

- | | | | | | | | |
|-------------|---|---|---|---|---|---|---|
| 4. fish | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. fishes | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. fished | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. batting | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. quick | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. these | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. physics | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. knock | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12. axis | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

J. In the following sets of words the sound of the vowel is the same in every case but one. Circle the word that has a different vowel sound.

- | | | | | |
|---------|-------|-------|-------|-------|
| 1. pen | said | death | mess | mean |
| 2. meat | steak | weak | theme | green |
| 3. sane | paid | eight | lace | mast |
| 4. ton | toast | both | note | toes |
| 5. hoot | good | moon | grew | suit |
| 6. dud | died | mine | eye | guy |

2

Phonology and Phonetic Transcription

Many people think that learning phonetics means simply learning to use phonetic transcription. But there is really much more to the subject than learning to use a set of symbols. A phonetician is a person who can describe speech, who understands the mechanisms of speech production and speech perception, and who knows how languages use these mechanisms. Phonetic transcription is no more than a useful tool that phoneticians use in the description of speech. It is, however, a very important tool.

When phoneticians transcribe an utterance, they are usually concerned with how the sounds convey differences in meaning. For the most part, they describe only the significant articulations rather than the details of the sounds. For example, when saying the English word *tie*, some people pronounce the consonant with the blade of the tongue against the alveolar ridge, others with the tip of the tongue. This kind of difference in articulation does not affect the meaning of the word and is not usually transcribed. We will begin by considering just this simplest form of transcription, sometimes called a broad transcription.

In order to understand what we transcribe and what we don't, it is necessary to understand the basic principles of phonology. **Phonology** is the description of the systems and patterns of sounds that occur in a language. It involves studying a language to determine its distinctive sounds, that is, those sounds that convey a difference in meaning. Children have to do this when they are learning to speak. To begin with they may not realize that, for example, there is a difference between the consonants at the beginnings of words such as *white* and *right*. Later they realize that these words begin with two distinct sounds. Eventually they learn to distinguish all the sounds that can change the meanings of words.

When two sounds can be used to differentiate words they are said to belong to different **phonemes**. There must be a phonemic difference if two words (such as *white* and *right* or *cat* and *bat*) differ in only a single sound. There are, however, small shades of sounds that cannot be used to distinguish words, such as the differences between the consonants at the beginning and end of the word

pop. For the first of these sounds, the lips must open and there must be a puff of air before the vowel begins. After the final consonant there may be a puff of air, but it is not necessary. In fact, you could say *pop* and never open your lips for hours, if it happened to be the last word you said before going to sleep. The sound at the end would still be a *p*. Both consonants in this word are voiceless bilabial stops. They are different, but the differences between them cannot be used to change the meaning of a word in English. They both belong to the same phoneme.

We cannot rely on the spelling to tell us whether two sounds are members of different phonemes. For example, the words *phone* and *foam* begin with the same sounds, although they have different spellings. To take a more complex example, the words *key* and *car* begin with what we can regard as the same sound, despite the fact that one is spelled with the letter *k* and the other with *c*. But in this case the two sounds are not exactly the same. The words *key* and *car* begin with slightly different sounds. If you whisper just the first consonants in these two words, you can probably hear the difference, and you may be able to feel that your tongue touches the roof of the mouth in a different place. This example shows that there may be very subtle differences between members of a phoneme. The sounds at the beginning of *key* and *car* are slightly different, but it is not the kind of difference that changes the meaning of a word in English. They are both members of the same phoneme.

We noted other small changes in sounds that do not affect the meaning in Chapter 1, where we saw that the tongue is farther back in *true* than in *tea*, and the *n* in *tenth* is likely to be dental, whereas the *n* in *ten* is usually alveolar. In some cases the members of a phoneme are more different from one another. For example, most Americans (and some younger speakers of British English) have a *r* in the middle of *piry* that is very different from the *r* at the end of the word *pir*. The one in *piry* sounds more like a *d*. Consider also the *l* in *play*. You can say just the first two consonants in this word without any voicing, but still hear the *l* (try doing this). When you say the whole word *play* the *l* is typically voiceless, and very different from the *l* in *lay*. Say the *l* at the beginning of *lay*, and you'll hear that it is definitely voiced.

It follows from these examples that a phoneme is not a single sound, but a name for a group of sounds. There is a group of *r* sounds and a group of *l* sounds that occur in English. It is as if you had in your mind an ideal *r* or *l*, and the ones that were actually produced were variations that differed in small ways that did not affect the meaning. These groups of sounds—the phonemes—are abstract units that form the basis for writing down a language systematically and unambiguously.

We often want to record all and only the variations between sounds that cause a difference in meaning. Transcriptions of this kind are called phonemic transcriptions. Languages that have been written down only comparatively recently (such as Swahili and most of the other languages of Africa) have a

fairly phonemic spelling system. There is very little difference between a written version of a Swahili sentence and a phonemic transcription of that sentence. But because English pronunciation has changed over the centuries while the spelling has remained basically the same, phonemic transcriptions of English are different from written texts.

THE TRANSCRIPTION OF CONSONANTS

We can begin searching for phonemes by considering the contrasting consonant sounds in English. A good way is to find sets of words that rhyme. Take, for example, all the words that rhyme with *pie* and have only a single consonant at the beginning. A set of words each of which differs from all the others by only one sound is called a minimal set. The second column of Table 2.1 lists a set of this kind. There are obviously many other words that rhyme with *pie*, such as *spy*, *try*, *spy*, but these words begin with sequences of two or more of the sounds already in the minimal set. Some of the words in the list begin with two consonant letters (*high*, *thy*, *sly*), but they each begin with a single consonant sound. *Sly*, for example, does not contain a sequence of two consonant sounds in the way that *spy* and *try* do.

Some consonants do not occur in words rhyming with *pie*. If we allow using the names of the letters as words, then we can find another large set of consonants beginning words rhyming with *pea*. A list of such words is shown in the third column of Table 2.1. (Speakers of British English will have to remember that in American English the name of the last letter of the alphabet belongs in this set rather than in the set of words rhyming with *bed*.)

Even in this set of words, we are still missing some consonant sounds that contrast with others only in the middle or at the end of words. The letters *ng* often represent a single consonant sound that does not occur at the beginning of a word. You can hear this sound at the end of the word *rang*, where it contrasts with other nasals in words such as *ram*, *ran*. There is also a contrast between the consonants in the middle of *mission* and *vision*, although there are very few pairs of words that are distinguished by this contrast in English. (One such pair in my English involves the name of a chain of islands—*Aleutian* versus *allusion*.) Words illustrating these consonants are given in the fourth column of Table 2.1.

Most of the symbols in Table 2.1 are the same letters we use in spelling these words, but there are a few differences. One variation between spelling and phonetic usage occurs with the letter *c*, which is sometimes used to represent a [k] sound, as in *cup* or *back*, and sometimes to represent an [s] sound, as in *cellar* or *receive*. Two *c*'s may even represent a sequence of [k] and [s] sounds in the same word, as in *accent*, *access*. A symbol that sometimes differs from the corresponding letter is [g], which is used for the sound in *guy* and *guess* but never for the sound in *age* or the sound in the name of the letter *g*.

TABLE 2.1 Symbols for transcribing English consonants. (Alternative symbols that may be found in other books are given in parentheses.) The last column gives the conventional names for the phonetic symbols in the first column.

p	pie	pea	lowercase p
t	tie	tea	lowercase t
k	key	key	lowercase k
b	by	bee	lowercase b
d	dye	D	lowercase d
g	gly		lowercase g
m	my	me	lowercase m
n	nigh	knee	lowercase n
ŋ			eng (or angma)
f	fee	fee	lowercase f
v	vie	V	lowercase v
θ	thigh	three	theta
ð	thy		eth
s	sigh	sea	lowercase s
z		zee	lowercase z
ʃ (ʒ)	shy	she	esh (or long s)
ʒ (ʒ)			long z (or yogh)
l	lie	lee	lowercase l
w	why	we	lowercase w
r	rye		lowercase r
j (y)		ye	lowercase j
h	high	he	lowercase h

Note also the following:

tʃ (tʃ)	ch(ime)	chea(p)
dʒ (dʒ)	ji(ve)	G

A few other symbols are needed to supplement the regular alphabet. The phonetic symbols we will use are part of the set approved by the International Phonetic Association, a body founded in 1886 by a group of leading phoneticians from France, Germany, Britain, and Denmark. The complete set of IPA symbols is given in the chart on the inside covers of this book. It will be discussed in detail later in this book. Because we often need to talk about the symbols, the names that have been given to them are shown in the last column of Table 2.1.

The velar nasal at the end of *range* is written with [ŋ], a letter *n* combined with the tail of the letter *g* descending below the line. Some people call this symbol *eng*; others pronounce it *angma*. The symbol [θ], an upright version of the Greek letter theta, is used for the voiceless dental fricative in words such as *thigh*, *thin*, *thimble*, *ether*, *breath*, *mouth*. The symbol [ð], called *eth*, is derived

from an Anglo-Saxon letter. It is used for the corresponding voiced sound in words such as *thy*, *then*, *them*, *breath*. Both these symbols are ascenders (letters that go up from the line of writing rather than descending below it). The spelling system of the English language does not distinguish between [θ] and [ð]. They are both written with the letters *th* in pairs such as *thigh*, *thy*.

The voiceless palato-alveolar (post-alveolar) fricative [ʃ] (long *s*) in *shy*, *sheep*, *rash* is both an ascender and a descender. It is like a long, straightened *s* going both above and below the line of writing. The corresponding voiced symbol [ʒ] is like a long *z* descending below the line. This sound occurs in the middle of words such as *vision*, *measure*, *leisure* and at the beginning of foreign words such as the French *Jean*, *gendarme*, and foreign names such as *Zsa Zsa*. In earlier editions of this book, the sound at the beginning of the word *rye* was symbolized by [r̥], an upside-down letter *r*. As the two major dictionaries of American and British English pronunciation (see Further Reading) use a regular [r] for this sound, I have done so here.

It is unfortunate that different books on phonetics use different forms of phonetic transcription. This is not because phoneticians cannot agree on which symbols to use, but because different styles of transcription are more appropriate in one circumstance than in another. Thus in this book, where we are concerned with general phonetics, I have used the IPA symbol [j] for the initial sound in *yes*, *yet*, *yeast* because I wish to reserve the symbol [y] for another sound, the vowel in the French word *mû*. Another reason for using [j] is that in many languages (German, Dutch, Norwegian, Swedish, and others) this letter is used in words such as *ja*, which are pronounced with a sound that in our spelling system would be written with the letter *y*. Books that are concerned only with the phonetics of English often use [y] where this one uses [j]. Some books on phonetics also use [ʃ̥] and [ʒ̥] in place of the IPA symbols [ʃ] and [ʒ], respectively.

There are also disagreements among texts on phonetics on how to transcribe sounds such as the first and last sounds in both *church* and *judge*. I have taken the position that these sounds are each sequences of two other consonants and should be written [tʃ] and [dʒ]. You can see that a word such as *choose* might be said to begin with [tʃ] if you compare your pronunciation of the phrases *white shoes* and *why choose*. In the first phrase, the [tʃ] is at the end of one word and the [ʃ] at the beginning of the next; but in the second phrase, these two sounds occur together at the beginning of the second word. The difference between the two phrases is simply one of the timing of the articulations involved rather than the use of different articulations. Other pairs of phrases that demonstrate this point are *heart sheets* versus *he cheats* and *might shop* versus *my chop*. There are no pairs of phrases illustrating the same point for the voiced counterpart [dʒ] found in *jar*, *gentle*, *age* because no English word begins with [ʒ] (as in *church* and *judge*) are really single units and are better transcribed with a single symbol, such as [tʃ] and [dʒ]. This view has much to commend it, since

the consonants [ʃ] and [ʒ] are not like other consonants such as [r] and [l]. Each of the latter pair of consonants can occur as the second element in many clusters (for example, in *priest*, *tree*, *cream*, *play*, *clay*). But [ʃ] and [ʒ] cluster only with [t] and [d], respectively. However, as this is a book on phonetics, it seems appropriate to use two symbols for the consonants in words such as *jay* and *age* so as to show that there are two elements in each of them, just as there are in other words containing consonant clusters, such as *tree* and *eats*.

There is one minor matter still to be considered in the transcription of the consonant contrasts of English. In most forms of both British and American English, *which* does not contrast with *wich*. Accordingly, both *why* and *we* in Table 2.1 are said to begin simply with [w]. But some speakers of English contrast pairs of words such as *which*, *wich*; *why*, *wye*; *whether*, *weather*. These speakers will have to transcribe the first of each of these pairs of words with [hw]. Note that phonetically the [h] is transcribed before [w] in that it is the first part of each of these words that is voiceless.

The CD has recordings of all these words as pronounced by a British English speaker and an American English speaker. Listen to these recordings while you familiarize yourself with the transcriptions of the consonants.

THE TRANSCRIPTION OF VOWELS

The transcription of the contrasting vowels (the vowel phonemes) in English is more difficult than the transcription of consonants for two reasons. First, accents of English differ more in their use of vowels than in their use of consonants. Second, authorities differ in their views of what constitutes an appropriate description of vowels.

Taking the same approach in looking for contrasting vowels as we did for contrasting consonants, we might try to find a minimal set of words that differ only in the vowel sounds. We could, for example, look for monosyllables that begin with [h] and end with [d] and supplement this minimal set with other lists of monosyllables that contrast only in their vowel sounds. Table 2.2 shows five such sets of words. You should listen to the recordings of these words on the CD while reading the following discussion of the vowels.

We will consider one form of British and one form of American English. The major difference between the two is that speakers of American English pronounce [r] sounds after vowels, as well as before them, whereas in most forms of British English [r] can occur only before a vowel. American English speakers distinguish between words such as *heart* and *hot* not by making a difference in vowel quality (as I do, speaking a form of British English) but by pronouncing *heart* with an [r] and *hot* with the same vowel but without an [r] following it. In *here*, *hair*, *hire* these speakers may use vowels similar to those in *he*, *head*, *high* respectively, but in each case with a following [r]. Most speakers of British

TABLE 2.2 Symbols for transcribing contrasting vowels in English. Column 1 applies to many speakers of American English, Column 2 to most speakers of British English. The last column gives the conventional names for the phonetic symbols in the first column unless otherwise noted.

	1	2						
i	i	heed	he	beed	heat	keyed	lowercase i	
ɪ	ɪ	hid		bid	hit	kid	small capital i	
eɪ	eɪ	heyed	hay	bayed	hate	Cade	lowercase e	
ɛ	ɛ	head		bed			epsilon	
æ	æ	had	hard	bad	hat	cad	ash	
ɑ	ɑ	had	hard	bard	heart	card	script a	
d	d	hod	hod	bod	hot	cod	turned script a	
ɔ	ɔ	hawed	haw	bawd		cawed	open o	
ʊ	ʊ	hood		bood		could	upsilon	
oʊ	oʊ	hoed	hoe	bood		code	lowercase o	
u	u	who'd	who	bood	hoot	cood	lowercase u	
ʌ	ʌ	Hudd	Hudd	bud	hurt	cud	turned v	
ɜ	ɜ	herd	her	bird	hurt	curd	reversed epsilon	
aɪ	aɪ	hide	high	bide	height		lowercase a (+ i)	
au	au		how	bowed		cowed	(as noted above)	
ɔɪ	ɔɪ	(a)hoɪ	(a)hoɪ	Boyd			(as noted above)	
ɪr	ɪr	here	here	beard			(as noted above)	
ɛr	ɛr	hair	hair	bared		cared	(as noted above)	
aɪr	aɪr	hired	hire				(as noted above)	

Note also:

ju ju hued hue Bude cued (as noted above)

English distinguish these words by using different **diphthongs**—movements from one vowel to another within a single syllable.

Even within American English there are variations in the number of contrasting vowels that occur. Many Midwestern speakers and most Far Western speakers do not distinguish between the vowels in pairs of words such as *odd*, *awed* and *cot*, *caught*. Some forms of American English make additional distinctions not shown in Table 2.2. For example, some speakers (mainly from the East Coast) distinguish the auxiliary verb *can* from the noun *can*, the latter being more diphthongal. But we will have to overlook these small differences in this introductory textbook.

There are several possible ways of transcribing the contrasting vowels in Table 2.2. The two principal forms that will be used in this book are shown in the first and second columns. The first column is suitable for many forms of American English and the second for many forms of British English. The two

columns have been kept as similar as possible; as you will see in Chapter 4, I have tried to make the transcriptions reasonably similar to those of well-known authorities on the phonetics of English.

As in the case of the consonant symbols, the vowel symbols in Table 2.2 are used in accordance with the principles of the IPA. Those symbols that have the same shape as ordinary letters of the alphabet represent sounds similar to the sounds these letters have in French or Spanish or Italian. Actually, the IPA usage of the vowel letters is that of the great majority of the world's languages when they are written with the Roman alphabet, including such diverse languages as Swahili, Turkish, and Navajo. The present spelling of English reflects the way it used to sound many centuries ago when it still had vowel letters with values similar to those of the corresponding letters in all these other languages.

One of the principal problems in transcribing English phonetically is that there are more vowel sounds than there are vowel letters in the alphabet. In a transcription of the English word *sea* as [si:], the [i:] represents a similar (but not identical) sound to that in the Spanish or Italian *si*. But unlike Spanish and Italian, English differentiates between vowels such as those in *seat*, *sit*, and *head*, *hid*. The vowels in *seat*, *head* differ from those in *sit*, *hid* in two ways: they have a slightly different quality and they are longer. Because the vowels in *sit*, *hid* are somewhat like those in *seat*, *head*, they are represented by the symbol [ɪ], a small capital *I*. In the previous edition of this book the difference in length was also shown by adding the symbol [ː], which, as we will see later, can be used when it is necessary to distinguish sounds that differ in length. Adding this symbol to some vowels shows additional phonetic detail, but it goes against the principle of showing just the differences between phonemes and will not be used when making phonemic transcriptions of English in this book.

The vowels in words such as *hay*, *hair*, *they* are transcribed with a sequence of two symbols [eɪ], indicating that for most speakers of English these words contain a diphthong. The first element in this diphthong is similar to sounds in Spanish or Italian that use the letter *e*, such as the Spanish word for 'milk', which is written *leche* and pronounced [leʎe]. The second element in the English words *hay*, *hair*, *they* is [ɪ], the symbol used for transcribing the vowel in *hid*.

Two symbols that are not ordinary letters of the alphabet, [ɛ] and [æ], are used for the vowels in *head* and *had*, respectively. The first is based on the Greek letter epsilon and the second on the letters *a* and *e* joined together. They may be referred to by the names epsilon and ash.

Most Americans have the same vowel sound in the words *heart* and *hot* and can use one form of the letter *a*. They would transcribe these words as [hɑrt] and [hɑt]. But some East Coast Americans and speakers of British English who do not pronounce [ɹ] sounds after a vowel distinguish between these words by the qualities of the vowels and have to use two different forms of the letter *a*. They would transcribe these words as [hɑt] and [hɑt̩].

Most speakers of British forms of English, and many American speakers, distinguish between pairs of words such as *cot*, *caught*; *not*, *naught*. The symbol [ɔ], an open letter *o*, may be used in the second of each of these pairs of words and in words such as *bawd*, *bough*, *law*. Many Midwestern and Far Western American speakers do not need to use this symbol in any of these words, as they do not distinguish between the vowels in words such as *cot* and *caught*. They may have different vowels in words in which there is a following [ɹ] sound such as *horse*, *hoarse*, but if there is no opposition between *cot*, *caught* or *not*, *naught* there is no need to mark this difference by using the symbol [ɔ]. Doing so would simply be showing extra phonetic detail, straying from the principle of showing just the differences between phonemes.

Another special symbol is used for the vowel in *hood*, *could*, *good*. This symbol [ʊ] may be thought of as a letter *u* with the ends curled out.

The vowel in *hoe*, *dough*, *code* is a diphthong. For most American English speakers, the first element is very similar to sounds that are written in Spanish or Italian with the letter *o*. Many speakers of English from the southern parts of Britain use a different sound for the first element of the diphthong in these words, which we will symbolize with [ə], an upside-down letter *e*. We will discuss this sound more fully in a later section. The final element of the diphthong in words such as *hoe* and *code* is somewhat similar to the vowel [ʊ] in *hood*.

An upside-down letter *v*, [ʌ] is used for the vowel in words such as *bad*, *hut*. This symbol is sometimes called wedge. Another symbol, [ɜ], a reversed form of the Greek letter epsilon, is used for the sound in *perr*, *bird*, *curr*, as pronounced by most speakers of British English and those speakers of American English who do not have an [ɹ] in these words. In most forms of American English, the *r* is fully combined with the vowel, and the symbol [ɜ˞] is used. The little hook [˞] indicates the *r*-coloring of the vowel.

The next three words in Table 2.2 contain diphthongs composed of elements that have been discussed already. The vowel in *hide* [haɪd] begins with a sound between that of the vowel in *cat* [kæɪt] and that in *hard* [hɑd] or [hɑrd] and moves toward the vowel [ɪ] as in *hid* [hɪd]. The symbol [aɪ] is used for the first part of this diphthong. The vowel in *how* [haʊ] begins with a similar sound but moves toward [ʊ] as in *hood*. The vowel in *boy* [bɔɪ] is a combination of the sound [ɔ] as in *bawd* and [ɪ] as in *hid*.

Most Americans pronounce the remaining words in Table 2.2 with one of the other vowels followed by [ɹ], while most British English speakers have additional diphthongs in these words. In each case, the end of the diphthong is [ə], the same symbol we used for the beginning of the diphthong in *hoe* for most British English speakers. We will discuss this symbol further in the next paragraph. Some (usually old-fashioned) British English speakers also use a diphthong in words like *poor*, *curr* that can be transcribed as [ʊə]. Some people (myself included) have a diphthong [æə] in words such as *fire*, *hire* [faɪə, haɪə]. Others pronounce these words as two syllables (like *higher*, *liar*), transcribing them as [faɪə, haɪə].

The words in Table 2.2 are all monosyllables except for *alloy*. Consequently, none of them contains both stressed and unstressed vowels. By far the most common unstressed vowel is [ə], the one we noted at the end of some of the diphthongs in British English. It is often called by its German name, *schwa*. It occurs at the ends of words such as *sofa*, *soda* [ˈsoʊfə, ˈsoʊdə], in the middle of words such as *emphasis*, *demonstrate* [ˈemfəˈsɪz, ˈdemənstreɪt], and at the beginnings of words such as *around*, *arise* [əˈraʊnd, əˈraɪz]. (In all these words, the symbol [ˈ] is a stress mark that has been placed before the syllable carrying the main stress. Stress should always be marked in words of more than one syllable.)

In British English, [ə] is usually the sole component of the *-er* part of words such as *brother*, *brotherhood*, *simpler* [ˈbrʌðə, ˈbrʌðəhʊd, ˈsɪmplə]. In forms of American English with *r*-colored vowels, these words are usually [ˈbrʌðər, ˈbrʌðərhʊd, ˈsɪmplər]. As with the symbol [ɜː], the small hook on [ər] symbolizes the *r*-coloring. Both [ə] and [ər] are very common vowels, [ə] occurring very frequently in unstressed monosyllables such as the grammatical function words *the*, *a*, *to*, and *but*. In connected speech these words are usually [ðə, ə, tə, and bət].

Some of the other vowels also occur in unstressed syllables, but because of differences in accents of English, it is a little more difficult to say which vowel occurs in which word. For example, nearly all speakers of English differentiate between the last vowels in *Sophie*, *sofa* or *pity*, *patter*. But some accents have the vowel [i] as in *heed* at the end of *Sophie*, *pity*. Others have [ɪ] as in *hid*. Similarly, most accents make the vowel in the second syllable of *taxi*s different from that in *Texas*. Some have [i] and some have [ɪ] in *taxi*s. Nearly everybody pronounces *Texas* as [ˈtɛksəs]. (Note that in English the letter *x* often represents the sounds [ks].) Compare your pronunciation of these words with the recordings on the CD and decide which unstressed vowels you use.

This is an appropriate moment to start doing some transcription exercises. There are a large number of them at the end of this chapter. To ensure that you have grasped the basic principles, you should try the first four sets of exercises.

CONSONANT AND VOWEL CHARTS

So far we have been using the consonant and vowel symbols mainly as ways of representing the contrasts that occur among words in English. But they can also be thought of in a completely different way. We may regard them as shorthand descriptions of the articulations involved. Thus [p] is an abbreviation for voiceless bilabial stop and [l] is equivalent to voiced alveolar lateral approximant. The consonant symbols can then be arranged in the form of a chart as in Figure 2.1. The places of articulation are shown across the top of the chart, starting from the most forward articulation (bilabial) and going toward those sounds

FIGURE 2.1 A phonetic chart of the English consonants we have dealt with so far. Whenever there are two symbols within a single cell, the one on the left represents a voiceless sound. All other symbols represent voiced sounds. Note also the consonant [h], which is not on this chart, and the affricates [tʃ, dʒ], which are sequences of symbols on the chart.

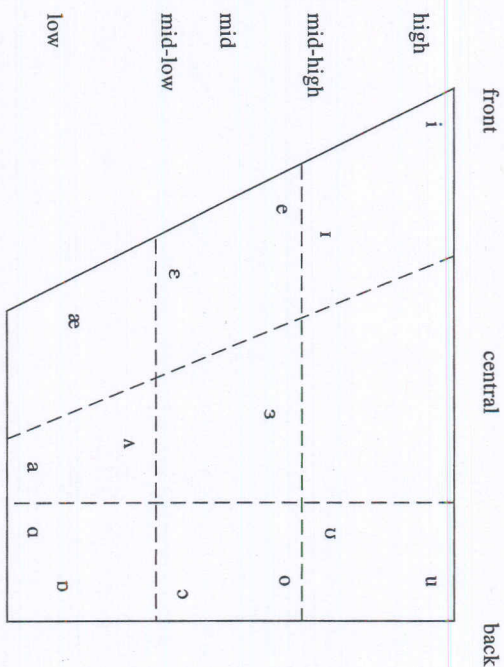
Manner of articulation	Place of articulation						
	bilabial	labio-dental	dental	alveolar	palato-alveolar	palatal	velar
nasal (stop)	m			n			ŋ
stop	p b			t d			k g
fricative		f v	θ ð	s z	ʃ ʒ		
(central) approximant				r		j	w
lateral (approximant)				l			

made in the back of the mouth (velar). The manners of articulation are shown on the vertical axis of the chart. By convention, the voiced–voiceless distinction is shown by putting the voiceless symbols to the left of the voiced symbols.

The symbol [w] is shown in two places in the consonant chart in Figure 2.1. This is because it is articulated with both a narrowing of the lip aperture, which makes it bilabial, and a raising of the back of the tongue toward the soft palate, which makes it velar. The symbol [h] does not appear anywhere on the chart. In English, [h] acts like a consonant, but from an articulatory point of view it is the voiceless counterpart of the surrounding sounds. It does not have a precise place of articulation, and its manner of articulation is similar to that of the vowels before and after it.

The symbols we have been using for the contrasting vowels may also be regarded as shorthand descriptions for different vowel qualities. There are problems in this respect, in that we have been using these symbols somewhat loosely, allowing them to have different values for different accents. But the general values can be indicated by a vowel chart as in Figure 2.2. The symbols have been placed within a quadrilateral, which shows the range of possible vowel qualities. Thus [i] is used for a high front vowel, [u] for a high back one, [ɪ] for a mid-high front vowel, [e] for a raised mid-front vowel, [ɛ] for a mid-low, and so on.

FIGURE 2.2 A vowel chart showing the relative vowel qualities represented by some of the symbols used in transcribing English. The symbols [e, a, o] occur as the first elements of diphthongs.



The simple vowel chart in Figure 2.2 shows only two of the dimensions of vowel quality, and (as we will see in later chapters), if they are taken to be descriptions of what the tongue is doing, these dimensions are not represented very accurately. Furthermore, Figure 2.2 does not show anything about the variations in the degree of lip rounding in the different vowels, nor does it indicate anything about vowel length. It does not show, for example, that in most circumstances [i] and [u] are longer than [ɪ] and [ʊ].

The consonant and vowel charts enable us to understand the remark I made in Chapter 1, when I said that the sounds of English involve about 25 different gestures of the tongue and lips. The consonant chart has 21 different symbols, but only 11 different gestures of the tongue and lips are needed to make these different sounds. The sounds [p, b, m] are all made with the same lip gesture, and [t, d, n] and [k, g, ŋ] with the same tongue gestures. (There are slight differences in timing when these gestures are used for making the different sounds, but we will neglect them here.) Four more gestures are required for the sounds in the fricative row, three more for the (central) approximants, and another one for the lateral approximant, making 11 in all. The vowel chart has 14 different symbols, each of which may be considered to require a separate gesture. But, as we have seen, accents of English vary in the number of vowels that they distinguish, which is why I said that English requires *about* 25 different gestures of the tongue and lips.

All these sounds will also require gestures of the other three main components of the speech mechanism—the airstream process, the phonation process, and the oro-nasal process. The airstream process involves pushing air out of the lungs for all the sounds of English. The phonation process is responsible for the gestures of the vocal folds that distinguish voiced and voiceless sounds, and the oro-nasal process will be active in raising and lowering the velum so as to distinguish nasal and oral sounds.

PHONOLOGY

At the beginning of this chapter we discussed another reason why it is only approximately true that in our transcriptions of English the symbols have the values shown in Figures 2.1 and 2.2. In the style of transcription we have been using so far, we have used symbols that show just the contrasting sounds of English, the phonemes. From this point on, we will use slash lines / / to mark off symbols when we are explicitly using them to represent phonemes.

As we have noted, some of the phoneme symbols may represent different sounds when they occur in different contexts. For example, the symbol /t/ may represent a wide variety of sounds. In *tap* /tæp/ it represents a voiceless alveolar stop. But the /t/ in *eight* /eɪtθ/ may be made on the teeth, because of the influence of the following voiceless dental fricative /θ/. This /t/ is more accurately called a voiceless dental stop, and we will later use a special symbol for transcribing it. In most forms of both British and American English, the /t/ in *bitten* is accompanied by a glottal stop, and we will also be using a special symbol for this sound. As we saw, for most Americans and for many younger British English speakers, the /t/ in *catty* /'kæti/ symbolizes a voiced, not a voiceless, sound. All these different sounds are part of the /t/ phoneme. Each of them occurs in a specific place: /t/ before /θ/ is a dental stop, /t/ before a word final /n/ is a glottal stop, and /t/ after a vowel and before an unstressed vowel is a voiced stop. None of these variations is different enough to change the meaning of a word in English.

Similarly, other symbols represent different sounds in different contexts. The symbols /l/ and /r/ normally stand for voiced approximants. But in words such as *ply* /plaɪ/ and *try* /traɪ/ the influence of the preceding stops makes them voiceless. Vowel sounds also vary. The /i/ in *head* /hɛd/ is usually very different from the /i/ in *heel* /hi:l/, and much longer than the /i/ in *heat*.

Many of the variations we have been discussing can be described in terms of simple statements about regular sound patterns. Statements of this kind may be considered rules or constraints that apply to English words. In most forms of American English, for example, it is a rule (constraint) that /t/ becomes voiced not only in *catty*, but on all occasions when it occurs immediately after a vowel and before an unstressed vowel (for example, in *piry*, *matter*, *utter*, *divinity*, etc.).

In English of nearly all kinds, it is also a rule that whenever /t/ occurs before a dental fricative, it is pronounced as a dental stop. We can show that this is a different kind of /t/ by adding a small mark [̥] under it, making it [t̥]. (As this symbol is not representing a phoneme it is placed between [].) The same is true of /d/, as in *width* [wɪð̥]; /n/, as in *tenth* [tɛnθ̥]; and /l/, as in *wealth* [welθ̥]. In all these cases, the mark [̥] may be added under the symbol to indicate that it represents a dental articulation. All these transcriptions are placed between square brackets as they are phonetic transcriptions rather than phonemic transcriptions.

Small marks that can be added to a symbol to modify its value are known as **diacritics**. They provide a useful way of increasing the phonetic precision of a transcription. Another diacritic, [◌̩], a small circle beneath a symbol, can be used to indicate that the symbol represents a voiceless sound. Earlier we noted that the /l/ in *play* is voiceless. Accordingly we can transcribe this word as [pl̩eɪ]. Similarly, *ply* and *try* can be written [pl̩aɪ] and [traɪ].

When we describe the sound patterns that occur in English, we want to be able to say that in some sense there are always the same underlying sounds that are changed because of the context in which they occur. The phonology of a language is the set of rules or constraints that describe the relation between the underlying sounds, the abstract units called phonemes described at the beginning of this chapter, and the phonetic forms that can be observed. When we transcribe a word in a way that shows none of the details of the pronunciation that are predictable by phonological rules, we are making a phonemic transcription.

The variants of the phonemes that occur in detailed phonetic transcriptions are known as **allophones**. They are generated as a result of applying the phonological rules to the underlying phonemes. We have now discussed some of the rules that generate different allophones of the phoneme /t/. For example, we know that in most varieties of American English, /t/ has a voiced allophone when it occurs between a stressed vowel and an unstressed vowel. We have also illustrated rules that make /r/ and /l/ voiceless when they occur after /p, t, k/. (These rules need more refinement before they can be considered to be generally applicable.)

In addition to applying rules that produce particular allophones of the phonemes in a transcription, there is another way we can show more phonetic detail. We can use more specialized phonetic symbols. For example, we noted that the vowel /i/ is longer than the vowel /ɪ/, as in *sheep* versus *ship*. This difference in length is always there as long as the two vowels are in the same phonetic context (between the same sounds and with the same degree of stress, etc.). We could transcribe this difference in length by adding a length mark to the longer of the two sounds. The IPA provides the symbol [ː] to show that the preceding symbol represents a longer sound. Accordingly we could transcribe the two sounds as /iː/ and /ɪ/. We would still be representing only the underlying phonemes in this particular accent of English, but doing so with greater phonetic precision.

The term **broad transcription** is often used to designate a transcription that uses the simplest possible set of symbols. Conversely, a **narrow transcription** is one that shows more phonetic detail, either by using more specific symbols or by representing some allophonic differences. A broad transcription of *please* and *trip* would be /plɪz/ and /trɪp/. A narrow (but still phonemic) transcription could be /plɪz/ and /trɪp/. This transcription would be phonemic as long as we always used /ɪ/ wherever we would otherwise have had /i/. In this way we would not be showing any allophones of the phonemes. A narrow allophonic transcription would be [plɪz̥] and [trɪp̥], in which [̥] and [̥] are allophones of /l/ and /r/.

Every transcription should be considered as having two aspects, one of which is often not explicit. There is the text itself and, at least implicitly, there is a set of conventions for interpreting the text. These conventions are usually of two kinds. First, there are the conventions that ascribe general phonetic values to the symbols. It was these conventions I had in mind when I said earlier that a symbol could be regarded as an approximate specification of the articulations involved. If we want to remind people of the implicit statements accompanying a transcription we can make them explicit. We could, for instance, say that, other things being equal, /i/ is longer than /ɪ/, perhaps stating at the beginning of the transcription /i/ = /iː/. We could also make explicit the rules that specify the allophones that occur in different circumstances, a topic we will return to in Chapter 4.

On a few occasions, a transcription cannot be said to imply the existence of rules accounting for allophones. This is at least theoretically possible in the case of a narrow transcription so detailed that it shows *all* the rule-governed alternations among the sounds. A transcription that shows the allophones in this way is called a completely **systematic phonetic transcription**. In practice, it is difficult to make a transcription so narrow that it shows every detail of the sounds involved.

On some occasions, a transcription may not imply the existence of rules accounting for allophones because, in the circumstances when the transcription was made, nothing was known about the rules. When writing down an unknown language or when transcribing the speech of a child or a patient not seen previously, one does not know what rules will apply. In these circumstances, the symbols indicate only the phonetic value of the sounds. This kind of transcription is called an **impressionistic transcription**.

I hope this brief survey of different kinds of transcription makes plain that there is no such thing as *the* IPA transcription of a particular utterance. Sometimes one wants to make a detailed phonetic transcription, at other times it is more convenient to make a phonemic transcription. Sometimes one wants to point out a particular phonetic feature such as vowel length, at other times the vowels are not of concern and details of the consonants are more important. IPA transcriptions take many forms.

EXERCISES

(Printable versions of all the exercises are available on the CD.)

A. Find the errors in the transcription of the consonant sounds in the following words. In each word there is one error, indicating an impossible pronunciation of that word for a native speaker of English of any variety. Make a correct transcription in the space provided after the word.

1. strength [strengθ] should be []
2. crime [craim] []
3. wishing [wɪʃɪŋ] []
4. wives [waɪvz] []
5. these [θɪz] []
6. hijacking [haɪjækɪŋ] []
7. chipping [tʃɪppɪŋ] []
8. yelling [ˈjelɪŋ] []
9. sixteen [ˈsɪksɪn] []
10. thesis [ˈθɪsɪs] []

B. Now try another ten words in which the errors are all in the vowels. Again, there is only one possible error but because of differences in varieties of English there are sometimes alternative possible corrections.

11. man-made [ˈmænmeɪd] should be []
12. football [ˈfʊtbɒl] []
13. tea chest [ˈtiːtʃɛst] []
14. tomcat [ˈtɒmkæt] []
15. tiptoe [ˈtɪptəʊ] []
16. avoid [æˈvɔɪd] []
17. remain [ˈreɪmən] []
18. bedroom [ˈbedrʊm] []
19. umbrella [ˈʌmbrelə] []
20. manage [ˈmænədʒ] []

C. Make a correct transcription of the following words. There is still only one error per word, but it may be among the vowels, the consonants, or the stress marks.

21. magnify [ˈmægnɪfər] should be []
22. traffic [ˈtræfɪc] []
23. simplistic [ˈsɪmplɪstɪk] []
24. irrigate [ˈɪrɪɡet] []
25. improvement [ˈɪmprʊvment] []
26. demonstrate [ˈdɛmənstreɪt] []

27. human being [ˈhʌmən bɪŋ] []
28. appreciate [əˈpreʃɪet] []
29. joyful [ˈdʒɔɪfʊl] []
30. wondrous [ˈwʌndrəs] []

D. Transcribe the following words or phrases as they are pronounced by either the British or the American speaker on the CD. Be careful to put in stress marks at the proper places. Use a phonemic transcription, and note which speaker you are transcribing.

31. languages
32. impossibility
33. boisterous
34. youngster
35. another
36. diabolical
37. nearly over
38. red riding hood
39. inexcusable
40. chocolate pudding

E. Which of the two transcriptions below is the narrower?

(For this exercise both transcriptions have been put between square brackets.)

Betty cried as she left in the plane.

- (a) [ˈbeti kraɪd əz ʃi ˈleft ɪn ðə ˈpleɪn]
- (b) [ˈbedi kraɪd əz ʃi ˈleft ɪn ðə ˈpleɪn]

State rules for converting the transcription in (a) above into that in (b). Make your rules as general as possible, so that they cover not only this pair of transcriptions but also other similar sentences (for example, [t] → [d] when it occurs after a vowel and before an unstressed vowel).

F. Pirahã, a language spoken by about 300 hunter-gatherers living in the Amazonian rain forest, has only three vowels, **i**, **a**, and **o**, and eight consonants, **p**, **t**, **k**, **ʔ**, **b**, **g**, **s**, **h**. (ʔ is the symbol for a glottal stop, a sound that does not have any lip or tongue action.) How many different gestures of the tongue and lips do the speakers of this language have to make? Note which are vocalic (vowel) gestures and which are consonantal gestures.

G. Hawaiian, now undergoing a revival although spoken natively by only a few hundred people, has the following vowels and consonants: **i**, **e**, **a**, **o**, **u**, **p**, **k**, **ʔ**, **m**, **n**, **w**, **l**, **h**. How many different gestures of the tongue and lips do the speakers of this language have to make? Note which are vocalic gestures and which are consonantal gestures.

H. Transcribe the following phrases as they are pronounced by either the British English or the American English speaker on the CD. Say whether the British or American English speaker is being transcribed.

1. We can see three real trees.
2. He still lives in the big city.
3. The waiter gave the lady stale cakes.
4. They sell ten red pens for a penny.
5. His pal packed his bag with jackets.
6. Father calmly parked the car in the yard.
7. The doll at the top costs lots.
8. He was always calling for more laws.
9. Don't stroll slowly on a lonely road.
10. The good-looking cook pulled sugar.
11. Sue threw the soup into the pool.
12. He loved a dull muddy-colored rug.
13. The girl with curls has furs and pearls.
14. I like miles of bright lights.
15. He howled out loud as the cow drowned.
16. The boy was annoyed by boiled oysters.

I. Transcribe the following phrases as they are pronounced by either the British English or the American English speaker on the CD. Make both (a) a broad transcription and (b) a narrower transcription. Say whether the British or American English speaker is being transcribed.

- Please come home.
- (a)
 - (b)
- He is going by train.
- (a)
 - (b)
- The tenth American.
- (a)
 - (b)
- His knowledge of the truth.
- (a)
 - (b)

I prefer sugar and cream.

- (a)
- (b)

Sarah took pity on the young children.

- (a)
- (b)

J. Read the following passages in phonetic transcription. The first, which represents a form of British English of the kind I speak myself, is a broad transcription. The second, which represents an American pronunciation typical of a Midwestern or Far Western speaker, is slightly narrower, showing a few allophones. By this time you should be able to read transcriptions of different forms of English, although you may have difficulty pronouncing each word exactly as it is represented. Nevertheless, read each passage several times and try to pronounce it as indicated. Take care to put the stresses on the correct syllables, and say the unstressed syllables with the vowels as shown. Now listen to these passages on the CD, and comment on any problems with the transcriptions.

British English

It iz 'pɒsəbl tə træn'skrɪb fə'nɛtɪklɪ
 'eni 'vɪtrəns, ɪn 'eni 'tʃeɪŋwɪdʒ,
 ɪn 'sevrəl 'dɪfrənt 'weɪz
 'ɔl əv ðəm 'ju:zɪŋ ði 'ælfəbet and kən'venʃnz
 əv ði 'aɪ 'pi 'er.
 ðə 'seɪm θɪŋ ɪz 'pɒsəbl
 wɪð 'maʊst 'ɔðə ɪntə'næʃənl fə'nɛtɪk 'ælfəbetz.
 ə træn'skrɪptʃn wɪf ɪz 'meɪd bɑ: 'ju:zɪŋ 'tʃetəz əv ðə 'sɪmplɪst 'pɒsəbl 'tʃeɪps,
 and ɪn ðə 'sɪmplɪst 'pɒsəbl 'nʌmbə,
 ɪz 'kəʊld ə 'sɪmpl fəʊ'nɪmɪk træn'skrɪptʃn.

American English

(This transcription includes a new symbol, [ɹ], which will be discussed more fully in the next chapter. Here it represents the form of /r/ that occurs between vowels.)

ɪf ðə 'nʌmbə əv 'dɪfrənt 'tʃetəz ɪz 'ɪnɔ: ðeɪ ðə 'mɪnɪməm
 əz də'faɪnd əbʌv
 ðə træn'skrɪptʃn wɪl 'nɔt bi ə fə'nɪmɪk,
 bət ən æ'lə'faɪnɪk wʌn.
 'sʌm əv ðə 'fəʊnɪmz, 'ðæ: ɪz tə 'seɪ,

wɪl bi ɹeɪpɹeɪzɛntɛd baɪ ɪnɹ ɔn 'wʌn dɪfrɛnt ˈsɪmbl.
 ɪn 'ʌðə- 'wɜ-dz 'sʌm ˈæləfoʊnz əv 'sʌm ˈfoʊnɪmz
 wɪl bi ˈsɪŋɡld ˈaʊt fə- ˈrɛprɛzɛntɛɪfŋ ɪŋ ðə ˈtrænskrɪpŋ,
 hɛns ðə ˈɪz-ɪm ˈæləfʌŋk.

(Both the above passages are adapted from David Abercrombie, *English Phonetic Texts* [Salem, N.H.: Faber & Faber, 1964].)

PERFORMANCE EXERCISES

As I said in the preface, it is extremely important to develop practical phonetic skills at the same time as you learn the theoretical concepts. One way to do this is to learn to pronounce nonsense words. You should also transcribe nonsense words that are dictated to you. By using nonsense words you are forced to listen to the sounds that are being spoken. All the “words” below are on the CD.

A. Learn to say simple nonsense words. A good way is to start with a single vowel, and then add consonants and vowels one by one at the beginning. In this way you are always reading toward familiar material, rather than having new difficulties ahead of you. Make up sets of words such as:

d
 za
 ɪzə
 ɪzə
 ɪzə
 ˈæɪzə
 ˈmæɪzə
 ˈmæɪzə
 ɪˈmæɪzə

B. Read the following words and listen to them as they appear on the CD. Ask a partner to click on the words on the CD in a different order. Enter the order in which the words are played.

pɪsuz
 pɪsuz
 pɪsuz
 pɪzuz
 pɪzuz

C. Repeat Exercise B with the following sets of words:

təθəθ ˈkɪpɪk ˈkɪpɪk ˈlæməɪn ˈlæməɪn ˈmʌlɪl ˈmʌlɪl
 təθəθ ˈkɪpɪk ˈkɪpɪk ˈlæməɪn ˈlæməɪn ˈmʌlɪl ˈmʌlɪl

təθəθ ˈkɪpɪk ˈlæməɪn ˈmʌlɪl
 təθəθ ˈkɪpɪk ˈkɪpɪk ˈlæməɪn ˈmʌlɪl
 təθəθ ˈkɪpɪt ˈlæməɪŋ ˈmʌrɪl

D. There is a set of nonsense words on the CD numbered D 1–5. Play them one at a time and try to transcribe them.

1. _____
2. _____
3. _____
4. _____
5. _____

E. After you have done Exercise D, look at the following nonsense words, which are the answers to Exercise D. Now make up a set of similar words, and say these to a partner. Your words can differ from the sample set in as many sounds as you like. But I suggest that you should not make them much longer at first. You will also find it advisable to write down your words and practice saying them for some time by yourself so that you can pronounce them fluently when you say them to your partner.

ˈskanzɪl
 bɹɑŋbluzd
 ˈdʒɪŋsmæŋ
 flɔʃθɹaɪðz
 pɪtɹɛɪf]

When you have finished saying each word several times and your partner has written the words down, compare notes. Try to decide whether any discrepancies were due to errors in saying the words or in hearing them. If possible, the speaker should try to illustrate discrepancies by pronouncing the word in both ways, saying, for example, “I said [ˈskanzɪl] but you wrote [ˈskansɪl].”

There is no one best way of doing ear-training work of this kind. I find it helpful to look carefully at a person pronouncing an unknown word, then try to say the word myself immediately afterward, getting as much of it right as possible but not worrying if I miss some things on first hearing. I then write down all that I can, leaving blanks to be filled in when I hear the word again. It seems important to me to get at least the number of syllables and the placement of the stress correct on first hearing, so that I have a framework in which to fit later observations. Repeat this kind of production and perception exercise as often as you can. You should do a few minutes’ work of this kind every day, so that you spend at least an hour a week doing practical exercises.