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A Biography of the English Language

Second Edition

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1996

HARCOURT BRACE COLLEGE PUBLISHERS

*Fort Worth Philadelphia San Diego New York Orlando Austin San Antonio
Toronto Montreal London Sydney Tokyo*

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C H A P T E R
2

PHONOLOGY

Language is called the garment of thought: however, it should rather be, language is the flesh-garment, the body, of thought.

—THOMAS CARLYLE



Most native speakers of English, even without training in linguistics, have a fairly good intuitive understanding of morphology, syntax, lexicon, and semantics. However, because the Latin alphabet is so inadequate for representing English sounds and because the match between English spelling and English pronunciation is both complex and poor, some specific training in English phonology is necessary as background for a study of the history of English.

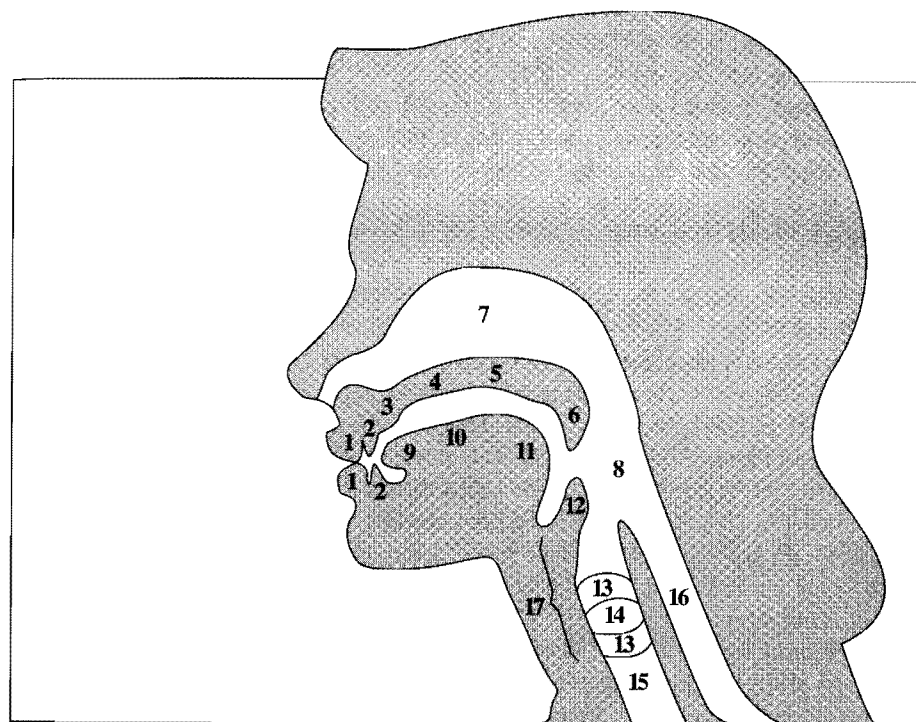
Partly because we are literate and accustomed to seeing speech represented on paper as a series of separate marks, we tend to think of speech as consisting of discrete sounds. Real speech is continuous, not discrete. In a sound spectrogram¹ of someone saying the word *dig*, for example, there are no clear boundaries between the *d*, the *i*, and the *g*. Nonetheless, if we are to analyze the sounds of speech, we must treat them as if they were discrete—and, for all its shortcomings, our writing system does just that. Further, all the evidence we have suggests that the human brain in some way also breaks up the continuous flow of speech and sorts it out into separate units. Therefore, the discipline of phonology is based on the fiction that speech consists of physically isolable units of sound.

There are at least three ways to approach the analysis of speech sounds: (1) from a perceptual point of view, or how the mind analyzes and interprets the sounds; (2) from an acoustic point of view, or the physical properties of the sounds; and (3) from an articulatory point of view, or how the sounds are produced by the speech organs. However, our understanding of how the mind interprets speech is still limited, and the acoustic approach to speech sounds requires elaborate equipment and an extensive knowledge of physics. Thus, for the purposes of studying the history of English, we will use the articulatory approach. It is relatively easy for people to see and feel what is going on in their mouths as they produce speech sounds. Furthermore, apart from pathological cases such as cleft palates or missing teeth, the vocal tracts of all human beings are basically identical and have not changed over the centuries. Finally, all the changes that occur in speech sounds can be described in articulatory terms.

The Production of Speech

Speech begins when air leaves the lungs. After that, the stream of air may be impeded or modified at any point from the larynx on up through the nose or lips; the nature of the resulting speech sound depends on how and where the stream of air is modified. The **articulators** of speech are the movable parts of the speech tract: the lips, the tongue, and the uvula. The tongue is the most important articulator. The **points of articulation** are the nonmovable portions of the speech tract with which an articulator comes in contact or near contact. Figure 2-1 shows the whole vocal apparatus, apart from the lungs.

FIGURE 2-1
The Human Vocal Apparatus



- | | |
|-----------------------|----------------------------|
| 1 Lips | 10 Front of tongue (Blade) |
| 2 Teeth | 11 Back of tongue (Dorsum) |
| 3 Alveolar ridge | 12 Epiglottis |
| 4 Hard palate | 13 Vocal cords |
| 5 Velum (Soft palate) | 14 Glottis |
| 6 Uvula | 15 Trachea (Windpipe) |
| 7 Nasal cavity | 16 Esophagus |
| 8 Pharynx | 17 Larynx |
| 9 Tongue tip (Apex) | |

1. The **lips** may be open, closed, partially closed, spread, or rounded during speech. Sounds involving the lips as articulator are called **labials**. If both lips are involved, the sounds are called **bilabials**.
2. The **teeth** may be open, closed, or partially closed during speech. Sounds in which the tongue touches the back of the teeth are called **dental**; those in which the tongue protrudes slightly between the teeth are **interdental**. **Labiodental** sounds are produced with the upper teeth on the lower lip.

¹ A sound spectrogram is a kind of "photograph" giving a visual representation of the intensity and frequency of sound waves in a segment of speech over time.

3. The **alveolar ridge** is the bony plate into which the upper teeth are fixed. **Alveolar** sounds are produced when the tip or the front of the tongue is in contact with the alveolar ridge.
4. The **hard palate** is the dome-shaped bony plate at the roof of the mouth. **Palatal** sounds are produced when the tip or the front of the tongue is in contact with the hard palate.
5. The **velum**, or **soft palate**, is the soft, muscular tissue behind the hard palate. (If you have a limber tongue, you can curl it back to feel the dividing line between the hard palate and the velum. Or you can find it with your forefinger.) The velum can be contracted to come in contact with the top of the throat, closing off the nasal passage. **Velar** sounds are produced when the back of the tongue, or **dorsum**, comes in contact with the velum.
6. The **uvula** is the cylindrically shaped extension of the velum that hangs down over the back of the tongue; you can view it in a mirror if you open your mouth very wide. The uvula is not used in forming English sounds, but it becomes an articulator in some languages when it is made to vibrate rapidly, producing a **uvular trill**. (It also vibrates during snoring and gargling.)
7. The **nasal cavity** is opened to the flow of air from the lungs when the velum is lowered. The resulting sounds are called **nasals**; the specific nature of the nasal sound depends on the position of other articulators.
8. The **pharynx** is the cavity at the back of the upper throat. It is not specifically involved in the production of sounds in English, though it is in some languages, for example, Arabic.
9. The **tongue tip**, or **apex** of the tongue, is one of the most important articulators. In **apical** sounds, the tongue tip is the articulator.
10. The **blade**, or front of the tongue, is that portion of the tongue just behind the tip. As an articulator, the blade may come in contact with the teeth, the alveolar ridge, or the hard palate.
11. The **dorsum**, or the back of the tongue, serves as an articulator when it comes in contact with the velum (soft palate).
12. The **epiglottis** is a piece of cartilage that folds down over the trachea to channel food down the esophagus and prevent it from going down the trachea and into the lungs. It is not an articulator and is involved in speech only to the extent that, when it is sealing off the trachea, speech is impossible.
13. The **vocal cords** are a pair of elastic muscular bands rather like thick rubber bands. They are attached to the front and back of the larynx. When the vocal cords are relaxed, air from the lungs passes through them unimpeded, and the resulting sounds are called **voiceless**. When the vocal cords are tensed, the opening between them is reduced, and air passing through them makes them vibrate rapidly; the resulting sounds are called **voiced**. The faster the vocal cords vibrate, the higher the pitch of the voiced sounds.
14. The **glottis** is the opening between the vocal cords. If the glottis is momentarily closed and then released, a voiceless speech sound called a **glottal stop** results. A glottal stop appears before the vowels in the two syllables of “*unh-unh*,” the vocal gesture meaning “no.” It also separates the two syllables of “*uh-oh*,” the sound we use to indicate trouble.

15. The **trachea** is the tube carrying air to and from the lungs.
16. The **esophagus** is the tube running parallel to the trachea, through which food passes on its way to the stomach. The esophagus is not involved in normal speech production.
17. The **larynx** is the general area between the pharynx and the trachea, including the vocal cords. It is not an articulator in English, though it is in some languages.

Phonemes and Allophones

The human vocal tract produces a wide assortment of noises. Some of them are speech sounds or suitable for use as speech sounds, and some are not. In studying phonology, we ignore snorts, sneezes, sighs, coughs, sniffs, screams, and so on. We ignore extralinguistic or supralinguistic aspects such as the pitch difference between male and female voices, whispering, and pathological conditions like harelips or malformed jaws.

Of the remaining sounds, the components of speech, no two are ever identical, even when produced by the same speaker. However, both speaker and hearer treat some sounds as if they were identical, and others as different. For example, the initial consonants of *pear* and *bear* are considered different because they distinguish two different words with two different meanings. On the other hand, the *p*-sounds in *pace* and *space* are also physically different for all native speakers of English. The *p* in *pace* is accompanied by a fairly strong puff of air called **aspiration**, whereas the *p* in *space* is not. However, this difference in aspiration is never used to distinguish two different words in English, that is, no two words contrast on the basis of this difference alone. Thus the two sounds are treated as being the same.

A group of sounds that never contrast significantly with one another, that speakers treat as the same sound, is called a **phoneme**. The noncontrastive variants that comprise a phoneme are called **allophones** of that phoneme. Hence *p* and *b* are separate phonemes in English, but aspirated *p* and unaspirated *p* are only allophones of the phoneme *p*. To indicate whether we are discussing phonemes or allophones, it is conventional to enclose phonemes between slashes (/ /) and allophones between square brackets ([]). Thus we say that [p] and [pʰ] (where the inverted apostrophe stands for aspiration) are allophones of the phoneme /p/.

Normally, all the allophones of a phoneme share many features. Both [p] and [pʰ] are voiceless, are bilabial, and involve a momentary complete stoppage of the air coming from the lungs. Their only difference lies in the force of the plosion when the stoppage is released. In a few instances, however, allophones of a single phoneme differ strikingly. For example, most allophones of the English phoneme /t/ are formed by the contact of the tongue with the alveolar ridge. But one common allophone, [ʔ], does not involve the tongue at all. Instead, it is formed by the momentary contraction and then release of the vocal cords. Phonetically, it is a glottal stop, not an alveolar stop; phonemically, it is still only an allophone of /t/ in English.

Although the glottal stop [ʔ] is only an allophone of /t/ or other stops in English, it constitutes a separate phoneme in some languages. This fact illustrates an important principle of phonology: *every language has its own unique configuration of phonemes*

and allophones. Even within a given language, the total set of phonemes and allophones may differ from dialect to dialect and may change over time. For example, though French and English both have /t/ phonemes, they are not the "same" /t/. Most of the allophones of the French /t/ are produced with the tongue touching the upper teeth rather than the alveolar ridge. Nor does the French /t/ have the aspirated allophone [t'] in initial position or the glottal allophone [ʔ]. Russian has a palatal version of its phoneme /t/ that does not occur at all in English. The concept of the phoneme and the allophone is meaningful only within the context of a specified language.

In discussing the earlier stages of a language, we normally operate at the phonemic level and not the allophonic level (though there are exceptions). Although we can identify with a fair amount of confidence the phonemes of past stages, we usually lack the precise knowledge of production required to identify the allophones.

As a means of representing actual pronunciation, English spelling is notoriously inadequate and complex. Words pronounced the same may be spelled differently (*meet*, *meat*, *mete*), and words spelled the same may be pronounced differently (*wind*, *arith-metic*, *invalid*). Some phonemes have no separate spelling of their own (for example, the two different initial consonants of *then* and *thin*). Some alphabetic symbols can stand for several different sounds—or no sound at all—as is the case of *s* in the words *sun*, *pays*, *treasure*, *tension*, and *aisle*. The letter *c* is totally redundant in that any phoneme that it represents also has another traditional representation: It replaces *k* in *call*, *s* in *cell*, *ch* in *cello*, *sh* in *social*, and stands for nothing at all in *indict*. Many words are spelled with "silent" letters (*b* in *climb*, *ch* in *yacht*, *g* in *sign*, *h* in *exhaust*, *n* in *autumn*, *p* in *receipt*, *t* in *castle*, and *w* in *answer*). In other instances, phonemes are not represented in spelling at all (the initial *w*-sound in *one* or the *y*-sound after *m* in *music*). We shall see in later chapters that there is usually a good historical explanation for these anomalies of spelling. They represent an earlier stage in the pronunciation of English—or even of Latin, French, Dutch, and so on. Knowledge of the history of English makes one more tolerant of the eccentricities of Present-Day English spelling.

In order to represent every phoneme by one and only one separate symbol, various phonemic alphabets have been devised. Most such alphabets use existing Latin symbols wherever possible, supplementing them with diacritical marks or modifications where necessary, and omitting Latin symbols that are totally redundant (such as *x* and *c* for English). The phonemic alphabet used in this book is one of the more common ones employed, especially by American linguists.

The Phonemes of Present-Day American English

The phonemes of all languages are conventionally subdivided into consonants and vowels. This division is convenient because of fundamental differences in the way consonants and vowels are produced and because of their different roles in the structure of syllables. In simplest terms, consonants are characterized by a stoppage or impedence of the flow of air at some point in the vocal tract, whereas vowels are characterized by

FOR THE BIRDS

Imitative (or echoic, or onomatopoeic) words comprise only a tiny, though entertaining, part of the total English vocabulary. Perhaps the highest proportion of such words is to be found in the name of birds and bird sounds. The word *owl*, for example, goes all the way back to an imitative Indo-European root *ul-. Other onomatopoeic names for English birds include *chiffchaff*, *chough*, *cock*, *cuckoo*, *curlew*, *hoopoe*, *pewit*, and *quail*. The process has continued into the modern period. When English colonists encountered unfamiliar birds in North America, they frequently named them for their songs or characteristic cries; hence such names as *bobolink*, *bobwhite*, *chewink*, *chickadee*, *chuckwill's widow*, *killdeer*, *peetweet*, *pewee*, *phoebe*, and *whippoorwill*. Among the imitative words describing bird noises are *cackle*, *caw*, *cheep*, *chirp*, *cluck*, *cock-a-doodle-doo*, *coo*, *gobble*, *hoot*, *peep*, *tweet*, and *twitter*. Although bird songs are notoriously difficult to describe to someone who has not heard them, people clearly are willing to keep trying.

an unimpeded flow of air but with modifications of the shape of the oral chamber through which the air passes. In English, every separate vowel constitutes the center of a separate syllable; the syllable may or may not include one or more consonants.

CONSONANTS

In articulatory terms, a **consonant** can be defined by its place of articulation and its manner of articulation. The places of articulation are illustrated in Figure 2-1 and discussed on pages 22-25. Figure 2-2 (p. 28) shows the classes of consonants defined by manner of articulation.

Stops **Stops**, also called **plosives**, are sounds produced by blocking the stream of air completely at some point in the mouth and then fully releasing it. The type of stop is defined by the point at which the stream of air is blocked. Thus /p/ is a bilabial stop because the air is blocked at the lips, whereas /g/ is a velar stop because the air is blocked at the velum by the back of the tongue. If the vocal cords vibrate during the production of the stop, it is called a **voiced** stop; if they do not vibrate, it is a **voiceless** stop.

Fricatives **Fricatives**, also called **spirants**, are produced by impeding but not totally blocking the stream of air from the lungs. This constriction of the passage produces friction, a hissing sound created by the turbulence of the stream of air. The type of fricative is defined by the point of narrowest stricture; /f/ is a labiodental fricative because the friction occurs at the point of loose contact between the upper teeth and the lower lip. Like stops, fricatives may be either voiced or voiceless in English.

FIGURE 2-2
Consonant Phonemes of Present-Day English

Manner of Articulation	Point of Articulation					
	Bilabial	Labio-dental	Inter-dental	Alveolar	Alveo-palatal	Velar
Stops						
Voiceless	p			t		k
Voiced	b			d		g
Affricates						
Voiceless					č	
Voiced					ǰ	
Fricatives						
Voiceless		f	θ	s	š	h*
Voiced		v	ð	z	ž	
Nasals	m			n		ŋ [†]
Lateral				l		
Retroflex				r		
Semivowels	w				j	(w) [‡]

Key

/p/	pill	/f/	feel	/m/	hum
/b/	bill	/v/	veal	/n/	Hun
/t/	till	/θ/	thigh	/ŋ/	hung
/d/	dill	/ð/	thy	/l/	lore
/k/	kill	/s/	seal	/r/	roar
/g/	gill	/z/	zeal	/w/	wore
/č/	chill	/š/	mesher	/j/	yore
/ǰ/	Jill	/ž/	measure		
		/h/	heel		

*The fricative /h/, in modern English only a burst of aspiration preceding a vowel, is actually produced at various points in the mouth, depending on the nature of the following vowel. For the sake of convenience, it is listed here as a velar phoneme.

[†]The velar /ŋ/ is not phonemic for many speakers of English, but only an allophone of /n/ that occurs before /k/ and /g/. If, in your speech, the words *finger* and *singer* rhyme, [ŋ] is probably not phonemic for you.

[‡]The phoneme /w/ actually has a dual articulation; it is bilabial by virtue of the rounding and near closure of the lips and velar by virtue of the raising of the back of the tongue toward the velum.

Affricates Affricates are a combination of stop plus fricative. The stream of air is stopped very briefly and then is released relatively gradually with accompanying friction. Though some languages have several types of affricate phonemes, English has only the alveopalatal affricates /č/ and /ǰ/, the former voiceless and the latter voiced.

Resonants All the remaining consonants of English can be grouped together as **resonants**; all are voiced only. The resonants include the nasals, the lateral, the retroflex, and the semivowels. The lateral and the retroflex are sometimes termed **liquids**. **Nasals**

are formed by blocking the oral passage at some point but lowering the velum so that air escapes through the nose. The particular type of nasal is determined by the point at which the oral passage is blocked. The **lateral** /l/ is produced when the center of the mouth is blocked by the tongue in contact with the alveolar ridge while air is allowed to escape along the sides of the tongue (hence the term *lateral*). The most common allophone of /l/ after a vowel is [ɫ], the so-called “dark l,” produced by raising the back of the tongue toward, but not touching the velum. The **retroflex** /r/ is produced by curling the tip of the tongue upward and pointing it toward the alveolar ridge or hard palate. **Semivowels** are produced by narrowing the air passage greatly but still allowing air to pass without stoppage or friction at any point. Semivowels are like vowels in that the stream of air is not blocked, but they are classified as consonants because they function like consonants before regular vowels and because the air passage is more constricted than with regular vowels. Our analysis classifies only /j/ and /w/ as semivowels; some analyses also treat English /r/ as a semivowel.

VOWELS

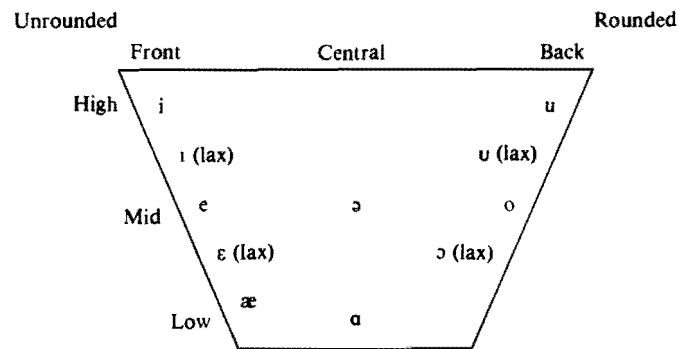
Unlike consonants, vowel phonemes cannot easily be defined by manner and point of articulation because the manner of articulation is essentially the same for all vowels. Further, vowels have no real point of articulation because the articulator (the tongue) does not come into actual contact with another part of the mouth. Instead, English vowels are traditionally defined by the height of the tongue, the location of the highest part of the tongue, and the degree of tension of the tongue during articulation.

The height of the tongue is normally correlated with the degree of openness of the mouth; the lower the tongue, the more open the mouth. Vowels are accordingly classified as **high**, **mid**, or **low**. The location in the mouth of the highest part of the tongue determines whether a vowel is **front**, **central**, or **back**. Finally, if the tongue is relatively tense, the vowel is called **tense**; if the tongue is relatively relaxed, the vowel is called **lax**.

These three features are adequate for defining all the vowels of modern American English. However, for other languages and for earlier periods of English, additional features are necessary. In Old English, some vowel phonemes were distinguished on the basis of rounding—a high front tense vowel, for example, could be articulated with either rounded or unrounded lips. In Present-Day English, all front vowels are unrounded and all back vowels are rounded, so the distinction is redundant and nonphonemic. In many languages, including Old and Middle English, vowel length, or the amount of time spent in producing a vowel, is distinctive. In some languages, such as modern French, nasality of vowels is phonemic; modern English vowels may have nasal coloring if the following consonant is a nasal, but no two vowels are distinguished on the basis of nasality alone.

The Latin alphabet is unsatisfactory for representing all the consonant phonemes of English, but it is hopelessly inadequate for representing the vowels. First, there simply are not enough separate vowel symbols. Second, drastic changes in the pronunciation of some vowels occurred after English spelling had become fixed, so the symbols used in standard written English today no longer correlate with their original

FIGURE 2-3
Vowel Phonemes of Present-Day American English



Key			
/i/	keyed	/ɑ [†] /	cod, card [‡]
/ɪ/	kid	/ʊ/	cooed
/e/	Kade	/ʊ/	could
/ɛ/	Ked	/o/	code
/æ/	cad	/ɔ [†] /	cawed
/ə/*	cud, curd		

*The symbol /ə/, called *schwa*, is used here for the stressed vowel sound in *but*, the unstressed final vowel in *sofa*, and the vowel preceding /t/ in words like *her*, *fir*, and *purr*. Many speakers will notice a definite qualitative difference in the sounds of the vowel in these three positions. However, because the three sounds are in complementary distribution (never contrast with each other), they can be treated as allophones of the phoneme /ə/. Some linguists prefer to use the symbol /ʌ/ for the stressed sound of *but* and /ə/ for the sound preceding /t/, leaving /ə/ only for the unstressed vowel of *sofa*. For those speakers of English who regularly omit /t/ except before a vowel, the “dropped” /t/ is often replaced by /ə/, especially after high and mid vowels. Thus, *fear* may be /fiə/ and *four* may be /foə/.

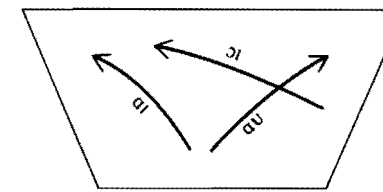
†If *cod* and *cawed* have the same vowel in your speech, you probably have /ɔ/ in both; you may have /ɑ/ in *balm* but /ɔ/ in *bomb*. If you think you have the same vowel in all of these words, /ɑ/ and /ɔ/ are probably not separate phonemes for you. You may—or may not—make the distinction by using [ɑ] in *aah* (*that’s good!*) and [ɔ] in *aw* (*shucks!*).

‡A following /t/ drastically affects the pronunciation of vowels in most dialects of English. In general, there is a tendency for the distinction between the lax and tense vowels and between /æ/ and /ɑ/ to be lost. For example, most speakers today probably do not distinguish *mourning* and *morning* by having /o/ in the former and /ɔ/ in the latter. Similarly, some speakers have /e/ in *Mary*, /ɛ/ in *merry*, and /æ/ in *marry*; others make only two distinctions here, and still others have /e/ in all three words. In some dialects, both *poor* and *pore* have /ɔ/; in others, *poor* has /ʊ/ or /u/ and *pore* has /ɔ/. In some dialects, nearly all vowels are followed by a short /ə/ before an /t/; other speakers use such a glide only to distinguish pairs of words like *mare* /mɛr/ and *mayor* /mɛər/; and still other speakers do not use a schwa here at all.

values or with the values they have in most other European languages. Therefore, in representing the vowel phonemes of English, it is necessary to use a number of symbols not in the Latin alphabet and to use the familiar Latin letters in some unfamiliar ways.

With a few exceptions, all native speakers of English have the same inventory of consonant phonemes and use these phonemes in the same places. However, there are

FIGURE 2-4
Diphthong Phonemes of Present-Day American English



Key	
/aɪ/	buy
/aʊ/	bough
/ɔɪ/	boy

great disparities among English speakers in both the total number of vowel phonemes and in their distribution in individual words. The configuration depicted in Figure 2-3 illustrates only the minimum number of distinctions made by most speakers of American English. Some speakers have additional distinctions, especially in the low central area, and some lack a phonemic distinction between /ɔ/ and /ɑ/.

Diphthongs In addition to so-called “pure” vowels, in which the tongue remains in one position during articulation, English also has several **diphthongs**, or **glides**. A diphthong is a vowel-like sound produced while the tongue is moving from one vowel position toward another. The two symbols used to transcribe a diphthong represent the approximate starting and ending points of that diphthong. For example, in the word *toy*, the tongue moves from the approximate position of /o/ or /ɔ/ toward the direction of /ɪ/ or /i/.

Phonetically, most English vowels, especially the tense vowels /i e o u/, are often diphthongized in actual speech. This is particularly noticeable in final position, where the vowel in a word such as *go* may clearly move from the [o] position toward the [u] position. Nevertheless, because these diphthongized versions never contrast with non-diphthongized versions, we can treat them simply as allophones of the “pure” vowels.

Of the three diphthongs that are phonemic in English, two, /aɪ/ and /ɔɪ/, are fronting diphthongs; that is, they move from a low or back position toward the high front position. One, /aʊ/, is a backing diphthong, that is, it moves from the low central position toward the high back position. The arrows in Figure 2-4 show the directions in which the diphthongs move.

Unstressed Vowels In most dialects of English, unstressed vowels are regularly reduced to /ɪ/ or /ə/, with the distribution of these two varying widely from dialect and even from speaker to speaker. The vowel /ɪ/ is especially common in inflectional endings (as in *patches*, *wishes*, *judges*), but it is by no means universal even here.

Prosody

The term **prosody** refers to the stress patterns of a language. In English, stress is distinctive both at the level of the individual word and at the level of phrases, clauses, and entire sentences. For our purposes, we need to be concerned only with stress in individual words. Here English distinguishes three levels of stress—primary, secondary, and reduced (or unstressed). When it is necessary to indicate stress or stress distinctions, an acute accent (´) represents primary stress (*Ápril, understánd*), a grave accent (`) represents secondary stress (*álp Хабè, bóokcàse*), and no marking at all represents reduced stress (*lánguage*). In this book, we will normally distinguish only primary and reduced stress.

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C H A P T E R

3

WRITING

To be a well-favoured man is the gift of fortune; but to write and read comes by nature.

—WILLIAM SHAKESPEARE

