individual. Languages existed for millennia before writing systems were invented. We learn to speak effortlessly, but must struggle to learn to write; many, in fact, do not learn to write yet are fluent speakers of the language. It is salutary to remember that even in Shakespeare's day the majority of English speakers were illiterate, yet verbally proficient enough to understand Shakespeare's word plays. Some languages have no written form, but all languages have spoken forms. Moreover, a variety of writing systems are used to record the languages of the world, some languages have more than one writing system, and even very closely-related languages may use very different writing systems.

1.1 English spelling

That writing is often an imperfect means of representing speech is perhaps most obvious in the well-known inadequacies of English spelling. If we compare the actual sounds of English with the **orthography**, the graphic symbols or letters used in writing, we find the following discrepancies:

- one sound can be represented by a variety of **graphemes** (alphabet letters), as with the vowel sound in *meat*, *meet*, *machine, city*, *key*, *ceiling*, *people*, *niece*, *evil*, *Caesar, amoeba,* and *quay*;
- one grapheme can represent a variety of sounds, as with *d* in *damage*, *educate*, *picked*;
- one or more graphemes may represent no sound at all, as in *knee*, *gnat*, *lamb*, *receipt*, *right*, *honor*, *rhyme*, *psalm*, and *salmon*;
- two or more graphemes may represent a single sound, as in *throne*, *chain*, *edge*, *shore*, *nation*, *itch*, *inn*, *school*, *eat*, *friend*, *too*, *leopard*, *cause*, *blood*, or *lieutenant*;
- a grapheme may simply indicate the quality of a neighboring sound, as in *dinner* vs. *diner* (where a double or single *n* indicates the quality of the preceding vowel) or *dine* vs. *din* (where the presence or absence of final *e* indicates the quality of the preceding vowel);

- a single grapheme may represent two or more sounds, as in *box*, where the letter *x* represents the sound sequence "ks"; and
- some sounds have no graphic representation, as with the initial sounds in *u̲niverse* and *o̲ne*.

Self-Testing Exercise 2.1: Examining the reasons for the marked incongruity between sound and spelling in English makes for a fascinating historical study. Read the brief discussion and do the self-testing exercise on the website.

For the study of speech sounds, therefore, orthographic systems are clearly inadequate. We need a system of recording sounds in which a single written symbol represents one and only one speech sound and in which a single sound is represented by one and only one written symbol. For this reason, the **International Phonetic Alphabet (IPA)** was invented in 1888 (and revised in 1989). It is based on the Roman alphabet primarily, with some symbols from other writing systems, as well as some invented symbols and **diacritics** (marks added to symbols). The recording of the sounds of a language in the IPA is called "transcription". Much of this chapter will be concerned with the transcription of English using the IPA.

1.2 The advantages of speech and writing

It is important to keep in mind, however, that each medium of language – speech and writing – fulfills different functions and has certain advantages. On one hand, the oral medium expresses certain meaning features that cannot always be recorded in the written medium:

1. emphasis: indicated by syllable stress in speech and very inexactly by underlining in writing, as in *I want thát one, not thís one*;
2. sentence type: indicated by **intonation** (the rising and falling contours of the voice) in speech and very crudely by end punctuation in writing, as in the difference between *He said he would help.* and *He said he would help?* (though often different word orders distinguish different sentence types such as questions or commands);
3. homographs: words that are spelled the same but pronounced differently, for example, *sewer* 'one who sews'/'a conduit for sewage' or *hót dòg* 'a sausage'/*hót dóg* 'an overheated canine';
4. paralanguage: tones of voice and vocal qualifiers, indicated by shouting, growling, whispering, drawling, and so on;
5. variations in pronunciation resulting from dialect or idiolect (an individual's unique dialect);
6. kinesics: indicated by body movement, facial expressions, and gestures;
7. performance errors, slips, or hesitations; and

8. features of the speech situation, such as the relation of the speaker and the hearer or intimacy and personal contact.

In reading over the above list, you might have thought of dialogue in novels or plays as an exception. However, dialogue is always very stylized and conventionalized. For example, tones of voice, kinesics, contextual features, and many performance errors must be explicitly described. If dialogue were faithfully to represent the performance errors of real conversation, it would be nearly incomprehensible; the transcribed conversation would be quite incoherent. Features of regional or social dialect are also imperfectly represented (as in the use of unconventional spelling *Ah'm tahrd* for a Southern US pronunciation of *I'm tired* or the use of spellings which approximate the actual pronunciation of words such as *bekuz*, *nite*, *wuz*, and *sez* (for the conventionalized spellings *because*, *night*, *was*, and *says*).

On the other hand, there are aspects of language which writing expresses but speech cannot:

1. historical changes: older pronunciations preserved in the spelling, such as *comb*, *gnat*, or *taught*;
2. words: indicated by spaces, sometimes disambiguating ambiguous phonological sequences such as *nitrate/night rate*, *syntax/sin tax*, or *homemade/home aid*;
3. homophones: words which are pronounced the same but spelled differently, such as *bear/bare*, *meat/meet*, or *maid/made*;
4. related words or affixes which sound different, such as *photograph*, *photography*, *photographic* or the past tense affix *-ed* in *rated*, *walked*, *robbed*;
5. a greater range of vocabulary, more complex syntax, and greater refinement of style, resulting in part from the planning permitted by the situation of writing;
6. language free of performance errors (which, in fact, we often are not consciously aware of in the spoken form);
7. a standard language without dialectal differences, allowing easier communication among diverse groups;
8. permanency: permitting the keeping of historical annals, the recording of laws, and the writing of other permanent records.

Incidentally, it is because of points (1) and (7) above that the many attempts at spelling reform in the history of the English language have been unsuccessful. For example, we will see below that certain modern dialects of English do not pronounce the "r" in words such as *par*t or *par*, while others do. Such instances of dialectal variation in pronunciation seriously impede decisions about standardizing English spelling: If English spelling were to represent pronunciation more closely, which dialect's pronunciation should become fixed in its orthography?

2. The production of speech sounds

Keeping in mind the primacy of speech, we will now consider how we make speech sounds. Speech sounds are produced using, but modifying, the respiratory system. When speaking, the number of breaths per minute increases. The intake of air (inspiration) becomes shorter while the period of exhalation (expiration) increases. A greater amount of air is expelled, with a gradual decrease in the volume of air and fairly constant pressure. Importantly for the production of sound, the air is often blocked or impeded at some point or points on its way out.

English and most languages of the world use the **egressive pulmonic system** to generate speech sounds. The term "egressive" refers to the fact that sound is produced when air is exiting, not entering, the lungs. "Pulmonic" refers to the use of the lungs as the power source. In speaking, air is expelled from the lungs by a downward movement of the ribs and upward movement of the diaphragm. The air travels up the bronchial tubes to the trachea, or "wind pipe", and through the larynx, or "Adam's apple". The larynx contains a valve which functions to close off the trachea while you are eating. This valve has been adapted for the purposes of speech; it is known as the **vocal cords**. The vocal cords are two muscles stretching horizontally across the larynx, attached to cartilage at either end that controls their movement. The vocal cords are relatively open during normal breathing, but closed during eating. The space between the cords when they are open is known as the **glottis**. The vocal cords of men and of women are of different lengths: 1.7 cm for women, 2.3 for men. This, as we will see later, accounts in part for the different vocal qualities of men and women. Air continues past the larynx into the pharynx, whose only real function is as a connector and resonator.

The air then moves into the vocal tract (see Figure 2.1), consisting of the **oral** and **nasal cavities**. The oral cavity, that is, the mouth, is a resonator and a generator of speech sounds via the articulators, which may be active (moving) or passive (stationary). The **active articulators** include the following:

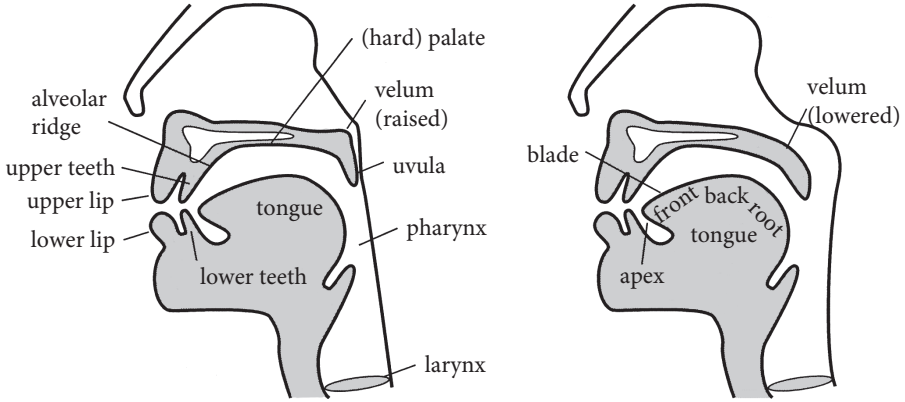
- the tongue, divided into (1) the front (consisting of the tip or "apex" and the blade or "lamina"), (2) the back (or "dorsum"), and (3) the root: the tongue modifies the shape of the cavity, acts as a valve by touching parts of the mouth to stop the flow of air, and is shaped in various ways to direct the flow of air.
- the lower lip: the lip may be placed against the upper teeth or, together with the upper lip, may be closed or opened, rounded or spread.

The **passive articulators** include the following:

- the teeth, both upper and lower.
- the roof of the mouth, which is divided into (1) the **alveolar ridge**, which is 1 cm behind the upper teeth, (2) the hard **palate**, which is the domed, bony plate, (3) the soft palate, or **velum**, which is the muscular flap at the rear, and (4) the uvula, which is the tip of the velum.

– the pharynx, or back of the throat, which is used by some languages (but not English) in producing speech sounds.

> **HINT:** If you run your tongue back along the top of your mouth from your teeth, you should be able to feel your alveolar ridge just behind the upper teeth and to distinguish your palate from your velum. As your tongue travels backwards towards the velum, you should feel the membrane covering the roof of the mouth become softer.



a. velum raised b. velum lowered

Figure 2.1. The Vocal Tract with (a) Velum Raised and (b) Velum Lowered

A useful feature of the velum is that it is movable. If it is raised against the back of the pharynx (called "velic closure") blocking the entrance to the nasal passageway, then air passes out only through the oral cavity (see Figure 2.1a). The result is known as an **oral sound**. If the velum is lowered (called "velic opening"), then air can pass out through the other cavity, the nasal cavity, that is the nose (see Figure 2.1b). If air passes out of the nose exclusively, a **nasal sound** is produced, but if air passes out of both the nose and the mouth, a **nasalized sound** is produced. People who have a "nasal quality" to their voice probably have incomplete closure of the velum at all times, so that a little air is always able to escape through the nose. Also, when you have a cold and your velum is swollen, you will have imperfect velic closure and hence a nasal voice; you will also not be able to produce exclusively nasal sounds since your nose is blocked and will substitute oral sounds (e.g. the sound "b" for "m").

Let us return, briefly, to the larynx and the vocal cords to see how they function in producing sounds. When the cords are widely separated and fairly taut, no noise is produced. This is known as an "open glottis" and produces a **voiceless** sound (see Figure 2.2a). However, the vocal cords may also be set in vibration ("phonation"), and this produces a **voiced** sound (see Figure 2.2b). They vibrate open and shut as air passes through. Vibration is begun by initially closing the vocal cords completely, but with the cords fairly relaxed. Air pressure builds up below the cords and blows them apart. Then the pressure decreases and

the cords close again; these events occur in rapid succession. Women's vocal cords, being smaller, vibrate more rapidly, normally 190–250 Hz (times/second), while men's larger vocal cords vibrate 100–150 Hz. When the vocal cords are vibrating, you can feel a vibration and hear a buzzing.

> **HINT:** To feel the vibration, place your fingers on your larynx or cup your hands over your ears and say *sa-za-sa-za*. You should sense the vibration of the cords with the "z" sound but not the "s" sound.

A "closed glottis" occurs when the vocal cords are brought completely together once and the air stream is interrupted. This produces a speech sound we will consider later called a "glottal stop".[1]

Whispering involves bringing the vocal cords close together, keeping them fairly taut but not vibrating them. Air is restricted through a small triangular passage between the arytenoid cartilages, and this produces a hissing sound (see Figure 2.2c). To produce a breathy voice, the vocal cords never close completely but are in vibration; hence, there is a murmuring sound. A creaky voice results from voicing with slow, regular vibration, whereas a harsh voice results from excessive tension in the vocal cords and irregular vibration. A hoarse voice usually results from swelling of the vocal cords producing irregular vibration and incomplete closure.

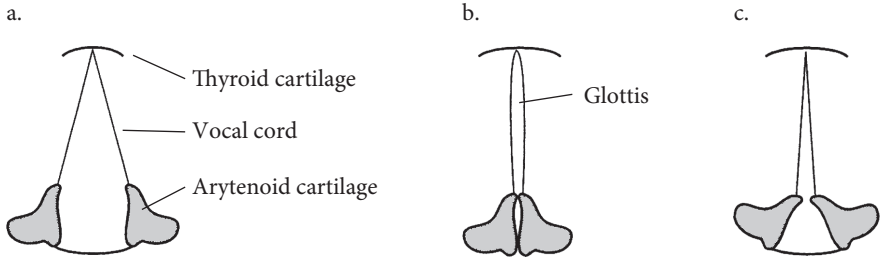


Figure 2.2. Configurations of the Larynx: (a) Voiceless (Exhalation), (b) Voiced, and (c) Whispered

1. Two other air stream mechanisms may be used in producing certain sounds in other languages, the "glottalic" system and the "velaric" system. In the latter, for example, the tongue is raised against the velum and simultaneously at a point further forward in the mouth, trapping air. Moving the tongue downward rarefies the air, and when the tongue is released, air rushes in to produce an ingressive sound. There are three types of such sounds, called "clicks", in the Bantu (e.g. Xhosa, Zulu) and Khoisan languages of southern Africa. These include the bilabial click (the "kissing" sound), the alveolar click (the "tut-tut" or "tsk-tsk" sound of disapproval), and the lateral click (the sound made to spur a horse on). Although we use these sounds, of course, they are not regular speech sounds.

Two other features of sound are **loudness** and **pitch**. Loudness is related to the pressure and volume of air expelled; as these increase, the sound becomes louder. Pitch is a matter of the quality of the sound, which is a consequence of the frequency of the sound wave emitted. Every person has a natural frequency and range. Men's voices tend to have a lower pitch than women's due to the larger size of their vocal cords, which vibrate more slowly. Pitch can be modulated by altering the tension on the vocal cords and changing their length. Pitch decreases when the vocal cords are elongated and tensed and increases when they are relaxed, hence shorter. Most human voices have a range of about two octaves.

3. Consonant sounds

Speech is a phonetic continuum, a continuous, smoothly flowing set of movements, not a set of discrete and isolated movements. It is convenient, however, to segment the speech chain into syllables, and to divide these in turn into consonants and vowels. A syllable consists necessarily of a vowel; optionally, it may begin and/or end with a consonant. A vowel is the nucleus or acoustic high point of a syllable; it is articulated for a longer time than surrounding consonants. While vowels tend to continue the airstream, consonants tend to break it. We begin our study of speech sounds with consonants, since they are somewhat easier to describe. We will look first – in abstract – at how consonants are articulated before examining in detail the specific consonants of English.

3.1 Classification of consonants

A **consonant** is defined as a speech sound which is articulated with some kind of stricture, or closure, of the air stream.

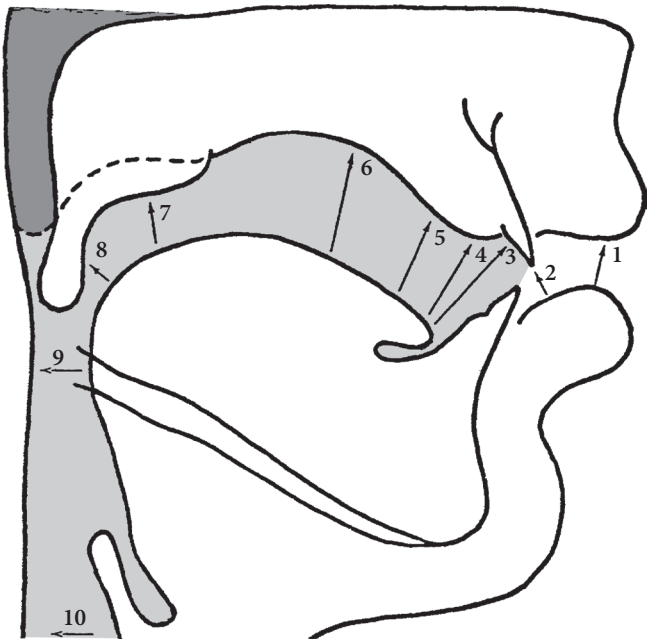
Consonants are classified according to four features:

1. the state of the glottis: in vibration (voiced) or open (voiceless);
2. the state of the velum: lowered (nasal) or raised (oral);
3. the **place of articulation**: the location where the stricture or place of maximum interference occurs and what articulators are involved; and
4. the **manner of articulation**: the amount of stricture, whether it is complete, partial (called "close approximation"), or relatively open ("open approximation").

The term "approximation" refers to the two articulators approaching (or approximating) one another.

In describing the place of articulation for consonants, it is traditional to list the active and then the passive articulator. Consonants involve a rather large number of discrete places of articulation (see Figure 2.3):

1. **bilabial**: the lips are brought together (the lower lip is active); the tongue is not involved but remains in the "rest position" (its position when you say *ah* for the doctor) – e.g. the sound of "b" in English;
2. **labiodental**: the lower lip is brought up against the upper front teeth; again the tongue is in rest position – e.g. the sound of "f" in English;
3. **dental**: the tip of the tongue (or apex) protrudes between the teeth or touches the back of the upper teeth – e.g. the sound of "t" in Spanish or "th" in English;
4. **alveolar**: the tip of the tongue makes contact with or is in close approximation to the alveolar ridge – e.g. the sound of "d" in English;
5. **alveolopalatal**: the front, or blade, of the tongue is raised to an area between the alveolar ridge and the palate – e.g. the sound of "sh" in English;
6. **palatal**: the front of the tongue is brought up against the palate – e.g. the sound of "y" in English;
7. **velar**: the back, or dorsum, of the tongue is brought into contact with the velum – e.g. the sound of "g" in English;
8. uvular: the back of the tongue touches the uvula;
9. pharyngeal: the root of the tongue (specifically, the epiglottis) is moved backwards against the wall of the pharynx; and
10. **glottal**: the vocal cords, functioning as articulators, make a brief closure.



1. bilabial
2. labiodental
3. dental
4. alveolar
5. alveolopalatal
6. palatal
7. velar
8. uvular
9. pharyngeal
10. glottal

Figure 2.3. Some Places of Articulation

While the uvular and pharyngeal places are not used for the articulation of English consonants, they are used in other languages: e.g. the uvular for German "r" and a French fricative and the pharyngeal for a fricative in Arabic.[2]

Each of the various places of articulation just examined may combine with a number of different manners of articulation to produce consonant sounds:

1. **stop**: ("oral stop") involving complete closure of two articulators with the velum raised (velic closure) – e.g. the sound of "p" in English;
2. **nasal**: ("nasal stop") involving complete closure of two articulators with the velum lowered ("velic opening") – e.g. the sound of "n" in English; for every stop position in English, there is a nasal articulated in the same position (**homorganic**);
3. **fricative**: (or "spirant") involving close approximation of two articulators; the air stream is partially obstructed so that a turbulent airflow is produced, resulting in a hissing or rubbing sound – e.g. the sound of "s" in English;
4. **affricate**: consisting of a stop released into a homorganic fricative – e.g. the sound of "ch" in English; this sound is analyzed either as a complex or a simple sound;
5. **trill**: (or "roll") involving complete closure alternating intermittently with open approximation, that is, a rapid vibration of the active articulator against the passive articulator (this sound in not common in English except for the Scottish "r" made with an apical trill);
6. **flap**: (or "tap") involving momentary complete closure in which the active articulator strikes the passive articulator only once; it is one strike of a trill and similar to a stop except that the tongue is more tense and controlled than in a stop; and
7. **approximant**: one articulator approaches another but generally not to the extent that a turbulent air stream is produced; there is usually open approximation in the three different types of approximants:

    a. **lateral**: involving complete closure of the central portion of the vocal tract, with the lateral passage of air; the air may pass around the sides with no stricture (open approximation) – e.g. the sound of "l" in English – or, in languages other than English, with some stricture (close approximation);
    b. **retroflex**: involving the underside of the tongue curling back behind the alveolar ridge towards the palate – e.g. the sound of "r" in English; laterals and retroflexes are called "liquids";

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2. Two places of articulation may also be used at the same time – what is called "coarticulation" – as in the case of labiovelars, which involve the lips, on one hand, and the tongue and velum, on the other.