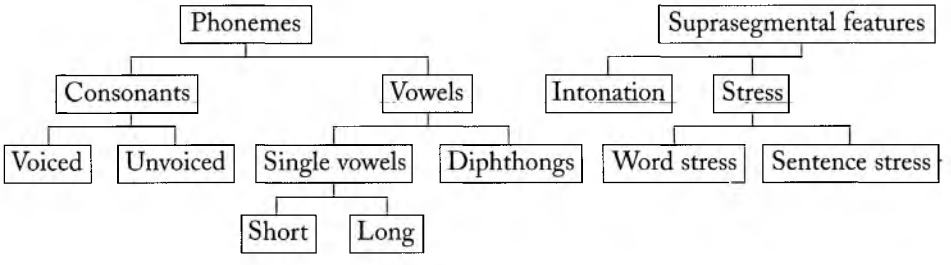
1 The description of speech

- What are the main features of pronunciation?
- The physiology of pronunciation
- The articulation of phonemes
- Phonemic transcription
- Phonetics and phonology

What are the main features of pronunciation?

In order to study how something works it is often useful to break it down into its constituent parts. The following diagram shows a breakdown of the main features of pronunciation.

Features of pronunciation



Phonemes

Phonemes are the different sounds within a language. Although there are slight differences in how individuals articulate sounds, we can still describe reasonably accurately how each sound is produced. When considering meaning, we see how using one sound rather than another can change the meaning of the word. It is this principle which gives us the total number of phonemes in a particular language. For example, the word *rat* has the phonemes /ræt/. (Refer to the **sounds chart** on the next page if you are not familiar with the symbols used here.) If we change the middle phoneme, we get /rɒt/ *rot*, a different word. If you or I pronounce /r/ in a slightly different way, the word doesn't change, and we still understand that we mean the same thing. To make an analogy, our individual perceptions of colours may theoretically vary (i.e. your notion of 'green' may not be the same as mine), but intuitively we know that we are likely to be thinking about more or less

the same thing. We can both look at a green traffic light and understand its significance, and how it differs from a red one.

Sounds may be **voiced** or **unvoiced** (sometimes referred to as 'voiceless'). Voiced sounds occur when the vocal cords in the larynx are vibrated. It is easy to tell whether a sound is voiced or not by placing one or two fingers on your Adam's apple. If you are producing a voiced sound, you will feel vibration; if you are producing an unvoiced sound, you will not. The difference between /f/ and /v/, for example, can be heard by putting your top teeth on your bottom lip, breathing out in a continuous stream to produce /f/, then adding your voice to make /v/. Hold your Adam's apple while doing this, and you will feel the vibration.

The set of phonemes consists of two categories: **vowel** sounds and **consonant** sounds. However, these do not necessarily correspond to the vowels and consonants we are familiar with in the alphabet. Vowel sounds are all voiced, and may be single (like /e/, as in *let*), or a combination, involving a movement from one vowel sound to another (like /eɪ/, as in *late*); such combinations are known as **diphthongs**. An additional term used is **triphthongs** which describes the combination of three vowel sounds (like /aʊə/ in *our* or *power*). Single vowel sounds may be short (like /ɪ/, as in *hit*) or long (like /iː/, as in *heat*). The symbol /ː/ denotes a long sound.

Consonant sounds may be voiced or unvoiced. It is possible to identify many pairs of consonants which are essentially the same except for the element of voicing (for example /f/, as in *fan*, and /v/, as in *van*). The following table lists English phonemes, giving an example of a word in which each appears.

Vowels		Diphthongs		Consonants			
iː	bead	eɪ	cake	p	pin	s	sue
ɪ	hit	ɔɪ	toy	b	bin	z	zoo
ʊ	book	aɪ	high	t	to	ʃ	she
uː	food	ɪə	beer	d	do	ʒ	measure
e	left	ʊə	fewer	k	cot	h	hello
ə	about	eə	where	g	got	m	more
ɜː	shirt	əʊ	go	tʃ	church	n	no
ɔː	call	aʊ	house	dʒ	judge	ŋ	sing
æ	hat			f	fan	l	live
ʌ	run			v	van	r	red
ɑː	far			θ	think	j	yes
ɒ	dog			ð	the	w	wood

(Pairs of consonants (voiced and unvoiced) are thickly outlined. The boxes containing unvoiced phonemes are shaded.)

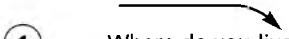
Suprasegmental features

Phonemes, as we have seen, are units of sound which we can analyse. They are also known as **segments**. **Suprasegmental features**, as the name implies, are features of speech which generally apply to groups of segments, or phonemes. The features which are important in English are **stress**, **intonation**, and how sounds change in connected speech.

With regard to individual words, we can identify and teach word stress. Usually one syllable in a word will sound more prominent than the others, as in *PAper*, or *BOttle*. The stresses in words are usually indicated in dictionaries.

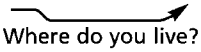
With regard to utterances, we can analyse and teach intonation as well as stress, although as features they can at times be quite hard to consciously recognise and to describe. Stress gives rhythm to speech. One or more words within each utterance are selected by the speaker as worthy of stressing, and thus made prominent to the listener. Intonation, on the other hand, is the way in which the **pitch** of the voice goes up and down in the course of an utterance. (When discussing speech the term **utterance** is used rather than 'sentence', as it refers to anything we say including grammatically incomplete sentences, and to different ways of saying the same sentence.)

Utterance stress and intonation patterns are often linked to the communication of meaning. For example, in the following utterance the speaker is asking a question for the first time. In this particular instance as you can hear on the CD, the pitch of her voice starts relatively high and falls at the end, finishing relatively low. This intonation pattern is shown here using an arrow.



1 Where do you live?

If the speaker should ask the question for a second time (having already been given the information, but having forgotten it), then the voice falls on the word *where* and rises again towards the end of the question. This indicates to the listener that the speaker is aware that they should know the answer.



2 Where do you live?

The next examples display how stress can have an equally significant role to play in the communication of meaning. The most stressed syllables within the utterances are in capitals. Changes to which syllable is stressed in the same sentence changes the meaning of the utterance in various subtle ways. The implied meaning is given in brackets after each utterance.

3

I'd like a cup of herbal TEA.	(A simple request.)
I'd like a cup of HERbal tea.	(Not any other sort of tea.)
I'd like a CUP of herbal tea.	(Not a mug.)

The first example is like the default choice, a first time request, while in the other two examples there is an apparent attempt to clear up some misunderstanding between the speaker and the listener. On the CD, we can notice how the speaker's voice falls on the syllables which are in capitals, demonstrating how intonation and stress are strongly linked in utterances.

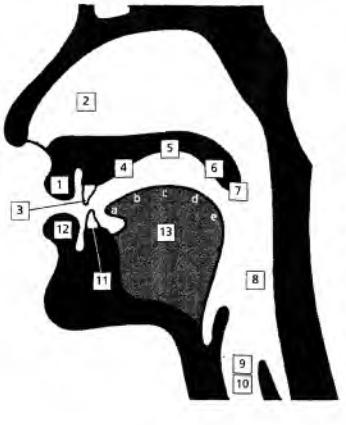
The physiology of pronunciation

Teachers also need to consider how the sounds we use come about, and to study the physiology which allows us to use those sounds. We all use the same speech organs to produce the sounds we become accustomed to producing. The set of sounds we acquire, however, may vary: a child brought up in an English-speaking environment will develop the phonemes of English, a French-speaking child will develop a different set, and so on. We also learn to use our voices in different ways: the English-speaking child will learn to use appropriate stress and intonation patterns, and the Cantonese-speaking child will learn to use **tones** (see page 87) to give distinct meanings to the same set of sounds.

To a certain extent we can learn to use our speech organs in new ways in order to produce learnt sounds in a foreign language, or to lose sounds from our own language which are not appropriate in the foreign language. It seems, however, that after childhood our ability to adopt an unfamiliar set of sounds diminishes somewhat.

The diagram below shows the location of the main areas of the head and neck associated with the production of sounds. In the human larynx (or 'voice box', as it is commonly known), there are two flaps of elastic, connective tissue known as vocal cords, which can open and close. During normal breathing, and also in the production of **unvoiced** sounds, the cords are open. When the edges of the vocal cords come close together, the air which passes between them makes them vibrate, resulting in **voicing**. The **pitch** of the sound (how high or low) is controlled by muscles which slacken and lengthen the cords for low tones, and shorten the cords, pulling them taut, for high-pitched tones.

We speak using the lips, tongue, teeth, hard and soft palates and alveolar ridge. (See the diagram below.) The nasal cavity comes into play for certain sounds, and the movement of the lower jaw is also important. Articulation happens when the airstream is interrupted, shaped, restricted or diverted. The role played by each physiological feature in the articulation of vowels and consonants is summarised in this chapter, and there is a more detailed investigation of the articulation of individual phonemes in Chapters 3 and 4.

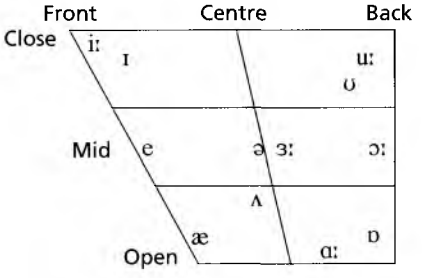


1 Upper lip
2 Nasal cavity
3 Upper teeth
4 Alveolar ridge
5 Hard palate
6 Soft palate
7 Uvula
8 Pharynx
9 Glottis
10 Larynx
11 Lower teeth
12 Lower lip
13 Tongue
- a tip
- b blade
- c front
- d centre
- e back

The articulation of phonemes

The articulation of vowels

Vowels are produced when the airstream is voiced through the vibration of the vocal cords in the larynx, and then shaped using the tongue and the lips to modify the overall shape of the mouth. The position of the tongue is a useful reference point for describing the differences between vowel sounds, and these are summarised in the following diagram.



The diagram is a representation of the 'vowel space' in the centre of the mouth where vowel sounds are articulated.

- 'Close', 'Mid' and 'Open' refer to the distance between the tongue and the roof of the mouth.
- 'Front', 'Centre' and 'Back' and their corresponding 'vertical' lines refer to the part of the tongue.
- The position of each phoneme represents the height of the tongue, and also the part of the tongue which is (however relatively) raised.

Putting these together:

/i:/ *bead* (a close front vowel) is produced when the front of the tongue is the highest part, and is near the roof of the mouth.

/æ/ *hat* (an open front vowel) is produced when the front of the tongue is the highest part, but the tongue itself is low in the mouth.

/ɒ/ *dog* (an open back vowel) is produced when the back of the tongue is the highest part, but the tongue itself is low in the mouth.

/u:/ *food* (a close back vowel) is produced when the back of the tongue is the highest part, and is near the roof of the mouth.

The articulation of consonants

Consonants, as mentioned earlier, can be voiced or unvoiced. The articulation of /p/ or /b/ is effectively the same, the only difference being that the latter is voiced and the former is unvoiced. As the relative force involved in producing /p/ is greater than that used to produce /b/, the terms **fortis** (strong) and **lenis** (weak) are sometimes used. Try holding a small slip of paper in front of your mouth and making both sounds; the paper should flap for /p/ and hardly move for /b/. Essentially, in English at least, 'fortis' applies to unvoiced consonant sounds like /p/, whereas 'lenis' describes their voiced counterparts like /b/. In addition to the presence or absence of voicing, consonants can be described in terms of the **manner** and **place of articulation**.

With regard to the manner of articulation, the vocal tract may be completely closed so that the air is temporarily unable to pass through. Alternatively there may be a closing movement of the lips, tongue or throat, so that it is possible to hear the sound made by air passing through. Or, as in the case of nasal sounds, the air is diverted through the nasal passages. The various terms used are explained in the following table:

Manner of articulation	
plosive	a complete closure is made somewhere in the vocal tract, and the soft palate is also raised. Air pressure increases behind the closure, and is then released 'explosively', e.g. /p/ and /b/
affricate	a complete closure is made somewhere in the mouth, and the soft palate is raised. Air pressure increases behind the closure, and is then released more slowly than in plosives, e.g. /tʃ/ and /dʒ/
fricative	when two vocal organs come close enough together for the movement of air between them to be heard, e.g. /f/ and /v/
nasal	a closure is made by the lips, or by the tongue against the palate, the soft palate is lowered, and air escapes through the nose, e.g. /m/ and /n/
lateral	a partial closure is made by the blade of the tongue against the alveolar ridge. Air is able to flow around the sides of the tongue, e.g. /l/
approximant	vocal organs come near to each other, but not so close as to cause audible friction, e.g. /r/ and /w/

With regard to the place of articulation, the following table summarises the main movements of the various articulators:

Place of articulation	
bilabial	using closing movement of both lips, e.g. /p/ and /m/
labio-dental	using the lower lip and the upper teeth, e.g. /f/ and /v/
dental	the tongue tip is used either between the teeth or close to the upper teeth, e.g. /θ/ and /ð/
alveolar	the blade of the tongue is used close to the alveolar ridge, e.g. /t/ and /s/
palato-alveolar	the blade (or tip) of the tongue is used just behind the alveolar ridge, e.g. /tʃ/ and /dʒ/
palatal	the front of the tongue is raised close to the palate, e.g. /j/
velar	the back of the tongue is used against the soft palate, e.g. /k/ and /ŋ/
glottal	the gap between the vocal cords is used to make audible friction, e.g. /h/

Voicing, manner and place of articulation are together summarised in the following table:

Table of English Consonant Phonemes

		Place of articulation							
		Front → Back							
		bilabial	labio-dental	dental	alveolar	palato-alveolar	palatal	velar	glottal
Manner of articulation	plosive	p b			t d			k g	
	affricate					tʃ dʒ			
	fricative		f v	θ ð	s z	ʃ ʒ			h
	nasal	m			n			ŋ	
	lateral				l				
	approxi-mant	(w)				r	j	w	

(Unvoiced phonemes are on a shaded background. Voiced phonemes are on a white background.)

Phonemic transcription

When writing in English, we use 5 vowel and 21 consonant letters. When speaking English we typically use 20 different vowel sounds (including 12 diphthongs), and 24 consonant sounds.

In some languages, there is essentially a one-to-one relationship between spelling and pronunciation, and there will be (with the occasional exception) the same number of phonemes used in the language as there are letters in the alphabet.

The lack of a one-to-one relationship between spelling and pronunciation in English, while by no means being unique, presents learners with many problems. A typically cited example is the pronunciation of *ough*, which has at least eight distinct sound patterns attached to it:

cough /kɒf/	through /θruː/
bough /baʊ/	bought /bɔːt/
rough /rʌf/	thorough /ˈθʌrə/*
although /ɔːlˈðəʊ/	lough /lɒx/**

* British English. /θʌrəʊ/ is more common in US English.

** /x/ represents the same sound as at the end of the more familiar 'loch'; the spelling used depends upon the variety of English.

Examples abound of spellings and pronunciations which can cause difficulties for learners:

Why don't you read /riːd/ this book?
Oh, I've already read /red/ it.
Look over there! I can see /siː/ the sea /siː/.

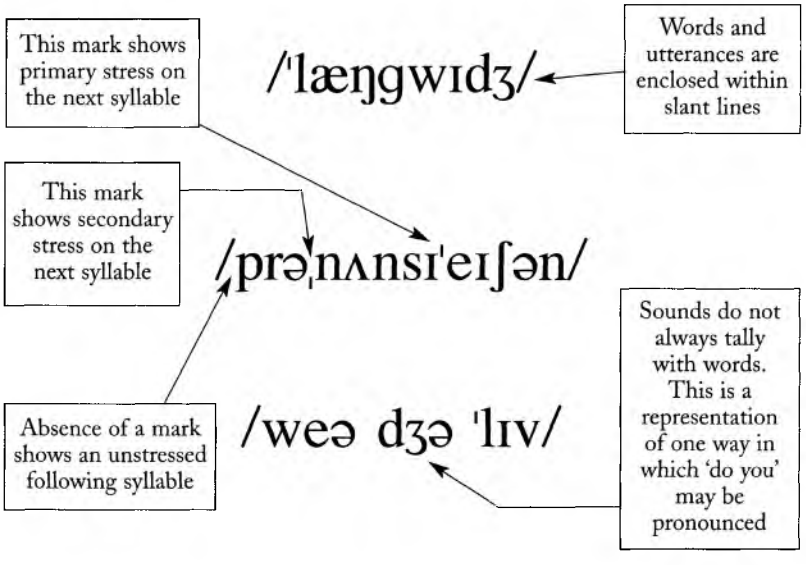
The difficulties that individual learners have may stem from one or more of the following:

- The learner's first language (referred to as **L1**) may have a one-to-one relationship between sounds and spelling. The concept of there not being such a relationship may be new.
- Even if such a concept is not new for the learner, they will have to become familiar with new sound–spelling relationships.
- There may be sounds, and combinations of sounds in L1, which do not occur in English.
- There may be sounds, and combinations of sounds, used in English which do not occur in L1.
- English may use stress and intonation patterns which feel strange to the learner.

Phonemic transcription gives both teachers and students a way of accurately recording the pronunciations of words and utterances.

It is not suggested that teachers should introduce their students to all of the phonemic symbols at once. It makes far more sense to work on those sounds which cause difficulty first, and introduce other phonemic symbols as appropriate. It is possible to tie in the teaching of new symbols with dictionary work, when the teacher can show students how the symbols are used. Be aware, though, that dictionaries may vary in the conventions they use. The best advice is to use a class set of the dictionary you or your students have chosen, and familiarise students with the conventions it uses.

The following examples are used to show certain conventions used in this book, and found in most dictionaries and reference books. It is useful for teachers to know these conventions, and to help students become familiar with them to aid independent study away from the classroom.



Other conventions exist for marking stress and intonation, which may be easier for students to understand. Chapters 5 and 6 will explain the theory behind their use and will also show teachers how to incorporate both standard and alternative notations for indicating stress and intonation in transcription. As suggested above, dictionary work can be very useful, not only because it helps foster independence in the learner, but also because learners will get used to seeing stress symbols used in the word transcriptions.

Phonetics and phonology

The study of pronunciation consists of two fields, namely **phonetics** and **phonology**. Phonetics refers to the study of speech sounds. A phonetician usually works in one or more of the following areas:

- the anatomical, neurological and physiological bases of speech (collectively known as **physiological phonetics**)
- the actions and movements of the speech organs in producing sounds (**articulatory phonetics**)
- the nature and acoustics of the sound waves which transmit speech (**acoustic phonetics**)
- how speech is received by the ears (**auditory phonetics**)
- how speech is perceived by the brain (**perceptual phonetics**)

Phonetics is a wide-ranging field, and it does not necessarily have a direct connection with the study of language itself. While the phonetic disciplines listed above can be studied independently of one another, they are clearly connected: speech organs move to produce sounds, which travel in sound waves, which are received by the ears and transmitted to the brain.

If phonetics deals with the physical reality of speech sounds, then **phonology**, on the other hand, is primarily concerned with how we interpret and systematise sounds. Phonology deals with the system and pattern of the sounds which exist within particular languages. The study of the phonology of English looks at the **vowels**, **consonants** and **suprasegmental** features of the language. Within the discipline of phonology, when we talk about vowels and consonants we are referring to the different sounds we make when speaking, and not the vowel and consonant letters we refer to when talking about spelling. It would be wrong to assume that phonology is always monolingual. Much work in phonological study deals with generalisations concerning the organisation and interpretation of sounds that might apply across different languages.

This book, while being primarily concerned with the phonology of English and how it might be integrated successfully into language teaching, will also draw on aspects of phonetics, particularly those concerned with articulation. As we will see, both fields have practical significance and application in the classroom.

Conclusions

In this chapter we have:

- introduced the main features of pronunciation, and distinguished between phonemes and suprasegmental features.
- introduced the vowel sounds. Vowel sounds are usually described in terms of the tongue position, which may be shown diagrammatically.
- introduced the consonant sounds. Consonant sounds are formed when the airflow is interrupted, restricted or diverted in a variety of ways.
- considered stress and intonation. Stress is described in terms of the prominences made in words and utterances. Intonation is described in terms of how the voice goes up or down across utterances.
- thought about reasons for using phonemic transcription in the classroom, as a way of accurately noting pronunciation and shown how transcription can be used to show sounds, stresses and intonation.
- distinguished between phonetics and phonology, and suggested that both areas have practical significance for teachers.

Looking ahead

In Chapter 2 we will:

- look closely at various ways of dealing with pronunciation in the classroom, and exemplify three different types of pronunciation lesson.