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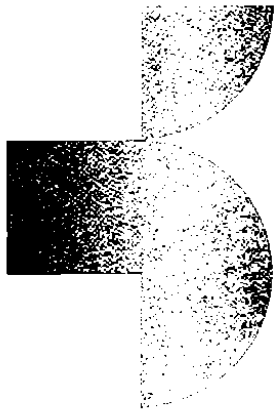

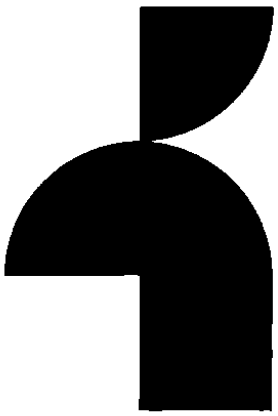

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CONTEMPORARY LINGUISTICS

Table 2.12 provides a summary of the places and manners of articulation of English consonants.

Table 2.12 English consonants: places and manners of articulation

Manner of articulation		*Place of articulation*							
		Bilabial	*Labiodental*	*Interdental*	*Alveolar*	*Alveopalatal*	*Palatal*	*Velar*	*Glottal*
Stop	voiceless	p			t			k	ʔ
	voiced	b			d			g	
Fricative	voiceless		f	θ	s	ʃ			h
	voiced		v	ð	z	ʒ			
Affricate	voiceless					tʃ			
	voiced					dʒ			
Nasal	voiced	m			n			ŋ	
Liquid	voiced lateral				l				
	voiced retroflex				ɹ				
Glide	voiced	w					j	w	
	voiceless	ʍ						ʍ	

LANGUAGE MATTERS What's the World's Most Unusual Speech Sound?

Pirahã, a language with only a couple of hundred speakers in Brazil, has a sound that is produced as follows: the tongue tip first touches the alveolar ridge and then comes out of the mouth, almost touching the upper chin as the underblade of the tongue touches the lower lip. Technically speaking, this is known as a "voiced, lateralized apical-alveolar/sublaminal-labial double flap with egressive lung air." (Fortunately, for all concerned, the sound is only used in "certain special types of speech performance.")

Information from: Peter Ladefoged and Ian Maddieson, *The Sounds of the World's Languages* (Malden, MA: Blackwell, 1996); Daniel Everett, "Phonetic Rarities in Pirahã," *Journal of the International Phonetic Association* 12, 2 (1982): 94–96.

6 Vowels

Vowels are sonorous, syllabic sounds made with the vocal tract more open than it is for consonant and glide articulations. Different vowel sounds (also called **vowel qualities**) are produced by varying the placement of the body of the tongue (remember

that for vowels your tongue tip is behind your lower front teeth) and shaping the lips. The shape of the vocal tract can be further altered by protruding the lips to produce **rounded vowels** or by lowering the velum to produce a nasal vowel. Finally, vowels may be tense or lax, depending on the degree of vocal tract constriction during their articulation. This section on vowels introduces most of the basic vowels of English.

Note that vowels are particularly subject to dialectal variation. The appendix at the end of this chapter lists a number of examples.

6.1 Simple Vowels and Diphthongs

English vowels are divided into two major types, **simple vowels** and **diphthongs**. Simple vowels do not show a noticeable change in quality during their articulation. The vowels of *pit*, *set*, *cat*, *dog*, *but*, *put*, and the first vowel of *suppose* are all simple vowels.

Diphthongs are vowels that exhibit a change in quality within a single syllable. English diphthongs show changes in quality that are due to tongue movement away from the initial vowel articulation toward a glide position. In the vowels classified as **major diphthongs**, the change in articulation is quite extreme and hence easy to hear. Listen to the change in articulation in the following words: *buy* ([aj]), *boy* ([ɔj]), and *now* ([aw]). Each of these diphthongs starts in one position (e.g., [a]) and ends up in another position (e.g., [w]). In **minor diphthongs**, the change in position of the articulators is less dramatic. If you listen carefully and note the change in your tongue position as you say *play* ([ej]) and your lip position as you say *go* ([ow]), you will realize that in each of these diphthongs, too, the starting position is different from the ending position. In the vowels of words like *heed* and *lose*, the change is more difficult to hear and in fact is not made by all English speakers, so we will not

LANGUAGE MATTERS Cross-Dialectal Variation

One of the best ways to learn to appreciate some of these fine differences in vowel articulation is to think of some cross-dialectal variation in English. Let us first consider the question of the minor diphthongs in [ej] and [ow]. In American English, these sounds are diphthongs (as reflected in our transcription), but this is not the case in *all* dialects of English. In Jamaican English, words like *go* and *say* have simple vowels and would be transcribed as [go] and [se].

Comparison across dialects can also help us understand why we have used the [a] symbol in the major diphthongs. In articulatory terms, the [a] sound is made at the front of the mouth with the tongue a bit lower than [æ]. You can hear this sound in many Romance languages (like French or Spanish) in words like *la* or *gato*. This [a] vowel is, in fact, where we start articulating our diphthongs. If you try to say words like *ride* and *round* with an [ɑ] sound rather than an [a], you will find yourself speaking with one variety of a British accent.

transcribe these as diphthongs. Some instructors, however, may ask that you transcribe them in the diphthongized form.

Table 2.13 presents the simple vowels and diphthongs of American English. The diphthongs are transcribed as vowel-glide sequences. Although diphthongs are complex in an articulatory sense (in that they are transcribed as a vowel plus a glide), they still act as a single vowel in some respects. For example, our judgments tell us that both *pin* (simple vowel) and *pint* (diphthong) are single-syllable words. Having a diphthong doesn't add a syllable to a word.

Table 2.13 Some simple vowels and diphthongs of American English

Simple vowels		*Minor diphthongs*		*Major diphthongs*	
pit	[ɪ]	say	[ej]	my	[aj]
set	[ɛ]	grow	[ow]	now	[aw]
put	[ʊ]			boy	[ɔj]
cut	[ʌ]				
bought	[ɔ]				
mat	[æ]				
pot	[ɑ]				
heat	[i]				
lose	[u]				

6.2 Basic Parameters for Describing Vowels

Vowel articulations are not as easy to feel at first as consonant articulations because the vocal tract is not narrowed as much. To become acquainted with vowel articulation, alternately pronounce the vowels of *he* and *ah*. You will feel the tongue move from a **high** front to a **low** back position. Once you feel this tongue movement, alternate between the vowels of *ah* and *at*. You will feel the tongue moving from the low **back** to low **front** position. Finally, alternate between the vowels of *he* and *who*. You will notice that in addition to a tongue movement between the high front and high back positions, you are also rounding your lips for the [u]. Figure 2.9 shows a midsagittal view of the tongue position for the vowels [i], [ɑ], and [u] based on X-ray studies of speech.

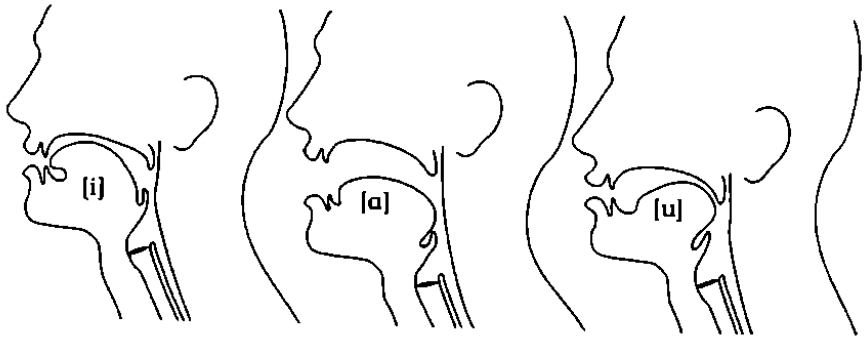

Figure 2.9 Tongue position and transcription for three English vowels

Vowels for which the tongue is neither raised nor lowered are called **mid vowels**. The front vowel of English *made* or *fame* is mid, front, and unrounded. The vowel of *code* and *soak* is mid, back, and rounded. In the case of diphthongs, the articulatory descriptions refer to the tongue position of the vowel nucleus, not the following glide. The vowels presented so far in this section are summed up in Table 2.14. Note that in describing the vowels, the articulatory parameters are presented in the order *height, backness, rounding.*

Table 2.14 Basic phonetic parameters for describing American English vowels

heat	[i]	high front unrounded
fate	[ej]	mid front unrounded
mash	[æ]	low front unrounded
Sue	[u]	high back rounded
boat	[ow]	mid back rounded
caught	[ɔ]	mid back rounded (in some dialects)
sun	[ʌ]	mid central unrounded
cot	[ɑ]	low back unrounded

As Table 2.14 shows, the vowel of *caught* (and certain other words such as *law*) is the mid back rounded lax vowel [ɔ] in many dialects of English, both in the United States and worldwide. However, in some dialects of North American English, the vowel [ɔ] has merged with the vowel [ɑ], and there is, therefore, no difference between *cot* and *caught;* the vowel in both words is [ɑ].

Tongue positions for some English vowels are illustrated in Figure 2.10. The trapezoid corresponds roughly to the space within which the tongue moves, which is wider at the top of the oral cavity and more restricted at the bottom. Nonfront vowels are traditionally divided into central and back vowels (see Figures 2.10 and 2.11); often the term *back* alone is used for all nonfront vowels.

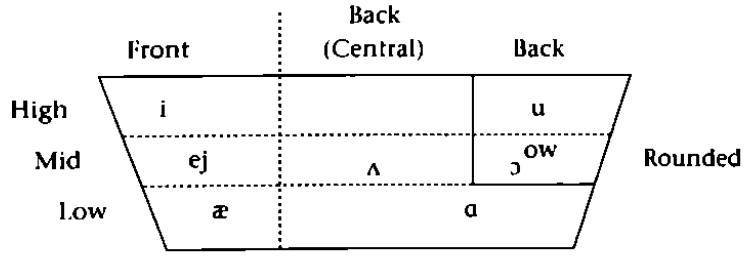

Figure 2.10 Basic tongue positions for English vowels

6.3 Tense and Lax Vowels

All the vowels illustrated in Figure 2.10 except [æ] and [ʌ] are tense. **Tense vowels** are produced with greater vocal tract constriction than nontense vowels and are longer in duration than nontense vowels. Some vowels of English are made with roughly the same tongue position as the tense vowels but with a less constricted

articulation; they are called **lax vowels**. The representation of vowels and their articulatory positions (Figure 2.10) is expanded in Figure 2.11 to include both tense and lax vowels, as well as the major diphthongs.

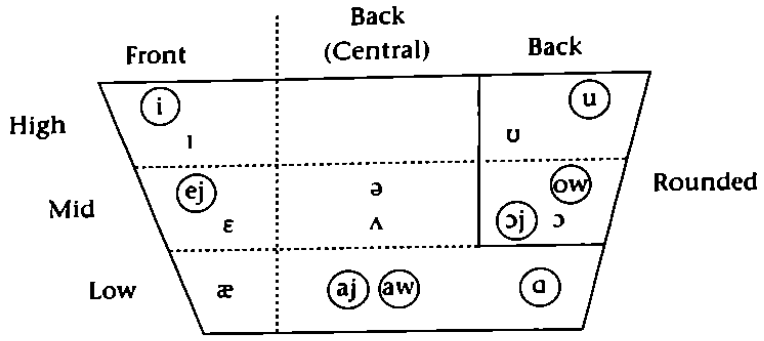

Figure 2.11 American English vowels (tense vowels are circled)

Table 2.15 provides examples from English comparing tense and lax vowels. Note that not all the vowels come in tense/lax pairs. The difference between two of the vowels illustrated in Table 2.15 is often not easy to hear at first. Both the vowel [ʌ] in *cut*, *dud*, *pluck*, and *Hun*, and the vowel [ə] of *Canada*, *about*, *tomahawk*, and *sofa* are mid, central, unrounded, and lax. The vowel of the second set of examples, called **schwa**, is referred to as a **reduced vowel**. In addition to being lax, its duration is briefer than that of any of the other vowels.

Table 2.15 Tense and lax vowels in American English

Tense		*Lax*	
heat	[i]	hit	[ɪ]
mate	[ej]	met	[ɛ]
—	—	mat	[æ]
shoot	[u]	should	[ʊ]
coat	[ow]	ought	[ɔ] (in some dialects)
—	—	cut	[ʌ]
—	—	Canada	[ə]
lock	[ɑ]	—	—
lies	[aj]		
loud	[aw]		
boy	[ɔj]		

A simple test can help determine whether vowels are tense or lax. In English, monosyllabic words spoken in isolation do not end in lax vowels (except for [ɔ]). We find *see* [si], *say* [sej], *Sue* [su], *so* [sow], and *spa* [spɑ] in English, but not *[sɪ], *[sɛ], *[sæ], *[sʊ], or *[sʌ]. Schwa, however, frequently appears in unstressed syllables (syllables perceived as less prominent) in polysyllabic words like *sof*[ə] and *Can*[ə]*d*[ə]. (See Section 8.3 for a discussion of stress.) It should be pointed

out—especially for those who think their ears are deceiving them—that many speakers produce the final vowel in the last two examples as [ʌ], not as [ə].

This rather formidable crowd of vowels should not intimidate you. If you are a native speaker of English, you have been using these vowels most of your life. Learning to hear them consciously and transcribe them is not a difficult task.

7 Phonetic Transcription of American English Consonants and Vowels

Tables 2.16 and 2.17 present the phonetic symbols for consonants and vowels commonly used to transcribe American English. To illustrate how each symbol is used, one word is transcribed completely, and then some other words in which the same sound is found are given. You will notice that in the example words, the spelling of the sound may vary. Be careful of this when you transcribe words phonetically—the sound of a word, not its spelling, is what is transcribed!

ble 2.16 Transcribing English consonants

	Symbol	*Word*	*Transcription*	*More examples*
Stops	[p]	spit	[spɪt]	spar, crispy, upper, culprit, bumper
	[b]	bib	[bɪb]	boat, liberate, rob, blast
	[t]	stuck	[stʌk]	stem, hunter, nasty, mostly
	[d]	dip	[dɪp]	dust, sled, draft
	[k]	skip	[skɪp]	scatter, uncle, blacklist, likely
	[g]	get	[gɛt]	gape, mugger, twig, gleam
Aspirated Stops	[pʰ]	pit	[pʰɪt]	pain, upon, apart
	[tʰ]	tick	[tʰɪk]	tell, attire, terror, tutu
	[kʰ]	keep	[kʰip]	cow, kernel, recur
Affricates	[tʃ]	chip	[tʃɪp]	lunch, lecher, ditch, belch
	[dʒ]	judge	[dʒʌdʒ]	germ, journal, budge, wedge
Fricatives	[f]	fit	[fɪt]	flash, coughing, proof, phlegmatic, gopher
	[v]	vat	[væt]	vote, oven, prove
	[θ]	thick	[θɪk]	thought, ether, teeth, three, bathroom
	[ð]	though	[ðow]	then, bother, teethe, bathe
	[s]	sip	[sɪp]	psychology, fasten, lunacy, bass, curse, science
	[z]	zap	[zæp]	Xerox, scissors, desire, zipper, fuzzy
	[ʃ]	ship	[ʃɪp]	shock, nation, mission, glacier, wish
	[ʒ]	rouge	[ɹuʒ]	measure, azure, visual, garage (for some speakers)
	[h]	hat	[hæt]	who, ahoy, forehead, behind

Table 2.16 Continued

	Symbol	*Word*	*Transcription*	*More examples*
Nasals	[m]	moat	[mowt]	mind, humor, shimmer, sum, thumb
	[n]	note	[nowt]	now, winner, angel, sign, wind
	[ŋ]	sang	[sæŋ]	singer, longer, bank, twinkle, speaking
Syllabic Nasals	[m̩]	m-m	[ʔm̩ʔm̩]	bottom, prism
	[n̩]	button	[bʌtn̩]	Jordan, fatten
Liquids	[l]	leaf	[lif]	loose, lock, alive, hail
	[ɹ]	reef	[ɹif]	rod, arrive, tear
Flap	[ɾ]	hitting	[hɪɾɪŋ]	butter, madder, writer, rider, pretty, amity
Syllabic Liquids	[l̩]	huddle	[hʌdl̩]	bottle, needle (for many speakers)
	[ɚ]	bird	[bɚd]	early, hurt, stir, purr
	[ɻ̩]	doctor	[dɑktɻ̩]	summer, eraser, eager
Glides	[j]	yet	[jɛt]	_use, c_ute, yes
	[w]	witch	[wɪtʃ]	wait, weird, queen, now
	[ʍ]	which	[ʍɪtʃ]	what, where, when (only for some speakers)

Table 2.17 Transcribing English vowels

Symbol	*Word*	*Transcription*	*More examples*
[i]	fee	[fi]	she, cream, believe, receive, serene, amoeba, highly
[ɪ]	fit	[fɪt]	hit, income, definition, been (for some speakers)
[ej]	fate	[fejt]	they, clay, grain, gauge, engage, great, sleigh
[ɛ]	let	[lɛt]	led, head, says, said, sever, guest
[æ]	bat	[bæt]	lab, racket, laugh, pal
[u]	boot	[but]	do, two, loose, brew, Louise, Lucy, through
[ʊ]	book	[bʊk]	should, put, hood
[ow]	note	[nowt]	no, throat, though, slow, toe, oaf, O'Conner
[ɔ]	fought	[fɔt]	caught, normal, all
[ɔj]	boy	[bɔj]	voice, boil, toy
[ɑ]	rob	[ɹɑb]	cot, father, body
[ʌ]	shut	[ʃʌt]	other, udder, tough, lucky, what, flood
[ə]	suppose	[səpʰowz]	collide, telegraph, about, hinted (in some dialects)
[aw]	crowd	[kɹawd]	(to) house, plow, bough
[aj]	lies	[lajz]	my, tide, thigh, buy

the speech of children, who often cannot pronounce all the consonant sequences that adults can. For example, some English-speaking children pronounce *spaghetti* as *pesghetti* [pəskɛɾi]. In this form, the initial sequence [spə], which is often difficult for children to pronounce, is metathesized to [pəs].

The pronunciation of *ask* as a[ks] is an example of metathesis that is common in adult speech. It is interesting that historically in English the word was a[ks] and underwent metathesis in the past to become a[sk].

Vowel Reduction

In many languages, the articulation of vowels may move to a more central position when the vowels are unstressed. This process is known as **(vowel) reduction**. Typically, the outcome of vowel reduction is a schwa [ə]; this can be observed in pairs of related words that show different stress placement such as *Canada* ['kʰænədə] versus *Canadian* [kʰə'nejdiən]. If you listen carefully to these words, you'll notice that the first vowel is [æ] when stressed (in *Canada*) but schwa when unstressed (in *Canadian*). And the second vowel is [ej] when stressed (in *Canadian*) but schwa when unstressed (in *Canada*). Since we cannot predict what vowel a schwa may turn into when it is stressed, we assume that [æ] and [ej] are basic to the words in question and are reduced in unstressed position.

10 Other Vowels and Consonants

So far, this chapter has described only the vowels and consonants of English. Many but not all of these sounds are found in other languages. Moreover, many of the sounds found in other languages do not occur in English. Tables 2.28 and 2.29 introduce a number of novel vowels and consonants that are relevant to the discussion and problems throughout this book. Once the basic articulatory parameters have been understood, it's not a big jump to describe and to pronounce new and unfamiliar sounds.

Table 2.28 Modified IPA chart for vowels, including the vowels of American English (shaded) and many of those found in other languages. Where symbols appear in pairs, the phone on the left is unrounded, and the one on the right is rounded.

	Front	*(Central)*	*Back*
High	i y ɪ ʏ	i u	ɯ u ʊ
Mid	e ø ɛ œ	ə	ɤ o ʌ ɔ
Low	æ	a	ɑ ɒ

Table 2.29 Modified IPA chart for consonants, including the sounds of English (shaded) and many of those found in other languages. Where symbols appear in pairs, the phone on the left is voiceless, and the one on the right is voiced. The term *approximant* is used by the IPA to include glides and some liquids in which there is a relatively free flow of air with no friction.

	Bilabial	*Labiodental*	*Interdental*	*Alveolar*	*Alveopalatal*	*Retroflex*	*Palatal*	*Velar*	*Uvular*	*Pharyngeal*	*Glottal*
Stop	p b			t d		ʈ ɖ	c ɟ	k g	q ɢ		ʔ
Fricative	ɸ β	f v	θ ð	s z	ʃ ʒ	ʂ ʐ	ç ʝ	x ɣ	χ ʁ	ħ ʕ	h ɦ
Nasal	m	ɱ		n		ɳ	ɲ	ŋ	ɴ		
Trill				r					ʀ		
Flap				ɾ							
Approximant	ʍ w ɥ			ɹ		ɻ	j ɰ	ɯ w			
Lateral Approximant				l		ɭ	ʎ	ʟ			
Lateral Fricative				ɬ ɮ							

Data from: International Phonetic Alphabet Data from the International Phonetic Association, Aristotle University, School of English, Department of Theoretical and Applied Linguistics, Thessaloniki, 54124, Greece, www.langsci.ucl.ac.uk/ipa/.

Remember that phonetic descriptions are universal—they apply to the sounds of any human language. If you encounter the description "voiced velar fricative," you know that the sound is a voiced continuant consonant made at the velum (i.e., the same place as the stop [g]). If you want to make this sound, the articulatory description can guide you: make a near closure at the velum and allow airflow to pass through. If you come across the description "high front rounded vowel", and want to produce this sound, make the high front unrounded vowel [i] and then round the lips to produce the high front rounded vowel [y].

Summing Up

The study of the sounds of human language is called **phonetics**. These sounds are widely transcribed by means of the **International Phonetic Alphabet.**

The sounds of language are commonly described in **articulatory** and **acoustic** terms and fall into two major types: syllabic sounds (**vowels, syllabic liquids,** and **syllabic nasals**) and nonsyllabic sounds (**consonants** and **glides**). Sounds may be **voiced** or **voiceless**, and **oral** or **nasal**. Consonants and glides are produced at various **places of articulation**: **labial, dental, alveolar, alveopalatal, palatal, velar, uvular, glottal,** and **pharyngeal**. At the places of articulation, the airstream is modified by different **manners of articulation** and the resulting sounds are **stops, fricatives, affricates, liquids**, or **glides**. Vowels are produced with less drastic closure and are described with reference to tongue position (**high, mid, low, back**, and **front**), tension (**tense** or **lax**), and lip rounding (**rounded** or **unrounded**). Language also exhibits **suprasegmental** phenomena such as **tone, intonation**, and **stress**.