Eighth Edition

Gimson's Pronunciation of English

Alan Cruttenden

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ROUTLEDGE

Gimson's Pronunciation of English

Since it was first published in 1962, *Gimson's Pronunciation of English* has been the essential reference book for anyone studying or teaching the pronunciation of English.

This eighth edition has been brought fully up to date, describing what is now termed General British (GB) as the accent of principal consideration and relinquishing the outdated expression 'RP', and the accompanying transcription has been updated in line with recent changes in pronunciation. This latest edition also includes completely rewritten chapters on the history of the language and the emergence of a standard, alongside an explanation for the change from RP to GB.

A further bonus to this important text is its extensive and attractive new companion website (www.routledge.com/cw/cruttenden), which now includes moment-by-moment commentaries on videos showing the articulation of all GB consonants and vowels in spoken phrases, as well as cross-referencing between the book and these videos. The companion website also includes new recordings of Old English, Middle English, and Early Modern English, and features links to recordings of recent and current GB with comments and transcriptions.

Comprehensive yet accessible, *Gimson's Pronunciation of English* remains the indispensable reference book for anyone with an interest in English phonetics.

Alan Cruttenden is Emeritus Professor of Phonetics, University of Manchester, and Fellow of the Phonetics Laboratory, University of Oxford.

'Under Alan Cruttenden's excellent stewardship, *Gimson's Pronunciation of English* continues to be the ultimate authority on the subject of English phonetics; no student or teacher of this subject can do without it.

Cruttenden's rejection of the term "Received Pronunciation" in favour of "General British" is, in my opinion, timely and his transcriptional revisions to certain vowel symbols reflective of current trends in General British pronunciation.

The commentaries on articulation added to the MRI videos on the companion website are particularly elucidating. I will definitely be referring my students to this informative material.'

Jane Setter, *University of Reading, UK*

'This well-respected volume continues to be an invaluable authority on the pronunciation of English, and the on-going efforts by Alan Cruttenden to keep it updated are exceptionally welcome. This latest update will ensure this volume continues to be an essential resource for anyone teaching or researching the pronunciation of English, especially with the continued development of on-line resources to accompany the book.'

David Deterding, *University of Brunei, Darussalam*

'There are books which you need to read, possibly from the library, and books which you need to own. Together with a pronouncing dictionary of English, this excellent update of Gimson's classic description of the pronunciation of English, now completely rewritten by Alan Cruttenden, should be on the bookshelf of every serious student or teacher of English.'

Daniel Hirst, *CNRS, Aix-Marseille University, France, and Tongji University, China*

'Unique and unrivalled, of Cruttenden's four successive brilliant re-workings and updatings upon the famous Gimson foundation, this is the most remarkable yet, not least for its groundbreaking new audio-visual companion website.'

Jack Windsor Lewis, *formerly of the University of Leeds, UK*

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Eighth Edition

Alan Cruttenden

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Foreword to the First Edition (1962)

The phonetic detail of the pronunciation of British English has already been described in several excellent works, notably those of Daniel Jones. This present book, written after a number of years of teaching the spoken language both to English students and to foreign learners, sets out to place the phonetics of British English in a larger framework than has been customary. For this reason, emphasis is given to the function of the spoken medium as a form of communication. Some treatment of the historical background and the linguistic implications of the present sound system is included, as well as information concerning the acoustic nature of English sounds. Those sections in Part II, in which detailed descriptions of the realizations of phonemes are given, deal with spelling forms, articulatory and acoustic features, variants and chief historical sources. In addition, throughout Parts II and III, general advice to the foreign learner is included.

The book is intended to serve as a general introduction to the subject which will encourage the reader to consult more specialized works on particular aspects. Though my own views and observations intrude both in the material and in its presentation, much of the information given is derived from the numerous sources quoted in the Bibliography. In particular, new evaluations, which seem to me to reflect more nearly the current trend of RP forms, are made of the phonetic characteristics of certain phonemes. In the acoustic field, where so much remains to be investigated and where research proceeds so rapidly, an attempt has been made to sum up the results of work done in the post-war period, though many of the conclusions must as yet be regarded as tentative. It was tempting to apply to British English a logical, elegant and economical phonemic analysis such as is now commonplace in the United States, involving a very much simplified phonemic notation. If this has not been done, it is mainly because a type of analysis was required which was explicit on the phonetic level as well as reasonably tidy on the phonemic level; it seemed easier, for instance, to deal with phonetic developments and variants in terms of the largely traditional (for British English) transcription which has been used.

Throughout the book, the influence of my teachers, Professor Daniel Jones and Dr H. N. Coustenoble, will be obvious. To them my sincere thanks are due, not only for their teaching over the past 25 years but also for the example of

dedication which they gave me. My gratitude is also due to Professor D. B. Fry and all my colleagues of the Department of Phonetics, University College, London, whose brains I have constantly picked during the writing of this book. In particular, I have valued the help of Mr J. D. O'Connor and Dr A. J. Fourcin who have read sections of the book, made corrections and suggested improvements. I am also much indebted to Professor Randolph Quirk for his helpful comments on several points of Old English phonology. I am most grateful, too, to Mr J. C. Wells, who has generously allowed me to use unpublished figures resulting from his work on the formants of RP vowels.

A. C. Gimson
University College
London
December, 1961

Foreword to the Eighth Edition (2014)

I have now edited four editions of this book (besides having a minor role in an earlier fifth). Throughout my editions I have thought to change it from being primarily a textbook to being a reference book. In keeping with this change, while updating the book I have regularly introduced references in end of chapter notes. At the same time, to fit with modern styling, I have often revised the writing to be rather simpler where sometimes the original was somewhat convoluted or tied with 'hedges'. In my editions I have also at different times thought it necessary to substantially rewrite most chapters. Some of the changes from the fourth edition to the seventh included rewriting the sections on intonation, on word accent, and on L2 teaching and learning; and adding in sections on L1 learning, on regional variations and on spellings. A major change in layout in the seventh edition saw the introduction of text-boxed information on spellings and on sources for vowels and consonants. The seventh edition also saw the setting up of a companion website.

This eighth edition continues the text-boxing by introducing boxes for the description of phonotactics. It revises and adds to the companion website: the MRI video scans introduced in the seventh edition have now been organised so that there is a commentary on what the articulating organs are doing at each stage; and specific references are made in Chapters 2, 4, 8 and 9 to particular points in the videos. The references are in bold and take the form, for example, **(see video 1.2)** or **(see videos 1.2, 3.18)**, where the digits before the stop show the number of the video and the digits after the stop refer to the relevant point on the scale beneath the video. Also on the companion website there are spoken versions of the transcriptions of Old English, Middle English and Early Modern English; and there are recordings to show how the language has changed over the last eighty years.

The only parts of the book which I had not previously changed much were Chapter 6 on the history of English and the first part of Chapter 7 on the evolution of a standard language. These I have now completely rewritten.

Two major changes have been made in the book to reflect current changes in the language and attitudes to it.

First, I no longer regard the book as describing RP (Received Pronunciation). Despite the fact that I and other phoneticians have sought to describe changes

in RP to make it a modern and more flexible standard, many, particularly in the media, have persisted in presenting an image of RP as outdated and becoming even more than ever the speech only of the 'posh' few in the south-east of England. For this reason I have dropped the name RP and now consider myself to be describing General British or GB. I have dealt in more detail with the background to this change in Chapter 7.

Second, I have made three substantial transcriptional alterations: (1) /æ/ has been changed to /a/. This change is long overdue in transcriptions of English. The symbol /æ/ has always been an oddity even in the IPA alphabet: nowhere else is there a separate symbol for a value intermediate between two Cardinal Vowels (showing an English bias—the symbol dates from Old English). Moreover the value of this vowel in current GB is much closer to Cardinal [a] than it was fifty years ago. (2) /eə/ has been changed to /ɛː/. The centring diphthongs in GB (and in other parts of the world) are being progressively monophthongised; the process is most advanced with the diphthong formerly transcribed /eə/, so this is recognised here by the new transcription /ɛː/. (3) /i,u/ are transcribed without length marks finally and before vowels, e.g. *react* /ri`akt/, *doing* /`duɪŋ/, *copy* /`kɒpi/ and in common pronunciations of *the*, *me*, *he*, *she*, *we* and *you*. These forms are described as allophones of /ɪ,ʊ/ but are nevertheless transcribed with slant brackets (as in a phonemic transcription); it particularly seems important to show that pronunciations with /ɪ/, though not uncommon, are generally considered part of an older or nowadays more 'conspicuous' General British or CGB. It also follows the practice in the three pronouncing dictionaries (see further on this topic in §8.9.2).

I keep to my own view of English rhythm. Knowing how many differences of opinion there can be about where the 'stresses' are in sentences, I continue not to believe in 'rhythmical stress' and in 'stress-timing'. I analyse utterances only in terms of pitch accents and full and reduced vowels, which are generally less ambiguous and account for rhythm better (see §11.2). In a related matter I keep ` for the primary accent in cited words as reflecting their usual pronunciation with a falling tone.

Finally a few thank yous for help. To Gim himself for educating me in phonetics through this book, for giving me a book to recommend to my students and for continuing to give me something to revise. Also to Ted Carney whose monumental work on spelling I continue to plunder. And to Jack Windsor Lewis, who has given me the benefit of his huge knowledge of English phonetics and who has read the whole book and given me the benefit of both numerous corrections and suggestions, besides being an expert proofreader. Finally to Rachel Daw and Sarah May at Routledge, with whom I cannot imagine a better co-operation.

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List of phonetic symbols and signs and abbreviations

(Letters additional to the Roman alphabet are given Unicode names)

a	Cardinal Vowel no. 4 (GB vowel in *cat*); also used for the first element of the GB diphthongs /aɪ/ and /aʊ/
æ	front vowel between open-mid (Cardinal 3) and open (Cardinal 4) (older pronunciation of the GB vowel in *cat* ('ash')
ɑ	Cardinal Vowel no. 5 (a retracted pronunciation of the GB vowel in *car*) ('alpha')
ɒ	Cardinal Vowel no. 13 (GB vowel in *dog*) ('turned alpha')
AN	Anglo-Norman
ANE	Australian English
b	voiced bilabial plosive (Eng. *b* in *labour*)
ɓ	voiced bilabial implosive (see §4.3.10) ('b with hook')
β	voiced bilabial fricative (sometimes heard for *f* in a sequence like *of blue*) ('beta')
C.	Cardinal Vowel
c	voiceless palatal plosive (sometimes for *qu* in French *quai*)
ç	voiceless palatal fricative (as in German *ich*) ('c with cedilla')
ɔ	Cardinal Vowel no. 6 (approximately as in German *Sonne*) also used for GB /ɔː/ in *saw* and first element of diphthong /ɔɪ/ ('open O')
d	voiced alveolar plosive (Eng. *d* in *lady*)
ɖ	voiced retroflex plosive (common pronunciation of English *d* in Indian English) ('d with tail')
ɗ	voiced alveolar implosive (see §4.3.10) ('d with hook')
dʒ	voiced palato-alveolar affricate (Eng. *j* in *jam*) ('d-ezh ligature')
ð	voiced dental fricative (Eng. *th* in *other*) ('eth')
e	Cardinal Vowel no. 2 (approximately as in French *thé*); also used for GB /e/ in *bed*, and for the first element of the diphthong /eɪ/
eModE	Early Modern English
ə	unrounded central vowel (Eng. initial and final vowels in *another*) ('schwa')
ɛ	Cardinal Vowel no. 3 (approximately as in French *père*) ('open e')
ɜ	unrounded central vowel (GB *ir* in *bird*) ('reversed open e')

ɜ˞	unrounded retroflexed central vowel (General American *ir* in *bird*) ('reversed open e with hook')
f	voiceless labiodental fricative (Eng. *f* in *four*)
ɟ	voiced palatal plosive (sometimes in French *guide*) ('dotless j with stroke')
GA	General American
GB	General British
GVS	Great Vowel Shift
g	voiced velar plosive (Eng. *g* in *eager*)
ɠ	voiced velar implosive (see §4.3.10) ('g with hook')
ɢ	voiced uvular plosive (see §4.3.3) ('small cap G')
ɣ	voiced velar fricative (Spanish *g* in *luego*) ('gamma')
ɤ	Cardinal Vowel no. 15 (a realisation of Eng. /ʊ/ in some varieties) ('ram's horn')
h	voiceless glottal fricative (Eng. *h* in *house*)
ɦ	voiced glottal fricative (sometimes Eng. *h* in *behind*) ('h with hook')
i	Cardinal Vowel no. 1 (approximately as in French *si*); also used for Eng. /iː/ in *see*
ɨ	unrounded close central vowel (a realisation of English /iː/ in some varieties) ('i with stroke')
ɪ	centralised unrounded close-mid vowel (Eng. vowel in *sit*) ('small cap I')
j	voiced palatal approximant (Eng. *y* in *you*)
ʝ	voiced palatal fricative (sometimes *j* in Eng. *yeast*) ('j with crossed tail')
k	voiceless velar plosive (Eng. *c* in *car*)
L1	learning as a first language (in this book, of English)
L2	learning as an additional language (in this book, of English)
LF	lexical frequency (i.e. as in dictionaries)
l	voiced alveolar lateral approximant (Eng. *l* in *lazy*)
ɬ	voiced alveolar lateral approximant with velarisation (GB *ll* in *ill*) ('l with middle tilde')
ɮ	voiceless alveolar lateral fricative (Welsh *ll*) ('l with belt')
ME	Middle English
m	voiced bilabial nasal (Eng. *m* in *me*)
ɱ	voiced labiodental nasal (Eng. *m* in *comfort*) ('m with hook')
ɯ	Cardinal Vowel no. 16 (like Eng. /uː/ with spread lips) ('turned m')
MRI	Magnetic Resonance Imaging (in Chapters 2, 4, 8 and 9 reference is regularly made to number and point of MRI videos on companion website, e.g. 3.15 refers to video 3, point 15)
NE	Northern (England) English
n	voiced alveolar nasal (Eng. *n* in *no*)
ŋ	voiced velar nasal (GB *ng* in *sing*) ('eng')
ɲ	voiced palatal nasal (French *gn* in *vigne*) ('n with left hook')
OE	Old English

OF	Old French
ON	Old Norse
o	Cardinal Vowel no. 7 (approximately as in French *eau*)
ø	Cardinal Vowel no. 10 (approximately as in French *peu*) ('o with stroke')
œ	Cardinal Vowel no. 11 (approximately as in French *peur*) ('ligature oe')
p	voiceless bilabial plosive (Eng. *p* in *pea*)
q	voiceless uvular plosive (see §4.3.3)
r	voiced alveolar trill (an emphatic pronunciation of *r* in Scottish English)
ɹ	voiced post-alveolar approximant (GB *r* in *red*) ('turned r')
ɻ	voiced retroflex approximant (sometimes for General American *r* in *red*) ('turned r with hook')
ʀ	voiced uvular trill (an emphatic pronunciation of French *r* in *rouge*) ('small cap R')
ʁ	voiced uvular fricative or approximant (French *r* in *peur*) ('small cap inverted R')
ɾ	voiced alveolar tap (sometimes *r* in Eng. *very*) ('r with fish hook')
SSE	Standard Scottish English
s	voiceless alveolar fricative (Eng. *s* in *see*)
ʃ	voiceless palato-alveolar fricative (Eng. *sh* in *she*) ('esh')
TF	text frequency (i.e. as in continous texts)
t	voiceless alveolar plosive (Eng. *t* in *tea*)
ʧ	voiceless palato-alveolar affricate (Eng. *ch* in *cheese*) ('t-esh ligature')
ʈ	voiceless retroflex fricative (common pronunciation of English *t* in Indian English) ('t with retroflex hook')
θ	voiceless dental fricative (Eng. *th* in *thing*) ('theta')
u	Cardinal Vowel no. 8 (approximately as in French *doux*); also used for Eng. /uː/ in *do*
ʉ	rounded close central vowel (a realisation for Eng. /uː/ in some dialects) ('u bar')
ʊ	centralised rounded close-mid vowel (GB. *u* in *put*) ('upsilon')
v	voiced labiodental fricative (Eng. *v* in *ever*)
ʌ	Cardinal Vowel no. 14; also used for Eng. /ʌ/ in *cup* ('turned v')
ʋ	voiced labiodental approximant (a speech defective pronunciation (but see §9.7.2) of Eng. *r* in *red*) ('v with hook')
w	voiced labial-velar approximant (Eng. w in *we*)
ʍ	voiceless labial-velar fricative (sometimes Eng. *wh* in *why*) ('turned w')
x	voiceless velar fricative (Scottish English *ch* in *loch*)
y	Cardinal Vowel no. 9 (approximately as in French *but*)
ʎ	voiced palatal lateral approximant (Italian *gl* in *egli*) ('turned y')
z	voiced alveolar fricative (Eng. *z* in *lazy*)
ʒ	voiced palato-alveolar fricative (Eng. *s* in *measure*) ('ezh')

‖	alveolar lateral click (the sound to make horses 'gee-up')
|	dental click (as in the Eng. vocalisation written 'tut-tut')
ʔ	glottal plosive (as at onset of emphatic pronunciation of Eng. *accident*)
/	boundary between intonational phrases (see §11.6)
//	phonemic transcription
[ ]	phonetic (allophonic) transcription also situational setting for intonational transcriptions (see §11.6.2.6)
[.]	indicates a syllable boundary
[-]	indicates a morpheme boundary
[ː]	indicates long vowel, e.g. [fiːd]
[ˑ]	indicates half long vowel, e.g. [fiˑt]
[˘]	indicates short, non-prominent, vowel, e.g. [wɪndɪ̆ə]
[○]	indicates full vowel without pitch accent (in interlinear tonetic transcriptions) (see §11.6.1.3)
[●]	indicates full vowel with pitch accent (in interlinear tonetic transcriptions)
[◕]	indicates reduced vowel (in interlinear tonetic transcriptions)
[ˋ]	high falling nuclear tone (and used to indicate primary accent in citation forms), e.g. ˋyes
[ˎ]	low falling nuclear tone, e.g. ˎyes
[ˊ]	high rising nuclear tone, e.g. ˊyes
[ˏ]	low rising nuclear tone, e.g. ˏyes
[ˇ]	falling-rising nuclear tone, e.g. ˇyes
[ˆ]	rising-falling nuclear tone, e.g. ˆyes
[˃]	mid-level nuclear tone, e.g. ˃yes
[˭]	stylised tone (high level followed by mid level), e.g. ˭sorry
[']	syllable carrying (high) secondary accent, e.g. 'come ˌhere
[ˌ]	syllable carrying (low) secondary accent, e.g. I ˌlike ˌthat
[~]	nasalisation, e.g. [õ]
[¨]	centralisation, e.g. [ö]
[˕]	more open quality, e.g. [o˕]
[˔]	closer quality, e.g. [o˔]
[◌̥]	devoiced lenis consonant, e.g. [z̥] (above in the case of [n̥,ʒ̊,g̊])
[◌̩]	syllabic consonant, e.g. [n̩] (above in the case of n̩])
[◌̪]	dental articulation, e.g. [t̪]
[˖]	fronted articulation, e.g. [t˖] or [t̟]
[-]	retracted articulation, e.g. [t-] or [t̠]
→	is realised (pronounced) as
<	developed from/less than
>	developed to/greater than
*	GB (Figs 12–31)
†	CGB (Figs 12–31)
< >	orthographic form

Part I

Language and speech

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Chapter 1

Introduction

1.1 Language and linguistics

1.1.1 Phonetics as part of linguistics

PHONETICS as a subject of study is nowadays considered to be part of linguistics. But in departments of linguistics in universities it is still a subject with more autonomy than other areas, for various reasons: it is the only section of linguistics which deals almost entirely with the spoken language (the exception being the relationship between sounds and spellings); it is often heavily dependent on instruments and even more dependent on computers than other areas of language study; it depends on data more than other areas of linguistics; and it depends on scaled measurements more than other areas of linguistics.

Nevertheless phonetics does overlap with and inform almost all other areas of linguistics. Phonetics informs MORPHOLOGY, particularly inflexions, e.g. the morphophonemic alternations in plural formation in English as illustrated by the /s/ in in *cats*, the /z/ in *dogs*, the /ɪz/ in *losses* (see §10.10.4(2)). Phonetics informs SYNTAX, e.g. it highlights word class differences, e.g. between the accent placement in the noun /ˈtɔːment/ and the verb /tɔːˈment/ (see §10.5). Phonetics informs PRAGMATICS, particularly in the way intonation is used, e.g. it shows the 'reservations' in a phrase such as *Well I like ˇsalmon (i.e. but in general I am not keen on fish)* where the ˇ indicates a fall and then rise in pitch on *salmon* (see §11.6.2.6(1)). Moreover phonetics plays a leading part in analyses in SOCIOLINGUISTICS, including variations in dialect (see, for example, §7.12) and style (see, for example, §12.5).

1.1.2 Phonetics, phonology and phonemics

We talked above about 'phonetics' but we must talk more precisely of 'phonetics and phonology', since this book is concerned with both. The PHONETICS of a language concerns the concrete characteristics (articulatory, acoustic, auditory) of the sounds used in languages while PHONOLOGY concerns how sounds function in a systemic way in a particular language. The traditional approach to phonology

is through PHONEMICS which analyses the stream of speech into a sequence of contrastive segments, 'contrastive' here meaning 'contrasting with other segments to make a change in meaning' (see further in §5.3 below). The phonemic approach to phonology is not the only type of phonological theory but it is the most accessible to those with no training in linguistic theory. The phonemic system of a language is relatable to the writing system: the relationship between the phonemes of a language and the letters used in its writing system is called GRAPHEMICS. A phonemic description also makes it easy to describe the combinatory possibilities of the sounds (the PHONOTACTICS), e.g. that /str/ is a sequence of sounds which begins words in English but not in many other languages. For such reasons the major part of this book is set within phonemic analysis.

1.1.3 Pronunciation and spelling

The word 'pronunciation' indicates that this book is not one about alternative theories of the phonology of English, nor indeed does it seek to justify the use of the phonemic framework other than in terms of the ease of access mentioned in the previous section.

The term 'pronunciation' covers both phonetics and phonemics. Moreover it also encompasses the PROSODY of English, i.e. the 'suprasegmentals' which operate on longer stretches of utterances than sounds or phonemes. Prosody deals with how words and sentences are accented (see Chapter 10), and how pitch, loudness and length work to produce rhythm and intonation (see Chapter 11).

Use of the word 'pronunciation' also indicates that the book makes reference to spellings, particularly in the chapters on vowels and consonants. Thus it gives guidance on how learners can pronounce what they read as well as how they can talk in conversation.

1.2 Change and variation

The central description of this book concerns English English (i.e. English as spoken in England) and more especially the description of a standard accent of English English known in the last century as Received Pronunciation (RP) but nowadays better called GENERAL BRITISH (GB). The reason we call it General British is that speakers of GB can be found not only in England but also in Wales and Scotland. There are many speakers who use what we will call REGIONAL GENERAL BRITISH (RGB), i.e. GB with the inclusion of a small number of local characteristics. A standard pronunciation has been evolving at least since the invention of printing in the fifteenth century (see §6.5 and §7.1). The standard started as the accent at the courts of kings and queens, widened to be the accent of the public schools in the nineteenth century, was codified as Received Pronunciation (RP) early in the twentieth century and widened again to become the accent favoured by the BBC in the middle of the twentieth century. Since then the direction of change has been towards dilution of what was called RP. Greater

generational, social and regional variation is now permitted within what is now called GB, and at the same time other accents have become acceptable in broadcasting. And in the last half century with the development of English into an international language the inclination in some quarters to regard GB as a monolithic standard has weakened and the need to describe variations within GB and the various types of use of English around the world has increased. So in this book, both in Chapter 7 on Standard and Regional Accents and in the subsections of Chapters 8 and 9 dealing with each consonant and vowel, while some space is devoted to the evolution of GB, more space is now also given to variation within GB and how other standards and dialects differ.

1.3 Learning

1.3.1 Functional load, phonetic cues and redundancy

While we put forward a model of English to be acquired for speaking, it must not be forgotten that a large part of language acquisition depends on listening, both listening to understand and listening to imitate. In order to understand when listening we are more dependent on some contrasts between sounds than on others; we say that some contrasts carry a higher FUNCTIONAL LOAD than others, e.g. the contrast between /iː/ and /ɪ/ carries a higher functional load than that between /uː/ and /ʊ/. Moreover while a contrast between two sounds or sets of sounds may be made in a combination of ways (this being part of the REDUNDANCY of language), some cues are always more important than others: thus the contrasts between /p,t,k/ and /b,d,g/ depend on the cues (i) voicing, (ii) aspiration (breath management), (iii) muscle tension and (iv) the effect on previous (particularly vowel) sounds. But of these cues (ii) and (iv) are far more important to listeners to GB than are (i) and (iii) and of the two (ii) is more important in syllable-initial position and (iv) in syllable-final position. So *pin* is distinguished from *bin* by the aspiration (breath) associated with the /p/ but not with the /b/ and *rope* is distinguished from *robe* by the shorter vowel in *rope*. Throughout this book we attempt to highlight the contrasts with high functional load and the cues which are more important. Besides functional load and the relative importance of specific phonetic cues, there are more general phonetic, grammatical and contextual cues which aid comprehension. If we hear an initial *th* sound [ð] we expect a vowel to follow and we know that some vowels are more likely than others. Or again, the total rhythmic shape of a word may provide an important cue to its recognition, e.g. in *I saw the sheet below* we will know if the final word is *below* or *billow* by the accenting of the first or second syllable. In a discussion about a zoo, involving a statement such as *We saw the lions and tigers* we are predisposed by the context to recognise *lions* even though the word might sound similar to *liars* or *lines*.

Thus teachers and learners of English must remember that communication does not depend on the perfect production and reception of every single element

of speech. To insist, for instance, on exaggeratedly clear articulation for clarity goes beyond the requirements of speech as a means of communication (although it may be necessary in certain situations, e.g. in a crowded room or in a theatrical or operatic production). The potential for redundancy becomes particularly important when considering what sort of simplified model is relevant to the many foreign learners whose need for English is limited to situations where a local English or an 'international' English is acceptable (this theme informs the discussion about choice of alternative models of English in §13.2).

1.3.2 Acquiring English as an L1

Children learning English as a first language will usually only have their family (and a wider circle of friends as they grow) to imitate as they learn the sound system of English, but a knowledge of the sorts of difficulties they face may enable adults to help all learners and in particular those with some sort of speech delay. Many children learning English as an L1 will have mastered the vowel system by the age of three but many will take at least until the age of five to master the system of consonants. Thus little special guidance is usually necessary for learning vowels but often particular guidance will help children to master the consonants, so hints are given in the various subsections in this book about difficulties which young children may have and the sort of guidance which may assist them (see, for example, §§8.7.1, 9.2.3, 9.4.2, 10.6, 11.4, 11.6.6).

1.3.3 Acquiring English as an additional language

When this book was first written learners learning English as an additional language were considered to have only two possible models: the British one, Received Pronunciation (RP), and the American one, General American (GA). This book represented a detailed description of target RP. There was some advice in the sections on individual vowels and consonants about the particular problems which speakers from different L1 backgrounds might face. This advice has been expanded with every edition. Moreover nowadays General British (GB), the successor to RP, is less homogeneous and much more variation within GB is allowed and discussed. Other British accents have become less stigmatised and on the BBC, for instance, almost all regional British accents are heard, certainly in discussion programmes and increasingly even in news presentations; so learners of English as an additional language need some guidance on the accents they are likely to hear (see §7.12 for some of these). In many countries around the world English is used as a *lingua franca*, and in international communication and conferences the common language is almost always English even in situations where none of the participants is a native speaker of English. For these types of communication two new models of English are discussed as targets in Chapter 13. There is firstly an Amalgam English which does not sound like any particular native speaker variety but incorporates the more easily learnable characteristics of various

Englishes and which additionally incorporates features which are common to particular subcontinental varieties (e.g. /t,d/ as retroflex [ʈ,ɖ] in Bangladesh, India and Pakistan). Secondly there is an INTERNATIONAL ENGLISH which reduces even further the consonant and (particularly) the vowel inventory to something even more easily learnable (e.g. the latter is potentially reduced from 20 to 10 vowels in long and short pairs). Thus the book has changed and evolved from exposition of RP as an almost invariant model for the foreign learner to one which describes GB only as one of a number of models for the learner of English as a second or foreign language.

Chapter 2

The production of speech: the physiological aspect

2.1 The speech chain

Speech is the result of a highly complicated series of events. The communication in sound of such a simple concept as *It's raining* involves a number of activities on the part of the speaker. In the first place, the formulation of the concept will take place in the brain; this first stage can be said to be psychological or psycholinguistic. The nervous system transmits this message to the organs of speech which will produce a particular pattern of sound; thus the second stage is physiological or, more precisely, articulatory. The movement of the organs of speech will create disturbances in the air; these varying air pressures can be investigated and constitute the third stage in the chain, the physical or, more precisely, acoustic. Since communication generally requires a listener as well as a speaker, these stages will be reversed at the listening end: the sound waves will be received by the hearing apparatus and information transmitted along the nervous system to the brain, where the linguistic interpretation of the message takes place. Phonetic analysis has often ignored the role of the listener. But any investigation of speech as communication must ultimately be concerned with both the production and the reception ends.

However, our first concern is with the second stage, speech production, or articulation. For this reason, we now examine how the various organs behave to produce the sounds of speech. References are made to the videos on the website where the reader can view the organs in action.

2.2 The speech mechanism

Humans possess, in common with many other animals, the ability to produce sounds. Humans differ from other animals in being able to organise the range of sounds which they can emit into a highly efficient system of communication. Non-human animals only rarely progress beyond the stage of using the sounds they produce as a reflex of certain basic stimuli to signal fear, hunger, sexual excitement and the like.[1] Nevertheless, like other animals, man uses organs for speaking whose original physiological function developed before vocal communication was acquired; in particular, organs situated in the respiratory tract.

2.2.1 Sources of energy—the lungs

The most usual source of energy for our vocal activity is provided by an airstream expelled from the lungs. There are languages which possess sounds not requiring lung (pulmonic) air for their articulation and, indeed, in English we have one or two extralinguistic sounds, such as that we write as *tut-tut* and the noise of encouragement made to horses, which are produced without the aid of the lungs; but all the essential sounds of English use lung air for their production. Our utterances are, therefore, partly shaped by the physiological limitations imposed by the capacity of our lungs and by the muscles which control their action. We are obliged to pause in articulation in order to refill our lungs with air and this will to some extent condition the division of speech into intonational phrases (see §11.6.1.1). In those cases where the airstream is not available for the upper organs of speech (as when, after the surgical removal of the larynx, lung air does not reach the mouth but escapes from an artificial opening in the neck) a new source of energy, stomach air, may be employed. A new source of this kind imposes more restrictions than those exerted by the lungs and variation of energy is less efficiently controlled.

A number of techniques are available for the investigation of the activity during speech of the lungs and their controlling muscles. At one time air pressure within the lungs was observed by the reaction of an air-filled balloon in the stomach. On the basis of such evidence from a gastric balloon, it was claimed that syllables were formed by chest pulses.[2] Such a primitive procedure was replaced by the technique of electromyography, which demonstrated the electrical activity of those respiratory muscles most concerned in speech, notably the internal intercostals; this technique disproved the relationship between chest pulses and syllables.[3] X-ray photography and CT scans can reveal the gross movements of the ribs and hence by inference of the surrounding muscles, although the technique of Magnetic Resonance Imaging (MRI) is now preferred on medical and safety grounds.[4]

2.2.2 The larynx and the vocal cords

The airstream provided by the lungs undergoes important modifications in the upper parts of the respiratory tract before it acquires the quality of a speech sound. First of all, at the top end of the TRACHEA or windpipe, it passes through the LARYNX, containing the vocal folds or, as they are more commonly called, the VOCAL CORDS (see Fig. 1).

The larynx is a casing, formed of cartilage and muscle, situated in the upper part of the trachea. Its forward portion is prominent in the neck below the chin and is commonly called the 'Adam's apple'. Housed within this structure from back to front are the vocal cords, two folds of ligament and elastic tissue which may be brought together or parted by the rotation of the arytenoid cartilages (attached at the posterior end of the cords) through muscular action. The inner

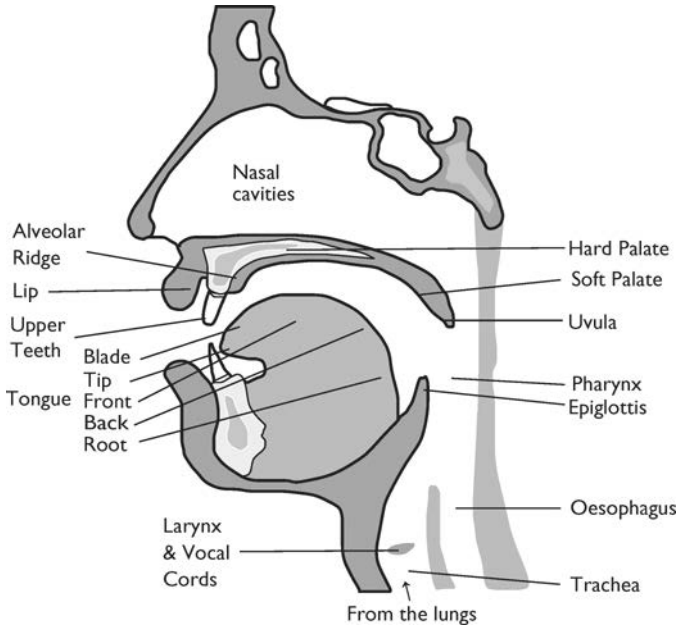


Figure 1 Organs of speech.

edge of these cords is typically about 17 to 22 mm long in males and about 11 to 16 mm in females.[5] The opening between the cords is known as the GLOTTIS. Biologically, the vocal cords act as a valve which is able to prevent the entry into the trachea and lungs of any foreign body, or which may have the effect of enclosing the air within the lungs to assist in muscular effort on the part of the arms or the abdomen. In using the vocal cords for speech, the human being has adapted and elaborated upon this original open-or-shut function in the following ways (see Fig. 2):

(1) The glottis may be held tightly closed, with the lung air pent up below it. A 'glottal stop' [ʔ] is produced when this closure is suddenly released and occurs in English, e.g. as an energetic onset to a vowel as in *apple* [ʔapl̩] or when it reinforces /p,t,k/ as in *clock* [klɒʔk] or even replaces them, as in *cotton* [kɒʔn̩]. It may also be heard in defective speech, such as that arising from cleft palate, when [ʔ] may be substituted for the stop consonants [p,t,k], which, because of the nasal air escape associated with cleft palate, cannot be articulated with proper compression in the mouth cavity.
(2) The glottis may be held open as for normal breathing and for voiceless sounds like [s] in *sip* and [p] in *peak*.
(3) The most common action of the vocal cords in speech is as a vibrator set in motion by lung air, which produces voice, or, more technically, PHONATION;

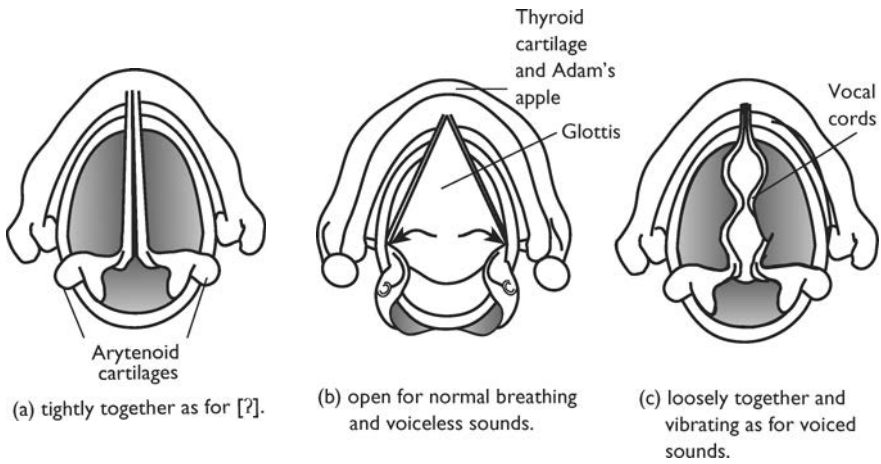


Figure 2 The states of the vocal cords as seen from above.

this vocal cord vibration is a normal feature of all vowels or of such a consonant as [z] in *zip* which makes them VOICED as compared with VOICELESS as [s] in *sip*. In order to achieve the effect of voice the vocal cords are brought sufficiently close together that they vibrate when subjected to the appropriate air pressure from the lungs. This vibration is caused by compressed air forcing the opening of the glottis and the resultant reduced air pressure permitting the elastic cords to come together again.[6] The vibration may be felt by touching the neck in the region of the larynx or by putting a finger over each ear flap when pronouncing a vowel or [z] for instance. In the typical speaking voice of a man, this opening and closing action is likely to be repeated between 100 and 150 times in a second, i.e. there are that number of cycles of vibration (called hertz, which is abbreviated to Hz); in the case of a woman's voice, this frequency of vibration might well be between 200 and 325 Hz. We are able, within limits, to consciously vary the speed of vibration of our vocal cords in order to change the pitch of the voice; the more rapid the rate of vibration, the higher the pitch (an extremely low rate of vibration being partly responsible for what is usually called creaky voice). Normally the vocal cords come together rapidly and part more slowly, the opening phase of each cycle thus being longer than the closing phase. This gives rise to 'modal' (or 'normal') voice which is used for most English speech. Other modes of vibration result in other voice qualities, most notably breathy and creaky voice which are used contrastively in a number of languages and may be used in English by some individuals and in some styles (see §5.8). Moreover, we are able, by means of variations in pressure from the lungs, to modify the size of the puff of air which escapes at each vibration of the vocal cords; in other words, we can alter the amplitude of the vibration, with a corresponding change of loudness of the sound heard by a listener. The

normal human being soon learns to manipulate his glottal mechanism so that most delicate changes of pitch and loudness are achieved. Control of this mechanism is, however, very largely exercised by the ear, so that such variations are exceedingly difficult to teach to those who are born deaf, and a derangement of pitch and loudness control is liable to occur among those who become totally deaf later in life.

(4) One other action of the larynx should be mentioned. A very quiet whisper may result merely from holding the glottis in the voiceless position throughout speech. But the more normal whisper, by means of which we are able to communicate with some ease, involves energetic articulation and considerable stricture in the glottal region. Such a whisper may in fact be uttered with an almost total closure of the glottis and an escape of air in the region of the arytenoid[7] cartilages.

The simplest way of observing the behaviour of the vocal cords is by the use of a laryngoscope, which gives a stationary mirrored image of the glottis. Using stroboscopic techniques, it is possible to obtain a moving record and high-speed films have been made of the vocal cords, showing their action in ordinary breathing, producing voice and whisper, and closed as for a glottal stop. The modern technique of observation is to use fibre-optic endoscopy coupled if required with a tiny videocamera.

2.2.3 The resonating cavities

The airstream, having passed through the larynx, is now subject to further modification according to the shape assumed by the upper cavities of the pharynx and mouth, and according to whether the nasal cavities are brought into use or not. These three cavities function as the principal resonators of the voice produced in the larynx.

2.2.3.1 The pharynx

The pharyngeal[8] cavity (see Fig. 1) extends from the top of the trachea and oesophagus, past the epiglottis and the root of the tongue, to the region at the rear of the SOFT PALATE. It is convenient to identify these sections of the PHARYNX by naming them: laryngopharynx, oropharynx, nasopharynx. The shape and volume of this long chamber may be considerably modified by the constrictive action of the muscles enclosing the pharynx, by the movement of the back of the tongue, by the position of the soft palate which may, when raised, exclude the nasopharynx, and by the raising of the larynx itself. The position of the tongue in the mouth, whether it is advanced or retracted, will affect the size of the oropharyngeal cavity; the modifications in shape of this cavity should, therefore, be included in the description of any vowel. It is a characteristic of some kinds of English pronunciation that certain vowels, e.g. the [a] vowel in *sad*, are

articulated with a strong pharyngeal contraction. Additionally, a constriction may be made between the lower rear part of the tongue and the wall of the pharynx so that friction, with or without voice, is produced, such fricative sounds being a feature of a number of languages, e.g. Arabic.[9]

The pharynx may be observed by means of a laryngoscope or fibre-optic nasendoscopy and its constrictive actions are revealed by MRI. **(See video 4.14–21)**

The escape of air from the pharynx may be effected in one of three ways:

(1) The soft palate may be lowered, as in normal breathing, in which case the air may escape through the nose and the mouth. This is the position taken up by the soft palate in articulation of the French NASALISED vowels in such a phrase as *un bon vin blanc* [œ̃ bõ vɛ̃ blɑ̃], the particular quality of such vowels being achieved through the resonance of the nasopharyngeal cavities. There is no absolute necessity for nasal airflow out of the nose, the most important factor in the production of nasality being the sizes of the posterior oral and nasal openings (some speakers may even make the nasal cavities vibrate through nasopharyngeal mucus or through the soft palate itself).[10]

(2) The soft palate may be lowered so that a NASAL outlet is afforded to the airstream, but a complete obstruction is made at some point in the mouth, with the result that, although air enters all or part of the mouth cavity, no oral escape is possible. A purely nasal escape of this sort occurs in such nasal consonants as [m,n,ŋ] in the English words *ram*, *ran*, *rang*. In a snore and some kinds of defective speech, this nasal escape may be accompanied by friction or a trill between the rear side of the soft palate and the pharyngeal wall.

(3) The soft palate may be held in its raised position, eliminating the action of the nasopharynx, so that the air escape is solely through the mouth. All English sounds, with the exception of the nasal consonants mentioned in (2), usually have this oral escape. Moreover, if for any reason the lowering of the soft palate cannot be effected, or if there is an enlargement of the organs enclosing the nasopharynx or a blockage brought about by mucus, it is often difficult to articulate either nasalised vowels or nasal consonants. In such speech, typical of adenoidal enlargement or the obstruction caused by a cold, the French phrase mentioned above would have its nasalised vowels turned into their oral equivalents and the English word *morning* would have its nasal consonants replaced by [b,d,g] becoming [bɔːdɪg]. On the other hand, an inability to make an effective closure by means of the raising of the soft palate—either because the soft palate itself is defective or because an abnormal opening in the roof of the mouth gives access to the nasal cavities—will result in the general nasalisation of vowels and the failure to articulate such oral stop consonants as [b,d,g]. This excessive nasalisation (or hypernasality) is typical of such a condition as cleft palate.

The action of the soft palate can be observed by MRI. **(See video 6.4ff.)** The pressure of the air passing through the nasal cavities may be measured at the nostrils or within the cavities themselves.

2.2.3.2 The mouth

Although all the cavities so far mentioned play an essential part in the production of speech sounds, most attention has traditionally been paid to the behaviour of the cavity formed by the mouth. Indeed, in many languages the word for 'tongue' is used to refer to our speech and language activity. Such a preoccupation with the oral cavity is due to the fact that it is the most readily accessible and easily observed section of the vocal tract. The shape of the mouth determines finally the quality of the majority of our speech sounds. Far more finely controlled variations of shape are possible in the mouth than in any other part of the speech mechanism.

The only boundaries of the mouth which are relatively fixed are, in the front, the teeth; in the upper part, the hard palate; and, in the rear, the pharyngeal wall. The remaining organs are movable: the lips, the various parts of the tongue and the soft palate with its pendant uvula (see Fig. 1). The lower jaw is capable of very considerable movement; its movement will control the gap between the upper and lower teeth and also to a large extent the disposition of the lips. Movement of the lower jaw is also one way of altering the distance between the tongue and the roof of the mouth.

It is convenient for descriptive purposes to divide the roof of the mouth into three parts: moving backwards from the upper teeth, first, the teeth ridge (adjective: ALVEOLAR)[11] which can be clearly felt behind the teeth; second, the bony arch which forms the hard palate (adjective: PALATAL) and which varies in size and arching from one individual to another; and finally, the soft palate (adjective: VELAR) which, as we have seen, is capable of being raised or lowered, and at the extremity of which is the uvula (adjective: UVULAR).[12] All these parts can be readily observed by means of a mirror.

(1) Of the movable parts, the lips (adjective: LABIAL), constitute the final obstruction to the airstream when the nasal passage is shut off. The shape which they assume affects very considerably the shape of the total cavity. They may be shut or held apart in various ways. When they are held tightly shut, they form a complete obstruction or occlusion to the airstream, which may either be momentarily prevented from escaping at all, as in the initial sounds of *pat* and *bat*, or may be diverted through the nose by the lowering of the soft palate, as in the initial sound of *mat*. If the lips are held apart, the positions they assume may be summarised under five headings:

(a) held sufficiently close together over all their length that friction occurs between them. Fricative sounds of this sort, with or without voice, occur in many languages and the voiced variety [β] is sometimes wrongly used by foreign speakers of English for the first sound in the words *vet* or *wet*;

(b) held sufficiently far apart for no friction to be heard, yet remaining fairly close together and energetically spread. This shape is taken up for vowels like that in *see* when energetically enunciated and is known as the SPREAD lip position;
(c) held in a relaxed position with a lowering of the lower jaw. This is the position taken up for the vowel of *sat* and is known as the NEUTRAL position;
(d) tightly pursed, so that the aperture is small and rounded, as in a precise or energetic enunciation of the vowel of *do*, or more markedly in the French vowel of *doux*. This is the CLOSE ROUNDED position;
(e) held wide apart, but with slight projection and rounding, as in the vowel of *got*. This is the OPEN ROUNDED position.

Variations of these five positions may be encountered, e.g. in the vowel of *saw*, for which a type of lip-rounding between open rounded and close rounded is commonly used. It will be seen from the examples given that lip position is particularly significant in the formation of vowel quality. English consonants, on the other hand, even including [p,b,m,w] whose primary articulation involves lip action, will tend to share the lip position of the adjacent vowel. In addition, the lower lip is an active articulator in the pronunciation of [f,v], a light contact being made between the lower lip and the upper teeth.

(2) Of all the movable organs within the mouth, the tongue is by far the most flexible and is capable of assuming a great variety of positions in the articulation of both vowels and consonants. The tongue is a complex muscular structure which does not show obvious sections; yet, since its position must often be described in considerable detail, certain arbitrary divisions are made. When the tongue is at rest, with its tip lying behind the lower teeth, that part which lies opposite the hard palate is called the FRONT and that which faces the soft palate is called the BACK, with the region where the front and back meet known as the CENTRE (adjective: CENTRAL). These areas together with the ROOT (which forms the front side of the pharynx) are sometimes collectively referred to as the body of the tongue. The tapering section in front of the body and facing the teeth ridge is called the blade (adjective: LAMINAL)[13] and its extremity the tip (adjective: APICAL). The edges of the tongue are known as the rims.

Generally, in the articulation of vowels, the tongue tip remains low behind the lower teeth. The body of the tongue may, however, be 'bunched up' in different ways, e.g. the front may be the highest part as when we say the vowel of *keen* **(see video 11.5)**; or the back may be most prominent as in the case of the vowel in *zoo* **(see video 2.28)**; or the whole surface may be relatively low and flat as in the case of the vowel in *father* **(see video 10.18)**. Such changes of shape can be felt if the above words are said in succession. These changes, together with the variations in lip position, have the effect of modifying very considerably the size of the mouth cavity and of dividing this chamber into two parts: that part of the cavity which is in the forward part of the mouth behind the lips and that which is in the rear in the region of the pharynx.

The various parts of the tongue may also come into contact with the roof of the mouth. Thus, the tip, blade and rims may articulate with the teeth as for the *th* sounds in English **(see video 12.16)**, or with the upper alveolar ridge as in the case of /t,d,s,z,n/ **(see videos 3.15,23, 2.17, 5.16, 6.7)** or the apical contact may be only partial as in the case of /l/ (where the tip makes firm contact whilst the rims make none—see the PALATOGRAM of /l/ in Figures 48 and 49) or intermittent in a trilled /r/ as in some forms of Scottish English. In some languages, notably those of India, Pakistan and Sri Lanka, the tip contact may be retracted to the very back of the teeth ridge or even slightly behind it; the same kind of RETROFLEXION, without the tip contact, is typical of some kinds of English /r/, e.g. those used in south-west England and by some speakers in the U.S.

The front of the tongue may articulate against or near to the hard palate. Such a raising of the front of the tongue towards the palate is an essential part of the [ʃ,ʒ] **(see videos 1.1, 11.23)** sounds in English words such as *show* and *measure*, being additional to an articulation made between the blade and the alveolar ridge; or again, it is the main feature of the [j] sound initially in *yield.*

The back of the tongue can form a total obstruction by its contact with the front side of the soft palate, the nasopharynx being closed in the case of [k,g], e.g. in *guard* **(see video 12.1)** and open for [ŋ] as in *hang* **(see video 10.4)**; or again, there may merely be a narrowing between the soft palate and the back of the tongue, so that friction of the type occurring finally in the Scottish pronunciation of *loch* is heard. And finally, the uvula may vibrate against the back of the tongue, or there may be a narrowing in this region which causes uvular friction, as at the beginning of the French word *rouge.*

It will be seen from these few examples that, whereas for vowels the tongue is generally held in a position which is convex in relation to the roof of the mouth, some consonant articulations, such as the southern British English /r/ in *ride* **(see video 4.2)** and the /l/ in *crawl* **(see video 2.9)**, will involve the 'hollowing' of the body of the tongue so that it has, at least partially, a concave relationship with the roof of the mouth.

Moreover, the surface of the tongue, viewed from the front, may take on various forms: there may be a narrow groove running from back to front down the mid line as for the /s/ in *see*, or the grooving may be very much more diffuse as in the case of the /ʃ/ in *ship.*

(3) The oral speech mechanism is readily accessible to direct observation as far as the lip movements are concerned as are many of the tongue movements which take place in the forward part of the mouth. Although a lateral view of the shape of the tongue over all its length and its relationship with the palate and the velum can be obtained by MRI, it should not be assumed that pictures of the articulation of, say, the vowel in *cat* will show an identical tongue position when pronounced by different people. Not only is the sound itself likely to be slightly different from one individual to another, but, even if the sound is for all practical purposes the 'same', the tongue positions may be different, since the shape of the mouth cavity is not identical for any two speakers; and, in any case,

two sounds judged to be the same may be produced by the same individual with somewhat different articulations. When, therefore, we describe an articulation in detail, it should be understood that such an articulation is typical for the sound in question, but that variations are to be expected.

Palatography, showing the extent of the area of contact between the tongue and the roof of the mouth, has long been a practical and informative way of recording tongue movements. At one time the palate was coated with a powdery substance, the articulation was made, and the 'wipe-off' subsequently photographed. But the modern method uses electropalatography, whereby electrodes on a false palate respond to any tongue contact, the contact points being simultaneously registered on a visual display. This has the advantage of showing a series of representations of the changing contacts between the tongue and the top of the mouth during speech. Electropalatograms of this sort are used to illustrate the articulations of consonants in Chapter 9.

Articulators used in speech

Articulator	*Relevance*
Airstream	Usually pulmonic
Vocal folds	Closed, wide apart, or vibrating
Soft palate	Lowered (giving nasality) or raised (excluding nasality)
Tongue	Back, centre, front, blade, tip and/or rims raised
Lips	Neutral, spread, open-rounded, close-rounded

Notes

1 But see, for example, Fouts & Mills (1999), for the training of chimpanzees to use a rudimentary language (but signed rather than spoken).
2 Stetson (1951).
3 Ladefoged (1967).
4 In this chapter and in Chapters 4, 8 and 9, videos on the companion website are referenced as, for example, video 12.4, where 12 is the number of the video and 4 is the relevant point on the video. See Cruttenden (2013) for some discussion of the use of these videos in teaching.
5 Clark *et al.* (2007: 178).
6 According to the 'Bernoulli Effect'.
7 Pronounced /aˈrɪtənɔɪd/ or /arɪˈtiːnɔɪd/.
8 Pronounced /ˈfarɪŋks/ and /fəˈrɪndʒɪəl/ or /fərɪnˈdʒiːəl/.
9 Recent research has shown that the pharyngeal consonants in Arabic are more correctly described as epiglottal (Ladefoged & Maddieson, 1996: 167).
10 Laver (1980: 77ff).
11 Pronounced /alviˈəʊlə/ or /alˈviːələ/.
12 Pronounced /ˈjuːvjuːlə/.
13 Pronounced /ˈlaminəl/ and /ˈeɪpɪkəl/.

Chapter 3

The sounds of speech: the acoustic and auditory aspects

3.1 Sound quality

To complete an act of communication, it is not sufficient that our speech mechanism should produce sounds; these have to be heard and interpreted, after transmission through a medium, normally the air, which is capable of conveying sounds. We now examine the nature of the sounds which we hear, the characteristics of the transmission phase of these sounds and the way in which these sounds are perceived by a listener.

When we listen to a continuous utterance, we perceive an ever-changing pattern of sound. When it is a question of our own language, we are not conscious of all the complexities of pattern which reach our ears: we tend consciously to perceive and interpret only those sound features which are relevant to the intelligibility of our language. Nevertheless, despite this linguistic selection which we ultimately make, we are aware that this changing pattern consists of variations of different kinds: of SOUND QUALITY—we hear a variety of vowels and consonants; of PITCH—we appreciate the melody, or intonation, of the utterance; of AMPLITUDE—some sounds or syllables sound 'louder' than others; and of LENGTH—some sounds will be longer to our ears than others. These are judgements made by a listener about a sound continuum from a speaker and, if the sound from the speaker and the response from the listener are made in the same linguistic system, then the utterance will be meaningful for speaker and listener alike. The transmission phase links the listener's impressions of changes of quality, pitch, amplitude and length with the articulatory activity on the part of the speaker. But an exact correlation between the production, transmission and reception phases of speech is not always easy to establish.

The production of sound requires some kind of energy and frequently this energy makes something vibrate. In the case of human speech the thing vibrating is usually the vocal cords which are energised by air pressure from the lungs. Any such sound produced in the larynx is then modified by the resonating chambers of the pharynx, the mouth and, in some cases, the nasal cavities. The listener's impression of sound quality will be determined by the way in which the speaker's vibrator and resonators function together.

Speech sounds, like other sounds, are conveyed to our ears by means of waves of compression and rarefaction of the air particles (the commonest medium of communication). These variations in pressure, initiated by the action of the vibrator, are propagated in all directions from the source, the air particles themselves vibrating at the same rate (or frequency) as the original vibrator. In speech, these vibrations may be of a complex but regular pattern, producing 'tone' such as may be heard in a vowel sound; or they may be of an irregular kind, producing 'noise', such as in the consonant /s/ or there may be both regular and irregular vibrations present, i.e. a combination of tone and noise, as in /z/. In the production of normal vowels, the vibrator is provided by the vocal cords; in the case of many consonant articulations, however, a source of air disturbance is provided by constriction at a point above the larynx, with or without accompanying vocal cord vibrations.

Despite the fact that the basis of all normal vowels is the glottal tone, we are all capable of distinguishing a large number of vowel qualities. Yet the glottal vibrations in the case of [ɑː] are not very different from those for [iː], when both vowels are said with the same pitch. The modifications in quality which we perceive are due to the action of the supraglottal resonators which we have previously described. To understand this action, it is necessary to consider a little more closely the nature of the glottal vibrations.

It has already been mentioned that the glottal tone is the result of a complex, but mainly regular, vibratory motion. In fact, the vocal cords vibrate in such a way as to produce, in addition to a basic vibration over their whole length (the FUNDAMENTAL FREQUENCY), a number of overtones or HARMONICS having frequencies which are simple multiples of the fundamental or first harmonic. Thus, if there is a fundamental frequency of vibration of 100 Hz, the upper harmonics will be of the order of 200, 300, 400 Hz. Indeed, there may be no energy at the fundamental frequency, but merely the harmonics of higher frequency such as 200, 300, 400 Hz. Nevertheless, we still perceive a pitch which is appropriate to a fundamental frequency of 100 Hz, i.e. the fundamental frequency is the highest common factor of all the frequencies present, whether or not it is present itself.

The number and strength of the component frequencies of this complex glottal tone will differ from one individual to another and this accounts at least in part for the differences of voice quality by which we are able to recognise speakers. But we can all modify the glottal tone so as to produce vowels as different as [iː] and [ɑː], so that despite our divergences of voice quality we can convey the distinction between two words such as *key* and *car*. This variation of quality, or timbre, of the glottal tone is achieved by the shapes which we give the resonators above the larynx—the pharynx, the mouth and the nasal cavities. These chambers are capable of assuming a very large number of shapes, each of which will have a characteristic vibrating resonance of its own. Those harmonics of the glottal tone which coincide with the chamber's own resonance are very considerably amplified. Thus, certain bands of strongly reinforced harmonics are characteristic

of a particular arrangement of the resonating chambers which produces, for instance, a certain vowel sound. Moreover, these bands of frequencies will be reinforced whatever the fundamental frequency. In other words, whatever the pitch on which we say, for instance, the vowel [ɑː], the shaping of the resonators and their resonances will be very much the same, so that it is still possible, except on extremely high or low pitches, to recognise the quality intended. It is found that, for male speakers, the vowel [iː] has one such characteristic band of strong components in the region of 280 Hz and another at about 2,200 Hz, while for female speakers these bands of energy are at about 300 Hz and 2,700 Hz (see §8.6).

3.2 The acoustic spectrum

This complex range of frequencies of varying intensity which go to make up the quality of a sound is known as the ACOUSTIC SPECTRUM, those bands of energy which are characteristic of a particular sound are known as the sound's FORMANTS. Thus, formants of [ɑː] are said to occur, for female speakers, in the regions around 700 and 1,300 Hz.

Such complex waveforms can be analysed and displayed as a SPECTROGRAM (see Fig. 3). Originally this display required a special instrument, a spectrograph, but nowadays it is generally done by computer. The spectrogram consists of a three-dimensional display: frequency is shown on the vertical axis, time on the horizontal axis and the energy at any frequency level either by the density of blackness in a black and white display, or by colours in a colour display. Thus the concentrations of energy at particular frequency bands (the formants) stand out very clearly. Fig. 3 shows, in the spectrogram of *Manchester music shops*, the extent to which utterances are not neatly segmented into a succession of sounds but, on the contrary, there is considerable overlap. Such spectrographic analysis provides a great deal of acoustic information in a convenient form.

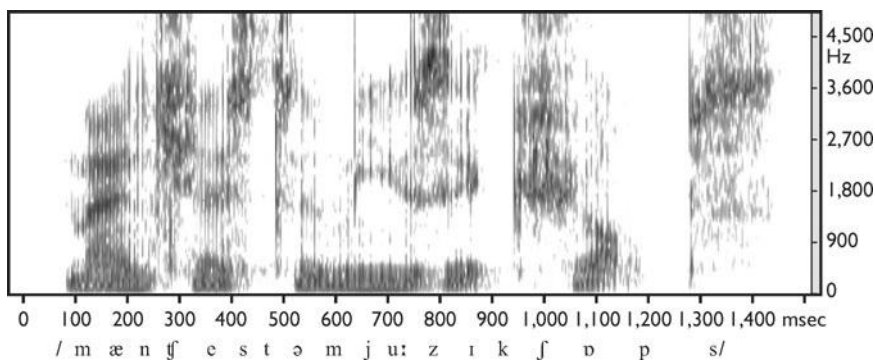


Figure 3 Spectrogram of the phrase *Manchester music shops* as said by a male speaker of GB.

Much of the information given on a spectrogram is, in fact, irrelevant to our understanding of speech and we need to establish which elements of the spectrum are essential to speech communication. For instance, two, or at most three, formants appear to be sufficient for the correct identification of vowels. As far as the English vowels are concerned, the first three formants are all included in the frequency range 0–4,000 Hz, so that the spectrum above 4,000 Hz would appear to be largely irrelevant to the recognition of our vowels. In both older (analogue) telephone systems with a frequency range of approximately 300–3,000 Hz and in newer (digital) systems with a range up to around 4,000 Hz, we have little difficulty in identifying the sound patterns of speakers and even in recognising individual voice qualities. Indeed, when we are dealing with a complete utterance in a given context, where there is a multiplicity of cues to help our understanding, a high degree of intelligibility may be retained even when there are no frequencies above 1,500 Hz.

As one would suspect, there appear to be certain relationships between the formants of vowels and the cavities of the vocal tract (i.e. the shapes taken on by the resonators, notably the relation of the oral and pharyngeal cavities). Thus, the first formant appears to be low when the tongue is high in the mouth: e.g. [iː] and [uː] have high tongue positions and have first formants for both men and women around 280–330 Hz, whereas [ɑː] and [ɒ] have their first formants in the region 600–800 Hz, their tongue positions being relatively low. On the other hand, the second formant seems to be inversely related to the length of the front cavity: thus [iː], where the tongue is raised high in the front of the mouth, has a second formant around 2,200–2,700 Hz, whereas [uː], where the tongue is raised at the back of the mouth (and lips are rounded), has a relatively low second formant around 1,200–1,400 Hz. (For averages for the first and second formants of all GB vowels for male and female speakers see Table 3 and Figs 10 and 11 in Chapter 8.)

It is also confirmed from spectrographic analysis that a diphthong, such as that in *my*, is indeed a glide between two vowel elements (reflecting a perceptible articulatory movement), since the formants bend from those positions typical of one vowel to those characteristic of another (see Table 4 and Fig. 9 in Chapter 8).

For many consonant articulations (e.g. the initial sounds in *pin*, *tin*, *kin*, *thin*, *fin*, *sin*, *shin*, in which the glottal vibrations play no part) there is an essential noise component, deriving from an obstruction or constriction within the mouth, approximately within the range 2,000–8,000 Hz (see Chapter 9, Fig. 32). This noise component is also present in the corresponding articulations in which vocal fold excitation is present, as in the final sounds of *ruse* and *rouge*, where we are dealing with sounds which consist of a combination of glottal tone and noise. Detailed acoustic data concerning vowel and consonant articulations in GB is given in Chapters 8 and 9.

Spectrographic analysis also reveals the way in which there tends, on the acoustic level, to be a merging of features of units which, linguistically, we treat separately. Thus, our discrimination of [f] and [θ] sounds depends only partly

on the frequency and duration of the noise component but also upon a characteristic bending of the formants of the adjacent vowel. Indeed, in the case of such consonants as [p,t,k], which involve a complete obstruction of the airstream and whose release is characterised acoustically by only a very brief burst of noise, the TRANSITION between the noise of the consonant and the formant structure of the vowel appears to be of prime importance for our recognition of the consonant (see §9.2.2(3) and Fig. 32).

3.2.1 Fundamental frequency: pitch

Our perception of the pitch of a speech sound depends directly upon the frequency of vibration of the vocal cords. Thus, we are normally conscious of the pitch caused by the 'voiced' sounds, especially vowels; pitch judgements made on voiceless or whispered sounds, without the glottal tone, are limited in comparison with those made on voiced sounds, but may be induced by producing friction in the larynx or pharynx and varying the shape of the resonating cavities in the usual way.

The higher the glottal fundamental frequency, the higher our impression of pitch. A male voice may have an average pitch level of about 120 Hz and a female voice a level in the region of 220 Hz.[1] The pitch level of voices, however, will vary a great deal between individuals and also within the speech of one speaker, the total range of one male speaking voice being liable to have a range of anything between 80 and 350 Hz. Following adolescence men's voices become lower until the forties after which they rise continuously into old age; women's voices generally become lower up to the time of the menopause, remain much the same for twenty years or so and then possibly rise slightly.[2] Yet our perception of frequency extends further than the limits of glottal fundamental frequency, since our recognition of quality depends upon frequencies of a much higher order. In fact, the human ear perceives frequencies from as low as 16 Hz to about 20,000 Hz and in some cases even higher. As one becomes older, this upper limit may fall considerably, so that at the age of 50 it may extend no higher than about 10,000 Hz. As we have seen, such a reduced range is no impediment to perfect understanding of speech, since a high percentage of acoustic cues for speech recognition fall within the range 0–4,000 Hz.

Our perception of pitch is not, however, solely dependent upon fundamental frequency. Variations of intensity on the same frequency may induce impressions of a change of pitch; and conversely, tones of very high or very low frequency, if they are to be audible at all, require greater intensity than those in a middle range of frequencies.[3]

Instrumental measurement of fundamental frequency based on signals received through a microphone employs two general methods. The first is to count the number of times that a particular pattern is repeated within a selected segment of a waveform such as that provided on an oscillogram. The second is to track the progress of the fundamental frequency on a spectral display like that provided

on a spectrogram, or, alternatively, to track the progress of a particular harmonic and divide by the relevant number. Nowadays various computer programs are available[4] which average the results from a range of measurements based on the two general methods noted above. But even with such sophisticated programs there are still likely to be occasional mistakes like octave jumps (each doubling in Hz representing an octave).

A third method of fundamental frequency extraction involves direct measurement of the vibration of the vocal cords either by glottal illumination or by electroglottography. One well-known technique in the latter class involves using a LARYNGOGRAPH.[5] With this technique electrodes are attached to the outside of the throat and the varying electrical impedance is monitored and projected onto a visual display. The signal generated by the variation in impedance can also be stored, enabling this technique to be used outside the laboratory.

Measures of fundamental frequency do not always correspond to our auditory perception of pitch. Besides the dependence on intensity mentioned above, different segments affect the fundamental frequency in different ways: for example, other things being equal, an [i] will have a higher fundamental frequency than an [a], and a [p] will produce a higher frequency on a following vowel than a [b]. Such (slight) changes in frequency will generally be undetectable by the ear. As in many other cases of instrumental measurement, we still have to use our auditory perception to interpret what instruments tell us.

3.2.2 *Intensity: loudness*

Our sensation of the relative loudness of sounds may depend on several factors, e.g. a sound or syllable may appear to stand out from its neighbours—be 'louder' —because a marked pitch change is associated with it or because it is longer than its neighbours. It is better to use a term such as PROMINENCE to cover these general listener impressions of variations in the perceptibility of sounds. More strictly, what is 'loudness' at the receiving end should be related to INTENSITY at the production stage, which in turn is related to the size or AMPLITUDE of the vibration. An increase in amplitude of vibration, with its resultant impression of greater loudness, is brought about by an increase in air pressure from the lungs. As we shall see (§10.2), this greater intensity is not in itself usually the most important factor in rendering a sound prominent in English. Moreover, all other things being equal, some sounds appear by their nature to be more prominent or sonorous than others, e.g. the vowel in *barn* has more carrying power than that in *bean* and vowels generally are more powerful than consonants.

The judgements we make concerning loudness are not as fine as those made for either quality or pitch. We may judge which of two sounds is the louder, but we find it difficult to express the extent of the difference. Indeed we generally perceive and interpret only gross differences of overall loudness, despite the fact that we recognise different vowels by reacting to characteristic regions of intensity in the spectrum.

3.2.3 Duration: length

In addition to affording different auditory impressions of quality, pitch and loudness, sounds may appear to a listener to be of different length. Clearly, whenever it is possible to establish the boundaries of sounds or syllables, it will be possible to measure their duration on traces provided by oscillograms or spectrograms. Such delimitation of units, in both the articulatory and acoustic sense, may be difficult, as we shall see when we deal with the segmentation of the utterance. But, even when it can be done, variations of duration in acoustic terms may not correspond to our linguistic judgements of length. We shall, for instance, refer later to the 'long' vowels of English such as those of *bean* and *barn*, as compared with the 'short' vowel in *bin*. But, in making such statements, we shall not be referring to absolute duration values, since the duration of all vowels will vary considerably from utterance to utterance, according to factors like whether the utterance is spoken rapidly or slowly, whether the syllable containing the vowel is accented or not and whether the vowel is followed by a voiced or voiceless consonant. In the English system, however, we know that no more than two degrees of length are ever linguistically significant and all absolute durations will be interpreted in terms of this relationship. This distinction between measurable duration and linguistic length provides another example of the way in which our linguistic sense interprets from the acoustic material only that which is significant.

The sounds comprising any utterance will have varying durations and we will have the impression that some syllables are longer than others. Such variations of length within the utterance constitute one manifestation of the rhythmic delivery which is characteristic of English and so is fundamentally different from the flow of other languages, such as French, where syllables tend to be of much more even length.

As already mentioned, the absolute duration of sounds or syllables will depend, among other things, upon the speed of utterance. An average rate of delivery might contain anything from about 6 to 20 sounds per second, but lower and much higher speeds are frequently used without loss of intelligibility. The time required for the recognition of a sound will depend upon the nature of the sound and its pitch, vowels and consonants differing considerably in this respect, but it seems that a vowel lasting only about 4 msecs may have a good chance of being recognised.

3.2.4 'Stress'

We have purposely avoided the use of the word 'stress' in this chapter because this word has been used in different and ambiguous ways in phonetics and linguistics. It has sometimes been used as simply equivalent to loudness, sometimes as meaning 'made prominent by means other than pitch' (i.e. by loudness or length) and sometimes as referring just to syllables in words in the lexicon

and meaning something like 'having the potential for accent on utterances'. Throughout this book we will avoid use of the term 'stress' altogether, using prominence as the general term referring to segments or syllables, SONORITY as the particular term referring to the carrying power of individual sounds and ACCENT as referring to those syllables which stand out above others, either in individual words or in longer utterances.

3.3 Hearing

Our hearing mechanism must be thought of in two ways: the physiological mechanism which reacts to the acoustic stimuli—the varying pressures in the air which constitute sound; and the psychological activity which, at the level of the brain, selects from the gross acoustic information that which is relevant in terms of the linguistic system involved. In this way, measurably different acoustic stimuli may be interpreted as being the 'same' sound unit. As we have seen, only part of the total acoustic information seems to be necessary for the perception of particular sound values. One of the tasks which confront the phonetician is the disentanglement of these relevant features from the mass of acoustic material that modern methods of sound analysis make available. The most fruitful technique for discovering the significant acoustic cues is that of SPEECH SYNTHESIS, controlled by listeners' judgements. After all, the sounds [ɑː] and [s] are [ɑː] and [s] only if listeners recognise them as such. Thus, it has been established that only two formants are necessary for the recognition of vowels, because machines which generate sound of the appropriate frequency bands and intensity produce vowels which are correctly identified by listeners.

Listeners without any phonetic training can, therefore, frequently give valuable guidance by their judgements of synthetic qualities. But it is important to be aware of the limitations of such listeners, so as to be able to make a proper evaluation of their judgements. A listener's reactions are normally conditioned by his experience of handling his own language. Thus, if there are only five significant vowel units in his language, he is liable to allow a great deal more latitude in his assessment of what is the 'same' vowel sound than if he has twenty. An Englishman, for instance, having a complex vowel system and being accustomed to distinguishing such subtle distinctions as those in *sit*, *set*, *sat*, will be fairly precise in his judgement of vowel qualities. A Spaniard, however, whose vowel system is made up of fewer significant units, is likely for this reason to be more tolerant of variation of quality. Or again, if a listener is presented with a system of synthetic vowels which is numerically the same as his own, he is able to make allowance for considerable variations of quality between his and the synthetic system and still identify the vowels correctly—by their 'place' in a system rather than by their precise quality; this is partly what he does when he listens to and understands his language as used by a speaker of a different dialect.

Our hearing mechanism also plays an important part in monitoring our own speech; it places a control upon our speech production which is complementary

to our motor, articulatory, habits. If this feedback control is disturbed, e.g. by the imposition of an artificial delay upon our reception of our own speech, disturbance in the production of our utterance is likely to result. Those who are born deaf or who become deaf before the acquisition of speech habits are rarely able to learn normal speech completely; similarly, a severe hearing loss later in life is likely to lead eventually to a deterioration of speech, although not down to the same level as those born deaf.

Notes

1 Fant (1956).
2 Hollien & Shipp (1972); Russell *et al.* (1995).
3 Denes & Pinson (1993: 101ff).
4 For example, *Praat* (Boersma & Weenink, 2011).
5 Abberton & Fourcin (1984).

Chapter 4

The description and classification of speech sounds

4.1 Phonetic description

We have considered briefly both the mechanism which produces speech sounds and also some of the acoustic and auditory characteristics of the sounds themselves. We have seen that a speech sound has at least three stages available for investigations—the production, transmission and reception stages. The most convenient and brief descriptive classification of speech sounds relies either on articulatory criteria or on auditory judgements, or on a combination of both. Those sounds which are commonly known as consonants are most easily described mainly in terms of their articulation, whereas the description of vowels depends more on auditory impressions.

4.2 Vowel and consonant

Two types of meaning are associated with the terms VOWEL and CONSONANT. In one type of definition consonants are those segments which, in a particular language, occur at the edges of syllables, while vowels are those which occur at the centre of syllables. So, in *red*, *wed*, *dead*, *lead*, *said*, the sounds represented by <r,w,d,l,s> are consonants, while in *beat*, *bit*, *bet*, *but*, *bought*, the sounds represented by <ea,i,e,u,ou> are vowels. This reference to the functioning of sounds in syllables in a particular language is a phonological definition. But once any attempt is made to define what sorts of sounds generally occur in these different syllable-positions, then we are moving to a phonetic definition. This type of definition might define vowels as median (air must escape over the middle of the tongue, thus excluding the lateral [l]), oral (air must escape through the mouth, thus excluding nasals like [n]), frictionless (thus excluding fricatives like [s]), and continuant (thus excluding plosives like [p]); all sounds excluded from this definition would be consonants. But difficulties arise in English with this definition (and with others of this sort) because English /j,w,r/, which are consonants phonologically (functioning at the edges of syllables), are vowels phonetically. Because of this these sounds are often called semi-vowels. The reverse type of difficulty is encountered in words like *sudden* and *little* where

the final consonants /n/ and /l/ form syllables on their own and hence must be the centre of such syllables even though they are phonetically consonants, and even though /n/ and /l/ more frequently occur at the edges of syllables, as in *net* and *let*. When occurring in words like *sudden* and *little*, nasals and laterals are called syllabic consonants.

In this chapter we will be describing and classifying speech sounds phonetically (in the next chapter we return to the phonological definitions). We shall find that consonants can be voiced or voiceless and are most easily described wholly in articulatory terms, since we can generally feel the contacts and movements involved. Vowels, on the other hand, are voiced and, depending as they do on subtle adjustments of the body of the tongue, are more easily described in terms of auditory relationships.

4.3 Consonants

For consonantal articulations, a description must provide answers to the following questions:

(1) Is the airstream set in motion by the lungs or by some other means? (pulmonic or non-pulmonic)
(2) Is the airstream forced outwards or sucked inwards? (egressive or ingressive)
(3) Do the vocal cords vibrate or not? (voiced or voiceless)
(4) Is the soft palate raised, directing the airstream wholly through the mouth, or lowered, allowing the passage of air through the nose? (oral, or nasal or nasalised)
(5) At what point or points and between what organs does closure or narrowing take place? (place of articulation)
(6) What is the type of closure or narrowing at the point of articulation? (manner of articulation)

In the case of the sound [z], occurring medially in the word *easy*, the following answers would be given:

(1) pulmonic
(2) egressive
(3) voiced
(4) oral
(5) tongue blade–alveolar ridge
(6) fricative.

These answers provide a reasonably full but concise phonetic label for the sound; a more detailed description would include additional information concerning, for instance, the shape of the remainder of the tongue, the relative position of the jaws and the lip position.

4.3.1 Egressive pulmonic consonants

Most speech sounds are made with egressive lung air. Virtually all English sounds are so made, the exception being [p,t,k], which in some dialects sometimes become ejectives (see §4.3.9).

4.3.2 Voicing

At any place of articulation, a consonantal articulation may involve the vibration of the vocal cords, i.e. may be voiceless or voiced.

4.3.3 Place of articulation

The chief points of articulation are the following (reference is made to the videos on the companion website where the articulations can be seen in spoken phrases):[1]

BILABIAL—The two lips are the primary articulators, e.g. [p,b,m]. **(See videos 1.12, 5.18, 6.0, 6.14, 14.6.)**

LABIODENTAL—The lower lip articulates with the upper teeth, e.g. [f,v]. **(See videos 3.13, 4.14, 10.14, 13.14.)**

DENTAL—The tongue tip and rims articulate with the upper teeth, e.g. [θ,ð], as in *think* and *then*. **(See videos 6.24, 10.21, 12.16.)**

ALVEOLAR—Either the blade, or tip and blade, of the tongue articulates with the alveolar ridge, e.g. English [t,d,l,n,s,z]. **(See videos 3.1, 3.15, 3.23, 5.16, 9.25, 11.10.)**

POST-ALVEOLAR—The tip of the tongue articulates with the rear part of the alveolar ridge, e.g. [ɹ] as at the beginning of English *red*. **(See videos 2.4, 4.2.)**

RETROFLEX—The tip of the tongue is curled back to articulate with the part of the hard palate immediately behind the alveolar ridge, e.g. [ɻ] such as is found in South-West British and some American English pronunciations of *red*.

PALATO-ALVEOLAR—Either the blade, or the tip and blade, of the tongue articulates with the alveolar ridge and there is at the same time a raising of the front of the tongue towards the hard palate, e.g. [ʃ,ʒ,ʧ,ʤ] as in English *ship*, *measure*, *beach*, *edge*.[2] **(See videos 1.1, 8.15, 9.1, 11.23.)**

PALATAL—The front of the tongue articulates with the hard palate, e.g. [j] or [ç] as in *queue* [kj̊uː] or [kçuː] or a very advanced type of [k,g] = [c,ɟ], as in French *quitter* or *guide*. **(See videos 5.5, 14.14.)**

VELAR—The back of the tongue articulates with the soft palate, e.g. [k,g,ŋ], the last as in *sing*. **(See videos 4.21, 7.1, 10.4, 11.1, 14.11, 15.22.)**

UVULAR—The back of the tongue articulates with the uvula, e.g. [ʁ] as in French *rouge*.

GLOTTAL—An obstruction, or a narrowing causing friction but not vibration, between the vocal cords, e.g. English [h] as in *ham*.

In the case of some consonantal sounds, there may be a secondary place of articulation in addition to the primary. Thus, in the so-called 'dark' [ɬ], as at the end of *bull* **(see video 1.20)**, in addition to the partial alveolar contact, there is an essential raising of the back of the tongue towards the velum (velarisation); or, again, some post-alveolar articulations of [ɹ] are accompanied by slight lip-rounding (labialisation). The place of PRIMARY ARTICULATION is that of the greatest stricture, that which gives rise to the greatest obstruction to the airflow. The SECONDARY ARTICULATION exhibits a stricture of lesser rank. Where there are two co-extensive strictures of equal rank an example of DOUBLE ARTICULATION results.

4.3.4 Manner of articulation

The obstruction made by the organs may be total, intermittent, partial, or may merely constitute a narrowing sufficient to cause friction. The chief types of articulation, in decreasing degrees of closure, are as follows:

(1) *Complete Closure*

PLOSIVE—A complete closure at some point in the vocal tract, behind which the air pressure builds up and can be released explosively, e.g. [p,b,t,d,k,g,ʔ] as in *pay*, *boot*, *tea*, *down*, *car*, *gate* and in a Cockney pronunciation of *water* as [wɔʊʔə].

AFFRICATE—A complete closure at some point in the mouth, behind which the air pressure builds up but the separation of the organs is slow compared with that of a plosive, so that friction is a characteristic of the second part of the sound, e.g. [ʧ,ʤ] in *cheese*, *joke*.

NASAL—A complete closure at some point in the mouth but, the soft palate being lowered, the air escapes through the nose, e.g. [m,n,ŋ] as in *modern*, *name*, *sing*. These sounds are continuants and, in their (most usual) voiced form, have no noise component; they are, to this extent, vowel-like.

(2) *Intermittent Closure*

TRILL (OR ROLL)—A series of rapid intermittent closures made by a flexible organ on a firmer surface, e.g. [r], where the tongue tip trills against the alveolar ridge as in Spanish *perro*, or [ʀ] where the uvula trills against the back of the tongue, as in a stage pronunciation of French *rouge*.

TAP—A single tap made by a flexible organ on a firmer surface, e.g. [ɾ] where the tongue tip taps once against the teeth ridge, as in many Scottish pronunciations of English /r/.

(3) *Partial Closure*

LATERAL—A partial (but firm) closure is made at some point in the mouth, the airstream being allowed to escape on one or both sides of the contact. These sounds may be continuant and frictionless and therefore vowel-like (i.e. approximants in (5) below), as in [l,ɬ] as pronounced in the south of England *little* [lɪtɬ] or they may be accompanied by a little friction [l̝] as in *fling* or by considerable friction [ɬ] as in *please*.

(4) *Narrowing*
FRICATIVE—Two organs approximate to such an extent that the airstream passes between them with friction, e.g. [ɸ,β,f,v,ʍ,θ,ð,s,z,ʃ,ʒ,ç,x,h]. In the bilabial region, a distinction is to be made between those purely bilabial such as [ɸ,β] where the friction occurs between spread lips, and a labial-velar sound like [ʍ] where the friction occurs between rounded lips and is accompanied by a characteristic modification of the mouth cavity brought about by the raising of the back of the tongue towards the velum. [ç] may occur at the beginning of *huge*, [x] and [ʍ] in Scottish pronunciations of *loch* and *which*, and [β] in Spanish *haber*.

(5) *Narrowing without Friction*
APPROXIMANT (or FRICTIONLESS CONTINUANT)—A narrowing is made in the mouth but the narrowing is not quite sufficient enough to cause friction. In being frictionless and continuant, approximants are vowel-like; however, they function phonologically as consonants, i.e. they appear at the edges of syllables. They also differ phonetically from such sounds functioning as vowels in either of two ways. First, the articulation may not involve the body of the tongue, e.g. post-alveolar [ɹ] and labiodental [ʋ], the former the usual pronunciation in GB at the beginning of *red*, the latter a regional or idiosyncratic pronunciation of the same sound, as well as a regular consonant in some languages, e.g. Hindi. Second, where they do involve the body of the tongue, the articulations represent only brief glides to a following vowel: thus [j] in *yet* is a glide starting from the [i] region and [w] in *wet* is a glide starting from the [u] region.

4.3.5 Obstruents and sonorants

It is sometimes found useful to classify categories of sounds according to their noise component. Those in whose production the constriction impeding the air-flow through the vocal tract is sufficient to cause noise are known as OBSTRUENTS. This category comprises plosives, fricatives and affricates. SONORANTS are those voiced sounds in which there is no noise component i.e. voiced nasals, approximants and vowels.

4.3.6 Fortis and lenis

A voiceless/voiced pair such as English /s,z/ are distinguished not only by the presence or absence of voice but also by the degree of breath and muscular effort involved in their articulation. Those English consonants which are usually voiced tend to be articulated with relatively weak energy (they are LENIS), whereas those which are always voiceless are relatively strong (they are FORTIS). Indeed, we shall see that in certain situations, the so-called voiced consonants may have very little voicing, so that the energy of articulation becomes a significant factor in distinguishing the voiced and voiceless series.

4.3.7 Classification of consonants

The chart of the International Phonetic Alphabet (IPA)[3] (see Table 1) shows manner of articulation on the vertical axis; place of articulation on the horizontal axis; and a pairing within each box thus created shows voiceless consonants on the left and voiced consonants on the right.

4.3.8 Ingressive pulmonic consonants

Consonants of this type, made as we are breathing in, sometimes occur in languages as variants of their egressive pulmonic equivalents. We may use such sounds when we are out of breath, but have not got time to pause, either because the need for communication is pressing, or because we do not wish someone else to have a chance to speak. The use of such an ingressive pulmonic airstream is, however, variable between languages and is not especially common in English. Individual sounds made on an ingressive pulmonic airstream may occur as speech defects.[4] Some sounds may also occur extralinguistically, so in English a common way of expressing surprise or pain involves the energetic inspiration of air accompanied by bilabial or labiodental friction.

4.3.9 Egressive glottalic consonants

In the production of these sounds, known as EJECTIVES, the glottis is closed, so that lung air is contained beneath it. A closure or narrowing is made at some point above the glottis (the soft palate being raised) and the air between this point and the glottis is compressed by a general muscular constriction of the chamber and a raising of the larynx. Thus plosive ejectives [p',t',k'] may be made by compressing the air in this way. But it is not only plosives which may be ejective; affricates and fricatives have this type of compression in a number of languages, e.g. [ts',tl',s',x']. Since the glottis is tightly closed, it follows that this type of articulation applies only to voiceless sounds.

[p',t',k'] occur sometimes in final positions in some dialects of English (e.g. in south-east Lancashire, where *stop* may be [stɒp']). This is not to be confused with other variants of final [p,t,k], which may be reinforced or replaced by a glottal stop, e.g. *stop* [stɒʔp] as in GB, or [stɒʔ] as in popular London speech.

4.3.10 Ingressive glottalic consonants

For these sounds a complete closure is made in the mouth but, instead of air pressure from the lungs being compressed behind the closure as in §4.3.9, the almost completely closed larynx is lowered so that the air in the mouth and pharyngeal cavities is rarefied. The result is that outside air is sucked in once the mouth closure is released; at the same time, there is sufficient leakage of lung air through the glottis to produce voice. It will be seen that the resulting sound is made by means of a combined airstream mechanism, namely an egressive

Table 1 The International Phonetic Alphabet.

THE INTERNATIONAL PHONETIC ALPHABET (revised to 2005)

CONSONANTS (PULMONIC) © 2005 IPA

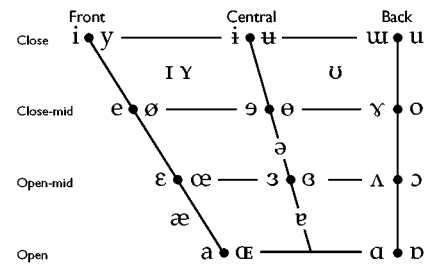
	Bilabial	Labiodental	Dental	Alveolar	Postalveolar	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	p b			t d		ʈ ɖ	c ɟ	k g	q ɢ		ʔ
Nasal	m	ɱ		n		ɳ	ɲ	ŋ	ɴ		
Trill	ʙ			r					ʀ		
Tap or Flap		ⱱ		ɾ		ɽ					
Fricative	ɸ β	f v	θ ð	s z	ʃ ʒ	ʂ ʐ	ç ʝ	x ɣ	χ ʁ	ħ ʕ	h ɦ
Lateral fricative				ɬ ɮ							
Approximant		ʋ		ɹ		ɻ	j	ɰ			
Lateral approximant				l		ɭ	ʎ	ʟ			

Where symbols appear in pairs, the one to the right represents a voiced consonant. Shaded areas denote articulations judged impossible.

CONSONANTS (NON-PULMONIC)

Clicks		Voiced implosives		Ejectives	
ʘ	Bilabial	ɓ	Bilabial	’	Examples:
|	Dental	ɗ	Dental/alveolar	pʼ	Bilabial
!	(Post)alveolar	ʄ	Palatal	tʼ	Dental/alveolar
ǂ	Palatoalveolar	ɠ	Velar	kʼ	Velar
‖	Alveolar lateral	ʛ	Uvular	sʼ	Alveolar fricative

VOWELS



Where symbols appear in pairs, the one to the right represents a rounded vowel.

OTHER SYMBOLS

ʍ	Voiceless labial-velar fricative	ɕ ʑ	Alveolo-palatal fricatives
w	Voiced labial-velar approximant	ɺ	Voiced alveolar lateral flap
ɥ	Voiced labial-palatal approximant	ʢ	Simultaneous ʃ and x
ʜ	Voiceless epiglottal fricative		
ʡ	Voiced epiglottal fricative		
ʔ	Epiglottal plosive		

Affricates and double articulations can be represented by two symbols joined by a tie bar if necessary. k͡p t͡s

SUPRASEGMENTALS

ˈ	Primary stress	
ˌ	Secondary stress	ˌfoʊnəˈtɪʃən
ː	Long	eː
ˑ	Half-long	eˑ
˘	Extra-short	ĕ
|	Minor (foot) group	
‖	Major (intonation) group	
.	Syllable break	ɹi.ækt
‿	Linking (absence of a break)	

TONES AND WORD ACCENTS

LEVEL			CONTOUR	
é͡ or ˥	Extra high		ě or ˧˥	Rising
é ˦	High		ê ˥˩	Falling
ē ˧	Mid		ě ˦˥	High rising
è ˨	Low		ě ˩˧	Low rising
ȅ ˩	Extra low		ȅ ˥˩˧	Rising-falling
↓	Downstep		↗	Global rise
↑	Upstep		↘	Global fall

DIACRITICS Diacritics may be placed above a symbol with a descender, e.g. ŋ̊

◌̥	Voiceless	n̥ d̥	◌̤	Breathy voiced	b̤ a̤	◌̪	Dental	t̪ d̪
◌̬	Voiced	s̬ t̬	◌̰	Creaky voiced	b̰ a̰	◌̺	Apical	t̺ d̺
◌ʰ	Aspirated	tʰ dʰ	◌̼	Linguolabial	t̼ d̼	◌̻	Laminal	t̻ d̻
◌̹	More rounded	ɔ̹	◌ʷ	Labialized	tʷ dʷ	◌̃	Nasalized	ẽ
◌̜	Less rounded	ɔ̜	◌ʲ	Palatalized	tʲ dʲ	◌ⁿ	Nasal release	dⁿ
◌̟	Advanced	u̟	◌ˠ	Velarized	tˠ dˠ	◌ˡ	Lateral release	dˡ
◌̠	Retracted	e̠	◌ˤ	Pharyngealized	tˤ dˤ	◌̚	No audible release	d̚
◌̈	Centralized	ë	~	Velarized or pharyngealized	ɫ			
◌̽	Mid-centralized	e̽	◌̝	Raised	e̝	(ɹ̝ = voiced alveolar fricative)		
◌̩	Syllabic	n̩	◌̞	Lowered	e̞	(β̞ = voiced bilabial approximant)		
◌̯	Non-syllabic	e̯	◌̘	Advanced Tongue Root	e̘			
◌˞	Rhoticity	ə˞ a˞	◌̙	Retracted Tongue Root	e̙			

pulmonic airstream in combination with ingressive glottalic air. Such ingressive stops (generally voiced) are known as IMPLOSIVES and occur as bilabial [ɓ], dental or alveolar [ɗ], or velar [ɠ]. Though such sounds occur in a number of languages, they are not usually found in English, although they are sometimes heard in the speech of the deaf and in types of stammering. Much more rarely voiceless implosives may occur in some languages, which means that in these cases the larynx must be completely closed and the ingressive glottalic airstream occurs on its own without the egressive pulmonic one.

4.3.11 Ingressive velaric consonants

Another set of sounds involving an ingressive airstream is produced entirely by means of closures within the mouth cavity; normal breathing through the nose may continue quite independently if the soft palate is lowered and may even produce accompanying nasalisation. Thus, the sound made to indicate irritation or sympathy (often written as 'tut-tut') is articulated by means of a double closure, the back of the tongue against the velum and the tip, blade and sides against the teeth and teeth ridge. The cavity contained within these closures is then enlarged mainly by tongue movement, so that the air is rarefied. The release of the forward closure causes the outer air to be sucked in; the release may be crisp in which case a sound of a plosive type is heard, or relatively slow, in which case an affricated sound is produced. These sounds are known as CLICKS, the one referred to above ('tut-tut') being a dental click [ǀ]. The sound made to encourage horses is a lateral click, i.e. the air is sucked in by releasing one side of the tongue [ǁ]. These clicks and several others occur as significant sounds in a small number of languages in Africa (e.g. Zulu) and paralinguistically in most languages (as in English).

4.4 Vowels

Vowels are normally made with a voiced egressive airstream, without any closure or narrowing such as would result in the noise component characteristic of many consonantal sounds; moreover, the escape of the air is characteristically accomplished in an unimpeded way over the middle line of the tongue. We are now concerned with a glottal tone modified by the action of the upper resonators of the mouth, pharyngeal and nasal cavities. As we have seen (Chapters 2 and 3), the movable organs mainly responsible for shaping these resonators are the soft palate, lips and tongue. A description of vowel-like sounds must, therefore, note:

(1) The position of the soft palate—raised for oral vowels, lowered for nasalised vowels.
(2) The kind of aperture formed by the lips—neutral, spread, close-rounded, or open-rounded.
(3) The part of tongue which is raised and the degree of raising.

Of these three factors, only the second—the lip position—can be easily described by visual or tactile means. Our judgement of the action of the soft palate depends less on our feeling for its position than on our perception of the presence or absence of nasality in the sound produced. The movements of the tongue, which so largely determine the shape of the mouth and pharyngeal cavities, may be so minute that it is impossible to assess them by any simple means; moreover, there being normally no contact of the tongue with the roof of the mouth, no help is given by any tactile sensation. A vowel description will usually, therefore, be based mainly on auditory judgements of sound relationships, together with some articulatory information, especially as regards the position of the lips. In addition, an acoustic description can be given in terms of the disposition of the characteristic formants of the sound (see §3.1).

4.4.1 Difficulties of description

The verbal description of vowel sounds has always presented considerable difficulty. Certain positions and gross movements of the tongue can be felt. We are, for instance, aware that when we pronounce most vowel sounds the tongue tip lies behind the lower teeth; moreover, in comparing two such vowels as /iː/ (*key*) **(see videos 3.6, 11.1)** and /ɑː/ (*car*) **(see videos 10.18, 12.7)** (Fig. 4), we can feel that, in the case of the former, the front of the tongue is the part which is mainly raised, whereas, in the case of the latter, such raising as there is is accomplished by the back part of the tongue. Therefore, it can be stated in articulatory terms that some vowel sounds require the raising of the front of the tongue, while others are articulated with a typical 'hump' at the back; and these statements have been confirmed by means of X-ray photography and by MRI scans. But the actual point and degree of raising is more difficult to judge. It is not, for instance, helpful to say that a certain vowel is articulated with the front part of the tongue raised to within 5 mm of the hard palate. Moreover this may be a statement of fact for one person's pronunciation, but an identical sound may be produced by another speaker with a different relationship between the tongue and palate. It is no more helpful to relate the vowel quality to a value used in

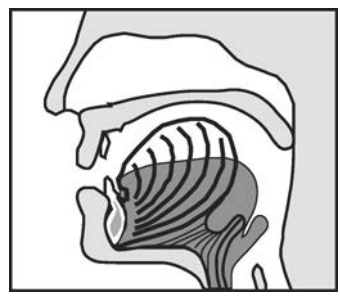


Figure 4 Tongue positions for [iː] and [ɑː].

a particular language, as is still so often done. A statement such as 'a vowel quality similar to that in the English word *cat*' is not very precise, since the vowel in *cat* may have a wide range of values in English. The statement becomes more useful if the accent of English is specified, but even then a number of variant interpretations will always be possible.

4.4.2 Cardinal Vowels

It is clear that a finer and more independent system of description is needed, on both the auditory and articulatory levels. The most satisfactory scheme is that devised by Daniel Jones and known as the CARDINAL VOWEL system. The basis of the system is physiological, i.e. the two qualities, upon which all the others were 'hinged', were produced with the tongue in certain easily felt positions: the front of the tongue raised as close as possible to the palate without friction being produced, for the Cardinal Vowel [i]; and the whole of the tongue as low as possible in the mouth, with very slight raising at the extreme back, for the Cardinal Vowel [ɑ]. Starting from the [i] position, the front of the tongue was lowered gradually, the lips remaining spread or neutrally open and the soft palate raised. The lowering of the tongue was halted at three points at which the vowel qualities seemed, from an auditory standpoint, to be equidistant. The tongue positions of these qualities were X-rayed and were indeed found to be fairly equidistant from a spatial point of view. The symbols [e,ɛ,a] were assigned to these vowel values. The same procedure was applied to vowel qualities depending on the height of the back of the tongue: thus the back of the tongue was raised in stages from the [ɑ] position and with the soft palate again raised; additionally the lips were changed progressively from a wide open shape for [ɑ] to a closely rounded one for [u] (reflecting the most usual lip positions for these tongue positions in the world's languages). As with the front of the tongue, three auditorily equidistant points were established from the lowest to the highest position; the corresponding tongue positions were photographed and the spatial relationships again confirmed. These values were given the symbols [ɔ,o,u]. Thus, a scale of eight primary Cardinal Vowels was set up, denoted by the following numbers and symbols: 1, [i]; 2, [e]; 3, [ɛ]; 4, [a]; 5, [ɑ]; 6, [ɔ]; 7, [o]; 8, [u].

The front series [i,e,ɛ,a] and [ɑ] of the back series are pronounced with spread or open lips, whereas the remaining three members of the back series have varying degrees of lip-rounding. These combinations of tongue and lip positions in the primary Cardinal Vowels are the most frequent in languages, i.e. front and open vowels are most commonly unrounded while back vowels other than in the open position are most commonly rounded. A secondary series can be obtained by reversing the lip positions, e.g. lip-rounding applied to the [i] tongue position, or lip-spreading applied to the [u] position. Such a secondary series is denoted by the following numbers and symbols: 9, [y]; 10, [ø]; 11, [œ]; 12, [ɶ]; 13, [ɒ]; 14, [ʌ]; 15, [ɤ]; 16, [ɯ].

This complete series of sixteen Cardinal Vowel values may be divided into two lip shape categories, with corresponding tongue positions:

Unrounded—[i,e,ɛ,a,ɑ,ʌ,ɤ,ɯ].
Rounded—[y,ø,œ,æ,ɒ,ɔ,o,u].

Such a scale is useful because (a) the vowel qualities are unrelated to particular values in languages, though many may occur in various languages and (b) the set is recorded, so that reference may always be made to a standard, invariable scale.[5] Thus a vowel quality can be described as being, for instance, similar to that of Cardinal 2 ([e]), or another as being a type halfway between Cardinal 6 ([ɔ]) and Cardinal 7 ([o]), but somewhat centralised. Diacritics are available in the IPA alphabet to show modifications of Cardinal values: subscript diacritics indicate more open, e.g. [o̞], and more close, e.g. [o̝], while a pair of dots over a symbol, e.g. [ɔ̈], indicates centralisation. The vowel quality mentioned above, that between C.[ɔ] and C.[o] and centralised, can in this way be symbolised as [ö̝] or [ö̞].

It is, moreover, possible to give a visual representation of these vowel relationships on a chart which is based on the Cardinal Vowel tongue positions. The simplified diagram shown in Fig. 5 is obtained by plotting the highest point of tongue raising for each of the primary Cardinal Vowels and joining the points together. The internal triangle, corresponding to the region of central or [ə]-type vowel sounds, is made by dividing the top line into three approximately equal sections and drawing lines parallel to the two sides, so that they meet near the base of the figure. On such a figure, the sound symbolised by [ö̝] or [ö̞] may have its relationship to the Cardinal scale shown visually (see the black circle on Fig. 5).

It must be understood that this diagram is a highly conventionalised one which shows, above all, quality relationships. Some attempt is, however, made to relate the shape of the figure to actual tongue positions: thus, the range of movement

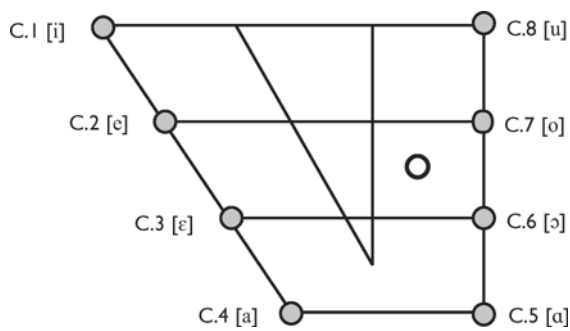


Figure 5 The primary Cardinal Vowels; the area symbolised by [ö̝] or by [ö̞] shown by a circle.

is greater at the top of the figure and the tongue raising of front vowels becomes more retracted as the tongue position lowers. Nevertheless, it has been shown that it is possible to articulate vowel qualities without the exact tongue and lip positions which this diagram seems to postulate as necessary. It is, for instance, possible to produce a sound of the Cardinal 7 ([o]) type without the lip–tongue relationship suggested. But, on the whole, it may be assumed that a certain auditorily identified vowel quality will be produced by an articulation of the kind suggested by the Cardinal Vowel diagram. Moreover, it is a remarkable fact that the auditory judgements as to vowel relationships made by Daniel Jones have been largely supported by acoustic analysis; in fact, charts based on acoustic analyses of GB vowels correspond very well with the traditional Cardinal Vowel figure (see Figs 10 and 11 in Chapter 8).

4.4.3 Nasality

Besides the information concerning lip and tongue positions which the above chart and symbolisation denote, a vowel description must also indicate whether the vowel is purely oral or whether it is nasalised. The sixteen Cardinal Vowels mentioned may all be transformed into their nasalised counterparts if the soft palate is lowered. It is unusual, however, to find such an extensive series of nasalised vowels, since it is unusual (though not unknown) for languages to make such fine, significant distinctions of nasalised qualities as are common in the case of the purely oral values.

4.4.4 Relatively pure vowels vs gliding vowels

It is clearly not possible for the quality of a vowel to remain absolutely constant (or, in other words, for the organs of speech to function for any length of time in an unchanging way). Nevertheless, we may distinguish between those vowels which are relatively pure (or unchanging), such as the vowel in *learn*, and those which have a considerable and deliberate glide, such as the gliding vowel in *line*. The so-called pure vowels are marked on a diagram as a dot, showing the highest point of the tongue, or, better, as a ring, since it is inadvisable to attempt to be over-precise in the matter of these auditory judgements; a gliding vowel sound (or DIPHTHONG) is shown as an arrow, which indicates the quality of the starting-point and the direction in which the quality change is made (corresponding to a movement of the tongue). Fig. 6 shows the way in which the vowels of *learn* **(see video 7.7)** and *line* **(see videos 4.4, 8.3ff)** will be marked.

We can now give a practical and comprehensive description of any vowel sound, partly in articulatory terms, partly in auditory terms. The vowel which we have symbolised in Fig. 5 as [ɚ̟] or [ɚ̠] might be described in this way: 'A vowel quality between Cardinal Vowels 6 and 7, but somewhat centralised'. Such a written description will have a meaning in terms of sound for anyone who is familiar with the Cardinal Vowel scale. The position of the lips and the soft

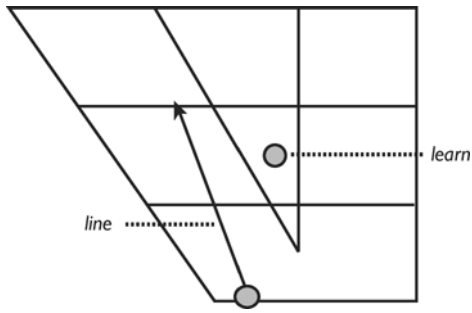


Figure 6 The vowels of *learn* and *line*.

palate is subsumed in this description. There may, of course, be other features of the sound which may be worth mentioning in a full phonetic description, e.g. a breathy or creaky voice quality.

4.4.5 Articulatory classification of vowels

Although precise descriptions of vowels are better done auditorily, nevertheless it is convenient to have available a rough scheme of articulatory classification. Such a scheme is represented by the vowel diagram on the chart of the International Phonetic Alphabet (IPA) as shown in Table 1. It will be noticed that this is of similar shape to the Cardinal Vowel diagram although a single line is used centrally rather than a triangle. Labels are provided to distinguish between FRONT, CENTRAL and BACK, and between four degrees of opening: CLOSE, CLOSE-MID, OPEN-MID and OPEN (see Fig. 7). At each intersection point on the periphery of the diagram on the IPA chart (Table 1) two symbols are supplied; these symbols are the same as those used for the Cardinal Vowels. However, on the IPA chart the UNROUNDED vowel is always the first of the pair and the ROUNDED the second;

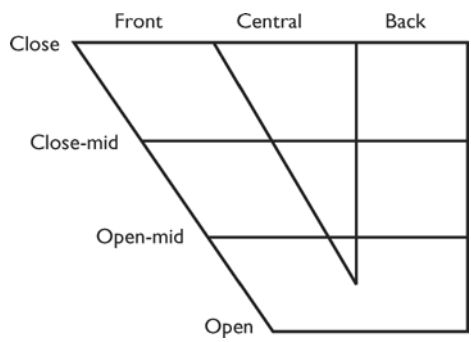


Figure 7 Articulatory labels combined with the Cardinal Vowel diagram.

this means that we cannot say that the first corresponds to the primary cardinal and the second to the secondary cardinal. (It will be remembered that primary cardinals involve the most frequent lip positions, back vowels being more usually rounded). The IPA diagram also supplies us with a number of additional symbols for vowels in certain positions, [ɪ,a,i̞,ə,ɐ] being used for unrounded vowels and [ʉ,ʊ,ɵ] for rounded vowels.

Notes

1 See Cruttenden (2013) for discussion of the use of these videos in teaching.
2 These are called post-alveolar on the chart of the International Phonetic Alphabet (Table 1).
3 Go to http://ipa.group.shef.ac.uk to see and hear recordings of each sound in the International Phonetic Alphabet.
4 See Duckworth *et al.* (1990).
5 Copies of the original recording of the Cardinal Vowels by Daniel Jones are on the companion website.

Chapter 5

Sounds in language

5.1 Speech sounds and linguistic units

We now have a way of classifying the sounds which can be produced by the speech organs. A speech sound produced in isolation can be described in purely phonetic terms; but any purely phonetic approach to the sounds of language encounters difficulties because speech is normally a continuum of sound. Two initial problems concern, first, the identification and delimitation of the sound unit (or segment) to be described and, second, the way in which different sounds are treated, for the purpose of linguistic analysis, as if they were the same.

As we have seen, in any investigation of speech, it is on the physiological and acoustic levels that most information is available to us. But in any articulation, as revealed by MRI, an utterance consists of apparently continuous movements by a very large number of organs; it is almost impossible to say, simply from a video of the speech organs at work, how many speech sounds have been uttered. A display of acoustic information is slightly easier to handle (see Fig. 3), but even here it is not always possible to delimit exactly the beginning and end of sound segments because of the way in which many sounds merge into one another. Moreover, even if we were able to delimit and identify certain sounds, it would not follow that all the individual units would fit into a useful linguistic description of the language being investigated. Thus, the word *tot* is frequently pronounced in the London region in such a way that it is possible to identify five sound segments: [t], [s], [h], [ɒ], [t]. Yet much of this phonetic reality may be discarded as irrelevant when it is a question of the structure of the word *tot* in terms of the sound system of English. Indeed, the speaker himself will probably feel that the utterance *tot* consists of only three 'sounds', such a judgement on his part being a highly sophisticated one which results from his experience in hearing and speaking English (and not only because of influence from the spelling). In other words, the [s] and [h] segments are to be treated as part of the phonological, or linguistic, unit /t/.[1] The phonetic sequence [tsh] does not, in an initial position in this type of English, consist of three meaningful units; in other languages, on the other hand, such a sequence might well constitute three linguistic units as well as three phonetic segments.

This same example illustrates how different sounds may count, in respect of their function in a language, as the same linguistic unit. In such a pronunciation of *tot* as is noted above, the initial /t/ is described as consisting of:

(1) a voiceless closure made by the tongue tip and rims against the alveolar ridge and side teeth with air from the lungs building up compression behind the closure—[t];
(2) a slow release of the closure and the compressed air, so that friction is heard—[s];
(3) an interval before the beginning of the next sound, during which there is friction in the glottis (and voiceless resonance in the supraglottal cavities)—[h].

The second manifestation of /t/, on the other hand, might have an articulation which could be described phonetically as follows:

(1) an alveolar stop made as before, but with a simultaneous stop made in the glottis;
(2) release of the glottal closure but retention of the alveolar closure while the soft palate is lowered and compressed air escapes through the nasal cavity.

The first [t] might be briefly described as a voiceless alveolar plosive, released with affrication and aspiration; the second as an unexploded voiceless alveolar plosive made with a simultaneous glottal stop. These two different articulations function as the same linguistic unit, the first sound occurring in syllable-initial position when accented and the second in syllable-final position (particularly where a pause follows). Such an abstract linguistic unit, which will include sounds of different types, is called a PHONEME; the different phonetic realisations of a phoneme are known as its ALLOPHONES.

5.2 The linguistic hierarchy

Thus speech and language require different types of unit in their analysis. An utterance, on the concrete speech level, will consist of the continuous physiological activity which results in a continuum of sound; the largest unit will, therefore, be the span of sound occurring between two silences. Within this unit of varying extent it may be possible to find smaller segments. It is from the abstract, linguistic level of analysis that we receive guidance as to how the utterance may be usefully segmented in the case of any particular language. We might find, for instance, that an utterance such as 'The boys ran quickly away and were soon out of sight' is spoken without a pause or interruption for breath; on the articulatory level, it consists of one breath-group. But, on the linguistic level, we know that this utterance is capable of being analysed as a sentence consisting of two CLAUSES. Moreover, certain extensive sequences occurring within the utterance might be meaningfully replaced by other sound sequences, e.g. *boys* might be replaced by

dogs, *ran* by *walked*, *quickly* by *slowly*, etc. These replaceable sound sequences are able to stand by themselves and are called WORDS. In written forms of language, it usually happens that words are separated from each other by spaces, this being a sophisticated convention which is not reflected in speech. (Although Chapter 11 shows there may be some phonetic characteristics marking word boundaries.)

Yet there are meaningful units smaller than the word. The word *boys* may be divided into *boy* and *s* ([z]), where the presence or absence of [z] indicates the plural or singular form; *quickly* may be said to consist of *quick* and the adverbial suffix *-ly*. These smaller sound sequences are known as MORPHEMES AND may correspond with words, e.g. *boy*, in which case they may stand alone (= FREE MORPHEME), or they may not normally occur other than in association with a word, e.g. *-ly* (= BOUND MORPHEME). But segmentation can be made at a still lower level. The word *ran* is also a morpheme; but, if instead of saying [ran] we say [rʌn], we have, by changing an element on a lower level than the morpheme, changed the meaning and function of the word. This basic linguistic element, beyond which it is not necessary to go for practical purposes, is what we have already referred to as a PHONEME. A phoneme may, therefore, be thought of as the smallest contrastive linguistic unit which may bring about a change of meaning. Indeed the word 'contrast' is regularly used in linguistics to indicate a change of meaning.

5.3 Phonemes

It is possible to establish the phonemes of a language by means of a process of commutation (= substituting) or the discovery of MINIMAL PAIRS, i.e. pairs of words which are different in respect of only one sound segment. The series of words *pin*, *bin*, *tin*, *din*, *kin*, *chin*, *gin*, *fin*, *thin*, *sin*, *shin*, *win* supplies us with twelve words which are distinguished simply by a change in the first (consonantal) element of the sound sequence. These elements, or phonemes, are said to be in CONTRAST or OPPOSITION; we may symbolise them as /p,b,t,d,k,ʧ,ʤ,f,θ,s,ʃ,w/. But other sound sequences will show other consonantal oppositions, e.g.

(1) *tame*, *dame*, *game*, *lame*, *maim*, *name*, adding /g,l,m,n/ to our inventory;
(2) *pot*, *tot*, *cot*, *lot*, *yacht*, *hot*, *rot*, adding /j,h,r/ (the sound of the letter <y> is phonemically transcribed /j/);
(3) *pie*, *tie*, *buy*, *thigh*, *thy*, *vie*, adding /ð,v/ (here the spelling <th> is transcribed /ð/);
(4) *two*, *do*, *who*, *woo*, *zoo*, adding /z/.

Such comparative procedures reveal twenty-two consonantal phonemes capable of contrastive function initially in a word.

It is not sufficient, however, to consider merely one position in the word. Possibilities of phonemic opposition have to be investigated in medial and final positions as well as in initial position. If this is done in English, we discover in

medial positions another consonantal phoneme, /ʒ/, cf. the word oppositions *letter*, *leather*, *leisure* or *seater*, *seeker*, *Caesar*, *seizure*. This phoneme /ʒ/ is rare in initial and final positions (e.g. in *genre* and *rouge*). Moreover, in final positions, we do not find /h/ or /r/ in most British speech (the letter <r> being silent in words like *car*, *serve*, *hear*) and it is also questionable whether we should consider /w,j/ as separate, final, contrastive units (see §8.2). We do, however, find one more phoneme that is common in medial and final positions but unknown initially, viz. /ŋ/ cf. *simmer*, *sinner*, *singer* or *some*, *son*, *sung*.

Such an analysis of the consonantal phonemes of English gives us a total of twenty-four phonemes, of which four (/h,r,ʒ,ŋ/) are of *restricted occurrence*—or six, if /w,j/ are not admitted finally. Similar procedures can be used to establish the vowel phonemes of English (see Chapter 8).

5.3.1 Diversity of phonemic solutions

It is important to emphasise the fact that it is frequently possible to make several different statements of the phonemic structure of a language, all of which may be equally valid from a logical standpoint. The solution chosen will be the one which is most convenient as regards the use to which the phonemic analysis is to be put. Thus, one solution might be appropriate when it is a question of teaching a language to a particular group of foreign learners, when similarities and differences between two languages may need to be underlined; another solution might be appropriate if it is a question of using the phonemic analysis as a basis for an orthography, when sociolinguistic considerations (for example, relations with other countries having particular orthographic conventions) have to be taken into account. Even without such considerations, discrepancies in analysis frequently arise in the case of such sound combinations as affricates (e.g. [ʧ,ʤ,tr,dr]) and diphthongs (e.g. [eɪ,əʊ,aɪ,aʊ]), which may be treated as single phonemes or combinations of two. Such problems concerning particular English sounds will be dealt with when vowels and consonants are considered in detail.

5.3.2 Distinctive features

Up to now we have obtained an inventory of phonemes for English which is no more than a set of relationships or oppositions. The essence of the phoneme /p/, for instance, is that it is not /t/ or /k/ or /s/, etc. This is a negative definition, which it is desirable to amplify by means of positive information of a phonetic type. Thus, we may say that /p/ is, from a phonetic point of view, characteristically voiceless (compared with voiced /b/); labial (compared with the places of articulation of such sounds as /t/ or /k/); plosive (compared with /f/). The /p/ phoneme may, therefore, be defined positively by stating the combination of DISTINCTIVE FEATURES which identify it within the English phonemic system: voiceless, labial, plosive.

As originally conceived, the distinctive features of a language were stated in articulatory terms using as a basis the phonetic classification of consonants described in the previous chapter. So the distinctive features of English /p/ were voiceless, labial and plosive. Here there are three dimensions of variation: voicing, place and manner. But it was conceded that the distinctive features of a language might involve more or less than three dimensions. For example, in some languages (e.g. in Tamil, a language of South India) voicing is not a distinctive feature (so changing from [p] to [b] does not bring about a change of meaning) and so only place and manner are distinctive. In other languages we may need to state four dimensions of variation. In Hindi not only is voicing (and place and manner) distinctive but aspiration is also separately distinctive from voice; compare, for example, /kaan/ 'ear', /k^{h}aan/ 'mine', /gaan/ 'anthem', /g^{h}aan/ 'quantity'. Such articulatory distinctive features sometimes involve two terms (voiceless vs voiced, aspirated vs unaspirated), sometimes three (e.g. labial /p,b/ vs alveolar /t,d/ vs velar /k,g/ in English) and sometimes more.

Later developments in the theory of distinctive features have involved explaining all the contrasts of a language in terms of BINARY distinctive features and suggesting that there is a set of binary features (involving around 12 or 13 distinctions) which will account for all languages. An apparent three-term distinction like labial vs alveolar vs velar is turned into two features with plus or minus values; using 'coronal' to mean 'made with the blade of the tongue raised above the neutral position' and 'anterior' to mean 'made in front of the hard plate', the English plosives /p,b,t,d,k,g/ are then defined as follows:

	p,b	t,d	k,g
coronal	−	+	−
anterior	+	+	−

In the most well-known set of binary distinctive features,[2] many features are still articulatory although some are auditory or acoustic (e.g. 'strident').

In this book we use distinctive feature analysis (of the more traditional kind which allows non-binary dimensions) where such analysis is not in doubt and where it is obviously explanatory. This means that we frequently refer to feature analysis when describing the consonants of English, but use it very little when describing the vowels, since almost all distinctive feature analysis in this area is disputed and not always helpful.

5.3.3 Allophones

No two realisations of a phoneme are the same. This is true even when the same word is repeated; thus, when the word *cat* is said twice, there are likely to be slight phonetic variations in the two realisations of the phoneme sequence /k+a+t/. Nevertheless, the phonetic similarities between the utterances will probably be more striking than the differences. But variants of the same phoneme will

frequently show consistent phonetic differences; such consistent variants are referred to as ALLOPHONES. We have seen (§5.1) how different the initial and final allophones of /t/ in the word *tot* may be. Or again, the [k] sounds which occur initially in the words *key* and *car* are phonetically clearly different: the first can be felt to be a forward articulation, near the hard palate, whereas the second is made further back on the soft palate. This difference of articulation is brought about by the nature of the following vowel, [iː] having a more advanced articulation than [ɑː]; the allophonic variation is in this case conditioned by the context. In some varieties of English the two [l] sounds of *lull* [lʌɬ] show a variation of a different kind. The first [l], the so-called 'clear' [l] with a front vowel resonance, has a quality very different from that of the final 'dark' [ɬ] with a back vowel resonance. Here the difference of quality is related to the position of the phoneme in the word or syllable and depends on whether a vowel or a consonant or a pause follows. It is possible, therefore, to predict in a given language which allophones of a phoneme will occur in any particular context or situation: they are said to be in conditioned variation or COMPLEMENTARY DISTRIBUTION. Statements of complementary distribution can refer to preceding or following sounds (e.g. fronted [k̟] before front vowels like /iː/ in *key* but retracted [k̠] before back vowels like /ɑː/ in *car*); to positions in syllables (plosives are strongly aspirated when initial in accented syllables); or to positions in any grammatical unit, e.g. words (vowels may optionally be preceded by a glottal stop when word-initial) or morphemes (Cockney has a different allophone of /ɔː/ in morpheme-medial and morpheme-final positions (cf. *board* [bɔʊd] vs *bored* [bɔwəd])).

Complementary distribution does not take into account those variant realisations of the same phoneme in the same situation which may constitute the difference between two utterances of the same word. When the same speaker produces noticeably different pronunciations of the word *cat* (e.g. by exploding or not exploding the final /t/), the different realisations of the phonemes are said to be in FREE VARIATION. Again, the word *very* may be pronounced [veɹi] (where the middle consonant is an approximant) or [veɾi] (where the middle consonant is a tap). The approximant and the tap are here in free variation. Variants in free variation are also allophones (since, like those in complementary distribution, they are not involved in changes of meaning).

It is usually the case that there is some phonetic similarity between the allophones of a phoneme: for example, both the [l] sounds discussed above, as well as the voiceless fricative variety which follows /p/ or /k/ in words such as *please* and *clean*, are lateral articulations. It sometimes happens that two sounds occur in complementary distribution, but are not treated as allophones of the same phoneme because of their total phonetic dissimilarity. This is the case of [h] and [ŋ] in English; they are never significantly opposed, since [h] occurs typically in initial positions in the syllable or word and [ŋ] in final positions. A purely logical arrangement might include these two sounds within the same phoneme, so that *hung* might be transcribed phonemically as either /hʌh/ or /ŋʌŋ/; but such a solution would ignore the total lack of phonetic similarity and also the feeling

of native speakers. Ordinary native speakers are, in fact, often unaware of the allophonic variations of their phonemes and will, for instance, say that the various allophones of /l/ which we have discussed are the 'same' sound; [h] and [ŋ], however, they will always consider to be 'different' sounds. When they make a statement of this kind, they are usually referring to the function of the sounds in the language system and can thereby offer helpful, intuitive, information regarding the phonemic organisation of their language. In the case of a language such as English, prejudices induced by the existence of written forms have naturally to be taken into account in evaluating the native speaker's reaction.

5.3.4 Neutralisation

It sometimes happens that a sound may appear to belong to either of two phonemes. In English, examples of this kind are to be found in the plosive series. The contrast between English /p,t,k/ and /b,d,g/ is shown in word-initial position by pairs like *pin/bin*, *team/deem*, *come/gum.* However, following /s/ there is no such contrast. Words beginning /sp-, st-, sk-/ are not contrasted with words beginning /sb-, sd-, sg-/, although a distinction sometimes occurs word-medially, as in *disperse/disburse* and *discussed/disgust* (which suggests a syllable division between the /s/ and the following plosive). In such circumstances we say that the contrast between /p,t,k/ and /b,d,g/, the contrast between voiceless and voiced plosives, is NEUTRALISED following /s/ in word-initial position. Words like *spin*, *steam* and *scar* could equally well be transcribed with /b,d,g/ as with /p,t,k/. Indeed, even though the writing system itself suggests /p,t,k/ (/k/ may be written with <k> or <c>), the sounds which actually occur following /s/ can in some respects be considered closer to /b,d,g/ since the aspiration which generally accompanies /p,t,k/ in initial position is not present after /s/ (although vowels following /p,t,k/ generally start from a higher pitch and vowels following /sp,st,sk/ have this higher pitch, which argues for /p,t,k/).[3]

Another case of neutralisation concerns the allophones of /m/ and /n/ before /f/ or /v/, in words like *symphony* and *infant.* The nasal consonant in each case is likely to be [ɱ] in fluent speech, i.e. a labiodental sound anticipating the labiodental [f]. Here again, /m/ and /n/ are not opposed, so that the sound could be allocated to either the /m/ or the /n/ phoneme. In practice, since in a slow pronunciation an [m] would tend to be used in *symphony* and an [n] in *infant*, the [ɱ] is usually regarded as an allophone of /m/ in the one case and of /n/ in the other.

5.3.5 Phonemic systems

Statements concerning phonemic categories and allophonic variants can be made in respect of only one variety of one language. It does not follow that, because [l] and [ɬ] are not contrastive in English and belong to the same phoneme, that this is so in other languages—in Russian [l] and [ɬ] constitute separate phonemes.

Or again, although /ŋ/ is a phoneme in most varieties of English, in Italian the velar nasal [ŋ] is an allophone of /n/ which occurs only before /k/ and /g/. Indeed, in English, too, /ŋ/ has not always had phonemic status. Nowadays, [ŋ] might be considered an allophone of /n/ before /k/ and /g/, as in *sink* and *finger*, if it were not for the fact that the /g/ in words such as *sing* was lost about four hundred years ago; once this situation had arisen, a phonemic opposition existed between *sin* and *sing*. In some parts of north-west England, the situation is still the same as it was four hundred years ago, e.g. not only is *sink* pronounced [sɪŋk] but *sing* is pronounced [sɪŋg] and in such dialects [ŋ] can be considered an allophone of /n/.

The number of phonemes may differ as between different varieties of the same language. In present-day English spoken in the south of England, the words *cat*, *half*, *cart* contain the phonemes /a/, /ɑ:/ and /ɑ:/ respectively. But one type of Scottish English has only one vowel phoneme for all three words, the words being phonemically /kat, haf, kart/ (the pre-consonantal /r/ being pronounced in Scottish English). Such a dialect of English has one phoneme less than speech in the south of England, since the opposition *Sam/psalm* is lost. On the other hand, this smaller number of phonemes is sometimes counterbalanced by the regular opposition of the first elements of such a pair as *witch/which*, which establishes a phonemic contrast between /w/ and /ʍ/.

It should not be assumed that the phonemic systems of two dialects differ only in having a lesser or greater number of phonemes. The sound sequence [sɛt], i.e. with a vowel in the region of Cardinal 3, may be a realisation of *sat* in one dialect and of *set* in another; the phonemic categories commonly represented as /e,a/, may nevertheless be present in both dialects, all the short front vowels /ɪ,e,a/ being closer in the first dialect than that in the second. Or again, the diphthong [əʊ] is a realisation of the phoneme of *boat* in most of the south of England, but is frequently a realisation of the vowel in *boot* in Cockney; however, the same number of vowel phonemes occurs in both kinds of English.

Moreover, speakers of different dialects may distribute their phonemes differently in words as when a speaker from the north of England pronounces *after*, *bath* and *pass* with /a/ where a speaker from the south of England pronounces them with /ɑ:/. Even speakers of the same dialect (as well as those of different dialects) may distribute the same number of phonemes differently among the words they use. In southern England, some will say *elastic* with /a/ in the second syllable, others /ɑ:/ and some will say /ˈju:nɪzn/ for *unison*, others /ˈju:nɪsn/.

Lastly, even individuals are inconsistent; in certain situations, they may change the number of their phonemes, e.g. the occasional use of /ʍ/ in southern England in words like *which*; and they may not always use the same phoneme in a particular word or group of words, e.g. the varying use, in the same person's speech, of /ɒ/ or /ɔ:/ in words like *off*.

To sum up, we may conclude that a phonemic analysis of a number of varieties of one language is likely to reveal: different phonemic systems; different realisations of phonemes; different distribution of phonemes in words (and this last even within the speech of one individual according to the situation). It is important

to remember this likelihood of complication in both the system and its realisation, not only for present-day English but also when it is a question of investigating past states of the language. (For a more detailed analysis of variation between dialects, see §7.12.)

5.4 Transcription

The transcription of an utterance (analysed in terms of a linear sequence of sounds) will naturally differ according to whether the aim is to indicate detailed sound values—an ALLOPHONIC (or NARROW) transcription—or the sequence of significant functional elements—a PHONEMIC (or BROAD) transcription.

In the former, an allophonic type of transcription, an attempt is made to include a considerable amount of information concerning our knowledge of articulatory activity or our auditory perception of allophonic features. The *International Phonetic Alphabet* (IPA), shown in Table 1, provides numerous diacritics for a purpose such as this; e.g. the word *titles* might be transcribed as [ˈtsʰäːëtɬɬz̥]. Such a notation would show the affrication and aspiration of the initial [t], the fact that the first element of the diphthong is centralised from Cardinal 4 and is long compared with the second element, which is a centralised Cardinal 2, that the [ɬ] has a back vowel resonance and is partly devoiced in its first stage, and that the final [z] is completely devoiced; additionally it is shown that the first syllable is accented. Such a notation is relatively explicit and detailed, but gives no more than an impression of the complexity of the utterance as revealed by various methods of physiological and acoustic investigation. This type of transcription (though usually not as detailed as this) is useful when the focus is on particular details of pronunciation.

In phonemic transcription a different principle operates—namely, that of one symbol per phoneme. Thus a phonemic transcription of the type of English described in this book uses forty-four different symbols (twenty-four consonants and twenty vowels). The basis on which an actual symbol is chosen depends on two further principles: (a) using the phonetic symbols of the most frequent allophones and (b) replacing non-Roman symbols arising from (a) by Roman symbols where these are not already in use. Thus the phonetic symbol for the most common allophone of the phoneme at the beginning of *red* is [ɹ] but the phonemic transcription replaces /ɹ/ by /r/ on the basis of (b). But in the transcription of vowels Romanisation (i.e. the principle under (b)) is not completely carried through in this book, e.g. the transcription uses /ɒ/ and /ɔː/ for the vowels in *cot* and *caught* where it would be possible to use /o/ and /oː/. Transcription of these vowels as used here is called COMPARATIVE PHONEMIC because it allows comparison with vowels in other languages to be made, even though a phonemic transcription is being used. It follows from the principles mentioned above that, even using the IPA, it is possible to construct different sets of symbols for the forty-four symbols of English, although the one used in this book is the most common one in use for the type of English described.

It must be remembered that a phonemic transcription does not by itself indicate how a sequence is to be pronounced. Only if we know the conventions which tell us how a phoneme is to be realised in different positions do we know its correct pronunciation. Nevertheless a phonemic transcription is particularly useful as a corrective instrument in a language like English where the orthography does not consistently mirror present-day pronunciation.

By now it will have become clear that slant brackets are used for a phonemic transcription, e.g. /ˈtaɪtlz/ while square brackets indicate an allophonic transcription, e.g. [ˈtʰäˑëtɬɬz̥]. Sometimes we may wish to show just the phonetic detail of one segment in an otherwise phonemic transcription. In such cases square brackets must still be used, e.g. [ˈtaɪtɬz]. Slant brackets are only used if the whole sequence is represented phonemically.

5.5 Syllables

The concept of a SYLLABLE as something at a higher level than that of the phoneme or sound segment, yet distinct from that of the word or morpheme, has existed since ancient times. It is significant that most alphabets which now have as their basis the representation of phonemes by letters (however irregular) have reached this state by way of a form of writing which symbolised a group of sounds—a syllabary. Indeed, the basis of the writing of many languages, e.g. that of the Semitic group, remains syllabic. But definitions of the syllable have always presented some difficulty. The best-known approach is that which used to be called a theory of prominence[4] but is nowadays better known as the sonority hierarchy.

5.5.1 The sonority hierarchy

In any utterance some sounds stand out as more prominent or sonorous than others, i.e. they are felt by listeners to be more sonorous than their neighbours. Another way of judging the sonority of a sound is to imagine its 'carrying power'. A vowel like [a] clearly has more carrying power than a consonant like [z] which in turn has more carrying power than a [b]. Indeed the last sound, a plosive, has virtually no sonority at all unless followed by a vowel. A SONORITY scale or hierarchy can be set up which represents the relative sonority of various classes of sound; while there is some argument over some of the details of such a hierarchy, the main elements are not disputed. One version of the hierarchy is as follows (the most sonorous classes are at the top of the scale):

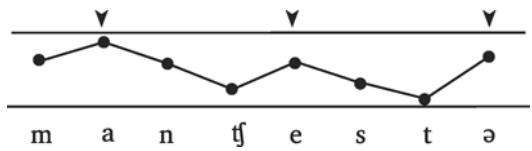
open vowels
close vowels
glides /j,w/
liquids /l,r/
nasals

fricatives
affricates
plosives

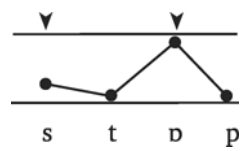
Intermediate vowels are appropriately placed between open and close. Within the last three categories voiced sounds are more sonorous than voiceless sounds.

The terms 'glide' and 'liquid' represent a division of the class 'approximant' (see §4.3.4(5)): glides are short movements away from a vowel-like position (e.g. English /j,w/), while liquid covers sounds like English /l,r/, which have narrowing without friction but are not relatable to vowel sounds. Trills and flaps are usually included with liquids, although this is not agreed by all (it fits well enough for English since trilled [r] and flapped [ɾ] are variants of the usual approximant [ɹ] of GB).

Using the sonority hierarchy we can then draw a contour representing the varying prominences of an utterance, e.g.



The number of syllables in an utterance equates with the number of peaks of sonority, in this case three (marked with arrow heads). This accords with native speakers' intuition. However, there are some cases where contours plotted with the sonority hierarchy do not produce results which accord with our intuition. Many such cases in English involve /s/ in clusters, as, for example, in *stop*:

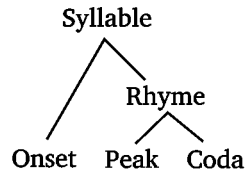


The contour of *stop* implies two syllables, while native speaker intuition is certain that there is only one syllable. This suggests that sounds below a certain level on the hierarchy cannot constitute peaks, i.e. that classes from fricatives downwards cannot constitute peaks in English (though the cut-off point may be drawn at different levels in different languages). Formal statements about the clustering possibilities of English consonants sometimes treat /s/ as an 'appendix'[5] to syllables which may consequently violate restrictions on their sonority (see §10.10.1).

5.5.2 Syllable constituency

In the previous section reference was made to syllable peaks. In a word like *print* /prɪnt/ the vowel /ɪ/ constitutes the peak and the consonants around it are

sometimes said to constitute the syllable margins, with those before the peak being called the onset and those after the peak being called the coda. The ONSET, PEAK and CODA of a syllable form a hierarchy of constituents, in which the coda is more closely associated with the peak than with the onset. This can be represented diagrammatically as



Evidence for the greater coherence of the peak and the coda compared with that between the onset and the peak comes from the use of rhyming in verse in which *pat*, *cat*, *sat* rhyme but *pat*, *pad*, *pack* do not rhyme (and hence the use of the term 'rhyme' itself), added to which there are very often restrictions between the peak and the coda in ways in which there are not between the onset and the peak, e.g. the consonant /ŋ/ as in *sing* can only follow short vowels. Moreover, onset consonants are involved in slips of the tongue but coda consonants are not, e.g. *pat the cake* may be produced with a slip to *cat the cake* or even *cat the pake* but slips do not produce *pak the cake* or *pak the cate.*

As implied by the sonority scale discussed above and illustrated in a word like *prints*, onsets generally involve increasing sonority up to the peak (e.g. /r/ is more sonorous than /p/ while the peak /ɪ/ is more sonorous than /r/) while codas generally involve decreasing sonority (e.g. /t/ is less sonorous than /n/ which is less sonorous than the peak /ɪ/). As mentioned above in this section the final /s/ is an exception which does not constitute a syllable despite being of higher sonority than the /t/ which precedes it.

5.5.3 Syllable boundaries

While the onsets and codas of syllables are obviously clearly identifiable at the beginnings and ends of words, dividing word-medial sequences of consonants between coda and onset can be problematical. In many languages such dividing of words into syllables is a relatively straightforward process (e.g. in Bantu languages, in Japanese and in French). In other languages, like English, it is not. The sonority hierarchy tells us how many syllables there are in an utterance by showing us a number of peaks of sonority. Such peaks represent the centres of syllables (usually vowels). Conversely it would seem reasonable for the troughs of sonority to represent the boundaries between syllables. Sounds following the trough would then be in ascending sonority up to the peak and sounds following the peak would be in descending sonority down to the trough. But problems arise because the hierarchy does not tell us whether to place a trough consonant itself with the preceding or the following syllable; an additional

problem is caused by the appended /s/ mentioned in the previous sections. So, for example, syllable division is problematical in words like *funny*, *bitter*, *mattress*, *extra* /ˈekstrə/. Various principles can be applied to decide between alternatives: align syllable boundaries with morpheme boundaries where present (the morphemic principle); align syllable boundaries to parallel syllable codas and onsets at the ends and beginnings of words (the phonotactic principle); align syllable boundaries to best predict allophonic variation, e.g. the devoicing of /r/ following /t/. Unfortunately such principles often conflict with one another. A further principle is often invoked in such cases, the maximal onset principle, which assigns consonants to onsets wherever possible and is said to be a universal in languages; but this itself often conflicts with one or more of the principles above. The syllabification of word-medial sequences in English is dealt with in detail in §10.10.3.

5.6 Vowel and consonant

It was seen in the previous chapter that attempts to arrive at a universal phonetic definition of the terms VOWEL and CONSONANT encounter difficulties as regards certain borderline sounds such as [j,w,r] in English. If, however, the syllable is defined phonologically, i.e. from the point of view of distribution of phonemes, a solution can be given to most of these problems. It will be found that the phonemes of a language usually fall into two classes, those which are typically central in the syllable (occurring at the peak) and those which typically occur at the margins (or onsets and codas) of syllables. The term 'vowel' can then be applied to those phonemes having the former function and 'consonant' to those having the latter. The frictionless English sounds /j,w,r/, which, according to most phonetic descriptions, are vowel-like, nevertheless function in the language as consonants, i.e. are marginal in the syllable. A further illustration of the consonantal function of /j,w,r/ is provided by the behaviour of the English articles when they combine with words beginning with these phonemes. *The* is pronounced /ði/ before a vowel and /ðə/ before a consonant; we also have the forms *a* /ə/ or *an* /ən/ according to whether a consonant or vowel follows. Since it is normal to pronounce *the yacht*, *the watch*, *the rabbit* with /ðə/ and to prefix /ə/ to *yacht*, *watch* and *rabbit* rather than /ən/, /j,w,r/ can be treated as belonging to the consonant class of phonemes, despite their vowel-like quality.

The English lateral and nasal sounds are commonly classed phonetically as of the consonantal type because of the complete or partial mouth closure with which they are articulated. From a functional viewpoint, too, they generally behave as consonants, since they are usually marginal in the syllable. Sometimes, however, they operate as a separate peak of sonority, e.g. in *middle* [mɪdl̩] and *button* [bʌtn̩], and thus function in the peaks of syllables. In such occurrences they are referred to as syllabic laterals and nasals.

It is clear that if the elements of the utterance are divided into two categories, some units which are assigned to one class according to phonetic criteria may

fall into the other class when it is a question of phonological (functional) analysis. But the latter prevails when we are doing a phonological analysis of English.

5.7 Prosodic features[6]

As we have seen in Chapter 3, a sound not only has a quality, whose phonetic nature can be described and whose function in the language can be determined, but also has features of length, pitch and loudness. There may be phonemic oppositions in a language based solely or in part on length differences; alternatively differences in the length of a phoneme may relate to different contexts, as when English vowels are generally shorter before voiceless consonants than before voiced consonants.

The features of pitch, length and loudness may contribute to patterns which extend over larger chunks of utterance than the single segment and when used thus are called suprasegmental, or PROSODIC. Pitch is used to make differences of TONE in tone languages, where a syllable or word consisting of the same segmental sequence has different lexical meanings according to the pitch used with it (e.g. in Chinese). Outside tone languages (and even within tone languages, although to a lesser extent) pitch also makes differences of INTONATION whereby different pitch contours produce differences of attitudinal or discoursal meaning (discoursal here refers to the way successive chunks of utterances are linked together). While tone is a feature of syllables or words, intonation is a feature of phrases or clauses. Some combination of the features of pitch, length and loudness will also produce ACCENT, whereby particular syllables are made to stand out from those around them. There are a number of other prosodic features whose linguistic use is far less understood. These include RHYTHM, the extent to which there is a regular 'beat' in speech (see §11.2); TEMPO (the average conversational tempo of speakers of General British is around four syllables per second);[7] and VOICE QUALITY, which includes both supralaryngeal settings of the mouth and tongue and laryngeal settings (or phonation types) involving either the vocal cords or the larynx as a whole. Sometimes a voice quality conveys meaning as when a creaky voice indicates boredom; sometimes a quality is appropriate to a situation, e.g. breathy voice is known as 'bedroom voice' and whispery voice as 'library voice'.

5.8 Paralinguistic and extralinguistic features

In addition to prosodic features which spread over more than one segment, there are also PARALINGUISTIC features, which are essentially interruptive rather than co-occurrent. The most common interruptive effect is pause, which functions often as part of the intonation system where it is one of the indicators of an intonational phrase boundary, but at other times functions as a hesitation marker. In the latter case a filled pause is often involved, by some combination of [ʔ] [m] and [ə] in General British, but by other sounds in other dialects and languages (e.g. by an [n] in Russian). Many other paralinguistic effects are more commonly

called VOCALISATIONS: these include single sounds or sequences of sounds like [ʃː] for 'be quiet', [pst] as an attention-getter and [| |] (a reduplicated dental click), for 'irritation' or 'naughty' (often written *tut-tut*) and various conventionalised types of cough and whistle. Since non-native speakers are likely to pause to think of the right word or grammar far more often than the native speaker, hesitation markers are of particular importance for them. With the acquisition of correct hesitations non-native learners can, if they so wish, dramatically increase their ability to sound like an Englishman.

While prosodic and paralinguistic features are used to convey meaning (although this meaning is in various ways outside the central phonemic system), the term EXTRALINGUISTIC is used for those features over which the speaker has no immediate control. Some of these features may be physical, e.g. sex, age and larynx size. Others may simply be speaker habits, e.g. a particular speaker may always speak with a creaky voice. Yet others may be specific to languages, e.g. speakers of one language may make much more use of an ingressive pulmonic airstream than other languages—this is reported to be so in Finnish—or to particular accents, e.g. Scouse, the dialect of Liverpool, is said to have an adenoidal quality, produced by retracting and raising the tongue, tightening the pharynx, raising the larynx and keeping the jaws close together, even for open vowels.[8] Many extralinguistic features are of course ones which may also function prosodically or paralinguistically, e.g. breathy voice may be understood as 'bedroom voice', although particular speakers may have this as a constant characteristic of their speech; and voice qualities involving a raised or lowered larynx, while being habitual, may also be interpreted as 'strained' or 'gloomy' respectively.[9] For further description of voice quality see under §11.8 below.

Notes

1 It is customary to distinguish sound segments from linguistic sound units (phonemes) by using [ ] to enclose the former and / / to enclose the latter.
2 Chomsky & Halle (1968).
3 Wingate (1982).
4 Jones (1918[1960: 55])
5 Giegerich (1992: 147–50).
6 For a detailed classification of prosodic and paralinguistic features, see Crystal & Quirk (1964).
7 Byrd (1992a) found men speaking 6.2 per cent faster than women.
8 Knowles (1987).
9 Laver (1974, 1980).

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Part II

The sounds of English

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Chapter 6

The historical background

The following abbreviations are used in this chapter: OE—Old English (up to approximately AD 1100); ME—Middle English (approx. 1100–1450); eModE—Early Modern English (approx. 1450–1600); GB—General British (GB), the modern unofficial standard; AN—Anglo-Norman; OF—Old French; GVS—Great Vowel Shift.

6.1 Evidence for phonetic reconstruction and change

Today any phonetic description depends on recordings and subsequent transcription and analysis, either by intensive expert listening or increasingly often by combining listening with examination of acoustic features. Obviously this type of evidence cannot be used for the reconstruction of past states of the spoken language. The further back we go into history the scantier the evidence of spoken forms becomes. Our conclusions are often based on information of an indirect kind (not until Early Modern English are there detailed and reliable direct descriptions); yet such is the agreement generally among the various types of evidence that the broad lines of sound change from Old English to modern General British (GB) can often be established with reasonable certainty.

6.1.1 Latin and Runic as base

The first written records of Old English go back to around AD 650. The most explicit evidence concerning its pronunciation comes from the way in which it was written and almost all writing used a form of the Latin alphabet. A great deal is known about the pronunciation of Latin, whose sound system had much in common with that of modern Italian. So we can assume as a starting-point that letters in OE had approximately their Latin values.

But the letters of that writing system were evidently inadequate for representing all English sounds: thus, the ligature <æ> was added to symbolise a sound between Latin <a> and <e>. For other sounds lacking in Latin, symbols were taken from RUNIC inscriptions.[1] Sounds which were like the ones now spelt

<th> were written in Old English as <Þ> (called 'thorn') or <ð> (called 'eth'). The rune <p> (called 'wynn') represented our present sound written <w>.

After the invention of printing in the fifteenth century the spelling of words became increasingly stereotyped and changes in pronunciation were increasingly not reflected in changes in spelling. The result of this is that our spellings of words nowadays are often a good guide to how they were pronounced around Shakespeare's time. We can tell, for example, that *swan* was pronounced [swan] rather than [swɒn] and that a lot of people pronounced *meet* and *meat* differently.

6.1.2 Intervening values

If we can be reasonably sure of a sound value at two points in history, we can, from our knowledge of phonetic possibilities, have a good idea of the intervening stages of development. For instance, knowing the pronunciation of a group of words like *no*, *goat*, *home* in Modern English and knowing that the vowel in such words was pronounced as [aː] in Old English, the development to be accounted for is [aː] > [əʊ]. The articulation has evidently always involved the back of the tongue, but has changed to a closer position and has become a diphthong. We might, therefore, postulate such developments as [aː > ɑʊ > oʊ > əʊ] or [aː > ɔː > oː > oʊ > əʊ]. Other evidence will then confirm or refute each hypothesis —in this case the second solution is more in keeping with the evidence.

6.1.3 Rhymes and metre

As we move through the ME and early eModE periods rhymes (and sometimes puns) become important. For example Chaucer rhymes the words *was* and *glas*.[2] We know quite a lot about the pronunciation of ME *glas*: in Old English the vowel was short [æ] which only much later in the eighteenth century was lengthened (and backed) to [aː] and the final consonant was [s] in Old English and remains so today. So Chaucer's *glas* was pronounced [glas] as it still is in northern England. Since *was* is made to rhyme with *glas*, we can assume it was pronounced [was], i.e. the vowel was not rounded as it is today and the final consonant was not voiced to [z] as it is today.

The metre of verse can reveal the accent of words. It is for this reason that we know that French words, in Chaucer's verse, generally retained their original accentual pattern, e.g. *pilgrymage* [pɪlgrɪˈmaːʤə],[3] and that the accent shift in these cases occurs only late in the ME period or in eModE.

6.1.4 Direct evidence

From the sixteenth century onwards, and increasingly after the invention of printing, more direct descriptions of pronunciation occurred. The earliest writings were about spelling reform (a subject which continued to be extensively written about well into the twentieth century). The early spelling reformers were obliged,

if they were to propose a more logical relationship of sound and spelling, to investigate the sounds of English. For example, in the sixteenth century John Hart published *An Orthographie* (1569). Besides making out his case for spelling reform and proposing a revised system, Hart describes the organs of speech, distinguishing between front and back vowels, and between voiced and voiceless consonants, even noting the aspiration of voiceless plosives.

Other early writers compared the pronunciation of English with other languages. William Salesbury, a Welshman, compiled a *Dictionary in Englyshe and Welshe* (1547). Sound values were indicated by comparing sounds in Welsh and English. Indicating the phonetic value of letters using guidelines from another language continues to this day, e.g. suggesting German <e> in *Meer* 'sea' be pronounced like <a> in English *fate*. But, like this example, they are rarely very precise.

6.2 Sound change

In the historical development of a language, some sorts of sound change affect a sound wherever it occurs, some affect it only when it is adjacent to particular other sounds and some affect only particular words. Besides changes affecting single sounds, which syllables are accented may change. Additionally the introduction of words from another language may introduce new sounds, and imported spellings may restrict or even reverse a sound change.

6.2.1 Phonemic change

The most important kind of change tends to affect a phoneme in all its occurrences. Such changes, not produced by an outside influence, are internal and isolate. Thus, the ME [uː] has become [aʊ] in GB, as in the word *mouth*; similarly, ME [aː] has become [eɪ] in GB, as in the word *name*. Changes of this type apply particularly to the English long vowels, which underwent a remarkable evolution of values, known as the Great Vowel Shift (see §6.5 below), in the sixteenth and seventeenth centuries. In addition to phonemic change there are also cases of phonemic merger: ME [eː] in *meet* and [ɛː] in *meat*, after intermediate changes, eventually merged into [iː] in the seventeenth century. Similarly there are cases of phonemic split. In OE [s] and [z] belonged to one phoneme, [z] occurring word-medially and [s] elsewhere. But the importation of words from French meant that both occurred medially, cf. [z] in *wisdom* (from OE) and [s] in *pencil* (from OF).

6.2.2 Contextual change

The change to a phoneme sometimes only occurs when it is adjacent to particular other sounds; such changes are internal but contextual. A relatively recent change of this type is exemplified by words such as *swan*. This word was probably pronounced [swan] in about 1600, but the [w] sound has rounded and retracted the vowel to give the modern form [swɒn]. The large majority of earlier [w]+[a]

sequences have now given [w]+[ɒ] or [ɔː] by reason of this change, e.g. *want*, *quality*, *war*, *water*. A similar contextual change is the lengthening of ME [a] to GB [ɑː] before voiceless fricatives, e.g. *after*, *path*, *pass* (this change has not taken place in the north of England and in most of America).

6.2.3 Lexical change

Some changes are neither independent nor dependent upon the phonetic context but concern the use of particular phonemes in particular words. Such changes are said to be lexical. In a group of words containing [ɛr] in ME, e.g. *certain*, *herd*, *clerk*, *servant*, *sergeant* an alternative pronunciation in [ar] developed in late ME and in eModE both pronunciations were around. Some of the words have now standardised on /ɜː/ (< [ɛr]), e.g. *certain*, *herd*, *servant*, while others have standardised on /ɑː/ (< [ar]), e.g. *clerk*, *sergeant*. Some words still remain with both possibilities, e.g. the county *Berkshire*. Some lexical changes involve specific phonetic processes like elision, e.g. *blackberry* → GB /ˈblakbri/ (where the vowel between /b/ and /r/ is elided); and metathesis, e.g. /wɒps/ → GB /wɒsp/). Elisions in unaccented syllables was particularly common in the development from OE to ME (see §§6.3, 6.4 below).

6.2.4 Foreign imports

The introduction of foreign words may add phonemes, or increase their positional possibilities in words (as in §6.2.1 above). Such changes are said to be external. Thus, if the French words *beige*, *prestige*, *camouflage* are used in English with the pronunciations /beɪʒ, presˈtiːʒ, ˌkaməflɑːʒ/, we have a case of a final /ʒ/ previously unknown in English words while the importation of originally Italian, later French, *gigolo* /ˈʒɪgələʊ/ makes the /ʒ/ possible in initial position. When first imported these words were more frequently made to conform to the existing English system: so /dʒ/ was used in place of /ʒ/.

6.2.5 Accentual change

In addition to changes of quality, some changes may be accentual. This applies to words which were relatively early imports from French into ME, e.g. *necessary* retained the main accent on the penultimate syllable—[nɛsɛˈsaːri].[4] Now, the accent has shifted to an earlier syllable (together with associated phonemic changes)—/ˈnesəsəri/ or /ˈnesəsri/ (though it retains something of the ME accentual pattern in General American). More recent borrowings or those in less common use often retain the French accentual pattern—thus, *hotel* or *machine*, with accent on the final syllable, which, if they had conformed to the English system, might have had such modern forms as /ˈhəʊtl/ and /ˈmaʃɪn/. Some such cases may still be changes in progress in GB: *garage* changing from /gaˈrɑːʒ/ to /ˈgarɪdʒ/ (see §7.10 on current changes in GB).

6.2.6 *The influence of spelling*

English has changed greatly since the time of Old English (AD 600–1100). It might be expected that printing with its creation of greater awareness of the written word would place some restraint on change from 1450 onwards but limited literacy meant that such restraint did not begin to occur on any notable scale until at least three hundred years later. Soon after 1500 the pronunciation of English underwent one of its biggest changes, the Great Vowel Shift (see §6.5), affecting all the long vowels, but spelling did not inhibit this change. However, with increasing literacy, particularly in the nineteenth and twentieth centuries, there was indeed an increasing tendency towards spelling pronunciations, e.g. many shortened forms of place names arose when people were unaware of their spelling but have now had the longer name restored.[5] With the advent of the digital age around 2000, and particularly the use of texting, it will be interesting to see if a more laissez-faire attitude to spelling becomes more general and whether any changes in pronunciation are increasingly reflected in spelling.

6.3 Old English (OE)

The term Old English spans a period of some five hundred years from about AD 600 to AD 1100. The invasions of the fifth and sixth centuries introduced four main varieties of English: Kentish, Saxon, Mercian and Northumbrian. From the extant texts most is known about West Saxon. In its later form—that in use between about AD 900 and AD 1100—it is referred to as Classical Old English. This is the system and transcription set out in §6.3.1.

The vowel values of the OE system were difficult to represent with the five Latin vowel letters and these were supplemented by Runic symbols (see §6.1.1 above). Length of both consonants and vowels was shown by doubling letters. From a comparison with other West Germanic languages, we know words were usually accented on their first syllable.

One particular internal contextual change, called I-MUTATION, took place early in OE. By this change an [i] or [j] caused a back vowel in a preceding syllable to be fronted. For example the word meaning 'mouse' in Classical OE was [muːs] but its plural was [myːs] which arose from an earlier form [muːsi]. The front vowel [i] had caused the back vowel [uː] to be fronted to [yː] (a type of 'vowel harmony') and somewhat later the [i] itself was dropped. Later developments in the language produced the unrounding of the [yː] to [iː] in ME (thus [miːs]) and the [iː] later diphthongised to [aɪ] by the GREAT VOWEL SHIFT (see §6.5 below) in the eModE period. This is the GB pronunciation of *mice* as [maɪs]. Meanwhile the singular form [muːs] continued unchanged until the Great Vowel Shift which diphthongised to [maʊs] which is the GB pronunciation of *mouse* (but some dialects in north-east England and in Scotland still have the unshifted form [muːs]).

Vowels in unaccented syllables, particularly those in suffixes, were beginning to be reduced to [ə] at the end of the Old English period (and many were later to disappear) and presented a particular problem to scribes, the Latin alphabet offering no way of showing a central vowel of the [ə] type. Unaccented [æ,e,i] soon began all to be written as <e> and unaccented [a,u,o] tended to be used indifferently, indicating that the vowel distinctions were being lost. Additionally OE diphthongs written <ea,ie> probably ended in [ə], i.e. [eə,ɛə].

6.3.1 *Classical Old English sound system*

Vowels

iː,ɪː,yː,ʏ	uː,ʊ
eː,ɛ	oː,ɔ
æː,æ	ɑː,ɑ ([ɒ] before nasals)

[ə] in some weakly accented syllables.

Diphthongs

ɛːə,ɛə; eːə,eə

Consonants

p,b,t,d,k,g([ɣ] between vowels),ʧ,ʤ
m,n ([ŋ] before velars)
l,r (tapped or trilled)
f,θ,s ([v,ð,z] medially),ʃ
h ([x,ç] medially before consonants, e.g. in *broht* 'brought' and *niht* 'night')
j,w

Note (1) Consonants may be short or long (written single or double)
Note (2) The spellings *hn, hl, hr, hw* were probably phonetically [n̥,l̥,r̥,w̥]

Transcription of Old English Text (St John, Chapter 14, verses 22, 23)[6]

juːdɑs kwæθ toː hɪm. næs nɑː seː skɑrɪɔt. drɪçtən, hwæt ɪs jəwɔrdən θæt θuː wɪlt θeː sylfnə jəswʊtɛlɪjən uːs næs mɪddɑnɛərdə.

seː hæːlənd ɒndswɑrədə ɒnd kwæθ toː hɪm; jɪf hwɑː meː lʊvɑθ heː hɪlt miːnə spræːʧə ɒnd miːn fædər lʊvɑθ hɪnə ɒnd weː kʊmɑθ toː hɪm ɒnd weː wʏrkɪɑθ ɛərdʊŋgstoːwə mɪd hɪm.

Literal translation

Judas spoke to him. It was not Iscariot. 'Lord, what has happened, that you will show yourself to us and not to the world?'

The Holy one answered and said to him, 'if someone loves me, he heeds my speech and my Father loves him and we come to him and we make our dwelling with him'.

6.4 Middle English (ME)

Middle English covers the period from 1100 to 1450. At this time letters usually still had their Latin values and those letters which were written were meant to be sounded. Thus, the initial <k,g,w> in words such as *knokke*, *gnat*, *writan* were still pronounced (although in the clusters written <hl,hr,hn> in OE the <h> was no longer pronounced or written in ME, e.g. OE *hlæhhan* becomes GB *laugh*). Long vowels still had their pre-Great Vowel Shift (see §6.5 below) qualities, e.g. <i> in *time* had an [iː] quality giving [tiːm]. This persistence of Latin values in spelling was helped by the Church, which was still the centre of teaching and writing. There was as yet no standardised spelling and scribes largely wrote as they thought they talked. But English spelling was modified by French influences. Notably, the French <ch> spelling was introduced to represent the [ʧ] sound in a word such as *chin* (in OE spelt *cinn*). Similarly, following French, <ou,ow> now represent the sound [uː], formerly written <u>, e.g. OE *hus*, ME *hous*. The simple <u> spelling was retained to represent the OE short [u] sound, though this latter sound is often written as <o>, especially when juxtaposed with the letters <w,m,n>, to avoid confusion between the letter shapes, e.g. *wonne* rather than *wunne*.

Words imported from French can give information concerning the timing of sound changes. Thus, a French word like *couch*, which we know from French sources had [uː] at the time of its introduction into English (*c.*1350), underwent the same changes in Early Modern English as native English [uː]. We can conclude, therefore, that at the time the French words came into the language the vowel [uː] had not begun the change (it diphthongised in eModE to [əʊ] and eventually became GB [aʊ]). A similar sort of evidence tells us that the [iː] in *time* and the [aː] in *name* remained undiphthongised for most of the ME period. Thus [iː,aː,uː] had not yet been subject to the Great Vowel Shift (see §6.5 below) which occurred in the eModE period.

One regular internal change was from OE [ɑː] to ME [oː] (in accented syllables), e.g. [hɑːm] > [hoːm], GB *home*. Many OE diphthongs became monophthongs in ME, while many new diphthongs were created through the combination of an OE vowel plus [h,g,w] giving vowel plus [i,u], e.g. [aɪ] from OE [dægə] 'day' and [ɔʊ] from OE [cnawə] 'know'. These were often pronounced the same as diphthongs from French. Notice also in the text from Chaucer below, the penultimate accent (indicated by the rhythm) on [kʊraːʤəs] and [pɪlgrɪmaːʤəs] and the pronunciation of <r> in all positions, e.g. [pɛrsəd] 'pierced'.

6.4.1 Late Middle English sound system

Vowels

iː,ɪ	uː,ʊ
eː	oː
ɛː,ɛ	ɔː,ɔ
aː,a	ɑː

[ə] in unaccented syllables.

Diphthongs
ɛɪ,aɪ,ɔɪ,ɪʊ,ɛʊ,ɔʊ,ɑʊ

Consonants
p,b,t,d,k,g,ʧ,ʤ
m,n ([ŋ] before velars)
l,r (tapped or trilled)
f,v,θ,ð,s,z,ʃ,h ([x,ç])
j,w ([ʍ] after /h/)

Transcription of Middle English Text
(from the *Prologue* to the *Canterbury Tales*)[7]

hwan θat aːprɪl, wɪθ hɪs ʃuːrəs soːtə
θə drʊxt ɔf marʧ haθ pɛrsəd toː ðə roːtə,
and baːðəd ɛːvrɪ vaɪm ɪn swɪʧ lɪkuːr
ɔf hʍɪʧ vɛrtɪʊ ɛndʒɛndərd ɪs θə fluːr,
hʍan zɛfɪrʊs ɛːk wɪθ hɪs sweːtə brɛːθ
ɪnspiːrəd haθ ɪn ɛːvrɪ hɔlt and heːθ
θə tɛndər krɔppəs, and ðə jʊŋgə sʊnnə
haθ ɪn ðə ram hɪs halvə kʊrs ɪrʊnnə,
and smɑːlə fuːləs maːkən mɛlɔdiːə
θat sleːpən ɑːl ðə nɪçt wɪθ ɔːpən iːə—
sɔː prɪkəθ hɛm naːtɪur ɪn hɪr kʊraːʤəs—
θan lɔːŋgən fɔlk toː gɔːn ɔn pɪlgrɪmaːʤəs.

Literal translation

When that April with its sweet showers
the drought of March hath pierced to the root
and bathed every vein in such juice
from whose power is brought forth flowers,
when Zephyrus also with his sweet breath
has encouraged in every wood and heath
the tender shoots, and the young sun
has in the Ram his half course run
and small birds make melody
who sleep all night with open eyes—
so nature spurs them in their hearts—
then people long to go on pilgrimages.

6.5 Early Modern English (eModE)

Early Modern English covers the time between 1450 and 1650. The introduction of the printing press at the beginning of this period brought about a very limited standardisation of spelling and the spoken and written forms of the language

began to diverge. But individuals, especially in their private correspondence, often used spellings of a largely phonetic kind, in the same unsophisticated and logical way that children still do. When fifteenth- and sixteenth-century spellings show the word *sweet* occasionally written as *swit*, it may be assumed that this original ME [eː] was by now so close that it could be represented by <i> with its Latin value. Or again, the spelling form *sarvant* instead of *servant* reflects an open type of vowel in the first syllable which was a common pronunciation throughout the eModE period in words like this. Moreover, the adoption of an unphonetic spelling can give information on pronunciation: thus, when words like *delight* (earlier spelt *delite*) began to be spelt with <gh>, this indicates that <gh> clearly no longer represented a fricative as it once did in *light*, since there never was any consonantal sound between the vowel and final [t] in *delight.* We may therefore conclude that <gh> no longer had its former phonetic significance in words such as *light.*

Rhymes continue to be useful as complementary evidence. When *night* began to rhyme with *white* it confirms the view that post-vocalic <gh> no longer had a consonantal value; or rhyming *can* and *swan* suggests that the rounding of [a] after [w] had not yet taken place. Elizabethan literature provides additional evidence in the frequent use of puns, which usually rely for their effect upon similarities, if not identities, of phonetic value. Shakespeare, for instance, plays on the phonetic identity of such pairs as *suitor*, *shooter* (both possibly pronounced [ʃuːtər]) and *known*, *none* (both [noːn]); such puns suggest that in each case the pronunciation of the two words was commonly sufficiently close to make for an immediate recognition by an audience.

The most important and fruitful evidence for this period is, however, of a direct kind. It is provided by the published works of the contemporary grammarians, ORTHOEPISTS (writers on 'correct' pronunciation) and schoolmasters, two of whom have been mentioned in §6.1.4. They are of unequal value and their statements have often to be interpreted in the light of other evidence; yet they provide us with the first direct accounts of the pronunciation of English. From the sixteenth century onwards, our conclusions rely more and more on their descriptive statements and less on clues of an indirect kind.[8] Sometimes there appears to be a conflict between the statements of grammarians and the evidence from other sources. Frequently the solution must be that there existed at any time a variety of pronunciations, resulting from differences of dialect, generation, class and fashion, in the same way that a description of GB must take account of such variant pronunciations.

The GREAT VOWEL SHIFT was almost complete in Shakespeare's time.[9] ME [iː] and [uː] had become diphthongs but the diphthongal movement was not as great as nowadays in GB: so *tide* and *mouth* were [təɪd] and [məʊθ] rather than [taɪd] and [maʊθ]. ME [eː] and [oː] had moved to closer positions, so *need* and *moon* had the pronunciations *need* [niːd] and *moon* [muːn] like today. But the lower ME vowels [ɛː] [aː] and [ɔː] were highly variable. The vowel in *bead* had for some speakers become [eː], for others (the conservatives) remained as [ɛː] and

for yet others (the advanced) had become [iː] like *need*. The lowest vowel, [aː] as in *make*, was also moving to a closer position: but not till the seventeenth century was it certainly [ɛː]; after that it moved to [eː] and eventually became [eɪ] in GB (but the earlier values [ɛː] and [eː] remain in some dialects). Finally in Shakespeare's time the back vowel [ɔː] in *boat* was beginning to move up to the [oː] position, later giving the GB [əʊ] (although remaining as [oː] in some dialects).

Thus it can be seen that all the ME long vowels were subject to change in the period of eModE. On the other hand, the short vowels had not much changed from ME (indeed even from OE) apart from the splitting of OE/ME [ʊ] which generally became unrounded to [ɤ] (> GB /ʌ/) in eModE but remained as [ʊ] after labial consonants, e.g. [ðɤs] but [wʊlf]. There were also lengthenings in open syllables, e.g. OE *bacan* 'to bake' had a short vowel in OE but had become a long vowel by eModE; and shortenings occurred before consonant clusters (*children* had a long vowel in OE which had become short by eModE).

Among consonants, loss of final [g] following a nasal, e.g. [sɪŋg] > [sɪŋ] produced a new contrast between /n/ and /ŋ/, e.g. *sin* vs *sing* and a new phoneme occurred in words where [zj] became [ʒ], e.g. *pleasure* [plezjuːɹ] > [pleʒuːɹ]. Initial consonants in the clusters /wr,kn,gn/ had been lost, e.g. in *write*, *knock*, *gnat*. The sounds [ç,x] represented by the spelling <gh> in words like *night* and *thought* had been lost with lengthening of the preceding vowel (so-called 'compensatory lengthening').

6.5.1 Early Modern English sound system

Vowels

iː,ɪ uː,ʊ
eː oː,ɤ
ɛː,ɛ ɔ,ɔː
a,aː
/eː/ was /iː/ or /ɛː/ in some types of pronunciation
[ə] occurs in unaccented syllables

Diphthongs

əi,əu,iu (or ju),ɛɪ,eu,ou,ɔi,ui.

Consonants

p,b,t,d,k,g,ʧ,ʤ
m,n,ŋ
l,r ([ɹ] except intervocalically [r])
f,v,θ,ð,s,z,ʃ,ʒ,h
j,w ([ʍ] after /h/)

Transcription of eModE Text (Shakespeare, *Macbeth*, Act II, Scene 1)[10]

nəʊ oːər ðə wɤn haːf wɤrld
nɛːtər siːmz dɛːd, ənd wɪkɪd dreːmz əbjuːz

ðə kɤrtɛɪnd sliːp: wɪʧkraft sɛlɪbrɛːts
pɛːl hɛkəts ɒfərɪŋz: ənd wɪðərd mɤrdər,
ələrəmd bəi hɪz sɛntɪnəl, ðə wʊlf,
huːz həʊlz hɪz waʧ, ðɤs wɪθ hɪz stɛlθəɪ pɛːs,
wɪθ tarkwɪnz rævɪʃɪŋ strəɪdz, tuːərdz hɪz dɪzəɪn
muːvz ləɪk ə goːst. ðəʊ sjuːr ənd fɛrm-sɛt ɛrθ
heːr nɒt məɪ stɛps, hʍɪʧ wɛɪ ðɛɪ woːk, fər feːr
ðə vɛrəɪ stoːnz prɛːt əv məɪ hwɛːrəbəʊt,
ənd teːk ðə prɛzənt hərər frəm ðə təɪm,
hʍɪʧ nəʊ sjuːts wɪð ɪt.

Rather than give a modern translation as was done for OE and ME, the Shakespearean text is shown here in the original spelling.[11]

Now o're the one halfe World
Nature seemes dead, and wicked Dreames abuse
The Curtain'd deepe: Witchcraft celebrates
Pale *Heccats* Offerings: and wither'd Murther,
Alarum'd by his Centinell, the Wolfe,
Whose howle's his Watch, thus with his stealthy pace
With Tarquins rauishing strides, towards his designe
Moues like a Ghost. Thou sure and firme-set Earth
Heare not my steps, which way they walke, for feare
Thy very stones prate of my where-about,
And take the present horror from the time,
Which now sutes with it.

6.6 Towards current General British (GB)

6.6.1 Direct evidence

In the centuries following Shakespeare the study of language for its own sake burgeoned. In the seventeenth century the Royal Society was founded and some of its members considered speech a topic worthy of scientific attention. Among these was John Wallis, who wrote a grammar of English, part of which describes the organs of speech and classifies speech sounds (not only for English but at least five other European languages). Another was Bishop John Wilkins who also described the organs of speech and set up a universal system of letters 'to express all those articulate sounds which are commonly known and used in these parts of the world'[12] (he also applied the system to some languages further afield like Chinese and Japanese). Also in the seventeenth century a schoolmaster named Christopher Cooper set up a system of phonetics specifically to teach rules for the pronunciation of English for 'Gentlemen, Ladies, Merchants, Tradesmen, Schools and Strangers'.[13] He provided more specific information about the pronunciation

of English than is to be found in the work of any other writer in this period. Numerous examples are given, e.g. more than three hundred cases of the *-tion* suffix pronounced with [ʃ]; words are listed which have either the same pronunciation with different spellings or the same spellings with different pronunciation; and rules are given for the accentuation of words.

In the eighteenth century the study of language took a different turn: rather than scientific investigation into language, writers were more concerned to prescribe rules for grammar and for pronunciation. The main achievement of the century was the compilation of comprehensive dictionaries, famously that of Samuel Johnson (1755), and, for pronunciation, those of William Kenrick (1773), Thomas Sheridan (1780) and John Walker (1791) (see §7.1 below), the last of which remained in print for over a hundred years. Walker also produced the first systematic study of intonation (1787). At this time and even more in the nineteenth century the emphasis in books on pronunciation changed from its relationship with spelling to rules for delivery, i.e. rhetoric and elocution. This last word figured regularly in the titles of books by three generations of the Bell family, e.g. 'The Elocutionary Manual' and 'The Principles of Speech and Elocution'. But at the same time these books of the nineteenth century represented a considerable advance in the study of English pronunciation. They gave detailed information on almost everything we would expect nowadays including systematic descriptions of word accent and intonation. The chief difficulty with these books is reading the transcription which, before the time of the International Phonetic Alphabet, is often not easily interpretable. Towards the end of the nineteenth century the emphasis changed yet again away from elocution and towards an emphasis on pure observation, e.g. in the works of Henry Sweet and Daniel Jones, who produced the first edition of his pronouncing dictionary in 1917. Much of this work was now directed to foreign learners. In the twentieth century, phonetics finally came of age with the establishment of departments of phonetics at universities in London, Leeds and Edinburgh, with the production of increasingly sophisticated instruments and finally with the arrival of the digital computer.

6.6.2 *Changes since Shakespeare*[14]

(1) At least in the dialect that was taken as standard, <r> was pronounced in all positions from OE right through to eModE. So *bird* and *beer* were pronounced [bɪɹd] and [biːɹ]. The type of /r/ pronounced had probably been a trill or a tap in OE and ME. There is some indication that this type of /r/ had weakened to a fricative or an approximant in eModE, particularly in final position. In the seventeenth century /r/ disappeared in non-pre-vocalic positions producing the situation largely as it is in GB today. This produced new diphthongs [ɪə], [eə] (later [ɛː]), [ɔə] (later [ɔː]) and [ʊə]; and also produced [ɜː] in *fern*, *bird* and *burn*.

(2) The Great Vowel Shift was completed, probably in the seventeenth century, so the final elements of the change were filled in: [ɛː] was raised to [iː] and

feet and *feat* were then pronounced the same. The diphthongisation of ME [iː] and [uː], which had become [əɪ] and [əʊ], was continued to the wide diphthongs they are today, i.e. *tide* and *mouth* became [taɪd] and [mɑʊθ]. Part of the Great Vowel Shift also saw ME [aː] raised eventually to [eː] and later to GB [eɪ].

(3) The splitting of ME [ʊ] which had begun in eModE continued with most words developing a half-open vowel [ʌ] but most words which had a preceding labial remaining as [ʊ], cf. *cut* [kʌt] vs *bush* [bʊʃ]. In the twentieth century the quality of [ʌ] moved forward to give its present value in GB.

(4) Some words which had ME [ɛː] (now spelt <ea>) and ME [oː] (now spelt <oo>) were shortened. ME [ɛː] > GB /e/, e.g. *breath*, *death*, *head*, and ME [oː] > GB /ʊ/, e.g. *good*, *book* or in a few cases /ʌ/, e.g. *blood*. The first change ([ɛː] > [e]) must have occurred before the GVS was completed, while the second ([oː] > GB /ʊ/ or /ʌ/) was evidently later.

(5) In the eighteenth century the vowel [a] was lengthened and retracted before voiceless fricatives and nasals, e.g. *path*, *fast*, *after*, *dance* becoming GB [pɑːθ][fɑːst][ɑːftə][dɑːns].

(6) Also in the eighteenth century short [a] was rounded to [ɒ] following a [w] and when not followed by a velar, e.g. in *wasp*, *swan*, *what*, *quality* (cf. *swagger*, *wax*).

(7) In the nineteenth century [eː] and [oː] were diphthongised to [eɪ] and [oʊ], the latter becoming /əʊ/ in current GB, e.g. in *gate*, *main*, *boat*, *home*.

(8) The ending <-y> in *city*, *ability*, *unfortunately*, etc., which in Shakespeare rhymed with words like *die* (i.e. it appeared to be part of the ongoing GVS) had reverted to long [iː] in Sheridan's (1780) and Walker's dictionary (1791) and, being commonly shortened to [i] in its final post-stress position, then fashionably became [ɪ] in the nineteenth century. In the last sixty years it has reverted to [i] again, which is the form generally given in the pronouncing dictionaries.

6.7 Overview of changes from OE to current General British (GB)

6.7.1 Categorical change, gradual change and variation

The [ɛː] of *meat* became [iː] in the seventeenth century. It might be assumed that this change was gradual. Evidence, however, suggests that the change [ɛː] > [iː] may not have been either simple or gradual, but that two pronunciations existed side by side for a long period (the conservative [ɛː] beside another form [iː] which had resulted from an early coalescence with the *meet* vowel). In other vowel changes, though the change probably was gradual, it is difficult to date precisely the stages of development. The change from [iː] to [aɪ] in *time* probably involved a gradually widening diphthong, but it is difficult to date the change to [əɪ] and then to [aɪ], though the [əɪ] pronunciation was current in Shakespeare's time.

At any particular date there were a number of different, co-existent, pronunciations, not only between regions but also between generations and social groups. A present-day example of such variation in Modern English is again provided by the vowel at the end of words like *city*, which in the south of England has progressively become [i] over approximately the last sixty years so that fewer and fewer speakers have [ɪ].

6.7.2 Vowel changes

The main vocalic changes in the development from Old English to present-day General British (GB) were:

(1) OE rounded front vowels [yː,ʏ] were lost by ME (following even earlier loss of [øː,œ]).
(2) Vowels in weakly accented final syllables (particularly in suffixes) were elided or obscured to [ə] or [ɪ] in ME or eModE.
(3) All OE long vowels closed or diphthongised in eModE or soon after.
(4) Short vowels have remained relatively stable. The principal exception is the splitting of ME [ʊ] into [ʌ] and [ʊ], the latter remaining only in some labial and velar contexts.
(5) ME [a] was lengthened and retracted before [f,θ,s] in the eighteenth century.
(6) The loss of post-vocalic [r] in the eighteenth century gave rise to the centring diphthongs /ɪə,eə,ɔə,ʊə/ (later /ɔə/ had merged with /ɔː/ by 1950 and /eə/ became /ɛː/ by 2000). The pure vowel /ɜː/ arose in the same way and the same disappearance of post-vocalic [r] introduced /ɑː,ɔː/ into new categories of words, e.g. *cart*, *port*.

Table 2 summarises the principal isolated vowel changes, in accented syllables, from OE to GB.

Table 2 Principal isolated vowel changes from OE to GB.

	Old English (OE)	*Middle English (ME)*	*Early Modern English (eModE)*	*General British (GB)*
time	iː	iː	əɪ	aɪ
sweet	eː	eː	iː	iː
clean	æː	ɛː	eː	iː
stone	ɑː	ɔː	oː	əʊ
name	ɑ	aː	ɛː	eɪ
moon	oː	oː	uː	uː
house	uː	uː	əʊ	aʊ
love	ʊ	ʊ	ɤ	ʌ

6.7.3 Consonantal changes

The main consonantal changes from OE to present-day General British (GB) were:

(1) Certain consonant clusters ceased to be tolerated, e.g. /hl,hr,hn/ by ME and /kn,gn,wr/ in the eModE period.
(2) New phonemes emerged, e.g. [v,ð,z], medial allophones of /f,θ,s/ in OE, became contrastive when words like *effort*, *ethic* and *passage* were imported from French with medial /f,θ,s/. In eModE the new phonemes /ŋ,ʒ/ arose, the one from coalescence of [zj] as in *vision* and the other from loss of [g] following [ŋ] producing a contrast between *sin* and *sing*.
(3) Post-vocalic [x] and [ç] (allophones of /h/ in OE and ME) in words like *brought* and *right* were lost in eModE (with compensatory lengthening of the preceding vowel).
(4) eModE /r/ has been lost in positions where it was not before a vowel, e.g. in *part*, *born*, *beard*, *fern*, apart from (mainly rural) areas of the south-west and north-west England and in Scotland.

Notes

1 Runic was used on inscriptions in England around two hundred years earlier than Latin-based spellings. The pronunciation of runes has been separately established.
2 Chaucer, Prologue to Canterbury Tales, line 151–2.
3 Chaucer, Prologue to Canterbury Tales, line 78.
4 Chaucer, The Manciple's Prologue, line 95, where it rhymes with 'us we carry'.
5 E.g. Cirencester (Gloucestershire) had become [ˈsɪsɪtər] or even [ˈsɪstər] but has now generally reverted to [ˈsaɪrənsestə].
6 Translation from Latin around AD 1000. See Bright & Harris (1906: 78). The companion website has a reading of this OE text.
7 Chaucer's pronunciation is late ME and represents London speech, but many details remain uncertain. It is not at all a direct descendant of the West Saxon exemplified in §6.3.1. The companion website has a reading of this ME text.
8 See particularly Dobson (1957).
9 This shift plays a major part in making Chaucer in its original pronunciation largely unintelligible to present-day listeners while Shakespeare is not so. Indeed Shakespeare's plays are sometimes performed in the original pronunciation—see http://originalpronunciation.com and Crystal (2005).
10 The companion website has a reading of this eModE text.
11 Text from first folio, 1623.
12 Wilkins (1668: 383).
13 Cooper (1687: Preface).
14 For details about the direct evidence and the chronology of changes, see MacMahon (1998).

Chapter 7

Standard and regional accents

7.1 The emergence of a standard

In the three centuries after the Norman conquest official business was conducted in either Latin or French. There were accepted written standards in both languages. Classical Latin was that of Cicero and Horace; French was at first Norman French but later became that of the French court in Paris. Until the latter half of the fourteenth century English was very much the speech of the lower classes and little of it was written. But from then on English started to replace French in many areas and over the next four centuries a standard written English emerged (particularly in spelling and grammar), codified eventually by grammarians in the eighteenth century.[1]

Although written English gained ground rapidly in the fifteenth century, any writing which commented on the spoken language did not appear until the sixteenth century, when one type of regional speech began to be said to have prestige. It was London and the speech of the monarch's court which was held up as the dialect to be imitated.[2] John Hart noted in 1570 that it is 'in the Court and London . . . where the general flower of all English country speaches are chosen and read . . . for that unto these two places, do dayly resort from all towns and countries, of the best of all professions'.[3] Around the same time George Puttenham (1589) gives advice about language to poets recommending:

> the usual speech of the Court, and that of London and the shires lying about London within 60 miles and not much above . . . Northern men, whether they be noblemen or gentlemen, or of their best clerks, [use an English] which is not so courtly or so current as our Southern English is.[4]

But there follows a hint that this form of speech may nevertheless sometimes be used in other areas of England: 'in every shire of England there may be gentlemen and others that speak . . . as good Southern as we of Middlesex or Surrey'. So there is the suggestion that courtly speech has to some extent spread as a national standard.

Throughout the seventeenth and eighteenth centuries the speech of London and its court are held up as the acme of pronunciation. Price (1665),[5] for

example, gives rules 'whereby any outlandish or meer English man, woman, or child, may speedily attain to the exact spelling, reading, writing, or pronouncing of any word in the English tongue'. Writing 'to the ingenious student' he says: 'All grammars are rules of common speech; yet I have not been guided by our vulgar pronunciation but by that of London and our universities'. In the eighteenth century the influence of the court begins to be criticised and at the same time there begins an interest in codifying the pronunciation of English. In a letter to his patron, Swift complains that 'the Court which used to be the standard of propriety and correctness of speech, [is now] the worst school in England for that accomplishment'. He wants to set up a society 'made up of such persons, as are generally allowed to be best qualified for such a work, without any regard to quality, party or profession'. He hopes his patron himself will be part of it. He says that 'the persons who are to undertake this work will have the example of the French [the Académie Française] before them to imitate where these have proceeded right and to avoid their mistakes'.[6] Nothing came of this, and despite Swift's criticisms, the court continues to be held up by some as the model for polite speech. Sheridan asserts that 'the pronunciation of English, as used by people of the best taste at court is so perfect that there are few of our words capable of improvement'.[7] But there was in the eighteenth century a greater concern with correctness in grammar rather than in pronunciation. Not till the end of this century did pronunciation become centre stage.

Johnson in his dictionary (1755) had intended to give guidance on the pronunciation of words, but this obviously added too much to what was already a massive burden (it took him nine years to compile) and in the end he gave little guidance on pronunciation. While Johnson's dictionary was the first comprehensive dictionary to deal with definitions (previous ones had often limited themselves to hard words), Kenrick (1773) and Walker (1791) filled the pronunciation gap left by Johnson; both attempted comprehensive pronouncing dictionaries. Walker was conscious of the need to choose his model of pronunciation carefully. In the Preface he states that 'custom [= usage] is the sovereign arbiter of language' but, he asks, 'what is this custom to which we must so implicitly submit?' No one had ever suggested wholly relying on 'the usage of the greater part of speakers, good or bad'. Should it, he says, be based on the speech of the majority in colleges and schools, together with those in the learned professions? Or should it be based on the speech 'of those who, from their elevated birth or station, give laws to the refinements and elegancies of a court?' But

> neither a finical pronunciation of the court, nor a pedantic Graecism of the schools, will be denominated respectable usage till a certain number of the general mass of speakers have acknowledged them; nor will a multitude of common speakers authorise any pronunciation which is reprobated by the learned and polite.

To conclude 'those sounds, therefore, which are the most generally received among the learned and polite, as well as the bulk of speakers, are the most

legitimate'.[8] This comes very near to recommendations in the twentieth century to attend to the actual usage of educated speakers.

In the last quotation in the previous paragraph there occurs the phrase 'generally received' and this recurs on other occasions in Walker's Dictionary. And the word 'received' eventually comes to dominate for a long time the idea of a model for British pronunciation.

7.2 Early uses of 'received' and 'received pronunciation'

'Received' as an adjective is little used nowadays being only commonly heard in a few set phrases, notably 'received wisdom and 'received opinion'. But its wider use goes back to at least before Shakespearean times. Among others the OED records 'received form' (1542) and 'received custom' (1597), Walker's use (1791) is the first time it is used with reference to pronunciation and he uses it with reference to the pronunciation of words to be transcribed in his dictionary; there is as yet no idea of a standard system. In the hundred years or so after Walker (whose dictionary itself continued to be reprinted for all that time) there were numerous manuals of elocution published in England (directed at those engaged in public speaking or acting) which talk of southern and northern speech but certainly have no concept of a standard pronunciation. Nor does the use of the word 'received' applied just to individual sounds or words seem to become any more common; it is not used at all in any of Alexander Melville Bell's numerous publications (e.g. 1849). But Alexander Ellis tells us that

> in the present day we may, however, recognise a received pronunciation [note no use of capitals] all over the country, not widely differing in any particular locality, and admitting a certain degree of variety. It may be especially considered as the educated pronunciation of the metropolis, of the court, the pulpit and the bar. But in so far as all these localities and professions are recruited from the provinces, there will be a varied thread of provincial utterance running through the whole.[9]

Two things should be noted about this statement: (1) there is still the reference to the court, and (2) it is accepted that there will be a regional element in the received pronunciation. Despite other occasional uses of the phrase 'received pronunciation' there is no systematic description of any type of standard pronunciation alongside the minutely detailed descriptions of very many dialect areas. Henry Sweet, who was the direct successor to Bell and Ellis, does not apparently use the term 'received pronunciation' at all nor does he attempt to set up any preferred model of English. But in his *Primer of Spoken English* he displays an ambiguous attitude to the idea of a standard:

> I must disclaim any intention of setting up a standard of spoken English. All I can do is to record those facts which are accessible to me—to describe

> that variety of spoken English of which I have a personal knowledge, that is, the educated speech of London and the district round it—the original home of Standard English both in its spoken and literary form.[10]

7.3 Daniel Jones, the BBC, RP and GB

The impetus for codifying something that is considered a standard system of pronunciation seems to have come from the increased interest in teaching English as a foreign language, plus the increased interest in spoken language resulting from the spread of literacy in elementary education. The journal *Le Maître Phonétique*, founded in 1886 (in the first three years called *Dhi fonétik tîtcer* and now the *Journal of the International Phonetic Association*) was prominent in this development. Daniel Jones became its editor in 1906 and was to dominate phonetics in England for the next half century. Three books by Jones, first published early in the twentieth century but all remaining in print in various later editions throughout the century, established the term 'Received Pronunciation' or 'RP' as representing standard spoken British English.[11] But it is also worth noting that Jones declared: 'I wish it to be understood that other types of pronunciation exist which may be considered equally good'.[12] Nevertheless Jones's books, particularly the *English Pronouncing Dictionary* and the *Outline of English Phonetics*, were regarded as the standard books from the 1920s to the 1960s and hence RP was the term used regularly to describe standard British English pronunciation. Most other books in these years promulgated a similar standard and generally called it RP.

The largest reason for the spreading of a standard pronunciation in the early twentieth century was the beginning of broadcasting by the BBC in 1926 with its formidable head John Reith, who was much concerned with prestige in that respect. The Advisory Committee on Spoken English, which he set up, had two phoneticians on it, Daniel Jones and Arthur Lloyd James, who managed to persuade it to adopt a relatively tolerant attitude. So even Reith himself in the Foreword to the Committee's first publication wrote: 'There has been no attempt to establish a uniform spoken language . . . The policy might be described as that of seeking a common denominator of educated speech'.[13] The BBC has never explicitly advocated a standard such as RP. 'In the early years of broadcasting, the announcers and newsreaders heard on the BBC spoke with an RP accent but this was a by-product of the restricted social group from which BBC employment was drawn, rather than a matter of deliberate policy.'[14] Nevertheless the BBC played a huge part in the promulgation of that accent described in Jones's books as RP.

The claim that only 3 per cent of the population of Britain use an RP accent is regularly made in the literature, usually without any attribution or evaluation.[15] The figure of 3 per cent may be correct if a dated version of RP is used as the model and if not one single regional feature is allowed. But even a figure as low as 3 per cent is almost certainly higher than that for any other established variety,

and no other accent is so widely spread (hence appropriate for foreign learners). Speakers of any dialect rarely regularly speak the broadest forms of their local accent and any modifications are usually towards RP. All this means that RP represents the 'common denominator' in many varieties of regional English, although, as is indicated below, the term General British (GB) is now preferred.

7.4 'Modern RP'

In the latter half of the twentieth century the type of pronunciation represented as RP changed considerably (even in public schools). Newsreaders and other regular broadcasters before the 1960s sound noticeably different from their current equivalents (even if those with obviously regional pronunciations like Scottish English are excluded).[16] The same applies to (ex-)army officers of that period. At the same time, with the advent of universal secondary education in 1944 and a huge expansion of tertiary education between the 1970s and the 1990s, the difference in pronunciation habits between those in public schools and other types of secondary education was considerably reduced. So we get a modern type of pronunciation used by a wider range of people and specifically called 'Modern RP' by some writers.[17]

The existence of Modern RP has remained unacknowledged by some in using the term RP only to refer to the older type of pronunciation, one which lingers mainly in the speech of some older people. To such people RP remains regarded as class-ridden, outdated and limited to a small minority in southern England. One scholar writes: 'Since the late twentieth century, Received Pronunciation has been gradually lessening in social prestige, and is no longer used by many members of the social and professional groups with which it was traditionally associated.'[18] A BBC Radio 4 programme in 2011 was called 'RP, RIP?', in which RP was represented as upper-crust and dying.[19] Those who take this attitude probably have the sound of what we will in this book call Conspicuous General British (CGB) in their mind, a really 'posh' variety limited now mainly to some elderly people.

Alongside speakers of Modern RP there are also an increasingly large number of people who have this accent with the admixture of a limited number of regional features (e.g. /a/ in words like *after* and *dance* in northern England). This was called Regional RP in earlier editions of this book and will now be referred to as Regional General British (RGB). When a number of features are admixed into GB from the popular speech of the London area the resultant type of RGB is often referred to as Estuary English (see §7.12.3).

7.5 Other names for RP

It will be gathered from the above that RP is not dead but very much alive, provided we understand by RP the successor to that accent described as RP in the middle of the twentieth century. But it remains true that many people,

laymen, linguists and phoneticians, object to the term in a variety of ways: either it is posh, it is an imposed standard, it is too regionally limited, or it is outdated. If we accept that the accent we are describing is one which we feel should continue to be the standard, can we call it something better than RP?

In the past the terms Oxford English and the Queen's (or King's) have been used. If, at some stage in the past, or ever, Oxford people, or just Oxford academics, spoke unadulterated RP, it is certainly not true now (as can be readily heard if we listen to various Oxbridge dons presenting series on British television). Although the present Queen's English has changed considerably during her reign, at the moment it still tends towards what in previous editions of this book was called Refined RP.

The term BBC English is used in recent editions of the *Cambridge English Pronouncing Dictionary*, the Introduction to the fourteenth edition of which states:

> The time has come to abandon the archaic name Received Pronunciation. The model used for British English is what is referred to as BBC English; this is the pronunciation of professional speakers employed by the BBC as newsreaders and announcers on BBC1 and BBC2, the World Service, and BBC Radio 3 and Radio 4.

It goes on to say that the accent is typical of broadcasters with an English accent (i.e. as opposed to Scottish, Welsh, or Irish). Given such restrictions the statement may be weakly true although there are some newsreaders and announcers who are English but have some regional characteristics. Moreover the Introduction to the *CEPD* goes on to say: 'Their speech does not carry for most people the connotations of high social class and privilege that RP and PSP [= Public School Pronunciation] have had in the past'. Thus the editors seem to be saying the accent they are describing is not RP, which is apparently still equated with PSP. Similarly it was recently written: 'The great majority of native speakers [of RP] . . . are educated at private schools and it is a misnomer to call it an accent of British English'.[20] The RP in these quotations evidently refers to an older type of RP. The fact that the last quotation was based on the speech of a 50-year-old woman educated at a preparatory school, a grammar school and Oxford University confirms this, as do the vowel diagrams in the article: /a/ is not lowered and /u:/ is not fronted as they are in a modern, evolved form of RP.

What of Southern British, or Standard Southern British? It is true that the speech of south-east England is nearest to the standard described in this book, but what about central-southern or south-western England, where a 'pre-consonantal /r/' extends quite a way up the educational scale particularly in rural areas and is certainly not 'pure' RP. Moreover the main point about the variety we are describing is that it is not geographically limited: there may be more pure speakers of this variety in south-east England but there are a lesser number in all regions of Britain and even in those areas the influence of the variety is enormous.

However, despite many attempts to say that RP has evolved and includes considerable variation within it, non-phoneticians and even some British linguists and phoneticians, persist in identifying RP as a type of posh, outdated, falsely prestigious accent spoken, for example, by various senior members of the Royal family (e.g. Prince Charles, but compare Prince Harry's much more modern pronunciation). Because of this narrow use by many of the name RP, and the frequent hostility to it, the name of the accent described in this book has been changed to General British (GB). But it has to be made clear that, compared with previous editions of this book, it is not a different accent that is being described, but an evolved and evolving version of the same accent under a different name.

7.6 General British (GB)[21]

In considering what term would be best as a replacement for RP, it has to be noted that Gimson himself commented on the prospect of our eventual arrival at the present situation. In the third edition of this book (Gimson, 1980: 303) he remarked that 'General British' (GB) 'has been used and may in time supersede . . . RP'. It is now indeed to be preferred, paralleling General American and its abbreviation GA. The first time the term General British was used, at least in a serious publication, was in Windsor Lewis (1972). In the introductory section called 'The design of the dictionary' the author says:

> this dictionary excludes any British pronunciations which are associated specifically only with a public boarding-school or any socially conspicuous background . . . This most general type of educated British pronunciation . . . is described fully in . . . Gimson's . . . *Pronunciation of English*. [General British is] a welcome avoidance of the less than happy, archaic-sounding term 'Received [Pronunciation]'.[22]

Maidment's *Speech Internet Dictionary* (2012) has the entry 'General British English' and describes it as

> The British accent whose varieties are least associated with any specific areas of Great Britain. It is the most frequent model employed in the teaching of British English as an additional language. It is also known by various other names including BBC English, and Southern (Standard) British English and, very widely but decreasingly often, Received Pronunciation.

The eighth edition of the *Oxford Advanced Learner's Dictionary* says 'The British pronunciations given are those of younger speakers of General British. This includes RP (Received Pronunciation) and a range of similar accents which are not strongly regional'.[23] To complete the full endorsement of these sentiments the term General British (GB) is now used in this book. Besides south-eastern

England there are lesser numbers of speakers of GB in south-west England, in the north of England, in Wales and in Scotland (it is not difficult to hear local speakers of GB in Cardiff and Edinburgh). There are an even larger number of speakers of Regional GB (i.e. GB with a small admixture of local characteristics) in all these areas. Ireland probably has fewer GB speakers (but Britain is not normally taken to include Northern Ireland).

7.7 Conspicuous General British (CGB)[24]

CONSPICUOUS GENERAL BRITISH (CGB) is that type of GB which is commonly considered to be 'posh', to be associated with upper-class families, with public schools and with professions which have traditionally recruited from such families, e.g. officers in the navy and in some army regiments. But the number of speakers of CGB, even in these areas, has considerably declined in the last fifty years and is now mainly limited to older speakers. For many other speakers, both of GB and of regional dialects, a speaker of CGB is often regarded as affected and a figure of fun. Particular characteristics of CGB are the conspicuous use of the vowel /ɪ/ finally in words like *city*, *happy*, *fully*, etc. (though this also occurs in some dialects) and of a very open word-final /ə/ (and where [ə] forms part of /ɪə/ and /ʊə/) in words like *bitter*, *here*, *sure*. The vowel /ɜː/ is also pronounced very open, this time in all positions (e.g. in *burn*, *occur*, *certain*). The vowel /a/ is often diphthongised as [ɛə] (e.g. in *mad*, *matter*) and /əʊ/ as [ɐ̈ʊ] (e.g. in *bone*, *open*, *window*) (though this last refinement has never been as widespread or persisted as long as the others). A common factor in most of these vowels is that the tongue and jaw positions are more open than in mainstream GB. Among consonantal pronunciations the maintenance of /tj,dj,sj/ in words like *tube*, *duty* and *suit* is notable.

7.8 Regional General British (RGB)[25]

Attempts in the early history of the BBC to use announcers who had even a mild regional accent used to provoke protests even from the region whose accent was used. But increasingly nowadays we hear speech which is GB with the inclusion of regional markers. We call such hybrids REGIONAL GENERAL BRITISH (or RGB). Although we choose for convenience to use two distinct categories of RGB on the one hand and a regional accent on the other, in practice there is a gradient between the two. But all types of RGB have something in common; they all contain a large proportion of GB features.

Compared with Conspicuous General British (CGB), Regional General British (RGB) reflects regional rather than class variation and will vary according to which region is involved. Hence, strictly speaking, we should talk of RGBs in the plural. Yet it is useful to have such a term as RGB to describe the type of speech which is basically GB except for the presence of a few regional characteristics which may well go unnoticed even by other speakers of GB. For

example, vocalisation of dark [ɬ] to [ʊ] in words like *held* [heʊd] and *ball* [bɔʊ], a characteristic of London Regional (and some other southern accents), now passes virtually unnoticed in an otherwise fully GB accent. Or, again, the use of /a/ instead of /ɑː/ before voiceless fricatives in words like *after*, *bath* and *past* (part of the Northern English accent within England) may be likewise acceptable in an RGB. But some other features of regional accents may still be too stigmatised to be describable as GB, e.g. realisation of /t/ by a glottal stop word-medially between vowels, as in *water* (in broad London speech) or the lack of a distinction between /ʌ/ and /ʊ/ (in much of the north of England). Even these two examples are becoming much less stigmatised than they were.

Special mention must be made of London RGB, because, under the name of 'Estuary English', it has provoked much discussion in the press. The vocalisation of dark [ɬ] to [ʊ] has already been noted as one of the features of this form of RGB. The name Estuary English was first used because such a pronunciation was thought to have spread outwards from London along the Thames Estuary into Essex and North Kent. But claims have been made that this type of pronunciation has spread not only into areas all around London (i.e. the 'Home Counties') but also into urban areas remote from London, e.g. Norwich, Bristol, Hull, Manchester, Liverpool, Newcastle and Glasgow. If this should be confirmed, Estuary English would be competing with the RGBs of these cities.[26] Estuary English is said to be being adopted by those wishing to avoid the stigma of GB as 'posh' and by upwardly mobile speakers of local accents. It is often characterised among younger speakers as having 'street credibility' or 'streetcred' or being 'cool', i.e. as being fashionable. The phonetic features of Estuary English are discussed further in the section on London English below (§7.12.3).

CGB and RGB are not accents with precisely enumerable lists of features but rather represent clusterings of features, such clusterings varying from individual to individual. Thus there are not categorial boundaries between the three types of GB; a speaker may, for example, generally be a GB speaker but have one noticeable feature of CGB. And the concept of RGB reflects the fact that there is nowadays a far greater tolerance of accentual variation in all walks of life, although only certain types of regional dilution of GB are generally acceptable.

7.9 GB and foreign learners

GB (often under its former name of RP) has traditionally been the type of pronunciation taught to learners of British English as an L2 and that most commonly described in reference books like this one and in textbooks and dictionaries on the pronunciation of British English. But it has to be recognised that the role of British English in the English-speaking world has changed very considerably in the last century. It has been estimated that 750 million people now speak English as a first or second language and a further 750 million learn it as a foreign language;[27] of this number native speakers of British English form only a very small proportion. At least 150 million use English in varying ways as an official

language and in these cases it is usually a form of local pronunciation of English which predominates (e.g. in India). However, despite the discrepancy in numbers, GB continues for historical reasons to serve as a model in many parts of the world; if a model is used at all, the choice is still effectively between GB and General American (GA) or some amalgam or 'cut-down' version of either or both (see §§13.2.3 and 13.4). Some sort of model based primarily on GB is more common than one based on GA; some form of British English is generally the target in Europe, in Africa, in the Indian subcontinent and increasingly in other parts of Asia and in South America. In Chapter 13 some suggestions are made about the way in which the pronunciation of GB may be adapted to suit local and international needs.

7.10 Recent changes in GB

In this section we survey changes in GB which have begun approximately in the last fifty years but which a number of speakers, either small or large, have not yet embraced. The decision to regard a change as 'almost complete', 'well established', or 'recent trend' is largely based on the judgement of phoneticians although collected data is referred to wherever it exists.

7.10.1 Changes almost complete

This involves pronunciations which are now typical of almost all speakers of GB:

(1) The distinction between /ɔː/ and /ɔə/ is lost, e.g. *paw* and *pour* (or *pore*) are pronounced the same and usually as [ɔː].
(2) /j/ is lost before /uː/ following /l,s,z/, e.g. *luminous*, *suit and exhume* are /ˈluːmɪnəs/, /suːt/ and /ɪgˈzuːm/.
(3) /r/ is realised as a post-alveolar approximant in all positions and not, as formerly, as a tap [ɾ] in intervocalic positions following an accented syllable, e.g. *very* and *error* are pronounced as [veɹi] and [eɹə] rather than [veɾi] and [eɾə].
(4) /əʊ/ is now regularly realised as [əʊ] rather than the older realisation as [öʊ], e.g. *over*, *boat* and *comb* as [əʊvə], [bəʊt], [kəʊm] rather than [öʊvə], [böʊt], [köʊm].
(5) /tj,dj/ are regularly changed to /ʧ,ʤ/. The change has been established longer in unaccented syllables, e.g. *culture* [kʌlʧə], *soldier* [səʊlʤə], than in accented syllables, e.g. *tune* /ʧuːn/, *endure* [ɪnˈʤʊə].

7.10.2 Changes well established

This section describes pronunciations which are now typical of the majority of speakers of GB:

(1) The vowel in *bad, land, amateur* is lowered from [æ] to [a], i.e. it is close to C.[a], e.g. in *mad, rat, flank, bang* and *cap.* In this way it has become closer to the vowel used in such words in the north of England (see §7.12.4.) although it retains greater length than the northern vowel.[28] This change is reflected in the changed phonemic transcription used in this book, i.e. from /æ/ to /a/. Retention of the [æ] quality is a marker of CGB.

(2) /ʊ,uː,ʊə/ are fronted to [ʉ,ʉː,ʉə],[29] e.g. *good* [gʉd], *soon* [sʉːn], *cure* [kjʉə] including when /ʊə/ is used rather than /ɔː/, e.g. *poor* [pʉə]. The fronting will in many cases be accompanied by unrounding giving [ɨ,ɨː], e.g. [gɨd], [sɨːn], [kjɨə]. This fronting (and unrounding) of [ʊ] may also occur in /əʊ/, e.g. *boat* [bəʉt] or [bəɨt].

(3) The final vowel in words like *city, happy, flabby, witty, daddy, lackey, sparky, baggy* now has the quality [i] rather than [ɪ], which is now a marker of CGB. Recent editions of pronouncing dictionaries transcribe this with /i/[30] without length marks, indicating that this final /i/ is shorter than /iː/ (and not subject to diphthongisation), cf. the final vowel in *city, possibly, chilly* [ˈsɪti] [ˈpɒsɪbli] [ˈʧili] with that in *settee, jubilee, pedigree* [seˈtiː] [ʤuːbɪˈliː] [ˈpedɪgriː]. In the transcription used in this edition /i/ is enclosed in slant brackets to draw attention to the recent change; but in the description of vowels it is treated as an allophone of /ɪ/.

(4) Former [eə] becomes monophthongal [ɛː], e.g. *fare* and *tear* as [fɛː] and [tɛː]. This is reflected in the revised phonemic transcription of /ɛː/ in the present edition rather than /eə/ in earlier editions.

(5) /t/ pre-consonantally becomes [ʔ], e.g. not *very* [nɒʔ veɹi], although such glottalisation is not acceptable before /l̩/, e.g. *little* [lɪʔl̩] is inclined to be stigmatised.[31]

(6) /j/ following /n/ is increasingly lost,[32] *news* [nuːz], neuter [nuːtə]. This may be under the influence of popular London or of American where it is already standard.

(7) /ʒ/ is increasingly used in imports where formerly they were anglicised to /ʤ/, e.g. *beige, rouge, adagio, management, gigolo, genre.*

(8) /ɔː/ may be used in place of /ʊə/ in some, particularly monosyllabic, words, e.g. in *sure, poor, cure, moor, tour.* This change is lexically conditioned: some words, like monosyllabic *pure* as well as non-monosyllabic *curious, puerile, endure* and *secure*, are less likely to have /ɔː/ while in others it is impossible, e.g. in *dour, gourd, lure, Ruhr* and *Ure.* It is also impossible in words derived from /uː/ plus a suffixal /ə/ like *doer, fewer, newer, two-er, viewer, sewer* (although, strictly speaking, this last is not analysable into root morpheme plus suffix). Use of /ʊə/ or /ɔː/ is highly idiosyncratic and shows no sign of obliterating the phoneme /ʊə/. Spelling may influence the choice so that *pure* is [pjʊə] while *poor* is [pjɔː] or [pɔː].

(9) A 'checking' high rise is used on declarative sentences in conversational narratives, where some form of fall would previously have been expected, e.g. (the mark ˊ indicates the high rise) 'I was at Heathˊrow yesterday.

They've got a new duty-'free shop'. This was a new trend in Australia and New Zealand some fifty years ago and perhaps even before that in parts of the U.S. How it has spread to Britain in the last twenty-five years is a matter of some dispute; suggested strong influences have been the high number of Australasian shop assistants in London and the popularity of Australian soap operas on British television. It remains to be seen whether an intonational practice of this sort becomes more widespread and whether it is permanent.

7.10.3 Recent trends

This section describes pronunciations which are now heard in GB but are not yet typical of a majority of speakers:

(1) /ɪə/ /ʊə/ are realised as [ɪː] and [ʊː], e.g. *beer* [bɪː], *sure* [ʃʊː]. The latter change intersects with the replacement of /ʊə/ by /ɔː/ (see §7.10.2(8)).
(2) /r/ is realised with no upward curl of the tongue tip, i.e. /r/ = [ʋ] or [ɰ], *red* as [ʋed] or [ɰed]. This has been described as one of the features of Estuary English, but it seems more likely that it is general tendency within GB and not something particularly typical of the London area.
(3) /e/ is lowered, following the lowering of /a/ (see §7.10.2(1)). i.e. it is being 'pulled' downwards'.[33]
(4) [ə] plus a non-syllabic consonant is used where previously a syllabic consonant has been the norm (and where the use of the [ə] was considered babylike), e.g. *garden* [gɑːdən], *bitten* [bɪtən], *middle* [mɪdəl], *bottle* [bɒtəl].[34]
(5) The vocalisation of dark [ɬ] to [ʊ] is increasingly heard more widely than in just London RGB. It is particularly common after labial consonants, e.g. in *ball*, *field*, *well*, but can certainly be heard following other consonants, e.g. in *deal*, *kill*, *kneel*.
(6) Use of the variant [ɒʊ] of /əʊ/ before [ɬ], e.g. in *goal*, *bold*, *moult*, has now spread so widely that it is reasonable to consider it part of GB, rather than confined to London RGB.

7.11 Systems and standards other than GB and their influence on RGB[35]

Certain types of regional pronunciation are firmly established as alternative standards. Some, especially Standard Scottish English (SSE), have been accepted for at least the last thirty years; others, particularly the popular forms of pronunciation used in large towns, are still often characterised as ugly (e.g. Liverpool or Birmingham) or strange (e.g. Newcastle) by those (especially of the older generations) who do not use them. This remains so even though these accents (often only in a less broad variety) are heard daily on TV and radio. This is a reflection of the social connotations of speech features which, though they have

lost some of their force, have by no means completely disappeared. On the other hand, GB itself (and particularly where there are some features of CGB) can be a handicap nowadays, since it may be taken as a mark of affectation or a desire to emphasise social superiority.[36] Most speakers of GB have themselves become aware of the fact that their type of pronunciation is one which is used by only a very small part of the English-speaking world. An American pronunciation of English, for instance, is now completely familiar in Britain and a 'mid-Atlantic' accent is common in pop-singers. The changing awareness of different English accents has been bolstered by the large number of recent immigrants who speak English with hugely varying competence and a multiplicity of accents.

7.12 Comparing systems of pronunciation[37]

A comparison of pronunciation in two dialects will reveal differences of several kinds (as first discussed in §5.3.5):

(1) SYSTEMIC DIFFERENCES (or differences in the inventory of phonemes)—The system is different, i.e. the number of phonemic contrasts is smaller or greater. The GB contrast between /a/ and /ɑː/ may not be present in Ulster or in Scotland, e.g. *Sam* and *psalm* being pronounced the same. The contrast between GB /ʌ/ and /ʊ/ may not be present in the English of the north of England, e.g. *putt* and *put* are pronounced the same. The presence of /g/ after [ŋ] in such a word as *sing* deprives [ŋ] of its phonemic status in the north-west midlands of England, i.e. [ŋ] then only occurs as an allophone of /n/ before /k,g/ as in *sink*, *sing* which are pronounced as /sɪŋk/ and /sɪŋg/ and there is no minimal contrast between /ŋ/ and /n/ as there is in GB, e.g. between *sin* /sɪn/ and *sing* /sɪŋ/ (see §7.12.4).

(2) DISTRIBUTIONAL DIFFERENCES (or different phonotactic possibilities)—The system may be the same, but the phonetic context in which a phoneme occurs may be limited, e.g. in GB /r/ has a limited distribution, being restricted in its occurrence to pre-vocalic position as in *red* or *horrid* (accents of this sort are called NON-RHOTIC). Others like most American and Scottish accents have a wider distribution of /r/ and are termed RHOTIC. In these accents /r/ occurs pre-consonantally and pre-pausally as well as pre-vocalically, thus *part* and *car* will be pronounced /pɑːrt/ and /kɑːr/ (cf. GB /pɑːt/ and /kɑː/). The distribution of /r/ in this sort of accent more closely reflects the spelling (see §§7.12.1, 7.12.2, 12.4.7). But note also that pre-consonantal /r/ may occur even in GB as a result of elision (see §10.8(1)(b)), e.g. *carol* [karl].

(3) LEXICAL DIFFERENCES (i.e. different phonemes in particular words)—The system may be the same, but the occurrence of phonemes in some words is different and this difference is not simply a consequence of syllable-position as in (2) above. The English of parts of the north of England has the opposition /uː/-/ʊ/ like GB, but nevertheless uses /uː/ in, for example, *book* and *took* (see §8.9.10). Other accents have /ɒ/ and /ʌ/ like GB but /ɒ/ is used

instead of /ʌ/ in, for example, *one* and *among* (see §8.9.6). GB has /ɒ/ in *off*, *cloth* and *cross* but popular London (and indeed CGB) have /ɔː/ (see §8.9.8).

(4) REALISATIONAL DIFFERENCES—The system of contrasts is the same in two dialects but the phonetic realisation of some phonemes is different. The GB opposition between the vowels of *bait* and *boat* is maintained in the English of the north of England, but the realisation of both vowels is monophthongal compared with the diphthongs in GB (see, for example, §7.12.4). Accents of English throughout Britain and Ireland have an /l/ occurring in words like *lesson* and *field* but in most of Ireland and Wales the /l/ is 'clear' [l], while in most of Scotland it is 'dark' [ɫ]; whereas in the south of England it is clear [l] before vowels (e.g. in *lesson*) and dark [ɫ] in other positions (e.g. in *field*).

7.12.1 General American (GA)

The traditional (although not undisputed) division of the United States for pronunciation purposes is into Eastern (including New England and New York City, although the latter has pronunciation characteristics of its own), Southern (stretching from Virginia to Texas and to all points southwards) and General (all the remaining area). General American (GA) can thus be regarded as that form of American which does not have marked regional characteristics (and is in this way comparable to GB) and is sometimes referred to as 'Network English' (just as GB, not entirely justifiably nowadays, is sometimes referred to as 'BBC English'). It is the standard model for the pronunciation of English as an L2 in parts of Asia (e.g. the Philippines) and parts of Latin American (e.g. Mexico).

There are two major areas of systemic difference between GB and GA. First, GA lacks the GB diphthongs /ɪə,ʊə/ and the long vowel /ɛː/ which correspond in GA to sequences of vowel plus /r/, e.g. *beard*, *sure*, *fare*, /bɪrd/, /ʃʊr/, /fer/. This reflects the allied distributional difference between GB and GA, namely that unlike GB, where /r/ essentially occurs only before vowels, GA /r/ can occur before consonants and before pause (GA is rhotic and GB non-rhotic—see §7.12(2)). Second, GA has no /ɒ/. Most commonly those vowels which have /ɒ/ in GB are pronounced with /ɑː/ in GA, e.g. *cod*, *spot*, *pocket*, *bottle*. But a limited subset has /ɔː/, e.g. *across*, *gone*, *often*, *cough*, *orange*, *porridge* (as can be seen from the examples, these frequently involve a following voiceless fricative). Moreover for an increasing number of GA speakers (and most Canadians) not only do GB /ɒ/ and /ɑː/ fall together but /ɔː/ also falls in with this group; for such speakers *cod*, *calm* and *cause* will have the same vowel.

The main difference of lexical occurrence concerns words which in GB have /ɑː/ while in GA they have /a/. Like the change from /ɒ/ to /ɔː/ this commonly involves the context of a following voiceless fricative, or alternatively a nasal followed by another consonant thus GB /pɑːst/~GA /past/, GB /ɑːftə/~GA /aftər/, GB /plɑːnt/~GA /plant/ (in this GA is like much of Northern English—see §7.12.4). Allied to the pronunciation of /r/ in pre-consonantal positions mentioned

in the previous paragraph, there is considerable re-alignment of vowels before /r/, so that *merry* and *marry* (and sometimes *Mary* too) may be pronounced the same while *short* and *sport* may have different vowels (/ɔː/ in the former and [oː] in the latter, corresponding to GB /əʊ/).

Differences of realisation are always numerous between any two systems of English pronunciation and only the most salient will be mentioned. Among the vowels this includes the realisation of the diphthongs /eɪ/ and /əʊ/ as monophthongs [eː] and [oː], hence *late* [leːt] and *load* [loːd]. Among the consonants, /r/ is either phonetically [ɻ], i.e. the tip of the tongue is curled further backwards than in GB, or else a similar auditory effect is achieved by bunching the body of the tongue upwards and backwards (this latter form of /r/ is now intruding into GB);[38] /t/ intervocalically following an accent is usually a voiced tap in GA, e.g. *better* [berə] and may sometimes become [d] producing a neutralisation between /t/ and /d/; and /l/ is generally a dark [ɬ] in all positions in GA, unlike GB where it is a clear [l] before vowels and a dark [ɬ] in other positions (see §9.7.1).

A wholesale change in the realisation of the short vowels in GA is increasingly reported, sometimes called the 'Northern Cities Shift',[39] although it now seems more widely spread than this. The vowel principally affected by this shift is /a/ which becomes closer to [ɛ] or [ɛə], or even [e] or [eə]. This affects both those words like *sad* which have /a/ in GB and those words like *after* where the GA /a/ corresponds to /ɑː/ in GB. In other areas of the U.S. including Columbus, Ohio, and Jackson, North Carolina, short vowels seem to be going in the opposite direction, i.e. /ɪ,e,a/ are lowering and losing a tendency to diphthongisation.[40]

7.12.2 Standard Scottish English (SSE)

There are nowadays taken to be three languages in Scotland: Gaelic, Scots and (Scottish) English. The Northumbrian dialect of Old English spread into the south and east of Scotland at much the same time as it spread through England and has continued in use as present-day Scots. A different type of English was re-introduced from the south of England in the eighteenth century but was subsequently much influenced by Scots; it is this that is now described as Scottish English. Most speakers in Scotland will slightly or considerably vary their style of speech between Scots and STANDARD SCOTTISH ENGLISH according to different situations. The typical vowel system of Scottish English involves the loss of the GB distinctions between /ɑː/ and /a/, between /uː/ and /ʊ/, and between /ɔː/ and /ɒ/. Thus the pairs *ant* and *aunt*, *soot* and *suit*, *caught* and *cot* are pronounced the same. On the other hand there may be a phonemic split corresponding to GB /e/; while most such words have a vowel of an [ɛ] quality, a small group of words have a vowel of an [ɛ̈] quality, e.g. *heaven*, *eleven*, *next*.

SSE also has no /ɪə,ʊə/ because, like General American, it is rhotic and *beard* and *dour* are pronounced as /biːrd/ and /duːr/ (= [dyːɹ]). Similarly GB /ɛː/ (formerly /eə/) is followed by an /r/, so *fare* GB /fɛː/ becomes SSE [feːɹ]). Some speakers will also have different sequences of (short) vowel plus /r/

corresponding to GB /ɜː/ in *bird*, *serve* and *turn*; others have the same r-coloured schwa [ɚ] in such words. Rhoticity in SSE is declining with many speakers now only semi-rhotic (i.e. pre-pausal and pre-consonantal /r/ may be treated differently). Moreover the lexical incidence of vowels before /r/ may not correspond to GB: *short* and *sport* may have different vowels as in GA, *short* rhyming with *caught* but *sport* with *boat*.

The SSE vowels corresponding to GB /eɪ/ and /əʊ/ are typically monophthongal (as in General American), e.g. *gate* and *boat* are [geːt] and [boːt]. Moreover the vowel common to *soot* and *suit* is not like either of the GB vowels in these words, but is considerably fronted to something like [ÿ], hence [sÿt]. More generally there is no systemic durational difference between long and short vowels, as there is in GB.

The chief differences from GB in the realisation of the consonants lies in the use of a tap [ɾ], e.g. *red* [ɾed] and *trip* [tɾɪp], though there is variation between this and [ɹ] (the usual type in GB), the use of [ɹ] being more common in post-vocalic positions and generally more prestigious. The phoneme /l/ is most commonly a dark [ɬ] in all positions, *little* [ɬɪtɬ] and *plough* [pɬaʊ]. Finally, intervocalic /t/ is often realised as a glottal stop (like London below), e.g. *butter* [bʌʔɚ].

7.12.3 London English, Estuary English (EE) and Multicultural London English (MLE)

The most dialectal type of London speech is called Cockney. Unlike the previous two varieties above (General American and Standard Scottish English), Cockney is as much a class dialect as a regional one. In its broadest form the dialect of Cockney includes a considerable vocabulary of its own, including rhyming slang. But the characteristics of Cockney pronunciation are spread more widely through London speech than its vocabulary; this type of pronunciation we henceforth refer to as popular London or broad London. The prevalence of a Cockney pronunciation in London is now much challenged by the growth of what has come to be known as Multicultural London English (MLE), dealt with towards the end of this section.

Unlike the previous two types of pronunciation there are no differences in the inventory of vowel phonemes between GB and popular London and there are relatively few (compared with GA and SSE) differences of lexical incidence. There are, however, a large number of differences of realisation. The short front vowels tend to be uniformly closer than in GB, e.g. in *sat*, *set* and *sit*, so much so that *sat* may sound like *set* and *set* itself like *sit* to speakers from other regions. Additionally the short vowel /ʌ/ moves forward to almost C.[a]. Among the long vowels, most noticeable is the diphthongisation of /iː/ (= [əi]), /uː/ (= [əu]) and /ɔː/ which varies between [ɔʊ] morpheme-medially and [ɔwə] morpheme-finally, thus *bead* [bəid], *boot* [bəut], *sword* [sɔʊd], *saw* [ɔwə]. Broad London speech also uses distinctive pronunciations of a number of diphthongs /eɪ/ = [aɪ], /aɪ/ = [ɑɪ], /əʊ/ = [aʊ] and /aʊ/ = [aː], e.g. *late* [laɪt], *light* [lɑɪt], *no* [naʊ], *now* [naː]. The

last two vowels are close enough to cause considerable confusion among non-London listeners, although the distinction is not usually neutralised. In two cases special allophones are used before dark [ɬ] (which itself = [ʊ]—see below): /əʊ/ = [ɒʊ] and /uː/ = [uː] (is monophthongal compared with the usual [əu]), e.g. *bowl* [bɒʊː], *fool* [fuːʊ]. Before the vocalised form of /l/ there is much neutralisation, e.g. *field* and *filled* as [fɪʊd], *col* and *coal* as [kɒʊ], and *pull* and *pool* as [puʊ]. The use of the [ɒʊ] variant of /əʊ/ is now spreading more widely outside London RGB and may be considered a variant within GB itself.

Among the consonants most notable are the omission of /h/ and the replacement of /θ,ð/ by /f,v/, e.g. *hammer* /ˈamə/, *think* /fɪŋk/, *father* /ˈfɑːvə/. Dark [ɬ], i.e. /l/ in positions not immediately before vowels becomes vocalic [ʊ], e.g. *milk* [mɪʊk], *middle* [ˈmɪdʊ]; /t/ is realised as a glottal stop following vowels, laterals and nasals, e.g. *butter* [ˈbʌʔə], *eat it* [ˈiːʔ ɪʔ], *not that* [nɒʔ ˈðaʔ], *benefit* [ˈbenɪfɪʔ], *belt up* [beʊʔ ˈʌp]; there may be similar replacement of /p,k/ before a following consonant, e.g. *soapbox* [ˈsaʊʔbɒks], *technical* [ˈteʔnɪʔʊ] (in this last word [ʊ] as the realisation of /l/ still counts as a consonant).

Popular London speech has historically been the major influence on the phonetic development of GB[41] and, as has been outlined in section 7.8, London RGB, i.e. a hybrid between GB and broad London, popularly called ESTUARY ENGLISH,[42] is now widely used in south-east England and may be spreading to other urban areas. The phonetic features of London in Estuary English include the replacement of dark [ɬ] by [ʊ], e.g. *field* [fɪʊd]; the glottalisation of /t/ pre-consonantally, e.g. *not that* [nɒʔ ˈðat] and increasingly word-finally before pause and before a following vowel, e.g. *not that* [nɒʔ ˈðaʔ], *eat ice* [iːʔ ˈaɪs]; the use of London-type realisations of the diphthongs /eɪ,aɪ/ and London-type allophones before /l/, e.g. *cold* [kɒʊd], *cool* [kuːʊ].

Other broad London sounds are less likely in Estuary English, e.g. /h/-dropping, monophthongisation of /aʊ/, the wide diphthong in /əʊ/, fronting of /ʌ/, the use of glottal stop for /t/ intervocalically as in [wɔːʔə] and the replacement of /θ,ð/ by /f,v/.

Some other characteristics sometimes claimed for Estuary English appear not to be based in London speech but may be changes more generally in progress in GB: the realisation of /r/ without a tongue tip contact, i.e. [ʋ] or [ɰ], and the replacement of /s/ by /ʃ/ where it is initial in consonant clusters, e.g. *stop*, *stare*, *industry*, *strain*, *obstruct* as [ʃtɒp], [ʃtɛə], [ˈɪndʌʃtri], [ʃtreɪn], [əbˈʃtrʌkt].

One intonational characteristic of London that seems to have spread into Estuary English and even more widely is the use of the 'unknown' tag interrogative. In this the speaker uses an interrogative tag with a falling tone (which usually expects the listener to know enough to agree with the speaker) in cases where the listener clearly has no relevant knowledge, e.g. 'I was woken up at 6.30 this morning; the postman came knocking on the door, didn't he?' (with a falling tone on *did*). Similarly there may be spreading usage of preposition and auxiliary verb accenting, 'I didn't do anything because there was nothing TO do', 'You couldn't have seen me in London because I haven't BEEN in London'

There are many pronunciations which are standard in London RGB but which must be considered as on the verge of being acceptable as part of GB. These include (i) the vocalisation of dark [ɬ] as [ʊ] in many pre-consonantal positions and finally, e.g. *held* [heʊd], *fill* [fɪʊ], *middle* [mɪdʊ], and (ii) the use of [ʔ] for /t/ before an accented vowel or before a pause, e.g. *not even* [nɒʔ ˈiːvn̩], *need it* [ˈniːd ɪʔ]. Before unaccented /ɪ,ə/ use of [ʔ] is still stigmatised as non-GB (and typical of broad London) both intra-word and inter-word, e.g. *water* [wɔːʔə], *got a* [gɒʔə], *that is* [ðaʔ ɪz].[43]

An alternative type of popular London speech has arisen over the last fifty years as a result of the large number of immigrants settling in the city. West Indians (a large number from Jamaica) were the first to arrive in the 1950s, followed by Asians (the largest groups were from the Indian subcontinent and from East Africa, where a large number of Indians had previously settled), followed most recently by those from Eastern Europe. These were the most prominent groups but there were lesser numbers from many other areas including Vietnam, West Africa and the Middle East. So there is now a large ethnic mix in London but it seems to be the West Indians who take the lead in language matters and hence the new accent is often called Jafaican (short for fake Jamaican) or, more academically, Multicultural London English (MLE).[44] But some Asian, African and local London characteristics may be in the mix. Some of the features of this accent are the absence of the fronting of /ʊ,uː,ʊə/, noted in §7.10.2 as now common in GB, the monophthongisation of /eɪ/ and /əʊ/ to [eː] and [oː] and the absence of the London 'crossover' (of /aɪ/ as [ɑɪ] with a back starting-point and /aʊ/ as [aʊ] with a very front starting-point, or even [aː]). The accent, as to be expected, is not a very homogeneous one; so, for instance, /ʊ,uː,ʊə/, instead of not being fronted at all, may be very fronted to [yː,ʏ,yː], /θ,ð/ may be fronted to /f,v/ like Cockney, /ʌ/ may be backed and so closer to Cardinal [ʌ]. However, there is very little evidence, in the form of recordings or transcriptions, to back up the phonetics of MLE (though there is more about vocabulary and grammar).

7.12.4 General Northern English (GNE)

While there is relative homogeneity in a broad London accent but much less so in General American and Standard Scottish English, the label General Northern English is even less homogeneous (strictly speaking the label should be General Northern England English). We use it here simply to identify those things which the disparate pronunciation systems in the North of England have in common (and we will also mention a few characteristics which are typical only of certain areas). The area we are talking about covers that area north of a line from the river Severn to the Wash and includes Birmingham. Within this area there was a traditional dialect distinction between the north and the south of a line joining the rivers Humber in the east and Ribble in the west. Such a distinction still remains in conservative rural dialects and is shown in features north of the line like /iː/ in *night* and /a/ in *long*.

The major identifying feature of this area is the loss of the distinction between GB /ʊ/ and /ʌ/, the single phoneme varying in quality from [ʊ] to [ä]. So GNE has no distinction between *put* and *putt*, *could* and *cud*, and, for many speakers, between *buck* and *book* (although others may use /uː/ in the latter word). Hypercorrections may be made by those attempting RGB producing, for example, *sugar* [ˈʃʌgə], *pussy* [ˈpʌsi], *put* [pʌt]. Almost as identifying a characteristic is the change-over in lexical incidence from /ɑː/ to /a/ in words with a following voiceless fricative (or a nasal followed by a further consonant), as in General American, e.g. *past* /past/, *laugh* /laf/, *aunt* /ant/. Another type of lexical incidence concerns the occurrence of a full vowel in prefixes where GB has /ə/, e.g. *advance* /adˈvans/, *consume* /kɒnˈsjuːm/ *observe*, /ɒbˈzɜːv/. These full vowel prefixes are generally those in closed syllables, whereas those with open syllables retain /ə/, e.g. *connect* /kənekt/. The diphthongs /eɪ/ and /əʊ/ may be monophthongal [eː] and [oː] as in GA and SSE (indeed sometimes, as in Newcastle, the direction of the diphthong is reversed to [eə] and [oə]). Many areas of Northern English have a fronted articulation of both /uː/ and /ɑː/ (the distinction between /a/ and /ɑː/ being carried by length alone). Vowel incidence in the final syllable of *city*, *pretty*, *usually*, etc. varies between /iː/ in, for example, Liverpool, Hull and Newcastle, and /ɪ/ in Manchester and Leeds.

Other vowel changes (compared with GB) characteristic of particular areas include the loss of the /ɛː/-/ɜː/ distinction in Liverpool (the local accent is called Scouse) and its common realisation as [œː], e.g. both *fare* and *fur* are pronounced [fœː]; a similar neutralisation and realisation of /ɛː/ and /ɜː/ in Hull where another notable feature is the monophthongisation of /əʊ/ to [ɜː]; the realisation of /au/ in many words as [uː] in broad Newcastle (where the local accent is called Geordie) while /uː/ itself becomes [ɪə], e.g. *about* [əˈbuːt].], *boot* [bɪət]; and the use of a particularly close /ɪ/ in all positions in Birmingham, e.g. *pit* is almost [pit], where the distinction between *pit* and *peat* will depend on length alone.

Most notable among the consonants of GNE is the realisation of /r/ as [ɾ] in a number of conurbations including Leeds, Liverpool and Newcastle, and the lack of the GB allophonic difference between clear [l] and dark [ɬ], clear [l] being used in all positions in many areas, e.g. Newcastle, and dark [ɬ] in others, e.g. Manchester. In a quite extensive area from Birmingham to Manchester and Liverpool the GB single consonant /ŋ/ becomes [ŋg], e.g. *singing* [ˈsɪŋgɪŋg]. Also in a number of urban areas, notably south-east Lancashire, /p,t,k/ in final position (i.e. before pause) may be realised as ejectives, e.g. *stop* [stɒpʼ].

A number of the features above are incorporated into the northern type of RGB. This applies particularly to the use of /a/ rather than /ɑː/ in words like *path* and *dance* and the use of full vowels in some suffixes like those in *conserve*, *object* and *advance*.

7.12.5 Australian English (ANE)

There is little regional variation in Australian English (ANE), the variation which does occur being largely correlated with social class and ranging from

a broad accent all the way up to GB. The broad accent described here shares many features with broad London speech, but has of course a particular combination of these and other features which identify it.

Like London there are no differences of phonemic inventory from GB and not an extensive number of words involved in differences of incidence. It is the realisation of long /ɑː/ as [aː] which more than any other identifies ANE, e.g. *father* [ˈfaːðə], *part* [paːt] (thus, for example, making it distinctively different from South African English). Words which in GB have /ɑː/ before clusters of nasal plus another consonant, e.g. *dance*, *advantage*, *chance*, vary between /a/ and /ɑː/ (= [aː]) in ANE; pronunciations with [aː] are by some considered prestigious, by others affected. Like London, /iː/ and /uː/ are realised as [əi] and [əu]; and the short front vowels are all closer than GB, the distance between /a,e,ɪ/ being thus reduced (compare this with New Zealand where /a,e/ are equally raised and /ɪ/ becomes [ɨ], almost indistinguishable from /ə/).

In its diphthongs ANE is again like London having /eɪ/ = [aɪ] and /ai/ = [ɑi] and in having a convergence of quality of /əʊ/ and /aʊ/; /ɪə,ʊə/ are monophthongised, so /ɪə/ = [ɪː], *clear* [klɪː] (leading to an accumulation of three vowels, /iː/, /ɪ/ and [ɪː] in the close front area), while /ʊə/ is either replaced by /ɔː/ as in *sure* or becomes disyllabic as in *sewer* /ˈsuːə/.

Although ANE, in its broader form, does drop /h/, it does not use glottal stop nor does it vocalise /l/, having dark [ɫ] in all positions.

A particular development in Australian English (and in New Zealand) which has been the subject of much discussion recently, both in newspapers and in academic journals,[45] is the increasing use of a high rising tone on declarative clauses (where a fall would normally have been expected). The meaning of this tone and the reasons behind its increased use have also been much discussed (see also §7.10.2(9) and §11.6.3).

7.12.6 Caribbean English

The most populous islands of the Caribbean where English is spoken as a first language are Jamaica, Trinidad (including Tobago) and Barbados, together with Guyana on the adjacent mainland; and there are numerous less populous islands. These islands (and Guyana) usually have a continuum in dialect from a broad variety generally referred to as a creole (a creole being a first language which has been derived from a pidgin) to a high variety which approaches GB and can be regarded as a type of RGB. What is described here is the broad creole variety. There are few descriptions of the English accent of most of the islands;[46] only Jamaica has been the topic of a number of articles and books.[47]

The most obvious characteristic of the vowel system is that it is like that of GB rather than that of General American. The second most obvious characteristic is the absence of /ə/, this vowel usually being replaced by /a/ (although sometimes by other full vowels), e.g. *father* [ˈfɑːda], *woman* [ˈwʊman]. Replacement of [ə] by [a] also occurs in the second part of the diphthongs ending in [ə]; corresponding to GB /ɪə/ and /ɛː/ is a diphthong approximating to [ea], e.g. *beer*

[bea] and *pear* [pea], and corresponding to /ʊə/ (and to some words which in GB have /ɔː/ where older forms of GB had /ɔə/) is [ɔa], e.g. *sure* [ʃɔa]. /eɪ/ and /əʊ/ are generally realised as monophthongal [eː] and [oː], the latter often very close to /aʊ/ pronounced [ɔʊ], so *load* [loːd] and *loud* [lɔʊd]. /ʌ/ remains unfronted as [ɔ] as it was in much older GB.

Among the consonants the most obvious characteristics are the absence of /θ,ð/; they are replaced by /t,d/, e.g. *thin*, *then* as [tɪn, den]. The clusters /tr,dr/ (including when derived from /θr/) may be replaced by /ʧ,ʤ/, e.g. *cheese* and *trees* both as [ʧiːz] and *draw* and *jaw* both as [ʤɔː]. /h,ʒ,v/ are also absent: /h/ is dropped as in many British accents, /ʒ/ is replaced by /ʤ/ or less commonly by /ʃ/, and /v/ may be replaced by /b/ (or occasionally /w/), e.g. *river* [ɹɪba]. Consonantal clusters are often reduced in basilectal Caribbean, the most noticeable being the dropping of final /t,d/ including when they are past tense markers so that *I kiss the lady* and *I kissed the lady* sound the same (as indeed they sometimes do in GB—see §12.4.6(2)). The pronunciation of /r/ post-vocalically is variable in the Caribbean though a majority of speakers probably follow GB in being non-rhotic; some, particularly Jamaicans, may be semi-rhotic (e.g. /r/ is present word-finally in *hear* but not pre-consonantally in *weird*). Additionally there are some allophonic preferences, notably /l/ being always a clear [l] and the palatalisation of /k,g/ before front vowels, e.g. king [cɪŋ] and *begin* [beɟɪn].

Notes

1 See the discussion of a written standard in Crystal (2004), particularly Chapter 10.
2 See Mugglestone (1995).
3 See Hart (1569).
4 See edition of Puttenham (1589) by Willcock & Walker (1936: 145).
5 Price (1665: v).
6 Swift (1712: 19).
7 Sheridan (1762: 260).
8 Walker (1791[1794]: viii).
9 Ellis (1869: 23).
10 Sweet (1890: v).
11 Jones (1909 [1950]). The companion website has a recording of Daniel Jones saying the Cardinal Vowels.
12 Jones (1918 [1932: 12]).
13 Lloyd James (1932).
14 Sangster (2011: xxviii).
15 For example, Crystal (1995: 365), MacMahon (1998: 380), Milroy & Milroy (2012: 151), British Library (2012). But see Trudgill (1979: 10, 2001: 3, 2002: 174).
16 There is a link on the companion website to recordings of older forms of GB.
17 See Upton *et al.* (2001: xii), Trudgill (2002), Wells (2008: xix), Ashby (2011).
18 MacMahon (1998: 395).
19 'RP, RIP', Radio 4, 06/08/11. See also Windsor Lewis (2011).
20 Roach (2004: 239).
21 There is a link on the companion website to recordings of current GB.
22 Windsor Lewis (1972: xiv, and 2013: §4.9).
23 *Oxford Advanced Learner's Dictionary* (2011: R45).

24 There is a link on the companion website to recordings of CGB.
25 The companion website has a link to recordings of London GB ('Estuary English') and Northern GB.
26 The term 'Estuary English' was first used by Rosewarne, 1984. See bibliography and documents on the website of phonetics at University College, London. http://www.phon.ucl.ac.uk/home/estuary (accessed 10.08.12).
27 Figures from Crystal (2003: 69).
28 Hawkins & Midgley (2005) show evidence that this change was most rapid in the middle of the twentieth century but that it is still ongoing.
29 Hawkins & Midgley (2005) suggest this may have been widespread by the 1970s.
30 See, for example, the three major pronouncing dictionaries of British English: Upton *et al.* (2001), Wells (2008) and Jones *et al.* (2011). See also Fabricius (2002a).
31 See Fabricius (2002b).
32 Wells (2008) includes it but considers it 'non-RP'.
33 Hawkins & Midgley (2005) suggest this began to fall before the 1980s.
34 See Windsor Lewis (2013: §3.7.I.11).
35 There is a link on the companion website to recordings of General Northern English and Standard Scottish English.
36 For a summary of experiments on the social evaluation of GB using the matched-guise technique, see Giles *et al.* (1990).
37 See Wells (1970, 1982).
38 There is an example of this type of /r/ in GB in the word *curious* in **video 5.15** on the companion website.
39 See Labov (1991).
40 Jacewicz *et al.* (2011).
41 Estuary English is an example of change from below (Labov, 1994: 300), being initiated by younger speakers in the Upper Working Class and Lower Middle Class social categories (see Glossary under Basilectal).
42 See Przedlacka (2002a) for evidence that Estuary English does not present a coherent new accent replacing GB.
43 See Fabricius (2002b). Windsor Lewis (2013: §3.7) suggests that the glottal is more allowable in the inter-word cases provided the vowel itself begins with a glottal, e.g. [gɒʔ ʔɒf].
44 Cheshire *et al.* (2011).
45 Guy *et al.* (1986), Britain (1992).
46 The only overall attempt at a description is in Wells (1982).
47 See Le Page & DeCamp (1960), Cassidy (1961) and Wells (1973).

Chapter 8

The English vowels

8.1 The distinctive vowels

There are a large number of vowel sounds (either relatively pure or clearly gliding in nature) in most accents of English. The contrasts are established by the commutations possible in series such as those shown in Table 3.

A general phonetic assessment of the qualities of these vowels in GB, in terms of the Cardinal Vowels (see §4.4.2 above), is made on p. 97, with examples in word-final and word non-final positions.

Table 3 Contrasts in GB vowels established by commutation.

/iː/	HEED	FEEL	BEAD	PEA	
/ɪ/	HID	FILL	BID		EXCEPT
/e/	HEAD	FELL	BED		
/ɛː/	HAIRED		BARED	PAIR	
/a/	HAD		BAD		
/ɑː/	HARD		BARD	PAR	
/ɒ/	HOD		BOD		
/ɔː/	HOARD	FALL	BOARD	PAW	
/ʊ/	HOOD	FULL			
/uː/	WHO'D	FOOL	BOOED	POOH	
/ʌ/			BUD		
/ɜː/	HEARD	FURL	BIRD	PURR	
/ə/					ACCEPT
/eɪ/		FAIL	BAYED	PAY	
/aɪ/	HIDE	FILE	BIDE	PIE	
/ɔɪ/		FOIL	BUOYED		
/əʊ/	HOED	FOAL	BODE		
/aʊ/	HOW'D	FOUL	BOWED	POW	
/ɪə/			BEARD	PEER	
/ʊə/				POOR	

Final.	*Non-final.*	*Quality*	*Notation*
I *Short*			
—	bid	centralised, raised [e]	/ɪ/
—	bed	between [e] and [ɛ]	/e/
—	bad	near [a]	/a/
—	bod	C.[ɒ]	/ɒ/
—	hood	centralised, raised [o]	/ʊ/
—	bud	central, open-mid	/ʌ/
barb*er*	*a*board	central, mid	/ə/
II *Long (relatively pure)*			
pea	bead	lowered [i] or [ɪi]	/iː/
pair	bared	C.[ɛ] or [ɛə]	/ɛː/
par	bard	centralised [ɑ]	/ɑː/
purr	bird	central, mid	/ɜː/
paw	board	raised [ɔ]	/ɔː/
pooh	booed	centralised [u] or [ɯ]	/uː/
II *Long (diphthongal glides, with prominent first element)*			
(a) glide to [ɪ]			
pay	fail	lowered [e] → [ɪ]	/eɪ/
pie	file	between [a] and [ɑ] → [ɪ]	/aɪ/
coy	foil	[ɔ] → [ɪ]	/ɔɪ/
(b) glide to [ʊ]			
no	load	[ə] → [ʊ]	/əʊ/
now	loud	between [a] and [ɑ] → [ʊ]	/aʊ/
(c) glide to [ə]			
peer	beard	[ɪ] → [ə]	/ɪə/
poor	moored	[ʊ] → [ə]	/ʊə/

Notes

(1) Word-final unaccented /ɪ/ has now been replaced in all but the oldest GB speakers by /i/ in word-final position, e.g. in *copy* (see §8.9.2(2)). This change is much less complete in inflected forms, e.g. in *copies*, *copied*. Although this /i/ is, strictly speaking, not a separate phoneme, in phonemic transcriptions throughout the book, final unaccented /i/ is generally shown rather than /ɪ/, e.g. *pity* /pɪti/. This is partly to bring this book into line with current pronouncing dictionaries, partly to show that /i/ is much shorter than /iː/ word-finally, and partly to show that alternative pronunciations with /ɪ/ are used by some speakers, particularly speakers of CGB. This final short /i/ contrasts with /iː/ in word-final position, cf, /i/ in *pity*, *probably*, *mummy*, *folly* with /iː/ in *aborigine*, *filigree*, *jubilee*, *epitome*. This short /i/ is also

heard and transcribed (rather than /ɪ/) when it occurs before other vowels as in *recreation* /rekri`eɪʃn̩/ and in the prefixes in words like *semicircle* /`semisɜːkl̩/ and *antidote* /`antidəʊt/.

(2) The length of the vowel /a/ varies considerably and is often almost as long as that of the long vowels. Length is dependent on individual speakers' usage, on the context and on the characteristic pronunciation of particular words (see §8.9.5). Because of this variation and because the distribution of [a] is like that of other short vowels (e.g. it does not occur word-finally), the vowel is included in the table of short vowels.

(3) Of the short vowels, it is to be noted that [ə] occurs primarily in unaccented syllables; accented /ə/ occurs only in connected speech, e.g. *she doesn't, does she?* /ʃi `dʌznt `dəʒ ʃi/

(4) The so-called pure vowels of *bead, bared* and *booed* frequently contain a glide between two distinct elements, especially in final position. Nevertheless, because the glides are relatively short and because a non-gliding vowel is common, these vowels are included in the 'long, pure' list.

(5) Some (usually much older) speakers of GB pronounce *saw* and *sore* differently, using a pure vowel in *saw* and a diphthong ([ɔə]) in *sore.* This type of pronunciation therefore possesses an extra phoneme /ɔə/.

(6) A vowel glide [ʊɪ] exemplified by such words as *ruin, fluid, suet*, is of rare occurrence within one syllable. The same glide occurs as a reduced form of [uː] + the suffix *-ing*, e.g. in *doing.* The same sequence also occurs across word boundaries as a result of smoothing (see §8.11(9)) e.g. *two in* [tʊɪn]. Since this glide is relatively rare, and since it may be analysed as disyllabic, it is regarded phonemically as a sequence of /ʊ/ plus /ɪ/.

(7) Devoicing of vowels is common in unaccented syllables between voiceless consonants. This is most likely to occur with short vowels (particularly /ə/) and before voiceless plosives, e.g. the first syllables of *capitulate, circumference, potato, fatigue*, and the second syllables of *footpath, quantity, guidebook.* This devoicing is an alternative to elision.

8.2 Vowel glides with preceding /j,w/

The sounds (semi-vowels) [j] and [w] regularly occur preceding most of the above vowels (some of the sequences are limited to only 'expressive' sounds):

[j + ɪ]	Yiddish	[w + ɪ]	wit
[j + e]	yet	[w + e]	wet
[j + a]	yap	[w + a]	wax
[j + ɒ]	yacht	[w + ɒ]	watch
		[w + ʊ]	wood
[j + ʌ]	young	[w + ʌ]	won
[j + ə]	fail*ure*	[w + ə]	were (weak form)
[j + iː]	yeast	[w + iː]	week

[j + ɛː]	'yeah'	[w + ɛː]	wear
[j + ɑː]	yard		
[j + ɔː]	yawn	[w + ɔː]	wall
[j + uː]	youth	[w + uː]	woo
[j + ɜː]	yearn	[w + ɜː]	word
[j + eɪ]	'yea'	[w + eɪ]	way
[j + aɪ]	'yikes'	[w + aɪ]	wide
[j + ɔɪ]	'yoicks'	[w + ɔɪ]	quoit
[j + əʊ]	yeoman	[w + əʊ]	woe
[j + aʊ]	'yowl'	[w + aʊ]	wound (past tense of *wind*)
[j + ɪə]	year	[w + ɪə]	weir
[j + ʊə]	pure	[w + ʊə]	wooer

Since [j] and [w] are often purely vocalic from a phonetic standpoint, being rapid vocalic glides from [i] and [u] positions, it is possible to consider their combination with other vowels as constituting:

(1) a rising diphthong, in the case of [j] or [w] followed by a vowel, i.e. vowel glides in which the second element rather than the first is the more prominent;
(2) a triphthong, in the case of [j] or [w] followed by a diphthong, i.e. a vowel glide in which there are three vocalic elements, the central one being most prominent.

Nevertheless, since such combinations affect almost all our previously established basic vowels and glides, it would add enormously to our inventory of basic vowels if we were to include these combinations in our list. Moreover, these [j] and [w] elements function very much as if they were consonants, marginally rather than centrally in a syllable, and, indeed, in examples like the [j] in *tune* or the [w] in *queen* are voiceless and fricative, which is phonetically characteristic of a consonant. Additionally they are preceded by the pre-consonantal forms of the indefinite and finite articles, e.g. *a yacht*, *the week*. For these reasons, it is more convenient to treat initial [j] and [w] as separate from the vocalic nucleus of the syllable and to include them in the list of consonants.

Note

It is possible, in the same way, to analyse the brief [ɪ] and [ʊ] elements occurring as the last part of diphthongal glides as consonantal /j,w/. Thus [eɪ] = /ej/; [aɪ] = /aj/; [ɔɪ] = /ɔj/; [əʊ] = /əw/; [aʊ] = /aw/. In the present analysis of vowels, however, such [ɪ,ʊ] elements are regarded as vocalic rather than consonantal because:

(1) they do not have a distribution after all vocalic elements as general as that which we find in the case of /j,w/ preceding vowels;

(2) they are in GB very weakly articulated (compared with pre-vocalic /j,w/) and may correspond to monophthongal pronunciations in many other accents, e.g. /eɪ/ may be [eː] or [ɛː];
(3) they have none of the devoiced fricative soundings characteristic of /j,w/ following /p,t,k/, e.g. in *tune* and *queen.*

8.3 Glides to [ə]

Similarly, glides to [ə] are treated here as single phonemes, since [ə] combines with another vowel element only in producing /ɪə,ʊə/ and even these two may for some speakers be realised as [ɪː,ʊː].

8.4 Vowel length

8.4.1 Phonetic relationships

There are phonetic relationships between short and long vowels in English, as illustrated by the following words:

bid and *bead*	/ɪ-iː/
good and *food*	/ʊ-uː/
cad and *card*	/a-ɑː/
cod and *cord*	/ɒ-ɔː/
(for)ward and *word*	/ə-ɜː/

Notes

(1) Only in the case of /ə/-/ɜː/ can there be said to exist an opposition solely of length and even in this case /ə/ occurs almost entirely in unaccented syllables (see §8.9.13), whereas /ɜː/ can occur in syllables carrying primary or secondary accent.
(2) In the other cases the opposition between the members of the pairs is a complex of quality and quantity; and of the two factors it is likely that quality is more important. In the case of the *cad/card* opposition, both vowels may be equally long.
(3) Although one member of each pair is marked as long, the length relationships between the vowels are complicated by the influence of following voiceless consonants. Thus:

/iː/ before voiceless consonants, as in *beat*, is only about half as long as the /iː/ in *bee* or *bead* and may be of approximately the same length as the /ɪ/ in *bid*;
/uː/ before voiceless consonants, as in *boot*, is only about half as long as the /uː/ in *do* or *food* and has about the same length as the /ʊ/ in *good*;

/ɔː/ before voiceless consonants, as in *caught*, is only about half as long as the /ɔː/ in *cord* or *saw* and has about the same duration as the /ɒ/ in *cod*.

The length of /ɜː/ and /ɑː/ varies in the same way before voiceless and voiced consonants, although the length relationships for /ə/ and /a/ are more complex because /ə/ occurs almost entirely in unaccented syllables, and because of the varying length of /a/ mentioned in §8.1 Note (2).

(4) The same considerable shortening before voiceless consonants applies also to the diphthongs, cf.

plate, play, played
wrote, row, road
tight, tie, tide
shout, cow, loud
voice, boy, noise
fierce, fear, fears
scarce, scare, scares

(5) Vowel length before the nasals /m,n,ŋ/ and the approximants /r,l/ (sounds which do not have voiceless equivalents) is approximately halfway between that before other voiceless and voiced consonants.

(6) One study[1] showed the duration of English vowels in different phonetic contexts as follows (measured in centiseconds (csecs) in accented monosyllables):

	word-final	*+ voiced C*	*+ nasal C*	*+ voiceless C*
Short vowels		17.2	13.3	10.3
Long vowels	30.6	31.9	23.3	16.5
Diphthongs		35.7	26.5	17.8

(7) /a/ was not included in (6) above, because of the special length often associated with it (see §8.1 Note (2) and §8.9.5), but is classified separately as 'neutral'. The following are the measurements for /a/: + voiced fricative 25.2 csecs; + voiced plosive 21.6 csecs; + nasal 19.6 csecs; + voiceless fricative 16.5 csecs; + voiceless plosive 15.0 csecs.

(8) An example of the relationship of two vowels phonetically paired (/iː/-/ɪ/) shows the following typical descending durations:

> /iː/ + voiced fricative 36.0 csecs; /iː/ + voiced plosive 28.5 csecs; /iː/ final (accented as in *set `tee*), 28.0 csecs; /iː/ + nasal 19.5 csecs; /ɪ/ + voiced plosive 14.7 csecs; /iː/ + voiceless fricative 13.0 csecs; /iː/ + voiceless plosive 12.3 csecs; /ɪ/ + nasal 11.0 csec; /ɪ/ + voiceless fricative 8.3 csecs; /ɪ/ + voiceless plosive 7.3 csecs.

Thus, it will be seen that /iː/ is typically shorter in a word such as *heat* (12.3 csecs) than /ɪ/ in a word such as *hid* (14.7 csecs).

(9) The difference between the long and the short vowels of English is sometimes alternatively referred to as an opposition between tense and lax, reflecting the fact that the short vowels are articulated with less muscular tension.

Sometimes also the difference is related to the distinction between Advanced Tongue Root (+ATR) and Retracted Tongue Root (+RTR) (or non-Advanced Tongue Root, –ATR), which is commonly used to distinguish different sets of vowels in a number of African languages (e.g. Igbo); no confirming instrumental evidence has been put forward to support such different tongue root positions.

8.4.2 Morphophonemic alternations

Another type of length relationship is that between the vowels in the root morpheme of cognate words. Thus the root morpheme *divin* in *divine* and *divinity* displays a relationship (called a MORPHOPHONEMIC ALTERNATION between the long vowel /aɪ/ and the short vowel /ɪ/). Originally this was an alternation between a short and a long vowel of the same quality, the alternation resulting from the different rhythmic structure of the two words (it will be noted that the shorter words generally have the long vowel and the longer words the short vowel). So in the case of the morpheme *divin* the alternation was between long [iː] and short [i]. However, historically the long vowels underwent the Great Vowel Shift (see §6.5), so that the correspondences are no longer between vowels of the same quality. The change in vowel is sometimes accompanied by a change in the position of the accent, e.g. *im`ply-impli`cation*. The relationship between pairs of vowels has remained productive, so that some recent newly imported words fall into the same patterns, e.g. *`microscope-micro`scopic* under (4) below. Five types of alternation are common:

(1) /aɪ/-/ɪ/ *divine-divinity, wise-wisdom, wide-width, five-fifty, type-typical, derive-derivative, sublime-sublimation, suffice-sufficient, divide-division, precise-precision, bible-biblical, wild-wilderness, reconcile-reconciliation, vice-vicious, recite-recitation, vile-villainy, deride-derision, private-privacy, title-titular, design-designation*

(2) /iː/-/e/ *hero-heroine, serene-serenity, athlete-athletic, sheep-shepherd, intervene-intervention, extreme-extremity, obscene-obscenity, supreme-supremacy, compete-competitive, discrete-discretion, cease-cessation*

(3) /eɪ/-/a/ *sane-sanity, exclaim-exclamatory, chaste-chastity, volcano-volcanic, profane-profanity, urbane-urbanity, explain-explanatory, grateful-gratitude*

(4) /əʊ/-/ɒ/ *mediocre-mediocrity, joke-jocular, diagnose-diagnostic, microscope-microscopic, neurosis-neurotic, episode-episodic, phone-phonic, nose-nostril, globe-globular, atrocious-atrocity, mode-modular*

(5) /aʊ/-/ʌ/ *pronounce-pronunciation, profound-profundity, abound-abundant, south-southern, found-fundamental.*

While such alternations are common, it is also the case that either vowel (but usually the long one) is often generalised to both forms, e.g. *desire-desirable, denote-denotation, promote-promotion.*

8.5 Transcriptions of English vowels

The principles underlying the construction of a set of symbols to represent the phonemes of a language were discussed in §5.4, where we noted that even basing ourselves on one phonetic alphabet (in this case, the International Phonetic Alphabet or IPA) it was possible to arrive at different sets of symbols. The main reason for this difference lies in the degree of application of the principle of Romanisation, i.e. the degree to which symbols giving phonetic detail about the most frequent allophone are replaced by their nearest Roman symbols, e.g. /r/ instead of /ɹ/ in *red*. The transcription of vowels in this present book does not carry the Romanisation principle very far, i.e. it continues to show the phonetic quality of vowels in its choice of symbols; thus for example, using the Romanisation principle, we could replace the /ɒ/ in *pot* by /o/ since we are not already using the latter symbol elsewhere, but this is not done because we wish to show that GB /ɒ/ is a rounded open back vowel. The sort of transcription of vowels used here is called comparative phonemic (see §5.4) because it seeks to be phonetically explicit for the purposes of comparing English with other languages.

Variation in the sets of symbols which have been used to represent GB vowels has ranged from the comparative phonemic of the present book to a simple phonemic transcription where the Romanisation principle is fully implemented. Such a simple phonemic system has been popular at various times and uses /iː,i,e,eː,a,aː,o,oː,u,uː,ʌ,ə,əː,ei,ai,oi,ou,au,iə,uə/ for the 20 vowels listed in §8.1 (i.e. all except two are simple roman symbols). A variation on these symbols uses double letters instead of the length mark to indicate long vowels, e.g. /aa/ instead of /aː/ in *card*. Almost all other transcriptions of GB vowels represent some degree of Romanisation lying between this fully Romanised transcription and the comparative phonemic of the present book. Only a few variations represent other factors; for example /e/ in *set* is sometimes transcribed by /ɛ/; this represents a judgement about the quality of the vowel, implying that it is nearer C.3 than C.2 (see further under §8.9.3) as does variation in the transcription of the first element of /əʊ/ as /oʊ/ (or, more commonly, /ou/), which again is a deliberate attempt to represent a different pronunciation (see under §8.10.4). Similarly /ʌɪ/[2] may be used rather than /aɪ/, reflecting a wish to show the starting-point of the diphthong as near GB /ʌ/.

Transcriptions of English vowels in books on linguistics, phonology and phonetics published in North America show further differences from those published in Britain. First, of course, differences in pronunciation between GB and GA are represented (GA has no /ɒ,ɛː,ɪə,ʊə/ (see §7.12.1)), and second, in the representation of monophthongal realisations of the vowels in *play* and *goat* as /e/ and /o/ (which necessitates the representation of the equivalent of GB /e/ in *set* as /ɛ/). Otherwise differences between British and American ways of transcribing vowels represent different traditions. Hence length in GA may be indicated by a macron, e.g. /ū/ rather than /uː/, and the second element in closing

diphthongs is shown as /j/ or /w/, e.g. /aj/ for /aɪ/ and /əw/ for /əʊ/ (this usage was discussed in §8.2(Note)).

In conclusion the transcription of the vowels of GB used in this book is clearly of the comparative phonemic sort. It uses vowel symbols which are to some extent indicative of the usual qualities of those vowels. Thus the short vowels /ɪ,a,ʌ,ɒ,ʊ,ə/ are given different symbols from the long vowels /iː,ɛː,ɑː,ɔː,uː,ɜː/ to show that they are different in quality as well as length. At the same time the length mark is still used with the long vowels. Such a transcription is of course redundant in indicating a difference between pairs of phonemes in two ways, quality and length. Yet it is considered important to use a transcription which reflects the fact that these factors are assumed to be equally important in maintaining the contrasts between the vowels; using the length marks also enhances the orthographic distinction between the various pairs.

8.6 Acoustics of GB vowels

Figs 8 and 9 show spectrograms of the GB relatively pure vowels and diphthongs respectively. Tables 4 and 5 give average values in GB for the first and second formants of GB pure vowels and diphthongs in citation form (in monophthongal words, mostly in the frame h–d); while Table 6 gives the same information for the GB pure vowels in connected speech. The values in Table 4 are averages from eight male and eight female speakers; those in Table 5 are averages from three males and three females; while those in Table 6 are from ten males and ten females.[3] Even though all the informants were speakers of GB, some had slight regional influences: in particular in Table 4 one male and one female showed slight London influence; in Table 5 two males and one female again showed similar influence from the London region; in Table 6 one speaker showed

Table 4 Formant frequencies for GB (relatively) pure vowels (in citation form).

Pure vowels	*F1*		*F2*	
	Male	*Female*	*Male*	*Female*
/iː/	275	319	2,221	2,723
/ɪ/	382	432	1,958	2,296
/e/	560	645	1,797	2,287
/ɛː/	538	691	1,864	2,210
/a/	732	1,011	1,527	1,759
/ʌ/	695	813	1,224	1,422
/ɑː/	687	779	1,077	1,181
/ɒ/	593	602	866	994
/ɔː/	453	431	642	799
/ʊ/	414	414	1,051	1,203
/uː/	302	339	1,131	1,396
/ɜː/	513	650	1,377	1,593

Table 5 Formant frequencies for GB diphthongs (in citation form).

	First component				*Second component*			
	F1		*F2*		*F1*		*F2*	
Diphthongs	*Male*	*Female*	*Male*	*Female*	*Male*	*Female*	*Male*	*Female*
/eɪ/	587	581	1,945	2,241	413	416	2,130	2,204
/aɪ/	734	822	1,117	1,275	439	359	2,058	2,591
/ɔɪ/	477	428	824	879	443	334	1,924	2,520
/əʊ/	537	545	1,266	1,573	379	380	1,024	1,267
/aʊ/	780	901	1,368	1,538	372	403	1,074	1,088
/ɪə/	382	399	2,096	2,514	578	417	1,643	1,846
/ʊə/	426	420	1,028	1,157	587	485	1,250	1,258

Table 6 Formant frequencies for some GB (relatively) pure vowels in connected speech.

Pure vowels	*F1*		*F2*	
	Male	*Female*	*Male*	*Female*
/iː/	280	303	2,249	2,654
/ɪ/	367	384	1,757	2,174
/e/	494	719	1,650	2,063
/a/	690	1,018	1,550	1,799
/ʌ/	644	914	1,259	1,459
/ɑː/	646	910	1,155	1,316
/ɒ/	558	751	1,047	1,215
/ɔː/	415	389	828	888
/ʊ/	379	410	1,173	1,340
/uː/	316	328	1,191	1,437
/ɜː/	478	606	1,436	1,695

similar influence from the north of England. The spread of values from which the averages are computed is in general greater for the females than for the males. There are no figures for /ə/, whose quality varies greatly according to phonetic environment, and whose average values may be taken to be equivalent to those for /ɜː/. A comparison of the values for citation forms and those for connected speech shows that the values for connected speech represent vowels considerably less peripheral (more centralised) in articulatory terms. This can be seen from Figs 10 and 11 which compare the values for pure vowels in citation form and in connected speech on vowel quadrilaterals, one for the male speakers and one for the female speakers. These figures also demonstrate the much higher formant values for female speakers. The average of the values for men and women in Table 4 is: for F1, 512 (M), 594 (W) and for F2, 1395 (M), 1655 (W). These values represent the smaller vocal tract of women, smaller cavities vibrating at a higher frequency.

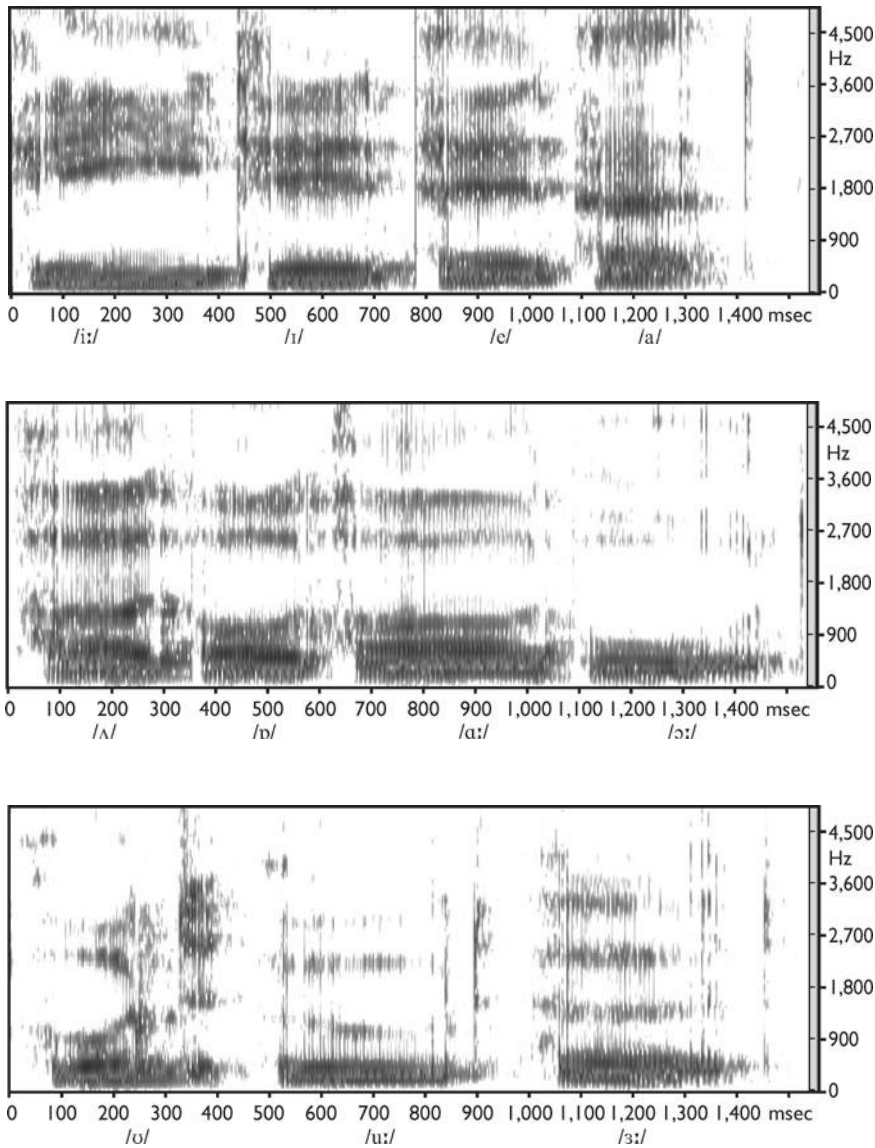


Figure 8 Spectrograms of the GB relatively pure vowels in the frame /h–d/ as spoken by a male speaker of GB. (For /ɛː/, see Fig. 9 where /ɛː/ is illustrated in its diphthongal realisation as [eə].)

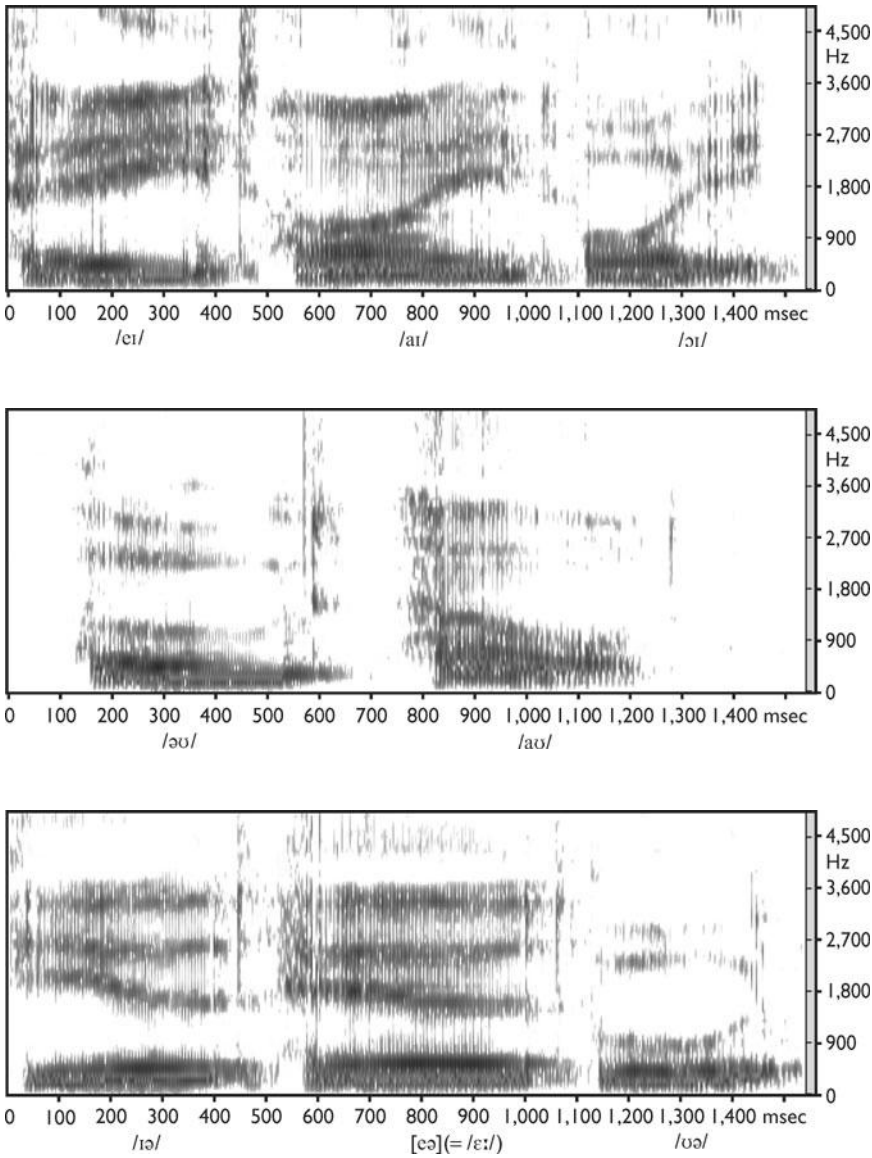


Figure 9 Spectrograms of the GB diphthongs in the frame /h–d/ as spoken by a male speaker of GB.

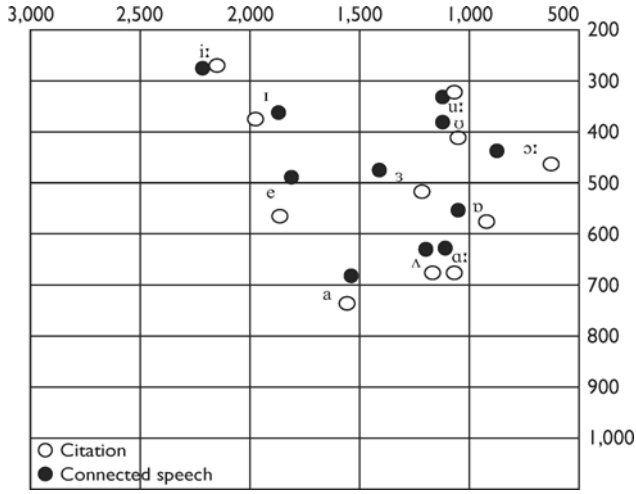


Figure 10 Formant frequencies (in Hz) for some GB pure vowels said in citation form and in connected speech (male speakers).

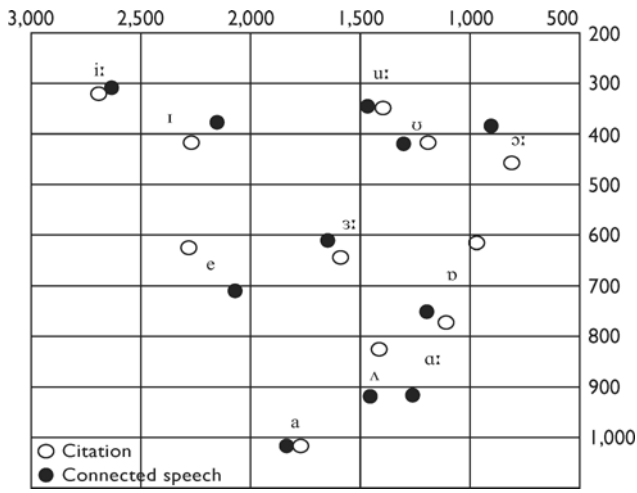


Figure 11 Formant frequencies (in Hz) for some GB pure vowels said in citation form and in connected speech (female speakers).

8.7 Learning of vowels

8.7.1 Acquisition of vowels by native learners

A striking fact about children's acquisition of their first language is that the vowel system, even one as complicated as that of English, is complete far earlier than the consonant system. In most children the full range of vowel phonemes is being produced by the age of two and a half years (2;6) and in many cases earlier. Because of the fast speed of development it is impossible to be very precise about any regular sequence of acquisition. During the period of babbling (approximately the latter half of the first year of life) an open vowel of the [a] type predominates and this continues into the first words (which usually occur around the age of 0;9–1;6). Vowels maximally differentiated from /a/ are likely to occur next, e.g. /iː/ and /uː/. Otherwise it is predictable that among the last vowel distinctions to be acquired will be those which are articulatorily closest together, e.g. /e/ vs /a/ vs /ʌ/, /iː/ vs /ɪ/, /uː/ vs /ʊ/, /ɔː/ vs /əʊ/.

8.7.2 Advice to foreign learners

Many foreign learners come from backgrounds where their L1 has only five vowels, e.g. Greek, Hindi, Japanese, Spanish and most Bantu languages. Russian also has five vowel phonemes though a great deal of variation within these phonemes, and some varieties of Italian have five although seven is the more common. Five is the most common category of vowel system in the world's languages with those with six vowels and seven vowels being the next two most common.[4] In whatever way the vowels of English are counted (i.e. even counting some or all of the diphthongs as sequences of short vowel plus semi-vowel (= consonant)), the English system is one of the less common and more complex types. It is therefore completely predictable that most foreign learners will have trouble attaining the vowel system of any variety of English including GB. As with L1 learning outlined above, difficulty is most predictable in those areas where vowels are closest within the vowel space; thus confusions are very likely within any of the following groups: /iː,ɪ/, /e,a,ʌ/, /ɒ,ɑː,ɔː/, /uː,ʊ/. These confusions and others may be reinforced or induced by English spelling or by the use of the Roman alphabet in the spelling of other languages: the letter <o> may represent a vowel around C.[o] in the L1 and hence the English diphthong /əʊ/ may be given a quality which heightens confusion with /ɔː/. The presence of an <r> in the spelling of /ɜː,ɜɪ,ɪə,ʊə/ may lead to the pronunciation of a short vowel plus an /r/. In many languages the letter <a> commonly represents a vowel between C.4 and C.5; hence it may be given that quality in English, leading to confusions between /a/ and /ʌ/. Because of such difficulties with the GB vowel system, foreign learners may need to set the more attainable targets of Amalgam English or International English (see §§13.2.3, 13.4, 13.5).

8.8 Description of the vowels

In the following detailed descriptions the GB vowel phonemes will be treated in a sequence based upon their quality relationships, i.e.

/iː,ɪ,e,ɛː,a,ʌ,ɑː,ɒ,ɔː,ʊ,uː,ɜː,ə/
/eɪ,aɪ,ɔɪ,əʊ,aʊ/
/ɪə,ʊə/

Each vowel is organised into the same sections as follows:

(1) Examples of words illustrating the main allophonic variants. Such variation concerns principally length variations occasioned by the shortening of vowels before voiceless consonants; a feature which is most obviously apparent in long vowels and diphthongs. Quality variation shows up principally before dark [ɬ]. Additionally in this section words are given which highlight relationships with auditorily adjacent vowels.
(2) An articulatory description and an assessment of quality in relation to the Cardinal Vowels. (In all cases, unless otherwise stated, the soft palate will be assumed to be in its raised position, the vocal cords vibrating and the tongue tip behind the lower teeth.) References are made to the videos on the companion website: the first number is the number of the video, the second is the relevant point in the video, e.g. 3.15 refers to video number 3, point 15.
(3) The descriptions in (2) are illustrated on Cardinal Vowel diagrams, including both GB and CGB variants, together with some regional variants. GB realisations are marked with a * and CGB realisations with a †.
(4) A description of some of the difficulties encountered by foreign learners, with appropriate advice. This advice is given on the assumption that the target is GB; those who set themselves a lesser target (in terms of the number of contrasts aimed at and preciseness of phonetic quality and duration) should refer to Chapter 13, particularly §13.4 and §13.5.
(5) Tables showing:
    (a) the main historical origins of the vowel. In line with Chapter 6, the OE classical forms are given from West Saxon, but the ME classical forms (e.g. from Chaucer) sometimes developed not from West Saxon but from a different OE dialect, Mercian. This particularly applies to West Saxon diphthongs [ɛːə,ɛə,eːə,eə] which were 'smoothed' in Mercian to [e,eː].
    (b) the main spellings associated with the vowel. Here TF = Text Frequency and LF = Lexical Frequency. Text Frequency is frequency in a running count of the spelling in continuous text; Lexical Frequency is frequency in citation forms, i.e. in the words in a dictionary.

8.9 (Relatively) pure vowels[5]

8.9.1 /iː/

(1) *Examples:*

Long [iː]—see, seed, seen; fee, feed, fees
Reduced [iˑ]—seat, feet, piece, lease, beef, reach
Compare [iː], [iˑ]—bead, beat; seize, cease; leave, leaf; liege, leash; Eden, eaten
Before [ɬ]—feel, meal, field, eels.
Final [iː]—(accented) settee, referee, decree, agree, foresee, licensee, ski; (unaccented) jubilee, pedigree, filigree, aborigine, epitome, kiwi

Spellings of /iː/

	Examples	*TF*	*LF*
ee	beef, canteen, cheese, eel, fee, feed, feel, feet, see, seed, tree		
e	be, complete, Eden, these		
	e, ee	64%	64%
ea	bead, beat, cease, eaten, leaf, leash, leave, meal, reach, reason, sea, seat	25%	20%
i	machine, police, prestige, suite		
ie	field, liege, piece, siege		
	i, ie	7%	1%
ei, ey	seize, receive, key		

Note (1): people, quay
Note (2): TF and LF do not include final -y spellings (which are counted under /ɪ/)

(2) *Description*—The front of the tongue is raised to a height slightly below and behind the front close position; the lips are spread; the tongue is tense, with the side rims making a firm contact with the upper molars. **(See videos 3.6, 11.3.)** The quality is nearer to C.[i] (with the glide mentioned below) than to C.[e]. /iː/ does not normally occur in a syllable closed by /ŋ/, it is sometimes heard in reduced forms of *being* /biːŋ/, seeing /siːŋ/, etc., and may occur under conditions of assimilation, e.g. *clean car* /kliːŋ kɑː/. The vowel is often noticeably diphthongised, especially in final positions.[6] A slight glide from a position near to [ɪ] is common among GB speakers, being more usual than a pure vowel. Any glide having a starting-point in the central area is dialectal, i.e. characteristic of a regional accent.

For the use of /i/ (i.e. without length marks) finally in words like *pity*, *fortunately*, *elegy*, in prefixes like *poly-* and *anti-* and in unaccented positions before other vowels as in *create*, see under /ɪ/ below.

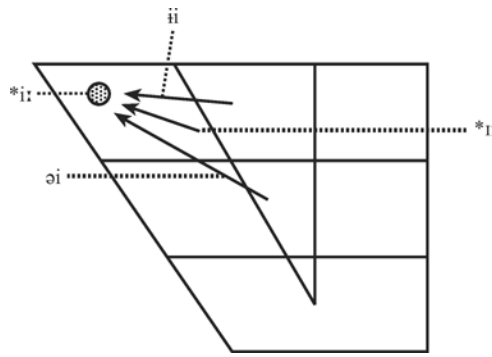


Figure 12 Variants of /iː/.

(3) *Regional variants*—A glide of the type [ɨi] is characteristic of the local pronunciation of Liverpool and Birmingham, whereas a lower central starting-point, i.e. [əɪ] may be heard in London and many other dialects. In Standard Scottish English, this vowel generally does not have the length characteristic of GB and is not, therefore, subject to the same tendency to diphthongisation.

Sources of /iː/

OE [eː]	ME [iː]	cheese, feed, sleeve
OE [eə]		deep, leaf, thief
OE [ɛː]		sea, needle
OE [øː]		geese, green
OE [ɪ] in open sylls		week
OE [ɛ] before [ɬd]		field
OF [ie], AN [eː]		siege, niece, grief

Note: Later adoptions include *esteem*, *canteen*, *unique*, *police*

(4) *Advice to foreign learners*—This vowel should give little difficulty to foreign learners, all of whom will have in their language a vowel of approximately the same quality. Their own vowel may not have the diphthongisation which is typical of GB, but they should attempt to imitate this glide only with caution, since any exaggeration will sound dialectal. More important is the reduction of length before voiceless consonants, since the differentiation between two words such as *seize* and *cease* is achieved more by the variation of the vowel length than by the quality of the final consonant. The reduced form of the vowel should, however, remain relatively tense and not be confused with [ɪ].

8.9.2 /ɪ/

(1) *Examples:*

Compare [iː], /ɪ/—feel, fill; seen, sin; bead, bid
[i], /ɪ/—least, list; reach, rich; sheep, ship; week, wick; feet, fit
[iː], [iˑ], /ɪ/—seed, seat, sit; league, leak, lick; seized, ceased, cyst
Before [ɬ]—will, hill, milk, built, film, kiln
Final (short) [i]—city, lady, sloppy, happy, charity, memory, donkey, auntie, quickie

Spellings of /ɪ/ including final /i/

/ɪ/	*Examples*	*TF*	*LF*
i	ability, bikini, fifth, fill, film, finish, kiln, milk, little, profit, rich, safari, sin, sit, spelling, will, with	61%	61%
e	cabbage, careless, England, except, finale, houses, needed, pretty, recipe, wicked, wicket	16%	16%
y (= /i/ finally)	celebrity, cyst, finale, happy, Italy, pity, recipe, rhythm, syllable, symbol	20%	21%
a	private, message, orange, surface, village	2%	1%
ie	cities, field, ladies, lingerie, reverie, sieve		
ey	donkey, honey, kidney, monkey, trolley		

Note (1): build, built /bɪld, bɪlt/, business /ˈbɪznɪs/, minute (time) /ˈmɪnɪt/, guinea /ˈgɪni/ Sunday ... etc., women /ˈwɪmɪn/

(2) *Description*—The short GB vowel /ɪ/ is pronounced with a part of the tongue nearer to centre than to front raised just above the close-mid position; the lips are loosely spread; the tongue is lax (compared with the tension for /iː/), with the side rims making a light contact with the upper molars. **(See videos 4.10, 6.5, 8.18, 14.7, 15.15.)** The quality is that of a centralised C.[e] = [ë].

In accented positions the sound will be as described above whereas in unaccented positions the sound is likely to be centralised (e.g. the second syllable of *visible* will be more centralised than the first). CGB speakers often diphthongise this vowel, particularly in accented monosyllables, e.g. *big* [bɪəg], *thin* [θɪən].

A short /i/, i.e. a vowel nearer in quality to the long /iː/, rather than /ɪ/ is now the norm in GB finally in words like *lady*, *sloppy*, *happy*, *donkey*, *prairie.* **(See videos 7.13, 13.23.)** Although treated here as a word-final allophone of /ɪ/ it is nevertheless indicated in phonemic transcriptions, e.g. /ˈleɪdi/, /ˈslɒpi/, /ˈhapi/ and in the weak forms of *he*, *she*, *we*, *me*, following the practice in the latest editions of the standard pronouncing dictionaries.[7] This final /i/ is shorter than the phoneme /iː/ in final position, cf. *city*, *silly*, *carry* with *settee*, *flee*, *refugee.* Although final /iː/ is accented in many words, there are some where it is not,

e.g. *ˈpedigree*, *ˈjubilee*, *ˈfiligree* so the final short /i/ cannot be regarded as an allophone of /iː/ conditioned by accent and position. A short /i/ is also an alternative to /ɪ/ when it occurs before other vowels, e.g. *create* /kriˈeɪt/ and in some prefixes, e.g. in *ˈantidote* and *polyˈtechnic*.

When words with final /i/ take the suffix /-z/ (plural or third person singular of present tense) the /i/ usually changes to /ɪ/, e.g. *memories* /ˈmeməɹz/, *hurries* /ˈhʌɹz/ but some speakers may retain the /i/, e.g. /ˈmeməriz/, /ˈhʌriz/, or the vowel may be intermediate between the two. A word-medial /i/ may also occur when the comparative and superlative are added, e.g. *easy* /ˈiːzi/, *easier* /ˈiːziə/, *easiest* /ˈiːziəst/.

CGB speakers have /ɪ/ in all the positions mentioned in the previous two paragraphs.

A trend towards /ə/ in unaccented affixes, rather than /ɪ/, is becoming increasingly noticeable among younger GB speakers:

(a) In some affixes, /ə/ is now most common, e.g.

-ity: /-əti/ e.g. in *sincerity*, *quality*.
-itive: /-ətɪv/ e.g. in *positive*, *fugitive*.
-ily: /-əli/ e.g. in *merrily*, *primarily*, *easily*, *happily*.
-ate: /-ət/ e.g. in *fortunate*, *chocolate*, but some words such as *magistrate*, *candidate* vary with /-eɪt/).
-ible: /-əbl/ e.g. *possible*, *visible*.
-em: /-əm/ e.g. as in *problem*, *system*, *item*.

(b) In other affixes, both /ɪ/ and /ə/ are heard from GB speakers, e.g.

-ess: /-əs/ is more common than /-ɪs/ as in *useless*, *goodness*; where *-ess* is strongly felt as a feminine suffix, e.g. *goddess*, /-es/ may be used.
-less: /-ɪs/ or /əs/ as in *featureless*, *painless/*
-ace: /-ɪs/ or /-əs/ as in *necklace*, *palace*, *preface*.
se-: /sɪ-/ is more common than /sə-/ as in *sedition*, *select*.
-et: /-ɪt/ is more common following /k,g,ʃ,ʤ/ as *in pocket*, *target*, *hatchet*, *budget*, but *-let*, *-ret* often have /-ət/, as in *bracelet*, *scarlet*, *claret*, *garret*.

(c) In yet other affixes, /ɪ/ remains dominant, e.g.

-age: /-ɪʤ/ as in *manage*, *village* but recent French borrowings such as *barrage*, *camouflage* usually have /-ɑːʒ/.
de-: /dɪ-/ as in *deposit*, *deny*, *desire*
be-: /bɪ-/ is more common than /bə/, as in *begin*, *between*, *become* but in *believe*, *belong*, *behave* /ə/ is often heard.

In the preceding cases, no significant contrast between /ɪ/ and /ə/ was involved. A contrast between /ɪ/ and /ə/ is usually maintained in inflected forms like *offices* /-ɪz/ vs *officers* /-əz/ or *chatted* /-ɪd/ vs *chattered* /-əd/. But the contrast may be lost in such pairs as *effect*, *affect* and *except*, *accept*.

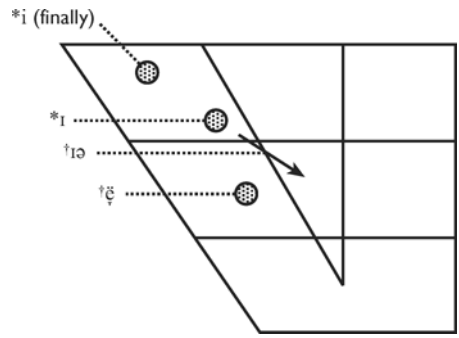


Figure 13 Variants of /ɪ/ (including /i/).

(3) *Regional variants*—Regionally the use of a very close /ɪ/(= [ï]), occurring in all positions, should be noted as particularly characteristic of Birmingham speech. As noted in the previous section, word-final /ɪ/ has now generally been replaced by a short /i/ in GB; this has also happened regionally throughout the south of England and the Midlands, while in the north the cities are divided between the two possibilities, with Liverpool and Newcastle having /i/ and Manchester and Leeds having /ɪ/, often more open than /ɪ/ in other positions, i.e. [e̞] or [ɛ̝], e.g. *city* [ˈsɪtɛ̝].

Sources of /ɪ/

OE [ɪ]	ME [ɪ]	drink, give, quick, ship, Smith, this
OE [iː]		bliss, wisdom
OE [y]		bridge, king, kiss
OF [i]		mirror, prison, rich, simple
OE, OF [e] before nasals		chimney, England, ink, string
Weakening of [ɛ]	before, benefit, biggest, declare, describe, despite, elegant, enquire, expect, hopeless, horses, hostess, kindness, prophet, waited	
Weakening of [aː]	orange, village	
Weakening of diphthongs	forfeit, fountain, sovereign	

(4) *Advice to foreign learners*—It is very important that a proper qualitative relationship should be maintained between /iː/ and /ɪ/. Many languages have a short variety of [i], e.g. French, Italian, but one which is likely to be too tense and close for the English /ɪ/; others, e.g. Polish, Russian, have a centralised type of [ɪ] which has too much of an [ə] quality for English; yet others, e.g. German, have a type of [ɪ] near to the English variety but often still too tense. Speakers of those languages which possess a vowel of the C.[e] type (which is approximately on the same level as the English /ɪ/)

should modify this sound in the direction of [ə]; alternatively, a [y] sound, as in French *but*, said with relaxed spread lips, will come near to the English /ɪ/ as in *bit*.

Of equal importance is the quantitative relationship of /iː/ and /ɪ/. Once the correct quality of /ɪ/ has been acquired, most learners can distinguish *bead* [biːd] from *bid* [bɪd], where the distinction is a complex of quality and quantity. But an opposition of the sort *beat* [bit] vs *bit* /bɪt/, where the difference of vowel length is much less, is more difficult. Three types of vowel should, therefore, be practised: close, tense, long [iː] (*bead*); close, tense, short [i] (*beat*); and the half-close, lax, short [ɪ] (*bit*, *bid*). It should be remembered that a short [i] is the usual pronunciation of a final <y>, e.g. for the adverb ending <ly>, e.g. *usually*, *briefly*, etc.

Less commonly there may be confusion between /ɪ/ and /e/, e.g. by speakers of Arabic, when the advice should be to make /ɪ/ more like a very short form of /eɪ/.

The fact that /ɪ/ occurs very frequently in unaccented syllables should also be noted, since an unreduced vowel in the weak syllables of words like *village*, *waited*, *fountain*, *describe* may seriously deform the accentual pattern.

8.9.3 /e/

(1) *Examples*:

Compare—/ɪ/, /e/—sit, set; tin, ten; will, well; disk, desk
/iː/, /ɪ/, /e/—neat, knit, net; reach, rich, wretch; reed, rid, red; feel, fill, fell
Before [ɬ]—well, sell, else, health, elm, held

Spellings of /e/

	Examples	*TF*	*LF*
e	bed, desk, elm, else, ell, held, net, red, sell, set, ten, well, went, wretch	84%	96%
ea	breath, dead, head, health	6%	3%
a	any, many, Thames		

Note: again, ate, bury, friend, Geoffrey, Leicester, said, says

(2) *Description*—For the short GB /e/, the front of the tongue is raised between the close-mid and open-mid positions; the lips are loosely spread and are slightly wider apart than for /ɪ/; the tongue may have more tension than in the case of /ɪ/, the side rims making a light contact with the upper molars. **(See videos 3.18, 11.19.)** The quality lies between that of C.[e] and that of C.[ɛ] = [e̝] or [ɛ̝]. The GB variety of /e/ tends to be closer to C.[ɛ] than to C.[e].[8]

A diphthong from a closer position [e] in the direction of [ə] is typical of CGB, e.g. *men*, *said*, *get* pronounced as [meᵊn, seᵊd, geᵊt]. Such diphthongisation is often characterised as 'affected'. /e/ does not occur in final open syllables, although in word-final position in CGB and in some dialects the quality of /ɪ/ may encroach on that of /e/.

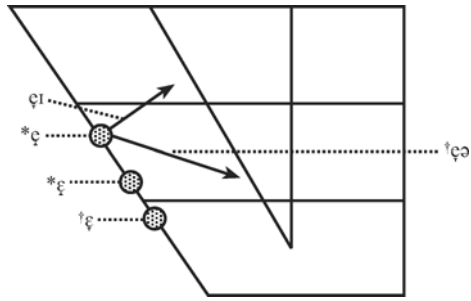


Figure 14 Variants of /e/.

(3) *Regional variants*—A closer variety of /e/ is heard in Australia and New Zealand, and in London, where it may additionally involve a glide towards [ɪ]. This is particularly apparent where /e/ is in its longer form before voiced consonants, e.g. *bed*, *leg* [beɪd, leɪg]. A more open type of /e/ at or slightly below C.[ɛ] is used in the north of England.

Sources of /e/

OE [ɛ]	ME [ɛ]	bed, best, edge, neck
OE [eː]		fed, met
OE [eːə]		bread, deaf, death, friend, theft
OE [æː]		ever, flesh, let
OE [y](Kentish [ɛ])		bury, merry
OF [ɛ]		accept, second, debt, member, press
	eModE [ɛɪ]	said, says

Note: Some words with /e/ (esp. before nasals) formerly vacillated between /e/ and /a/, e.g. *then*, *when*, *any*, *many*

(4) *Advice to foreign learners*—This vowel may present difficulties to those foreign learners whose native language possesses two types of /e/, usually of C.[e] and C.[ɛ] qualities. Learners may in such cases equate English /e/ with one or other of their own vowels; this risks confusion with /ɪ/ if a C.[e] quality is used, e.g. by Arabic speakers, or with /a/ if a C.[ɛ] quality is used, e.g. by Cantonese, German and Hindi speakers. The aim should therefore be to produce a vowel intermediate between the two qualities.

8.9.4 /ɛː/

(1) *Examples:*

Long [ɛː]—pair, there, chairs, cared
Reduced [ɛˑ]—scarce
Before [ɬ]—Merlot

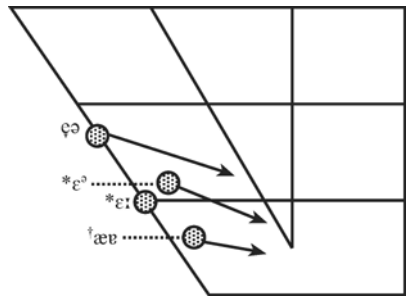


Figure 15 Variants of final /ɛː/.

(2) *Description*—For GB /ɛː/ the tongue is in the open-mid front position, i.e. approximately C.[ɛ]. The lips are neutrally open throughout. **(See video 7.22.)** Older speakers of GB may have a diphthong [ɛə], in which the tongue glides from a position near C.[ɛ] to a position similar to /ə/; in final positions the finishing area will be more open [ᵊ]. CGB will also have this diphthongal pronunciation; the starting-point may be more open, i.e. [æ], and the final sound will be even more open [ɐ]. Thus *bear* may be [bɛː], [bɛᵊ], or [bæɐ].

Spellings of /ɛː/

	Examples	*TF*	*LF*
ar, are	aware, care, fare, hare, librarian, parent, rarity, scare, scarce, share, stare, welfare	59%	64%
air	affair, air, chair, despair, eclair, fair, hair, impair, pair, stair	28%	15%
ear	bear, pear, swear, tear (v.), wear	10%	6%
ae	aerial, aerobic, aeroplane		

Note: *compere, heir, their, there, mayor, prayer, premiere, questionnaire, sombrero*

(3) *Regional variants*—Rhotic dialects like General American and Standard Scottish English have no /ɛː/, but rather /eɪ/ or /e/ plus /r/. In Liverpool the contrast between /ɛː/ and /ɜː/ is lost, with the resulting single phoneme being realised as a vowel centralised from C.[ɛ] and rounded, i.e. [œː]. In

Cockney a diphthong with a closer starting-point is used, giving [eᵩ]. In East Anglia, in the Atlantic states of the U.S., in the Caribbean and in New Zealand, there may be no contrast between /ɛː/ and /ɪə/,[9] e.g. *bare* and *bear* may be pronounced the same.

Sources of /ɛː/

	ME [aː] + [r]	care, hare, mare
	ME [ɛɪ] or [æɪ] + [r]	air, fair, hair, their
OE [ɛː] + [r]	ME [ɛː] + [r]	bear, swear, there, where

Note: ME [aː][æɪ][ɛɪ] > [ɛː] 16c., [ɛː] + [r] > [ɛːɹ] or [ɛɪɹ] 17c., > [eə] 18c., > [ɛː] 20c.

(4) *Advice to foreign learners*—All words having /ɛː/ have an <r> in the spelling, e.g. *bear*, *fare*, *pair*, *fairy*. Learners should avoid pronouncing an <r> in such words. The post-vocalic <r> of the spelling forms can be pronounced as a linking form only when a following word begins with a vowel, e.g. *pair of shoes* /pɛːr əv `ʃuːz/, or when a vowel occurs in the following syllable of the same word, e.g. *care* /kɛː/, but *caring* /`kɛːrɪŋ/. A suitable realisation of this phoneme can be achieved starting from /e/ and adding length and opening the mouth somewhat.

8.9.5 /a/

(1) *Examples:*

Long [aː]—bad, cab, bag, badge
Reduced [a]—bat, cap, back, batch
Compare /e/, /a/—pet, pat; peck, pack; said, sad; lend, land; merry, marry
/ɪ/, /e/, /a/—bid, bed, bad; big, beg, bag; tin, ten, tan; miss, mess, mass
Before [ɬ]—alphabet, shall (accented form), balcony, scalp

Spellings of /a/

	Examples	*TF*	*LF*
a	alphabet, back, bad, badge, bag, balcony, bat, batch, cab, cap, hand, lamp, land, macho, marry, mass, pack, pat, rash, sad, sat, scalp, tan	99%	99%

Note: daiquiri, plaid, plait, reveille, timbre (tamber)

(2) *Description*—The mouth is more open than for /e/; the front of the tongue is raised to a position just above open, with the side rims making a very slight contact with the back upper molars; the lips are neutrally open. **(See**

videos 10.1, 13.16.) This vowel has become more open recently, previously being nearer to C.[ɛ] where it is now close to C.[a].[10] Since the vowel /ʌ/ has had a tendency over a somewhat longer period to move forward towards C.[a], this may occasionally result in a neutralisation of /a/ and /ʌ/. More often, however, the lowering of /a/ has resulted in a retreat of /ʌ/ towards the central region. This lowering also brings GB /a/ nearer to its equivalent in Northern (England) English, although it remains considerably longer. Even more recently there are reports that GB /a/ is backing as well as being more open (and hence may be driving /ʌ/ further back and perhaps raised as well).[11]

This traditionally short vowel is now generally longer in GB than the other short vowels /ɪ,e,ʌ,ɒ,ʊ/. Such lengthening is particularly apparent before voiced consonants, e.g. in *cab*, *bad*, *bag*, *badge*, *man*; /a/ in these contexts is almost equivalent to the long vowels, so *badge* /baʤ/ and *barge* /bɑːʤ/ have vowels of similar length. Moreover some GB speakers in the south of England appear to have a contrast between short /a/ and long /aː/ which shows up in a limited number of minimal pairs like *jam* (to eat) (and probably also *jamb*) as [ʤam] and *jam* (of traffic) [ʤaːm]. Potential minimal pairs involve *land* (n.) and *land* (v.), *banns* and *bans*, and *champ* (= *champion*) and *champ* (at a bit).

Speakers of CGB and older speakers of GB usually have a closer variety of /a/ almost at the level of C.[ɛ] which may also be diphthongised to [ɛᵊ], hence *bad*, *bag* as [bɛˑd, bɛˑg] or [bɛᵊd, bɛᵊg] (cf. similar diphthongisation of /ɪ/ and /e/): such speakers may also produce /a/ with considerable constriction in the pharynx, the tongue itself having more tension than is the case for /e/. But see §§13.4.2 and 13.5.2 if the target is not GB.

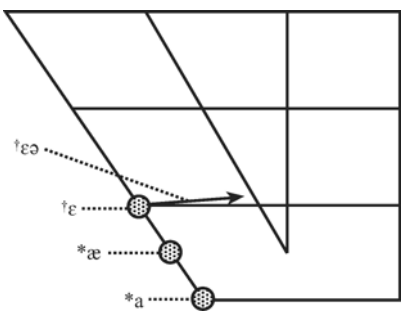


Figure 16 Variants of /a/.

(3) *Regional variants*—Like /e/, this vowel will generally be produced closer in Australian English and in London, speakers in both areas having a vowel around C.[ɛ]; Cockney may also have a diphthongisation to [ɛᵊ] (like CGB; indeed a closer realisation of the three front vowels is typical of Australian,

London and CGB). The north of England generally has a fully open [a] like GB, but is noticeably different from GB in not having the length associated with this vowel in GB; in this area /a/ is no longer than the other short vowels. Also in the north of England words which have /ɑː/ plus a voiceless fricative or nasal plus another consonant in GB are pronounced with /a/, hence *past*, *after*, *bath*, *dance*, *demand* /past, ˋaftə, baθ, dans, dɪˋmand/; this variation also applies to General American, where such words are also prone to raising to [ɛ], and in a limited way to Australian where it occurs only in the nasal plus consonant words. It should also be noted that Scottish English generally has no distinction between /a/ and /ɑː/; thus the words *cam* and *calm* will have the same vowel (of intermediate length) between C.[a] and C.[ɑ].

Sources of /a/

OE [æ,ɑ]	ME [a]	apple, back, sad; cat, man
OE [ɛːə]		shadow, shank
OE [æː,ɑː]		ladder, mad; hallow
ON [ɑ]		anger, flat
OF [a]		lamp, manner, passage
OF [au]		salmon, savage

Note: OE [w] + [æ] > /a/ in *wag*, *wax*, *twang*, but > /ɒ,ɔː/ in *watch*, *quality*, *water*

(4) *Advice to foreign learners*—The main difficulty for all those whose own languages have a less complex vowel system than English lies in the establishment of the qualitative oppositions /ɪ/-/e/-/a/-/ʌ/. The opposition /e/-/a/ may be emphasised by making use of the length component of GB /a/ in certain contexts, e.g. in *men*, *man*; *bed*, *bad*. Where length may not be so distinctive, e.g. in *net*, *gnat*, learners should be careful not to make /a/ like the typical <a> vowel in those languages which only have one (central) vowel in the open region (e.g. many in the Bantu group, which only have a five or seven vowel system). /a/ must be kept fully front and, if necessary, above C.[a] if confusion with /ʌ/ and even /ɑː/ is to be avoided (e.g. by Arabic speakers).

8.9.6 /ʌ/

(1) *Examples:*

Compare /a/, /ʌ/—cat, cut; lamp, lump; match, much
/ɑː/, /ʌ/—cart, cut; barn, bun; march, much
/ɒ/, /ʌ/—cot, cut; fond, fund; wander, wonder
/ɜː/, /ʌ/—curt, cut; fern, fun; turf, tough
Before [ɬ]—dull, result, pulse, bulge, bulb

Spellings of /ʌ/

	Examples	*TF*	*LF*
u	bulb, bulge, bun, cut, drug, dull, fun, fund, lump, much, pulse, result, sun	63%	91%
o	among, colour, come, done, London, Monday, monkey, month, mother, nothing, one, onion, oven, son, wonder	27%	7%
ou	country, couple, enough, southern, tough, young	8%	2%
oo	blood, flood		
oe	does		

(2) *Description*—The short GB /ʌ/ is articulated with a considerable separation of the jaws and with the lips neutrally open; the centre of the tongue is raised just above the fully open position, no contact being made between the tongue and the upper molars. **(See video 12.22.)** The quality is that of a centralised and slightly raised C.[a] = [a̟] (the IPA symbol for a vowel in this region is [ɐ]; /ʌ/ is kept partly for traditional reasons and partly because a more back vowel is used in many dialects). In the first part of the twentieth century /ʌ/ was increasingly fronted from its earlier back vowel position but its progress forward was halted in the second half of the century by the impending clash with the tendency to a more open /a/.[12] /ʌ/ does not occur in final, open, syllables. Alternation between the vowels /ʌ/ and /ɒ/ may be heard within GB in words where the letter <o> is followed by a nasal consonant, e.g. *accomplish*, *combat*, *comrade*, *conduit*, *constable*, *Montgomery*. CGB has a variety of /ʌ/ which is more of a back vowel (= [ɐ̟]) although this variety is increasingly heard in GB, again reflecting the avoidance of a clash with the opening of /a/.

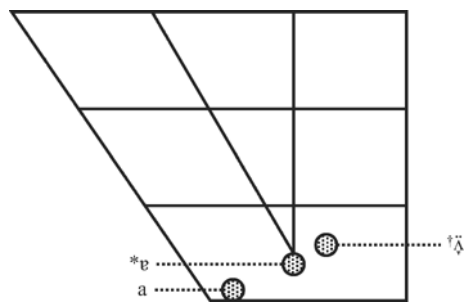


Figure 17 Variants of /ʌ/.

(3) *Regional variants*—Popular London has a vowel further forward and more open, approaching C.[a]. In popular north of England speech there is no contrast between /ʌ/ and /ʊ/, so that *put* and *putt* are pronounced the same; the vowel in such cases is generally closer to the quality of GB /ʊ/ and thus it can

be said that NE has no /ʌ/. More sophisticated northern speakers may use /ə/ rather than /ʊ/. Some Regional GB speakers from the north of England (see §7.12.4) may, in adopting /ʌ/, use the vowel in words which even in GB have /ʊ/, e.g. *butcher* /ˈbʌtʃə/, *cushion* /ˈkʌʃn̩/, *sugar* /ˈʃʌgə/. Most such hypercorrections involve words written with the letter <u>; the spellings <oo, ou>, seem to block pronunciations with /ʌ/, e.g. in *shook* and *should.* This is connected to the fact that a number of words spelt with <ook> are pronounced with the long vowel /uː/ in parts of the north of England, e.g. *look, cook, book* /luːk, kuːk, buːk/. Also in much of the north of England the morpheme *one* is pronounced /wɒn/ rather than /wʌn/, e.g. /ˈsʌmwɒn, ˈnəʊwɒn/.

Sources of /ʌ/

OE [ʊ]	ME [ʊ]	love, nut, sun, ugly
OE [uː]		enough, husband, scum, us, utter
OE [oː]	ME [oː] > [uː] > [ʊ]	blood, done, flood, glove, month, mother
OE [y]		blush, much, such
OF [u]		colour, cousin, cover, dozen, touch
OF [o] before nasals		comfort, front, money, uncle
OF [y]		judge, just, public, study

Note (1): The ME [ʊ] sound has, in developing to /ʌ/, i.e. [ɐ̈], been lowered and lost its lip-rounding. Seventeenth-century London had a vowel around C.[ɤ] and this seems to have developed to C.[ɤ̈] by around 1800

Note (2): ME [ɔː] > /ʌ/ in *one* and its compounds and in *none* by analogy. Cf. *alone* with /əʊ/

(4) *Advice to foreign learners*—Most languages possess a central vowel midway between C.[a] and C.[ɑ]; this sound will generally be spelt <a> if the Roman alphabet is used. The English /ʌ/ should be related to this quality to counter prejudice induced by the frequent English spelling with <u> or <o>; if the quality thus obtained is too fronted and too near to /a/, it may be modified in the direction of /ɑː/. A proper qualitative distinction should be maintained between the vowels in such words as *match, much, march*; *ban, bun, barn*; *hat, hut, heart.* There should be no lip-rounding which can lead to confusion with lip-rounded /ɒ/ (this is common among Arabic speakers).

8.9.7 /ɑː/

(1) *Examples:*

Long [ɑː]—bar, far, farm, large, hard
Reduced [ɑˑ]—dart, last, raft, lark, arch
Compare [ɑː], [ɑˑ]—card, cart; parse, pass; carve, calf; large, larch
/ɑː/, /ʌ/—cart, cut; harm, hum; march, much; lark, luck; dance, dunce
Before [ɬ]—snarl, gnarled, Charles

Spellings of /ɑː/

	Examples	*TF*	*LF*
ar	arch, bar, car, card, cart, carve, Charles, dart, far, farm, gnarled, hard, harm, larch, large, lark, march, part, parse, snarl		
ear	heart, hearth		
er	clerk, Derby, sergeant		
	ar, ear, er	60%	60%
a	bath, dance, last, pass, past, plaster, raft		
al	calf, calm, half, palm		
au	aunt, laugh		
	a, al, au	34%	32%

Note: memoir, repertoire, reservoir

(2) *Description*—This normally long vowel is articulated with a considerable separation of the jaws and the lips neutrally open; a part of the tongue between the centre and back is in the fully open position, no contact being made between the rims of the tongue and the upper molars. **(See videos 10.18, 12.7.)** The quality is nearer to C.[ɑ] than to C.[a]. Although there is a difference of length according to whether it occurs in a syllable closed by a voiceless or voiced consonant, the shortening effect of a closing voiceless consonant is not as marked as for other long vowels; thus, whereas the reduced [i] of *beat* may be of similar length to the /ɪ/ of *bit*, the reduced [ɑ] of *cart* is still somewhat longer than the short /ʌ/ of *cut*. /ɑː/ does not normally occur before /ŋ/ except under conditions of assimilation, e.g. *barn conversion* /bɑːŋ kəmˈvɜːʃn/. A variety of /ɑː/ retracted near to the quality of C.[ɑ] is typical of CGB and in some words a pronunciation with /ɑː/ rather than /a/ is typical of CGB, e.g. in *plastic* and *lather*. It should also be noted that smoothing (see §8.11) of the sequences [aɪə] and [aʊə] (*fire*, *tower*) may produce a new long vowel [aː] or this may fall together with /ɑː/—see §8.11.

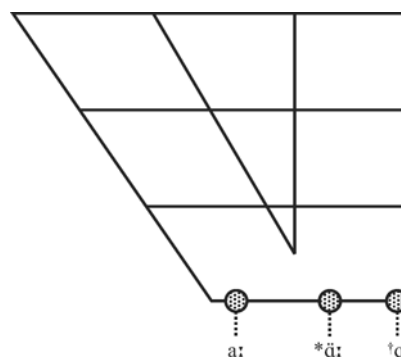


Figure 18 Variants of /ɑː/.

(3) *Regional variants*—A quality near to C.[a] is typical of Australian English and in much of south-west England as well as in some cities in the north of England, e.g. Liverpool, Manchester and Leeds. In some parts of the south-west, where the short vowels are in general lengthened, the fronting of /ɑː/ may thus lead to neutralisation between /ɑː/ and /a/.

Where an /ɑː/ is followed in GB by a voiceless fricative or by a nasal plus a second consonant, General American and the north of England have /a/, e.g. in *laugh*, *pass*, *branch*, *advance*. (Australian has the variation but limited to the nasal plus consonant words.) Such a pronunciation may occur as part of a Regional GB, particularly if the /a/ is given the extra length usual in GB but not usual in northern England. In many dialects including General American and that of south-west England GB /ɑː/ corresponds in a number of words to /ɑː/ + /r/ (indicated by an <r> in the spelling), e.g. in *car*, *card*, *large*, (such dialects, having /r/ in positions other than before a vowel are called rhotic, see §7.12(2)). This also applies to Standard Scottish English but here in addition the remaining instances of GB /ɑː/ fall together with /a/ and there is thus no contrast between these words, *cam* and *calm*, *Pam* and *palm* being pronounced equivalently.

Although GB /ɑː/ followed by a voiceless fricative or a nasal plus second consonant generally corresponds to /a/ in northern English, the reverse is not true, that is, there are examples where GB itself has /a/ in these contexts, e.g. *passage*, *finance*, *gas*, *romance*. In such words hypercorrections may sometimes be heard from speakers of Regional GB, e.g. /ˈpɑːsɪdʒ, fɪˈnɑːns, gɑːs, rəʊˈmɑːns/. In a number of other words GB is undecided; thus *lather*, *transfer*, *elastic*, *plastic* are words in which either /a/ or /ɑː/ may be heard.

Sources of /ɑː/

OE [æ]	ME [a] + [r]	charm, march
OE [ɛ, eə]	ME [ɛ] + [r]	far, heart, star
OF [ɛ]	ME [ɛ] + [r]	clerk, farm, sergeant
	ME [a] before [f,θ,s,ð,n]	after, staff; bath, path; ask, cast, pass; rather, father; dance
OF [ã]	ME [au] > [ɒː]	aunt, branch, chant, command
	ME [a] + [l]	balm, calf, half, palm

Note (1): Recent imports from Fr. and It.: *charade*, *moustache*, *memoir*, *sonata*
Note (2): Recent optional smoothing of [aɪə, aʊə] > [ɑː], e.g. *fire*, *tower* (see §8.11)

(4) *Advice to foreign learners*—Many languages do not have a qualitative opposition, in the relatively open region, of the English /a/-/ɑː/ type. The retracted nature of GB /ɑː/ should be insisted upon to distinguish it from /a/ and its length to distinguish it from /ɒ/ (a common confusion among Arabic speakers). Retraction can sometimes be achieved by getting learners to open the mouth more widely.

In the case of words in which /ɑː/ is shown in the spelling by vowel letter <r>, and if the target is GB, the temptation to pronounce any kind of /r/ should be overcome (except when word-final /r/ may link to a following word beginning with a vowel). It is helpful to consider such post-vocalic <r> letters simply as a mark of length for the preceding vowel. French learners should be careful not to use undue nasalisation in words of French origin which suggest modern French forms, e.g. *branch, plant*, etc.

8.9.8 /ɒ/

(1) *Examples:*

Compare /ɒ/, /ɑː/—lodge, large; cot, cart; cough, calf; impossible, impassable
/ɒ/, /ɔː/—cod, cord; don, dawn; stock, stalk
Before [ɬ]—doll, involve, revolver, solve

Spellings of /ɒ/

	Examples	*TF*	*LF*
o	cod, cot, dock, dog, doll, don, gone, holiday, impossible, involve, lodge, revolver, solve, sorry, stock	92%	95%
a	quarrel, swan, want, was, watch, what, yacht	6%	4%
ou, ow	cough, Gloucester, knowledge, trough		
au	Austria, Australia, because, cauliflower, laurel, sausage		

Note: The spelling <a> above represents the rounding of ME [a] to [ɒ] (except before velars, e.g. *quack* retains [a])

(2) *Description*—This short vowel is articulated with open jaws and slight open lip-rounding; the back of the tongue is nowadays nearer to C.[ɔ] than C.[ɒ].[13] No contact is made between the tongue and the upper molars. **(See videos 4.17, 14.18.)** /ɒ/ does not occur in a final, open syllable. There is some small variation within GB older speakers having a more open articulation, as does CGB. A small number of words prefer /ɔː/ in CGB, e.g. *off, cloth, across, gone.*

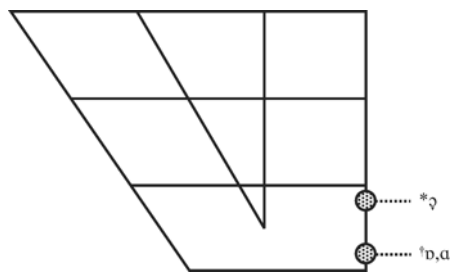


Figure 19 Variants of /ɒ/.

(3) *Regional variants*—Like CGB, broad London speech uses /ɔː/ in *off*, *cloth*, *across*, *gone*. Otherwise there is little variation within Britain. Such variation as there is generally involves unrounding to [ɑ] as in south-west England; in such cases it is /ɒ/ and /ɑː/ which may be kept apart by length (although, as noted under /ɑː/ above, /ɑː/ often = [aː]). In General American the contrast between /ɒ/ and /ɑː/ is lost, both *bomb* and *balm* being pronounced with a vowel similar to GB /ɑː/. However, a smaller group of words with /ɒ/ in GB may have /ɔː/ in General American (including those words mentioned above which have a following voiceless fricative or a nasal), e.g. *across*, *gone*, *dog*, *borrow*. In SSE almost all words with GB /ɒ/ fall together with /ɔː/, the quality being nearer to the latter GB vowel; thus *cot* and *caught*; *not* and *nought*; *nod* and *gnawed* will all be pronounced with /ɔː/ (though the vowel will be shorter than that in GB). In other cases GB /ɒ/ corresponds to Scottish /ɔː/ while GB /ɔː/ corresponds to /ɔː/ plus /r/ (Scottish English generally being rhotic), hence *cod* /kɔːd/ but *cord* /kɔːrd/.

Sources of /ɒ/

OE [ɔ]		cock, dog, long, song
OF [ɔ]		jolly, lodge, offer, lodge
OE [oː]		blossom, soft
	ME [w] + [a] + non-velar	swan, was, watch, want, what, quality. Cf. wag, wax, swagger, twang (and swam)
	ME [ɔː]	gone, knowledge, sausage, shone

Note (1): ME [ɔ] before [f,θ,s] and nasals, e.g. in *across*, *broth*, *lost*, *off*, *gone*, was lengthened in 18c. but has reverted to /ɒ/; pronunciations with /ɔː/ are nowadays considered CGB (or Cockney)

Note (2): /ɒ/ is used in some recent French borrowings, e.g. *restaurant*, *fiancé* as /ˈrestrɒnt, fiˈɒnseɪ/

(4) *Advice to foreign learners*—Many languages have a vowel around C.[ɔ] and this can be used for GB /ɒ/ (although the lip-rounding must only be slight). A vowel nearer to C.[o] (which there might be a temptation to use because of the frequent spelling <o>) should be avoided because of possible confusion with GB /ɔː/ and with the pronunciation of /əʊ/ as [oː] in many dialects other than GB. For these reasons /ɒ/ must also be kept short. Confusions between the three vowels /ɒ,ɑː,ɔː/ are common, e.g. by Cantonese, Hindi and Spanish speakers.

8.9.9 /ɔː/

(1) *Examples:*

Long [ɔː]—saw, war, born, board, dawn
Reduced [ɔˑ]—sort, ought, horse, chalk, quart
Compare [ɔː], [ɔˑ]—saw, sort; war, wart; board, bought; saws, sauce
/ɒ/, /ɔː/—cod, cord; don, dawn; stock, stork
/ʊ/, /ɔː/—put, port; could, cord; bull, ball
/əʊ/, /ɔː/—code, cord; cold, called; bone, born
Before [ɬ]—all, ball, bald, walled, halt, false

Spellings of /ɔː/

	Examples	*TF*	*LF*
ar, or, ore	quart, war; born, cord, horse; before, more	25%	35%
our	court, four	8%	4%
oar, oor	board, door, floor, oar		
	Total preceding /r/	39%	43%
au(gh)	cause, daughter, fault	11%	27%
a(l)	all, salt, talk, water	34%	15%
aw	awesome, jaw, lawn, saw, yawn	9%	12%
ou	bought, ought		
oa	broad		
	Total not preceding /r/	61%	57%
ure	sure, pure, cure (alternatives with /ʊə/)		

Note (1): *sword*
Note (2): Spelling <or> usually corresponds to /ɔː/ but /ɜː/ in *word, work, worm, worse, worst*

(2) *Description*—This relatively long vowel is articulated with medium lip-rounding; the back of the tongue is raised between the open-mid and close-mid positions, no contact being made between the tongue and the upper molars. **(See video 2.6.)** The quality lies between C.[ɔ] and C.[o], i.e. [ɔ̟] or [o̞]. /ɔː/ does not normally occur before /ŋ/ except under conditions of assimilation, e.g. *dawn chorus* /dɔːŋ ˈkɔːrəs/.

Until the middle of the last century there was a contrast between /ɔː/ and /ɔə/ in GB, so that *saw* and *sore* were pronounced differently. Nowadays this contrast is generally not made, except by some older speakers. Many words which formerly had only /ʊə/ in GB have now acquired an alternative pronunciation with /ɔː/, e.g. *sure*, *poor*, *your* (see §8.12.2 below). In CGB many words with an /ɔː/ alternating with /ʊə/ will commonly be lowered and unrounded, giving [ʌː]: this applies particularly in sequences of /jɔː/, e.g. *pure*, *puerile*, *secure*, *endure*.

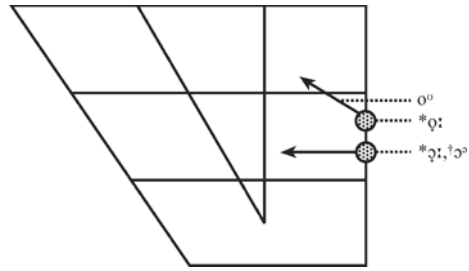


Figure 20 Variants of /ɔː/.

(3) *Regional variants*—Words which formerly had /ɔə/ have often been derived from [ɔ] or [ɔː] plus /r/, as reflected in the spelling; rhotic dialects like General American and Scottish English will therefore have a shorter vowel plus /r/ in words like *horse*, *cord*, *war*. In non-rhotic dialects other than GB, /ɔə/ may nevertheless be kept distinct from /ɔː/, e.g. in some parts of the north of England. In Standard Scottish English /ɔː/ covers both GB /ɔː/ and GB /ɒ/, no contrast being made between these two vowels; thus *cot* and *caught* are pronounced the same. However, a number of pairs of words are still kept apart by the presence of /r/, e.g. *cod* /kɔːd/, *cord* /kɔːrd/. Moreover SSE will keep the vowel quality in *horse* and that in *hoarse* distinct, like the vowels in *sport* and *boat*.

There is also no distinction between /ɔː/ and /ɒ/ in General American. Words which have /ɒ/ in GB usually have /ɑː/ in GA but a minority have /ɔː/, e.g. *across*, *trough*, *coffee*. The quality of the vowel in General American is generally more open (= [ɔː]) than in GB. In general, dialectal variation in /ɔː/ is small; most notable is the diphthong or triphthong of popular London speech, where /ɔː/ = [o̞ʊ] in morpheme-non-final positions, but [o̞wə] in morpheme-final positions, cf. *board* [bo̞ʊd] and *bored* [bo̞wəd].

Sources of /ɔː/

OE [ɑ] + [w]	ME [ɑʊ]	thaw
OE [ɑ] + [ɣ]		law
OE [æː] + [x]		taught
OE [ɑ] + [v]		hawk
OE [ɑ] before [ɬ]		all, call, fall, talk, walk
OF [ã] or [ɑ] + [o,u]		autumn, cause, haunt, lawn, sauce
OF [ɑ] + [v]		laundry
OE [ɑː,ɔ,oː] + [x]	ME [ɔu]	ought; bought, wrought; brought, daughter, thought
	ME [a,aː] following [w]	quart, warm, warn, water
	ME [ɔ,ɔː,oː,uː] + [r]	horse, short; board, force; floor, sword; fourth, mourn, pour

Note: Loss of [ɬ] in *talk*, *walk* occurred later (possibly 17c.)

(4) *Advice to foreign learners*—In many countries a type of /ɔː/ is taught which is rather more open than the GB variety described above and which cannot be said to be typical of GB. The slightly higher tongue position should be accompanied by closer lip-rounding. Other languages have a vowel in the region of C.[o]; this latter sound may serve as a starting-point for acquiring GB /ɔː/, the tongue and lip positions being relaxed until the correct quality is reached.

The spelling forms of /ɔː/ often cause difficulty. If aiming at GB, no <r> should be pronounced where it occurs in the spelling of such words as *port*, *sort*, *lord*, *more*, except when, in a word-final position, it is used as a link with a following word beginning with a vowel, e.g. *pour out* /pɔːr `aʊt/. Words having /ɔː/ and spelt with <au, aw, ou>, e.g. *taught*, *saw*, *ought*, are often wrongly given a [ɔu] or [ou] type of diphthong. The monophthongal nature of /ɔː/ should be insisted upon, especial care being taken to keep a proper distinction between /ɔː/ and /əʊ/ in such pairs as *caught*, *coat*; *saw*, *sew*.

8.9.10 /ʊ/

(1) *Example:*

Compare /ʊ/, /uː/—full, fool; wood, wooed
/ʊ/, /ɔː/—could, cord; wood, ward
Before [ɬ]—full, pull, wool, wolf

Spellings of /ʊ/

	Examples	*TF*	*LF*
u	butcher, cellular, cushion, full, pull, put, sugar	32%	54%
oo	book, good, wood, wool	64%	35%
o	bosom, wolf, woman		
ou	could, courier, should, would		

Note: Worcester, worsted

(2) *Description*—The short GB vowel /ʊ/ is pronounced with a part of the tongue nearer to centre than to back raised just above the close-mid position; it has, therefore, a symmetrical back relationship with the front vowel /ɪ/; the tongue is laxly held (compared with the tenser /uː/), no firm contact being made between the tongue and the upper molars. **(See videos 1.14, 9.5.)** This vowel has moved forward recently[14] and there is

an increasing tendency for it to be unrounded; if the lips are rounded at all, close rounding is involved. The quality is that of a centralised C.[o] = [ŏ] or [ʉ̟] or (with unrounding) centralised C.[ɤ] = [ɤ̆] or [ɨ̟]. The unrounding is particularly noticeable in the common word *good* [gɤ̆d] or [gɨ̟d], and also in *should*, *could* and, to a lesser extent, *would.* (But the unaccented forms of these last three words very often have /ə/ rather than /ʊ/.) This vowel occurs in both accented and unaccented syllables, being present in the accented syllable of a relatively small number of words, though some of these are of common occurrence, e.g. *put*, *good*, *look*, *wood.* /ʊ/ does not occur in word-initial positions nor before final /ŋ/. In some words there is a variation between /ʊ/ and /uː/: while /uː/ is generally the more common, /ʊ/ is common in *room*, unusual in *groom* and *broom*, and rare in *tooth.*

Like the change from /ɪ/ to /i/ word-finally, final /ʊ/ has changed to /u/. Like /i/ this is a deviation from strict phonemic transcription, but follows current practice in pronouncing dictionaries. It is, however, rarer than /i/, occurring most commonly in *you*, *who* and *to* (cf. *to* and *two*, e.g. *he didn't want to*, *he didn't want two*). This short /u/ also occurs before other vowels, e.g. *doing* /duɪŋ/.

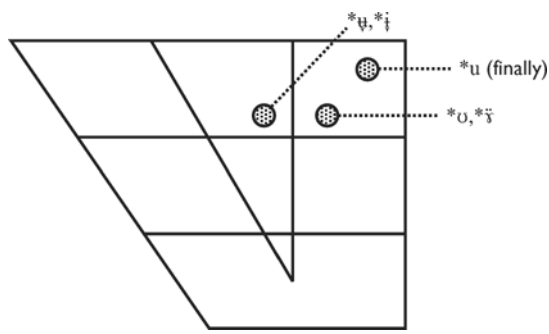


Figure 21 Variants of /ʊ/.

(3) *Regional variants*—Throughout the north of England no contrast is made between /ʊ/ and /ʌ/ by a very large number of speakers, a vowel in the region of /ʊ/ occurring for both the GB vowels (see §§7.12.4 and 8.9.5). A form of [ɤ̆] represents /ʊ/ and /ʌ/ in some northern regional speech, e.g. *butter* [ˈbɤ̆tə]; and again, in some northern speech, many words spelt with *oo* have /uː/, e.g. *cookery book* /kuːkəri buːk/. In Standard Scottish English the opposition /ʊ/-/uː/ is neutralised, a fronted [u˙] being used for both, so that *pull* and *pool* have a similar vowel quality around [ʏ].

Sources of /ʊ/

OE [ʊ]	ME [ʊ]	bosom, bull, could, full, pull, put, should, wolf, woman, wood, wool, would
OF [u]		bullion, butcher, courier, cushion, pullet, pulley, push, sugar
OE [oː]	ME [oː]	book, cook, foot, good, hood, hook, look, rook, stood

Note (1): ME [ʊ] regularly developed to /ʌ/ but remained [ʊ] in some words with a preceding labial or labial-velar, e.g. *bull, put, wolf*
Note (2): ME [oː] regularly developed to /uː/ but shortened to /ʊ/ in some words. These still have /uː/ in parts of the north of England, e.g. *cook, wood, wool*
Note (3): Exclamation *shush*

(4) *Advice to foreign learners*—The difficulty of /ʊ/ is similar to that of /ɪ/, i.e. just as the vowels /iː/ and /ɪ/ presented three oppositions involving complexes of quality and quantity, [iː]-[i]-[ɪ], so /ʊ/ has to be distinguished from /uː/ sometimes by quality alone (*foot-boot*), sometimes by quality and quantity (*good-food*). If the target is GB, the quality of /ʊ/ must be kept quite distinct from that of the reduced form of /uː/; if a vowel of the quality of C.[o] occurs in the learner's own language, this may be used as a starting-point for learning English /ʊ/—essentially a centralised C.[o]. Thus, in the case of French learners, for instance, the vowel in *foot* may be usefully related to the French vowel in *faute* and the English vowel acquired by relaxing the whole articulation. Relating /ʊ/ and C.[o] in this way underlines the fact that /ʊ/ is not a kind of [u] sound. If the centralisation of /ʊ/ is not sufficient, the starting-point may be a central [ə] modified in the direction of [o]. The opposition between /ʊ/ and fully long /uː/ is less difficult once the distinction /ʊ/-reduced /uː/ is established (see following section for comparative exercises).

8.9.11 /uː/

(1) *Examples:*

Long [uː]—two, blue, food, move
Reduced [u]—boot, fruit, hoof, group, douche, hoop
Compare [uː], [uˈ]—shoe, shoot; rude, root; lose, loose; use (v.) [jüːz], use (n.) [jüˈs]; nude, newt; Jews, juice
[uː], /ʊ/—food, good; pool, pull
[uˈ], /ʊ/—boot, foot; loop, look
Before [ɬ]—cool, rule, schools, fooled

Spellings of /uː/

	Examples	*TF*	*LF*
u	crucial, June, nude, rude, rule, Susan, use	27%	42%
oo	boot, cool, food, fool, hoop, loop, loose, moon, pool, root, school, shoot, soon, spoon	39%	33%
o	do, lose, move, two, who	15%	7%
ou	boules, ghoul, group, soup, through, wound ('injure')	7%	8%
ew	askew, chew, flew, Jew, newt	9%	5%
ue, ui, oe	blue, juice, shoe		

Note: the spellings <u, eu, ew, ue, ui> originally represented /juː/. The /j/ no longer remains after /l/ and /r/, but generally remains after other consonants. In some cases both /uː/ and /juː/ are heard, e.g. *enthusiasm*, *new*, *nude*, *suit*

(2) *Description*—GB long /uː/ is a close back vowel with varying degrees of centralisation and unrounding. Two types occur within GB: (i) a more centralised monophthongal vowel [üː] or, with unrounding, [üːˌ]; and (ii) a short diphthong[15] [ʊu] or, with unrounding, [ʉ̟ʊ̟] (these being particularly common in final position, e.g. in *do*, *shoe*, *who*). **(See video 2.22.)** The centralisation of the monophthongal [üː] is greatest following /j/, e.g. in *youth*, *beauty*, *cute*. A more monophthongal vowel nearer fully back [uː] is common before [l], e.g. in *tool*, *school*, *rule*. In CGB a near fully back vowel may occur more widely.

The relationship of /uː/ to /ʊ/ is similar to that between /iː/ and /ɪ/, the articulation of /uː/ being tense compared with that of /ʊ/, though no firm contact is made between the tongue and the upper molars. /uː/ does not normally occur before /ŋ/ except under conditions of assimilation, e.g. *soon came* /suːŋ ˋkeɪm/.

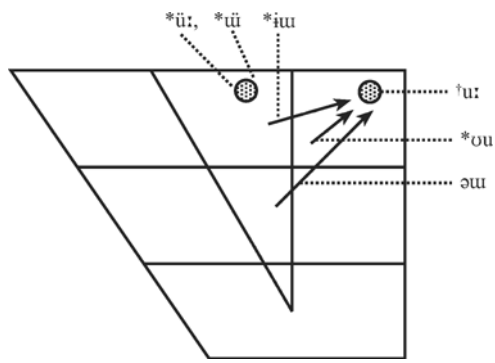


Figure 22 Variants of /uː/.

(3) *Regional variants*—Increased diphthongisation and unrounding is characteristic of a number of other dialects. Popular London has diphthongs of the type [əʊ̈] and [ɪʊ̈] with little, if any, lip-rounding. Diphthongisation of the former variety is also typical of Australian English. As mentioned under the section on /ʊ/, SSE loses the contrast between /uː/ and /ʊ/, the common vowel being in the region of [ü] or [ÿ]; in some cases the lip-rounding may be only slight, so that the distinction between /uː/ and /ɪ/ in, for example, *room* and *rim* may be minimal. Fronting of this vowel in varying degrees is now common in much of England.

Sources of /uː/ and /juː/

/uː/

OE [oː]	ME [oː]	doom, soon, to, tool, goose
ON [oː]		boon, root
OE [w] + [aː]		two, whom, womb
OF [oː]		proof, prove

Note (1): [oː] > [uː] by around 1550
Note (2): Fr. imports with [uː] later than c.1400 kept [uː], e.g. *group, route, routine, soup*
Note (3): Fr. imports with final *-on* [-ð] finally have [uː], e.g. *balloon, platoon, saloon, typhoon*

/juː/

OE [i,eːə] + [w]	ME [iu,eu,yː] > [juː]	hue, Tuesday; knew, you
OF [iu,eu,y,ui]		adieu, lieu; due, view; accuse, deluge, duke; pew, nuisance, suit
OE [ɛːə,æː] + [w]	ME [ɛu] > [eu] > [juː]	few, dew, hew
Late OF (post-1400) [ɛu]		feud, neuter

Note: All these sounds had coalesced on [juː] by 1800

(4) *Advice to foreign learners*—The quality of this vowel should cause no difficulty to most learners, many of whom will have a close back rounded vowel in their own language. A pure vowel of this kind will usually be suitable in English, though too energetic lip-rounding should be avoided. The typical GB centralisation or diphthongisation should be imitated only with caution, since any exaggeration of the movement will produce an effect which may be judged dialectal, nor need the centralisation of /uː/ following /j/ be consciously aimed at. Those learners, such as Norwegians, who have a centralised [ü] in their own languages, should avoid using this sound in English because often it is too fronted even considering the present centralisation of this vowel in GB; moreover such a variety may sound an

oddity if the rest of the speaker's pronunciation is not as contemporary. Similarly the unrounded back vowel of Japanese may involve considerably more lip-spreading than the newer unrounded realisation of English /uː/ and Japanese learners of English should introduce some lip-rounding.

More difficult is the relationship of fully long [üː], reduced [ü˙] and short [ʊ] as in *food, boot* and *foot.* It should be noted, for instance, that *use* (v.) [jüːz] differs from *use* (n.) [jü˙s] more by the length of the vowel than by the quality of the final consonant, and that the difference between the vowels of *boot* ([u˙]) and of *foot* ([ʊ]) may lie as much in their quality than in their length.

8.9.12 /ɜː/

(1) *Examples:*

Long [ɜː]—fur, burn, bird, urge
Reduced [ɜ˙]—first, earth, worse, church
Compare [ɜː], [ɜ˙]—cur, curt; heard, hurt; surge, search; purrs, purse; Thursday, thirsty; serve, surf
Before [ɬ]—earl, curl, world, girl

Spellings of /ɜː/

	Examples	*TF*	*LF*
er, err	err, her, perfect, serve	39%	54%
ur, urr	burn, church, curl, cursor, curt, fur, hurt, nurse, purr, purse, surge, Thursday, turn, urge	24%	24%
ir, irr	bird, first, girl, sir, thirsty	18%	11%
yr, yrr	myrrh, myrtle		
w + or	word, work, world, worse, worst, worth	4%	17%
ear	earl, earth, heard, search	8%	4%
our	courtesy, journey, scourge		

Note: colonel /kɜːnl/, milieu /miːljɜː/

(2) *Description*—GB /ɜː/ is articulated with the centre of the tongue raised to a mid position, no firm contact being made between the tongue and upper molars; the lips are neutrally spread. **(See video 7.7.)** The quality is, therefore, remote from all peripheral Cardinal Vowel values. /ɜː/ being the only accented vowel in the central area, there is considerable individual variation in its realisation, with variations from close-mid to open-mid. /ɜː/ does not normally occur before /ŋ/, except under conditions of assimilation, e.g. *burn candles* /bɜːŋ ˋkandlz/.

The quality of /ɜː/ often coincides with that of /ə/, the difference between the two being only one of length. Since /ɜː/ usually occurs in accented syllables and /ə/ in unaccented syllables, this might suggest that the two vowels be treated as accented and unaccented allophones of the same phoneme. However, there are clear cases where /ɜː/ occurs in unaccented syllables and is not reducible to /ə/, e.g. in *commerce* /ˈkɒmɜːs/, cf. *commas* /ˈkɒməz/, and indeed most speakers have a minimal pair between *foreword* /ˈfɔːwɜːd/ and *forward* /ˈfɔːwəd/. Moreover most words which have /ɜː/ in their citation form do not reduce this vowel to /ə/ when they occur unaccented in connected speech, e.g. *Now its ˋmy turn, he said* (but note that *were*, *her* and *sir* can be reduced to /ə/).

A pronunciation somewhat below open-mid is characteristic of CGB. Such a pronunciation comes close to the usual GB position for /ɑː/; however, speakers of CGB generally use a retracted variety of /ɑː/ to ensure the vowels keep their distance.

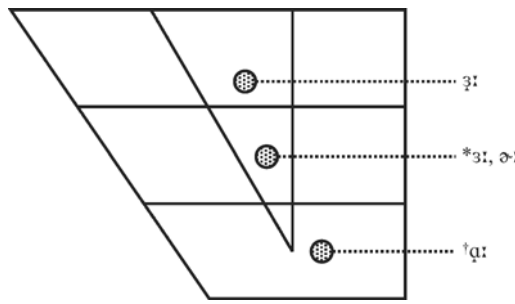


Figure 23 Variants of /ɜː/.

(3) *Regional variants*—/ɜː/ is derived from an earlier sequence of vowel plus /r/ and in General American and in south-west England this shows up in r-colouring of this vowel, often symbolised as [ɜ˞]. This r-colouring is produced by slight retroflexion of the tip of the tongue or by contraction of the body of the tongue. In Standard Scottish English a sequence of vowel (usually [ɪ,e,ʌ,ʊ]) plus /r/ is retained; hence this dialect has no /ɜː/ in its phonemic inventory. In broad varieties of Tyneside /ɜː/ falls together with /ɔː/ so that *burn* and *born* may be pronounced the same. There is considerable variation in the quality of /ɜː/ in other dialects, notable being a close variety (= [ɜ̝ː]) in Australian English and in Birmingham, and a rounded variety (= [ɞː]) in Liverpool, where the contrast between /ɜː/ and /ɛː/ is lost, *fur* and *fare* being pronounced the same.

Sources of /ɜː/

ME [ɛ,ɛː] + [r]	earth, fern, heard, virtue
ME [ɪ] + [r]	birth, myrrh, shirt
ME [ʊ] + [r]	journey, spur, word

Note (1): These sequences became [ər] 17c. and [əː](= /ɜː/) 18c.
Note (2): The Fr. final sequence [œʁ] sometimes > /ɜː/, e.g. *connoisseur* /kɒnə`sɜː/, liqueur /lɪ`kɜː/

(4) *Advice to foreign learners*—It is comparatively rare to find a long central vowel such as /ɜː/ in other languages. Some languages, however, possess somewhat centralised front rounded vowels of the [ø] and [œ] types, e.g. Dutch, French, German and the Scandinavian languages. These are unacceptable for GB because of the lip-rounding. An articulation with spread lips should, therefore, be encouraged, keeping the same position with spread lips for such words as *fur*, *bird*, *learn* as for *fee*, *bead*, *lean*. Lip-spreading is particularly important after /w/, e.g. in *word*, *world*, *work*, etc. In addition, the quality must be of a central rather than fronted kind, though some latitude may be allowed as far as the degree of raising of the tongue is concerned.

Since nearly all cases of /ɜː/ occur in words having an <r> in the spelling, if the target is non-rhotic GB, care must also be taken to avoid post-vocalic /r/ (except as a liaison form as in *stir up* /stɜːr`ʌp/) or any retroflexion of the tongue such as would produce /r/-colouring.

8.9.13 /ə/

(1) *Examples:*

/ə/ is most frequently in opposition either with zero vowel, e.g. *about*, *bout*; *waiter*, *wait*, or with unaccented /ɪ/ or /i/, e.g. *affect*, *effect*; *accept*, *except*; *razors*, *raises*; *grocers*, *grosses*; *mitre*, *mighty*; *waiter*, *weighty*; *sitter*, *city*; *battered*, *batted.*

/ə/ is normal in the usual weak (unaccented) forms of such words as *a*, *an*, *the*, *to*, *for*, *but*, *and*, etc. (see §11.3).

/ə/ may occasionally occur in accented syllables in connected speech, e.g. *I'm going to* /aɪm `gənə/, *no monsieur* /nəʊ mə`sjə/, *you do*, *don't you* /juː `duː `dənʧu/. (Similar stressing may be found in tags with *can*, *could*, *has*, *must*, *was* and *would.*)

Spellings of /ə/ (excluding function words)

	Examples	*TF*	*LF*
a	about, affect, woman	35%	30%
o	oblige, offend	19%	24%
e	gentlemen /-mən/	13%	13%
er, re	batter, grocer, mitre, mother, waiter	15%	12%
i	possible, quality		
u	suppose		
ar, or, our, ure	colour, doctor, figure, particular, razor		
ou	famous		

Note: /ə/ in weak forms, e.g. *a, an, and, but, for, the, to* (see §11.3)

(2) *Description*—/ə/ has a very high frequency of occurrence in unaccented syllables. Its quality is that of a central vowel with neutral lip position, having in non-final positions a tongue-raising between open-mid and close-mid, e.g. in ɑ*lone*, *fɑtigue*, *deco*ɾ*ɑtive*, *afte*ɾ*wɑ*ɾ*ds*. **(See videos 2.11 (*a*), 3.11 (*of*), 6.13 (*the*), 8.10 (*the*), 13.12 (*the*).)** In the vicinity of the alveolar consonants /t,d,n,s,z/ the tongue may be raised to the close-mid position; around the velar consonants /k,g,ŋ/ the tongue may be slightly close-mid and retracted, e.g. in *long* ɑ*go* [lɒŋ ˧-ˈgəʊ]. In final positions, e.g. in *moth*er, *doct*or, *ov*er, *pict*ure, *Chin*a, the vowel may be articulated in the open-mid central position (= [ɐ̝]). **(See videos 10.25, 11.26.)** The acoustic formants of /ə/ are, therefore, likely to be similar to those for /ɜː/ or /ʌ/ according to the situation. In CGB, final /ə/ will be below open-mid (= [ɐ]) and may even approach /ɑː/, so that the two vowels in *father* become similar in quality.

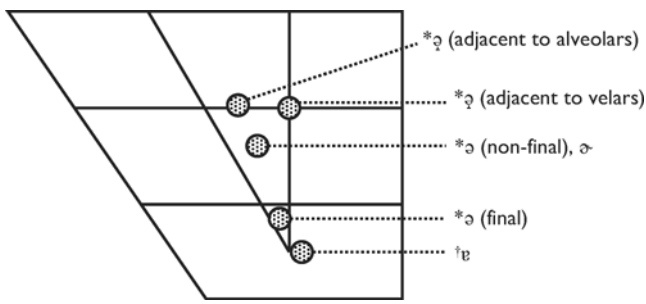


Figure 24 Variants of /ə/.

(3) *Regional variants*—Many examples of /ə/ derive from sequences of vowel plus /r/ (usually shown in the spelling, e.g. *waiter*, *doctor*, *colour*, *figure*).

In rhotic dialects this original /r/ may be reflected in r-colouring of the schwa (= [ɚ]) as in General American and south-west England, or may correspond to sequences of a full vowel (usually short) plus /r/, as in Scottish English. In the north of England a number of prefixes in closed syllables which have /ə/ in GB have a full vowel, e.g. *con-*, *ad-*, *sub-* as in *conclude* /kɒŋˈklu:d/, *advance* /adˈvans/, *substantial* /sʌbˈstanʃəl/.[16]

Sources of /ə/

As the large variety of spellings shows, /ə/ ('schwa') represents the 'reduced' unaccented form of any vowel or diphthong. The process of reducing 'full' vowels began in OE, in which the letters <æ,e,i> are often confused in unaccented syllables. Reduction became more pervasive in ME, achieving the present position in the 15c. or 16c. in which spellings such as *disabey*, *Bishap*, *tenne a clocke*, *sapose*, seem to indicate a vowel of the [ə] type.

Since ME the accented syllable has changed in some words, so that a previously accented vowel is now unaccented and reduced to /ə/. Thus *adversary* was pronounced [advɛrˈsa:rɪ] or [ədvərˈsa:rɪ] in ME, whereas today the previously accented syllable has been reduced, giving /ˈædvəsəri/. In words like *follow*, *pillow*, *widow*, *window*, which in ME had a final [ə], present-day GB has restored the full vowel /əʊ/. In northern England some prefixes retain a full vowel, e.g. e.g. *advance* /ædˈvæns/, *conflict* /kɒnˈflɪkt/, *observe* /ɒbˈzɜ:v/.

(4) *Advice to foreign learners*—The quality of this vowel, including the two main allophones described in (2) above, does not usually present difficulties to foreign learners, provided that they remember that English /ə/ has no lip-rounding and is extremely short. Moreover, when /ə/ is spelt with vowel + <r>, the learner should avoid pronouncing any kind of [r] sound, except when in final positions an /r/ is pronounced as a link to a following word beginning with a vowel, e.g. *mother and father* /mʌðər ən ˈfɑ:ðə/.

When occurring in final positions, e.g. in *supper*, *sofa*, *actor*, the quality of /ə/ should not be too open or too long. There is a tendency for some learners, e.g. Hindi and Bantu speakers, to equate final /ə/ with /ɑ:/.

In particular, the learner should note those syllables of a word containing /ə/, remembering that /ə/ is a sound which occurs very frequently in native speaker varieties and that correct use of unaccented syllables of a word is as much a part of the word's accentual pattern as the vowels of the accented syllables. If aiming at GB, learners can gain greater familiarity with the occurrence of /ə/ by reading English texts transcribed phonetically and by making phonetic transcriptions of connected English. Particular attention should be paid to the use of [ə] in the weak forms of function words like *the* /ðə/, *has* /həz/, *for* /fə/, *from* /frəm/, etc. (see §11.3).

8.10 Diphthongal vowel glides

The sequences of vocalic elements included under the term 'diphthong' are those which form a glide within one syllable. They may be said to have a first element (the starting-point) and a second element (the point in the direction of which the glide is made). The GB diphthongs have as their first element sounds in the general region of [ɪ,e,a,ə,ʊ] and for their second element [ɪ,ʊ,ə] (but see §8.2). The following generalisations refer to all the GB diphthongs:

(1) Most of the length and stress associated with the glide is concentrated on the first element, the second element being only lightly sounded (see §§8.12.1, 8.12.2 for the exceptional cases of /ɪə,ʊə/); diphthongs of this type are said to be 'falling'.
(2) They are equivalent in length to the long (pure) vowels and are subject to the same variations of quantity, e.g. *plays* [pleːɪz], *place* [pleˈɪs]. The reduced forms show a considerable shortening of the first element.
(3) They are particularly susceptible to variation regionally and socially. Even within GB, considerable variation is possible in both elements.
(4) No diphthong occurs before /ŋ/, except where word-final /n/ is assimilated to /ŋ/ in connected speech (see §12.4.5).
(5) With the exception of /ɔɪ/, the GB diphthongs principally derive from earlier pure vowels.

8.10.1 /eɪ/

(1) *Examples:*

Long [eːɪ]—day, made, game, gaze
Reduced [eˈɪ]—eight, late, face, safe, ache
Compare [eːɪ], [eˈɪ]—played, plate; ray, race; way, waist; save, safe
/e/, /eɪ/—bet, bate; fell, fail; chess, chase; west, waist
Before [ɬ]—male, pail, failed, sails

Spellings of /eɪ/

	Examples	*TF*	*LF*
a (inc a..e)	ache, ape, base, chase, face, game, gaze, lady, late, made, make, male, late, race, safe, save, waste	65%	82%
ai	aim, Braille, fail, hail, rail, rain, sail, straight, waist	12%	10%
ay	crayon, day, may, play, ray, way	18%	4%
ei, ey	eight, rein, they, veil, weigh, weight, whey		
ea	break, great, steak		

Note (1): *gauge, gaol, fete, suede*
Note (2): from French: *ballet, cafe, dossier, foyer, matinee, puree, sachet, sauté*

(2) *Description*—The glide begins from slightly below the close-mid front position and moves in the direction of GB /ɪ/, there being a slight closing movement of the lower jaw; the lips are spread. **(See videos 6.3, 14.1, 15.1.)** The starting-point is, therefore, [ę] (somewhat closer than GB /e/ of *bet*). Although this quality is the most common in GB, nevertheless there is considerable variation in the starting-point. Older speakers may have a starting-point nearer to C.[e], while in CGB a more open starting-point nearer to C.[ɛ] is common. Before [ɬ], the [ɪ] element is often absorbed into the [ə] or [ʊ] glide on to [ɬ], e.g. *sail* [seᵊɬ]. This diphthong does not normally occur before /ŋ/, except under conditions of assimilation, e.g. *Spain came* /ˈspeɪŋ keɪm/

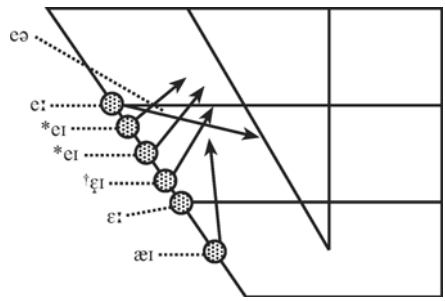


Figure 25 Variants of /eɪ/.

(3) *Regional variants*—An even more open starting-point (= [æɪ]) is usual in broad London. When /eɪ/ is produced as openly as this, /aɪ/ has its starting-point retracted so that *fate* [fæɪt] is kept distinct from *fight* [fɑɪt]. A similar movement of these two vowels occurs in Australian English. This change of /eɪ/ and /aɪ/ is often part of a more general change known as the 'Southern Diphthong Shift', typical of London, Birmingham and the south and midlands of England, whereby /iː/ = [əɪ], /eɪ/ = [aɪ], /aɪ/ =[ɑɪ] or [ɔɪ] and /ɔɪ/ = [oɪ] (the accent of Birmingham is otherwise more similar to the north of England).

Many other regional realisations of /eɪ/ have a monophthongal [eː], e.g. Standard Scottish English and General American. Northern English may have [eː] or [ɛː] and some areas may have a split between [eː] in *late* and *main* and [ɛː] in *eight* and *straight*. In many parts of north-east England, notably broad Tyneside, there is a centring movement giving [eə].

Sources of /eɪ/

OE [æ,ɑ] in open syllable	ME [aː]	ale, ape, name, raven
ON [ɑ] in open syllable		take
OF [aː]		cave, male, nature, state
OF [au]		chamber, change, safe, strange
OE [æ,æː,ɛ] + [j]	ME [æɪ,ɛɪ]	again, day; clay, grey; play, way
OF [ai,ei]		chain, pay; faith, obey
ON [ei]		they, swain

Note (1): ME [æɪ,ɛɪ] > [ɛɪ]15c., > [ɛː]16c.17c., > [ɛɪ]18c., > [eɪ]19c.
Note (2): ME [ɛː] (normally > ModE /iː/) > /eɪ/ in *break, great, steak*
Note (3): Recent French borrowings: *ballet, bouquet, beige, crepe, fiance, soiree*

(4) *Advice to foreign learners*—Foreign learners of GB should give sufficient length to the first element of this diphthong, making the correct reduction of quantity in the appropriate contexts. Care should also be taken that the quality remains within the permitted GB limits, i.e. preferably slightly more open than C.[e] and not as open as C.[ɛ]. The second part of the diphthong should be only lightly touched on and should never reach the region of fully close [i]. For those who do not have a diphthong in this area, e.g. Arabic, French and German speakers, there may be a tendency to substitute a pure vowel around [eː]. This is a realisation of this phoneme in many accents of English, e.g. Scottish English and General American. It is an acceptable substitute for the diphthong provided the sound is kept long; if it is shortened, there is danger of confusion with /ɪ/ or /e/.

8.10.2 /aɪ/

(1) *Examples:*

Long [aːɪ]—fly, die, mine, hide, eyes
Reduced [aˈɪ]—fight, like, ice, ripe
Compare [aːɪ], [aˈɪ]—tie, tight; tidal, title; eyes, ice; riding, writing
Before [ɬ]—mile, aisle, piles, mild

Spellings of /aɪ/

	Examples	*TF*	*LF*
i (inc i..e)	bite, climb, design, hide, ice, like, mild, mile, mine, pile, ride, ripe, tide, time, title, write		
ie, y, ye (finally)	by, cry, die, dry, dye, fly, lie, pie, tie, tried i, ie (non-finally) y, ye (finally)	80%	82%
y (non-finally)	anodyne, asylum, cycle, type, tyrant	2%	9%
igh	bright, fight, high, light, might, right, sight, tight	13%	4%

Note: *aisle, buy, eider, either, eye, height, maestro, neither*

(2) *Description*—The most frequent glide of GB /aɪ/ begins at a point slightly behind the front open position, i.e. [ä], and moves in the direction of the position associated with GB /ɪ/, although the tongue is not usually raised to a level closer than [ë]; the glide is much more extensive than that of /eɪ/, the closing movement of the lower jaw being obvious. **(See videos 4.4, 8.3, 9.13.)** The lips change from a neutral to a loosely spread position. Before [ɬ] the [ɪ] element is often absorbed into the [ə] or [ʊ] glide on to the [ɬ], e.g. *pile* [paːˢɬ]. This diphthong does not normally occur before /ŋ/ except under conditions of assimilation, e.g. *fine game* /faɪŋ `geɪm/.

Since GB /eɪ/ is realised between the limits [eɪ] and [ɛɪ], /aɪ/ cannot, while remaining contrastive, have a first element closer than C.[ɛ]. Those GB speakers who use the closest form of /eɪ/ will probably have a type of [æɪ] glide for /aɪ/, while those whose /eɪ/ is nearer to [ɛɪ] may realise /aɪ/ with the more retracted type of [a] mentioned above. In CGB a very back starting-point is most common, and this may sometimes involve the elimination of the glide, leaving [ä], which may be only marginally differentiated from /ɑː/ realised as C.[ɑ].

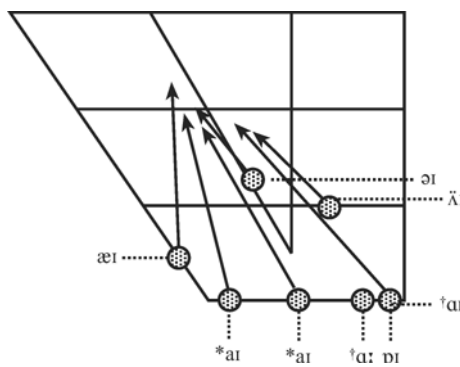


Figure 26 Variants of /aɪ/.

(3) *Regional variants*—In broad London also /aɪ/ has a back starting-point to give [ɑɪ], as indeed has Australian English, although in this case there may be rounding to [ɒɪ] (see this realisation as part of the Southern Diphthong Shift under /eɪ/ above). In different parts of the north of England, all varieties of starting-point from front to back may be heard. In an extensive area of south-west and south-central England, particularly in rural areas, a closer starting-point may be heard (= [əɪ]). In Scottish English many speakers have a distinction between a morpheme-non-final realisation [aɪ] and a morpheme-final [ɐ̈ɪ], thus *tide* [taɪd] but *tied* [tɐ̈ɪ]. In the so-called mid-Atlantic pronunciation used by pop singers, *I* and *my* are generally reduced to [ä], following the open monophthongal pronunciation of this vowel in the southern United States.

Sources of /aɪ/

OE [iː]	ME [əi]	ice, like, life, time
OE [ɪ]		child, find, wild
OE, ON [y]		hide, kind, mice, sky
OE [eː] or [ɛː] + [j]		dye, eye fly, lie
OE [eː] + [ç]		light, night
OF [iː]		arrive, fine, licence, price

Note: [iː] > [ɪi] 15c. > [əɪ] 16c. > [aɪ] 17c./18c.

(4) *Advice to foreign learners*—Apart from observing the proper reductions of quantity in syllables closed by a voiceless consonant, foreign learners should avoid over-retraction and rounding of the first element, so as to remain within the limits of the GB vowel and avoid confusion with /ɔɪ/. Many languages have a vowel in the region [ä] and this is generally a suitable starting-point. Care should also be taken not to glide to too close a position, i.e. to the C.[i] area, such as is reached in diphthongs of this type in many languages.

8.10.3 /ɔɪ/

(1) *Examples:*

Long [ɔːɪ]—boy, noise, void, coin
Reduced [ɔɪ]—voice, joist, joint, choice
Compare [ɔːɪ], [ɔˈɪ]—noise, voice; joys, joist
Before [ɬ]—soil, coiled, boils

Spellings of /ɔɪ/

	Examples	*TF*	*LF*
oi	boil, choice, coil, joint, joist, noise, point, soil, voice, void	62%	71%
oy	boy, joy, oyster, toy, voyage	38%	29%

Note: *buoy*

(2) *Description*—For GB /ɔɪ/ the tongue glide begins at a point between the open-mid and open back positions and moves in the direction of /ɪ/, generally not reaching a level closer than [ë̞]. **(See video 9.22.)** The tongue movement extends from back to centralised front, but the range of closing in the glide is not as great as for /aɪ/; the jaw movement, though considerable, may not, therefore, be as marked as in the case of /aɪ/. The lips are open rounded

for the first element, changing to neutral for the second. Before [ɬ] the [ɪ] element is often absorbed into the [ə] or [ʊ] glide on to the [ɬ], e.g. *oil* [ɔːᵊɬ]. This diphthong does not normally occur before /ŋ/, except under conditions of assimilation, e.g. *coin game* /ˈkɔɪŋ geɪm/.

CGB unrounds, raises and centralises the starting-point, so that we have [ə̟ɪ]. This produces a cluster of unrounded back open vowels or diphthongs: /ɑː/ = [ɑː], /ɜː/ = [ɑ̟ː], /aɪ/ = [äɪ], /ɔː/ = [ə̟ɪ] and /aʊ/ = [ɑːᵘ], the cumulative effect of which is the so-called 'plummy' effect associated with this accent.

It will be noted that this is the third diphthongal glide towards an [ɪ] sound; it is, however, the only glide of this type with a fully back starting-point (if the case of [ʊɪ], as in *ruin* (see §8.1 Note (6)) is discounted). To this extent, /ɔɪ/ may be considered asymmetrical in the GB diphthongal system.

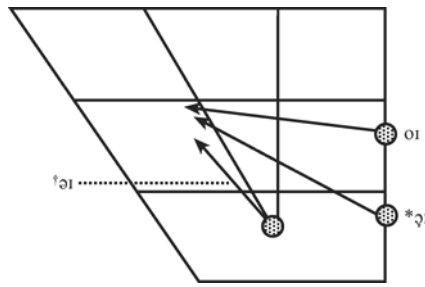


Figure 27 Variants of /ɔɪ/.

(3) *Regional variants*—A number of dialects have a starting-point closer than that of GB, i.e. something between close-mid and open-mid, e.g. London, Australian English and Scottish English. A phonemic merger between /ɔɪ/ and /aɪ/ is typical of many West Indian accents; thus there is, for example, no difference between *buy* and *boy*.

Sources of /ɔɪ/

OF [ɔɪ]	ME [ɔɪ]	choice, noise
OF [ui]	ME [oɪ]	boil, coin, join, point

Note: In the 18c. the ME [oɪ] words were often confused with present /aɪ/ words, e.g. between *boil* and *bile*

(4) *Advice to foreign learners*—This diphthong does not present very great difficulties to foreign learners, provided that, in addition to the appropriate variations of quantity, the quality of the first element lies between the sounds of GB /ɔɪ/ and /ɒ/ and that the glide does not extend beyond the close-mid front level, i.e. [ë].

8.10.4 /əʊ/

(1) *Examples:*

Long [əːʊ]—go, toe, home, road, pose
Reduced [əˑʊ]—goat, rope, oak, post, both
Compare [əːʊ], [əˑʊ]—robe, rope; toes, toast; grows, gross; road, wrote; cold, colt
/əʊ/, /ɜː/—foe, fur; own, earn; goal, girl; oath, earth; coat, curt; foam, firm
/əʊ/, /ɔː/—so, saw; pose, pause; bold, bald; load, lord; boat, bought; choke, chalk
/əʊ/, /ɜː/, /ɔː/—foe, fur, four; bone, burn, born; woke, work, walk; coat, curt, caught; coal, curl, call
Before [ɬ]—hole, roll, old, moult, bolt, poles

Spellings of /əʊ/

	Examples	*TF*	*LF*
o (inc. o..e)	bimbo, bold, bolt, bone, both, choke, clone, cold, colt, folk, go, hole, gross, old, home, pole, pose, roll, rope, so, trombone, woke, wrote, zero		
oe	toe, doe, foe, hoe, oboe, sloe		
	o, o..e, oe	75%	85%
ow	blow, bungalow, grow, know, hollow, meadow, own, pillow, sparrow	18%	7%
oa	boat, coal, coat, cocoa, oak, foal, foam, goal, goat, hoax, load, loaf, oath, reproach, road, soap, toast	4%	5%
ou	soul, though, shoulder, boulder, soldier, moult, smoulder		

Note: *beau, brooch, bureau, chauffeur, don't, gauche, mauve, plateau, sew, won't, yeoman*

(2) *Description*—The glide of GB /əʊ/ begins at a central position, between close-mid and open-mid, and moves in the direction of GB /ʊ/, there being a slight closing movement of the lower jaw; the lips are neutral for the first element, but have a tendency to round on the second element. The starting-point may have a tongue position similar to that described for /ɜː/. **(See video 1.5.)** Older speakers of GB commonly use a rounded first element, i.e. [ɵ̈ʊ]. A very recent development in GB is the fronting of the second element to [ʉ] giving [əʉ], similar to the fronting of /ʊ,uː/. This diphthong does not normally occur before /ŋ/, except under conditions of assimilation, e.g. *bone graft* /ˈbəʊŋ grɑːft/. Before /l/ use of a variant [ɒʊ], e.g. in *soul, cold, bolt*, which was in previous editions considered part of London Regional GB, is now spreading widely enough to be considered part of GB.

CGB may use a type of diphthong where an unrounded first element is produced further forward, i.e. between close-mid and open-mid and centralised from front, giving [ɛ̟ʊ]. Alternatively an unrounded central first element may be lengthened and absorb the second element resulting in [əː] so that the distinction between /əʊ/ and /ɜː/ may be completely lost (especially where [ɬ] follows, e.g. between *goal* and *girl*, where a weak [ʊ] element may be taken as the glide onto dark [ɬ]).

/əʊ/ is regularly kept in GB in unaccented syllables where other dialects reduce to /ə/, e.g. in *window* /ˈwɪndə/, *barrow* /ˈbarə/; *fellow* /ˈfelə/ was once fashionable in the early twentieth century, and still occurs in a casual or jocular style, sometimes spelt <fella> or <feller>). In unaccented syllables in some other words a careful pronunciation produces an allophone [o] e.g. in *obey*, *phonetics*, although /ə/ is more common. The reduction of /əʊ/ to [əː] may produce in casual speech homophones which are distinct in a more careful style, e.g. *ferment* (v.) *foment*—both /fəˈment/, *hypertension, hypotension*—both /haɪpəˈtenʃn/.

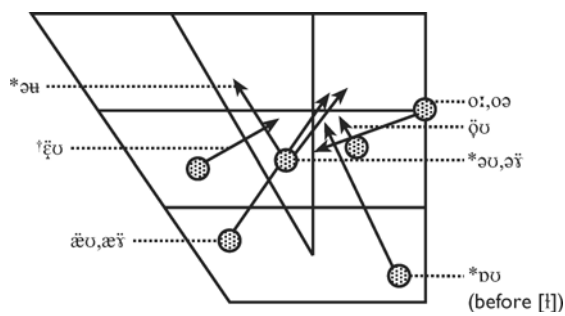


Figure 28 Variants of /əʊ/.

(3) *Regional variants*—Dialectally there is considerable variation in this vowel. Broad London has [ӕʊ] or even [ӕɤ̈], with unrounding spreading to the second element; this realisation is near to CGB [ɛ̟ʊ]. The lower and more front pronunciation of /əʊ/ in broad London keeps it apart from the realisation of /uː/ as [əu], see above §8.9.11. Regional GB of the London region may have the unrounding but not the fronting of London, i.e. [əɤ̈].

Australian English has a very similar spread of allophones for this phoneme as broad London. Many other dialects have a relatively pure vowel around C.[o]; this applies to SSE, to GA, and to much of the north of England, although north-east England (particularly Tyneside) may have a reversed diphthong [oə].

Sources of /əʊ/

OE [ɑː]	ME [oː]	ghost, go, home, loaf, no
OE [æ,ɛə] before [ld]		cold, old, told
OE [ɔ] in open sylls		hope, nose, open, over
OF [ɔ]		coat, gross, robe, rose, toast
OE [ɑː,ɔ] + [w,ɣ]		blow, dough, know, own, snow, soul
OE [oː] + [w]		flow, glow, row

Note: Later borrowings from French words with [ɔ,o]: *beau, bureau, hotel*

(4) *Advice to foreign learners*—It is advisable to learn /ɜː/ first and to modify /ɜː/ by adding lip-rounding to the end of the vowel. Thus, *fur* may be modified to *foe*, *girl* to *goal*, and *burn* to *bone*. In this way, the diphthong will be kept distinct from /ɔː/ (see comparative examples in (1) above). In addition, proper prominence must be given to the first element and reduction of the total length of the glide made in the appropriate contexts.

Many foreign learners will use a pure vowel around C.[o], e.g. speakers of Arabic, French, German, Italian and Spanish. This is the realisation of this phoneme in many accents of English. There is no objection in principle to this but the danger is then of confusion with /ɔː/. Consequently, for those aiming at a GB pronunciation, it is worthwhile attempting the diphthong in the way outlined above.

8.10.5 /aʊ/

(1) *Examples:*

Long [aːʊ]—how, loud, town, cows
Reduced [aˑʊ]—shout, about, mouse, mouth
Compare [aːʊ], [aˑʊ]—allows, a louse; found, fount; mouth (v.), mouth (n.); loud, lout
Before [ɬ]—cowl, foul, owls

Spellings of /aʊ/

	Examples	*TF*	*LF*
ou	about, blouse, council, doubt, foul, found, fount, ground, house, loud, lout, mouse, mouth, out, shout, sound		
ow	allow, browser, cow, crowd, growl, how, owl, powder, town		
	ou, ow	99%	96%

Note: the present spellings <ou,ow> come from French where it represented [uː]

(2) *Description*—The glide of GB /aʊ/ begins at a point between the back and front open positions, more fronted than the position for GB /ɑː/, and moves in the direction of GB /ʊ/, though the tongue may not be raised higher than the close-mid level, i.e. [ö]. **(See video 6.16.)** The glide is much more extensive than that used for /əʊ/ and is symmetrically opposed to the front glide of /aɪ/. The lips change from a neutrally open to a weakly rounded position. This diphthong does not normally occur before /ŋ/, except under conditions of assimilation, e.g. *town gate* /taʊŋ ˋgeɪt/.

The GB diphthong /aʊ/ is in opposition in the back region with /əʊ/; if the latter has a starting-point in the central area below close-mid, the starting-point of /aʊ/ cannot be raised to any extent without the possible loss of contrast between such words as *tone* and *town.* GB variants, therefore, involve particularly the fronting or retraction of the starting-point rather than its raising. Considerable latitude is permitted between the values C.[a] and C.[ɑ]; for many speakers, the first element of /aɪ/ and /aʊ/ may in fact be identical. Since, however, several popular regional forms of speech (especially in the London region) have typically a first element in the C.[a] or [æ] areas, reaction among careful speakers causes the diphthong to have a more retracted starting-point, sometimes reaching C.[ɑ]. In CGB the [ɑ] element is extra long, especially in those contexts in which the diphthong has its fully long form, with a weak glide involving comparatively little raising of the tongue and little, if any, lip-rounding; *loud* and *lard* may, therefore, be distinguished only by a slight movement at the end of the vowel.

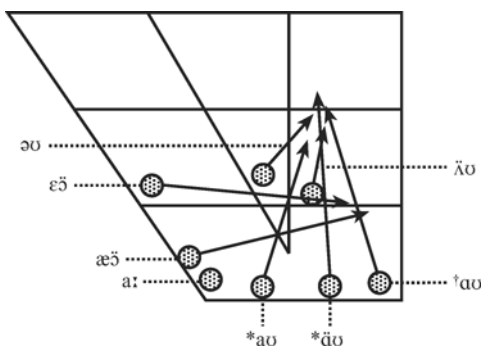


Figure 29 Variants of /aʊ/.

(3) *Regional variants*—In London, the first element may be of the [ɛ] or [æ] varieties. It would appear that with such a glide there would be risk of confusion with the realisation of /əʊ/ as [ɐ̈ʊ] or [äɤ̆], as between such words as *now* and *no*; in fact, the starting-point used for /əʊ/ may be more open than that of /aʊ/, e.g. *no* [näɤ̆], *now* [nɛ̈ʊ]. Even if the two starting-points are on the same level, however, the diphthongs are kept phonetically separate

by the greater centralisation of the first element of /əʊ/ and also, in some cases, by the closer end point reached in /əʊ/ as compared with that of /aʊ/: [ăʊ] or [ăʊ̈] for /əʊ/ as against [æɔ̈] or [ɛɔ̈] for /aʊ/. Alternatively, /aʊ/ may be realised as a long, relatively pure vowel of the [aː] type, e.g. *town* [taːn]. The realisations of /əʊ/ in Australian English are once again similar to those in London, although the monophthongal variant does not seem to occur. In Scottish English and in Northern English, where /əʊ/ is realised as [oː], the starting-point of /aʊ/ may be raised to give [əʊ] or [ɐ̈ʊ]. Also some speakers of these dialects may have [uː] as a realisation of /aʊ/. Generally, but not always, the contrast between /aʊ/ and /uː/ is not lost, since /uː/ is realised as [ÿː] in Scottish English and [ɪə] in those parts of the north of England (mainly the north-east) which use the traditional dialect [uː] realisation of /aʊ/. In Scottish English realisation with [uː] in words like *town*, *mouse*, *about*, *house* is typical only of broad accents and is regarded as a feature of Scots rather than Scottish English.[17]

Sources of /aʊ/

OE [uː]	ME [uː]	cow, house, mouth
OE [ʊ]		ground, found
OE [oː] + [w] or [ɣ]		fowl, bow, bough
OF or AN [uː]		allow, powder, couch, count, mountain

Note (1): [uː] > [ʊu] 15c. > [əʊ] 16c. > [aʊ] 18c.
Note (2): in some northern and Scottish accents the change in note (1) did not occur, e.g. present Scottish /huːs/ = [hyːs]
Note (3): [uː] sometimes remains or was shortened near bilabial consonants, e.g. *wound* (n.), *droop*, *stoop*; *plum*, *crumb*, *thumb*

(4) *Advice to foreign learners*—Just as for /aɪ/, foreign learners should be careful to use a correct first element, i.e. a variety which is not so fronted or raised as to be dialectal; a starting-point too near to C.[ɑ] is also to be avoided, being part of the nowadays very marked CGB (see §7.7). The first element should be the most prominent and the second element only lightly touched on, the tongue closing to a position not higher than close-mid, i.e. [oː].

8.11 Diphthongs + [ə]

All diphthongs may be followed by [ə] within the word, either as an inseparable part of the word, e.g. *layer*, *fire*, *society*, *Goya*, *Noah*, *our*, *sour* /leɪə, faɪə, sə`saɪəti, gɔɪə, nəʊə, aʊə, saʊə/, or as a suffix appended to the root, e.g. *player*, *drier*, *employer*, *slower*, *mower*, /pleɪə, draɪə, ɪm`plɔɪə, sləʊə, məʊə/ or, sometimes, as a separable element internal in a composite form, e.g. *nowadays* /`naʊədeɪz/. In such cases, the third vocalic element [ə] may be added to the two elements of

the diphthongal glide. But there is a tendency in colloquial GB to omit the second ([ɪ] or [ʊ]) element, especially when [ə] is not a separable suffix. This process is sometimes known as SMOOTHING.[18]

(1) /eɪə/ → [eːə] e.g. in cases involving a suffixed [ə] *player*, *greyer*, *conveyor*, *layer*. The resultant diphthong may be levelled with the older diphthongal pronunciation of /ɛː/ as [eə] so that homophones such as *prayer*, *pray-er*; *lair*, *layer*, may be produced.

(2) /aɪə/ → [äːə], e.g. in *fire*, *tyre*, *choir*, *society*, *hire*, *shire*, *liable*, and also in cases where [ə] is a separable suffix, e.g. *higher*, *shyer*, *buyer*.

(3) /ɔɪə/ → [ɔːə] as in *employer*, *enjoyable*, *buoyant*, *joyous*. Thus *coyer* ('more coy') may be pronounced the same as /ɔː/ + /ə/ *coir*.

(4) /əʊə/ → [əː] = /ɜː/ thus homophones may be produced, e.g. *mower*, *myrrh*; *slower*, *slur*.

(5) /aʊə/ → [äːə] e.g. in *our*, *coward*, *nowadays*, *shower*, *flower*.

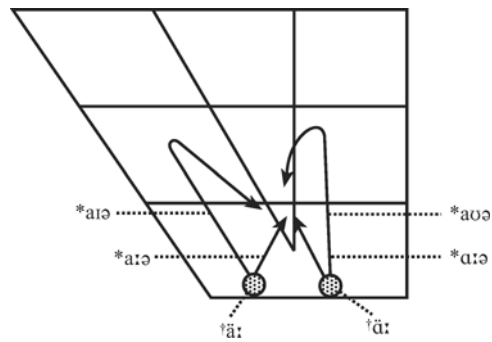


Figure 30 Variants of /aɪə,aʊə/.

(6) It will be seen that the reduction of the phonetic sequences /aɪə, ɑʊə/ results in a neutralised form [äːə] (although for some speakers the distinction may be maintained as [aːə]~[ɑːə]).

(7) A further smoothing of [äːə] may eliminate the [ə], leaving both [äː], and this may be close or equal to /ɑː/. So many new homophones may be produced in this way, e.g. *tyre*, *tower*, *tar*; *shire*, *shower*, *Shah*; *sire*, *sour*, *Tsar*. This further smoothing with the reduction to a monophthong is nowadays mainly a feature of CGB and is commonly regarded as affected. But it can be present in other accents, in particular broad London and Liverpool. Also some words of high frequency are regularly heard with /ɑː/, e.g. *our*, *hour*.

(8) Most speakers distinguish between sequences of diphthong + /əl/ (usually in the case of terminations spelt *-el*, *-al*, e.g. *tail*, *trial*, *towel*, *royal*) and sequences of diphthong + /l/ (e.g. *tale*, *tile*, *owl*, *toil*). But a smaller number of speakers may reduce both to [eːə, äːə, ɔːə].

(9) In the case of /əʊ/ + [ɬ], the [ʊ] element of the diphthong may be retained, both because it is reinforced by the glide on to [ɬ] and also in order to maintain the distinction /əʊ/-/ɜː/ as in *pole, pearl.* In London Regional GB (= Estuary English) it is also likely that /əʊ/ before /l/ as in *pole* will be produced with the contextual allophone [ɒʊ] and the quality of the beginning of the diphthong will thus keep such words distinct. This allophone is now so widely used as to be on the verge of mainstream GB.

(10) There is some suggestion that smoothing may be more likely where the triphthong is within one morpheme rather than when two morphemes are involved, e.g. that smoothing is more likely in *flour* and *hire* than in *plougher* and *higher.* Nevertheless smoothing does occur across morpheme boundaries and may occur even across word boundaries where a word-final diphthong is followed by a word-initial /ə/, e.g. *they are* [ðeːə] or [ðɛːə], sometimes rhyming with *there*; *go away* /gɜː`weɪ/; *buy a house* [baː`haʊs]; *now and then* [naːn`ðen]; *boy and girl* [bɔːŋ`gɜːl].

(11) The weakness of the final elements of diphthongs is also demonstrated by their instability before vowels other than /ə/. Thus, in the case of /eɪ,aɪ,ɔɪ/, when /iː/ or /ɪ/ follow (i.e. a vowel articulation at or closer than the end point of the diphthongal glide), the [ɪ] second element of the diphthong may be lost, e.g. in *playing, way in, they eat it, highest, hyena, buy it, try each, annoying, the boy easily.* The [ɪ] element may also be absorbed before other vowels, e.g. in *way up, by all means, they understand, toy engine.*

(12) In the case of /əʊ,aʊ/, absorption of the [ʊ] element before /ʊ/ or /uː/ rarely arises, since a following /ʊ/ or /uː/ is unusual. But absorption of the [ʊ] element of the narrow diphthong /əʊ/ frequently occurs before other vowels, e.g. in *go easy, glowing, no end, go off, know all, show up.* Loss of the [ʊ] element of /əʊ/ does not lead to confusion with /ɜː/, since /ɜː/ in such a position will normally be realised with a linking /r/, cf. *slow it* /ˈsləʊ ɪt/ or /ˈslɜː ɪt/ and *slur it* /ˈslɜːr ɪt/. In the case of /aʊ/, loss of the [ʊ] element may also occur before vowels other than [ə], e.g. in *allow each, vowing, how else, now or never*, but when the following vowel has an open quality similar to that of the first element of /aʊ/ some tongue movement towards [ʊ] normally takes place, e.g. in *how are they, plough up, how odd.*

(13) This tendency to absorb the second element of diphthongs before other vowels is a feature which is more marked in CGB. A more careful pronunciation of sequences of diphthong following vowel may involve the presence of a linking [^{j,w}], e.g. *way in* [weɪ^{j}ɪn], *plough up* [plaʊ^{w}ʌp], but this linking [^{j,w}] is rarely as prominent as phonemic /j,w/, cf. *three ears* vs *three years* and *two-eyed* vs *too wide* (see further under §12.4.7).

(14) A similar weakening of the monophthongs /uː/ and /iː/ sometimes occurs across syllable boundaries. Reduced allophones [i] and [u] may be used, or the vowels may change to /ɪ/ and /ʊ/, when the following word begins with a vowel, e.g. *two in the morning* /tu ɪn ðə `mɔːnɪŋ/, /tʊ ɪn ðə `mɔːnɪŋ/ or even /twɪn ðə `mɔːnɪŋ/ and *three o'clock* /θri ə`klɒk/ or /θrɪ ə`klɒk/.

(15) There are difficulties of analysis into syllables related to the smoothing of triphthongs. The diphthongs which form the first part of triphthongs are clearly monosyllabic, i.e. they involve only one peak of prominence. But when a /ə/ is added, this produces a sequence with two peaks of prominence and hence two syllables. When the triphthongs are smoothed, the sequences are again reduced to one syllable.

(16) *Advice to foreign learners*—Foreign learners should be aware of this tendency to reduction of vowel sequences, in order that they may understand colloquial English. They will observe that such reduced forms are normal for many speakers. Nevertheless, like many changes in pronunciation, these reductions are often condemned as substandard—frequently by those who use them and are not aware of the fact. Foreign learners should, therefore, avoid the extreme forms of reduction, e.g. [äː] for [aɪə] and [ɑʊə], and [ɜː] for [əʊə]. But the levelling to [aːə], [eːə] and [ɔːə] is acceptable, particularly in unaccented syllables, e.g. *empire, entire, sunflower* and *Cheshire* (and other counties). Certainly such pronunciations are preferable to the use of an exaggerated [j] or [w], giving [ajə], [ɑwə], [əwə], [ejə], [ajə].

8.12 Centring diphthongs

8.12.1 /ɪə/

(1) *Examples:*

Long [ɪːə]—dear, here, cheer, beard
Reduced [ɪˈə]—pierce, fierce
Compare [ɪːə], [ɪˈə]—fears, fierce
Before [ɬ]—real

Spellings of /ɪə/

	Examples	*TF*	*LF*
er, ere	austere, hero, here, interfere, material, sincere, zero	12%	10%
ear, eer	career, cheer, dear, deer, fear, nuclear, sneer, year	32%	12%
ia	brilliant, familiar, industrial, material, media, ruffian	10%	31%
ea	area, beard, cochlea, diarrhoea, idea, nausea, pancreas, real	12%	6%
eu, eo	creosote, museum, theological		
ie	fierce, pierce, salient, soviet, spaniel, thirtieth (...etc.)		
io, iou	axiom, chariot, million, opinion, period, previous		
iu	delirium, medium, stadium, tedium, union		

Note: *weird*

(2) *Description*—The glide of GB /ɪə/ begins with a tongue position approximately that used for /ɪ/, i.e. close-mid and centralised from front, and moves in the direction of the more open variety of /ə/ when /ɪə/ is final in the word; in non-final positions, e.g. in *beard, fierce*, the glide may not be so extensive, the quality of the [ə] element being of a mid type. **(See videos 5.13, 5.22, 15.7.)** The lips are neutral throughout.

In unaccented syllables of this type[19] [ɪə] may not always constitute the falling diphthong described, i.e. prominence may not always be on the first element. Thus the first element may be the weaker of the two, giving a rising diphthong which is frequently reduced to [j], cf. the sequences in both syllables of *period, serious*, [ˈpɪərjəd] and [ˈsɪərjəs]. Thus a falling diphthong is usual in *reindeer* and a rising diphthong in *windier*.[20] If there is more prominence than [j], then a closer vowel is to be heard in such words, i.e. [ˈpɪəriəd], [ˈsɪəriəs], which supports the view that there is a vowel 'hiatus' between two syllables since /i/ occurs elsewhere before another vowel, as in *create* /kriˈeɪt/. This bisyllabic sequence often occurs where there is a vocalic suffix, e.g. *easier*, /ˈiziə/ or /ˈiːzjə/, *carrier* /ˈkariə/ or /karjə/. So the rising sequence is treated as /iə/ and bisyllabic, or as /jə/ and monosyllabic, alongside the falling sequence /ɪə/ which is always treated as a (monosyllabic) diphthong.

Increasingly pronunciations with a monophthong [ɪː] can be heard within GB. (This type of pronunciation has been common in Australian English for some time.) In some kinds of CGB, and especially when /ɪə/ is accented and final, another type of rising diphthong may be heard (different from that in the previous paragraph), the quality of the second part being near to the phonetic quality of /ɜː/ or even /ɑː/. Thus, *here, dear*, may become /hjɜː, djɜː/ or /hjɑː/(= [çɑː]) /djɑː/. The form with /ɑː/ is usually characterised as an affectation.

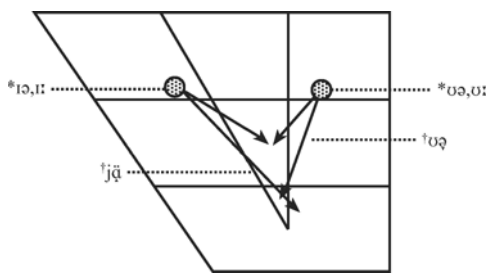


Figure 31 Variants of final /ɪə,ʊə/.

(3) *Regional variants*—Rhotic dialects like General American and Standard Scottish English have no /ɪə/, having /ɪ/ or /iː/ + /ɹ/ in those words which have an <r> in the spelling. In broad London a glide from a relatively close to an almost open position may be heard, sometimes with an intervening [j], i.e. [ɪjə̯]. Speakers of some dialects, including East Anglia, New Zealand and the Atlantic states of the U.S., may have no distinction between [ɪə] and [ɛː]. (See §8.9.4.)

Sources of /ɪə/

ME [eː] + [r]	appear, clear, dear, hear, here, weary
ME [ɛː] + [r]	beard, ear, fear, shear

Note (1): ME [eː,ɛː] + [r] > [iːɹ] by 17c. > [iːə] 18c.
Note (2): /ɪə/ also arises from juxtaposition of two vowels with weakening of the second, e.g. *idea*, *idiom*, *museum*

(4) *Advice to foreign learners*—Foreign learners should avoid using a first element which is too close, i.e. /ɪ/ should be used rather than /iː/. Because of the <r> in the spelling, many foreign learners may use the nearest vowel plus /r/. They should know that to native speaker hearers this gives the impression of an American pronunciation. The <r> should not be pronounced finally or before a consonant, except that an /r/ link is regularly made before a following vowel in a suffix or in a compound, e.g. *hearing* /ˈhɪərɪŋ/ (cf. /hɪə/), *car auction* /ˈkɑːr ɔːkʃn/, or initial in the next word of the group, e.g. *here and there* /hɪər ən ˈðɛː/.

8.12.2 /ʊə/

(1) *Examples:*

Long [ʊːə]—tour, pure, demure, secure, plural
Reduced [ʊˑə]—only occurs before voiceless consonants in *bourse* and in some names of foreign origin, e.g. *Kurt*, *Ewart*, *Stewart* (*Stuart*) and *Vervoerd*
Before [ɬ]—jewel

Spellings of /ʊə/

/ʊə/	*Examples*	*TF*	*LF*
oor	boor, poor, moor	No figures	
our	amour, bourgeois, dour, gourd, tour, tournament	available	
ua, ue	actual, cruel, dual, fluent, gradual, mutual, puerile, usual		
uou	ambiguous, impetuous, incestuous, incongruous, innocuous, conspicuous, continuous		
ure	abjure, cure, endure, pure, secure, sure		
ur	curious, during, furious, insurance, security, spurious		

Note: *jewel*

(2) *Description*—GB /ʊə/ glides from a tongue position similar to that used for /ʊ/ towards the more open type of /ə/ which forms the end point of both centring diphthongs with, again, a somewhat closer variety of [ə] when the diphthong occurs in word-medial position. **(See videos 5.7, 13.4.)** The lips are weakly rounded at the beginning of the glide, becoming slightly spread as the glide progresses. A monophthongal variant [ʊː] is increasingly common.

In the same way that the sequence /i/ + /ə/ may constitute a rising diphthong, the sequence /u/ + /ə/ may also, in unaccented syllables, have the prominence on the second element, e.g. in *influence*, *valuable*, *vacuum*. These sequences often concern a final unaccented /u/ + a morpheme /ə/, e.g. *rescuer*, /ˈreskjuə/. They are to be regarded as bisyllabic; the first element is occasionally weakened to /w/ in which case the sequence is monosyllabic, e.g. *jaguar* /ˈʤagwə/.

Many words which can have /ʊə/ have an alternative pronunciation with /ɔː/, e.g. in *moor*, *poor*, *sure*, *tour*. So *sure* and *shore* are pronounced the same; so, too, *you're* and *your*. Pronunciations with /ɔː/ are less frequent in uncommon monosyllabic words such as *dour*, *gourd*, *Ruhr*, *lure*. Words with a preceding /j/ are also less liable to pronunciations with /ɔː/, e.g. *cure*, *curious*, *endure*, *pure*, *puerile*, *secure*, although they are more common in CGB. The bisyllabic sequence /uə/ derived from /uː/ plus /ə/, as in *rescuer*, *sewer*, is not subject to alternation with /ɔː/.

(3) *Regional variants*—The development /ʊə/ → [ʊː], mentioned above as a recent development in GB, occurred somewhat earlier in Northern English, in London and in Australian English, although in all these accents a merger with /ɔː/ often occurs with a quality nearer to [ɔː]. In those kinds of English like General American and Standard Scottish English, in which /r/ occurs before consonants and before a pause, the /ʊə/ of GB usually corresponds to an /uː/ or /ʊ/ plus /r/ where there is an <r> in the spelling.

Sources of /ʊə/

ME [ɔː,oː] + [r]	boor, moor, poor
ME [iu,ɛu] + [r]	pure, sure

Note (1): ME [ɔː,oː,uː] + [r] often > lowered vowel /ɔː/, e.g. *fourth*, *floor*, *court*. Many other /ʊə/ words have alternatives with /ɔː/ in GB (see §8.9.9)
Note (2): /ʊə/ may arise from /ʊ,uː/ + a vowel reduction, e.g. *influence*, *truant*, *virtuous*, *jewel*

(4) *Advice to foreign learners*—In /ʊə/, as opposed to the bisyllabic /uə/, care should be taken to use a first element of a close-mid kind rather than a quality resembling that of /uː/. Alternatively /ʊə/ may be pronounced as a monophthong, achieved by lengthening /ʊ/. Additionally, if aiming at GB, the spelling <r> should not be pronounced, except when an /r/ link is made before a following vowel, either occurring initially in the next word, e.g. *poor old man* /pʊər əʊld ˈman/, or before a prefix or the second element of a compound, e.g. *tour* /tʊə/ but *touring* /ˈtʊərɪŋ/, *cure* /kjʊə/ but *cure-all* /ˈkjʊərɔːl/. See §8.12.1(4) above for comments about the effect of producing the post-vocalic /r/ in all positions.

8.13 Vowels in syllables without primary accent

We are here referring to the citation forms of words. With the principal exception of /ə/, which occurs almost entirely (see §8.9.13) in unaccented syllables, we have so far dealt mainly with vowels in accented syllables. In polysyllabic words one syllable is pronounced with a PRIMARY ACCENT (the principal exponent of accent being pitch prominence—but see Chapter 10 for more on the phonetic exponents of accent). Table 7 illustrates the occurrence of vowels in a selection of situations other than that of primary accent—in words containing from two to five syllables. The first column, *Remote Preceding*, shows vowels in a place more than one syllable before the primary accent; the second, *Adjacent Preceding*, vowels immediately preceding the accent; the third, *Adjacent Following*, vowels immediately following the accent; and the fourth, *Remote Following*, vowels in a place more than one syllable after the accent.

Table 7 Vowels in syllables without primary accent.

	Remote Preceding	*Adjacent Preceding*	*Adjacent Following*	*Remote Following*
Reduced				
/ɪ,i/	in`spired	e`ffect, re`act	in`sipid, `sorry	`apathy, ina`bility
/ʊ,u/	superi`ority	silhou`ette	`ambulance	`neighbourhood
/ə/	conside`ration	a`llow	`mother	`character
Short				
/e/	refe`ree	Sep`tember	`prefect	`architect
/a/	maga`zine	can`teen	`syntax	`caravan
/ʌ/	subjec`tivity	sul`phuric	`product	`aqueduct
/ɒ/	poli`tician	Oc`tober	`diphthong	`catalogue
Long				
/iː/	precon`ceive	aes`thetic	`phoneme	`obsolete
/ɛː/	varia`bility	where`by	`fanfare	`underwear
/ɑː/	arti`san	sar`castic	`placard	`reservoir
/ɔː/	audi`bility	au`gust (adj.)	`record	`corridor
/uː/	super`sede	Ju`ly	`nephew	`residue
/ɜː/	perpen`dicular	ur`bane	`expert	`universe
Diphthongs				
/eɪ/	phrase`ology	a`orta	`detail	`magistrate
/aɪ/	bio`logical	mi`nute (adj.)	`missile	`civilise
/ɔɪ/		employ`ee	`convoy	`celluloid
/əʊ/	photo`graphic	No`vember	`window	`episode
/aʊ/	counte`ract	out`rageous	`compound	`eiderdown
/ɪə/	superi`ority	theo`logical	`frontier	`overseer
/ʊə/	neuro`logical	cu`rator	`contour	`manicure

Notes

(1) One of the syllables before that having the primary accent may carry a SECONDARY ACCENT (marked by pitch prominence, like primary accent). This may be on the Remote Preceding or the Adjacent Preceding, e.g. *referee* /ˈrefəˌriː/, *canteen* /kanˌtiːn/. Any vowel except /ə/ may form the centre of a syllable with secondary accent.
(2) Some of the remaining syllables (i.e. those not carrying a primary or secondary accent) have a FULL VOWEL (i.e. one other than /i/, /ɪ/, /ə/ or /ʊ/) at their centre, e.g. *window*. Such syllables have a degree of prominence (sometimes called a weak accent) lesser than that produced by the pitch prominence of primary and secondary accent.
(3) Other syllables not containing a pitch prominence have a REDUCED VOWEL, i.e. /i/, /ɪ/, /ə/ or /ʊ/. These are the short vowels with a central or centralised quality (apart from final /i/) and are the least prominent syllables.

The present relationship of vowel quality and accentuation arises from the various conflicting phonological influences to which English has been exposed over the last thousand years. As a general rule, weak accent in Old English led to the centralisation of short vowels and the shortening of long vowels. By Middle English, however, new long vowels or diphthongs under relatively weak accent emerged as a result of vocalisation of earlier consonantal articulations, e.g. [iː] < OE [ɪ] + [g] (*holy*), [ɔu] < [o] or [ɔ] before [ɣ] or [w] (*follow*). Words of French origin such as *empire*, *increase* (n.), while shifting their primary accent back to the first syllable, kept the full vowel quality in the final syllable. In the case of polysyllables like *temporary*, *secretary*, American English still keeps a full vowel in the penultimate syllable, as was the case in English up to the eighteenth century, whereas in present GB the former [e] or [ɛː] is reduced to [ə] or elided. In cases of this sort, full vowels were found in eModE in a number of positions where today weakening is more usual,[21] e.g. *certain*, *bargain*, with [eɪ] in the final syllable; *history*, *majesty*, *tragedy* and *merrily*, with [əi] finally; and *emperor*, *saviour*, with [əur] finally.

8.14 The frequency of occurrence of GB vowels[22]

Text frequencies for GB vowels are shown in Table 8. In GB, /ə/ (26.91 per cent) and /ɪ/ (21.03 per cent) clearly emerge as the vowels having the highest text frequency. This is to be expected, since /ə/ is the most common vowel in unaccented syllables in a language which has a high proportion of unaccented syllables, and /ɪ/ (which includes final /i/ in these figures) has a high frequency of occurrence in both accented and unaccented syllables. Frequency in General American is similar after allowance has been made for the absence of /ɛː,ɒ,ɪə,ʊə/ (and /ʌ/ often combined with /ə/) and the corresponding higher frequency of /r/ through its regular occurrence in coda positions in syllables.

Table 8 Text frequencies of vowels in GB. (Final /i/ counted with /ɪ/), showing percentages of vowels among all phonemes and among vowels only.

	% *All*	% *V*		% *All*	% *V*
/ə/	10.72	26.91	/ɔː/	1.30	3.30
/ɪ/	8.29	21.03	/uː/	1.29	3.28
/e/	2.77	7.03	/ɑː/	0.68	1.72
/aɪ/	2.02	5.13	/aʊ/	0.63	1.60
/iː/	1.72	4.37	/ʊ/	0.62	1.57
/a/	1.62	4.12	/ɜː/	0.57	1.44
/eɪ/	1.57	3.99	/ɛː/	0.32	0.81
/ʌ/	1.56	3.96	/ɪə/	0.29	0.74
/ɒ/	1.56	3.96	/ɔɪ/	0.20	0.51
/əʊ/	1.55	3.94	/ʊə/	0.04	0.10

Total all vowels: 39.4%

Notes

1 Wiik (1965). Gonet & Stadnicka (2006) give comparable figures for citation forms but show the differences to be much less in connected speech.
2 Upton *et al.* (2001).
3 Values for Tables 4 and 6, and for Figures 10 and 11, are taken from Deterding (1990, 1997), the values for /ɛɪ/ being taken from the first element of the diphthong [eə]. Those in Table 5 were computed in the Phonetics Laboratory, Department of Linguistics, University of Manchester; details can be obtained from the author at The Phonetics Laboratory, 41 Wellington Square, Oxford OX1 2JF.
4 Maddieson (1984: 126) estimates 21.5 per cent as having five vowels, 13.6 per cent 6 vowels, 10.7 per cent seven vowels, with only 4.1 per cent having over 17.
5 In the vowel diagrams * indicates GB pronunciations and † indicates Conspicuous GB (CGB) pronunciations. For meanings of abbreviations in the boxes on sources see the heading to Chapter 6.
6 The diphthongisation of /iː/ was transcribed as /ij/ as long ago as Sweet (1900), as discussed in Kraut's blog 04.04.13 and Windsor Lewis's blog 10.04.13.
7 Upton *et al.* (2001), Wells (2008), Jones *et al.* (2011). Fabricius (2002a) finds the final vowel quality to be often halfway between /iː/ and /ɪ/.
8 Hawkins & Midgley (2005) suggest it became more open during the latter half of the twentieth century.
9 Kurath & McDavid (1961), Trudgill (1974, 2004), Cassidy & Le Page (1980).
10 Hawkins & Midgley (2005) present evidence showing that the opening movement was occurring rapidly in the middle of the twentieth century but that it is still in progress now. The opening process is confirmed by Harrington *et al.*'s (2000) study of the Queen's Christmas broadcasts from the 1950s to 1980s.
11 Fabricius (2006), Kamata (2006).
12 Fabricius (2006) presented evidence that /ʌ/ is now backing and rising among middle-class speakers.
13 Wikström (2013).
14 Hawkins & Midgley (2005) present acoustic evidence to show that the fronting of /ʊ,uː/ may have been general by the 1970s.
15 The diphthongisation of /uː/ was transcribed as /uw/ as long ago as Sweet (1900), as discussed in Kraut's blog 04.04.13 and Windsor Lewis's blog 10.04.13.

16 Windsor Lewis (2013: §7.4) summarises full-vowelled prefixes in northern England as occurring in syllables ending with a 'strong' consonant (= non-approximant) immediately followed by another strong consonant, e.g, *admit* /ad`mɪt/, *computer* /kɒm`pju:tə/, but *produce* /prə`ʤu:s/, *attract* /ə`trakt/.
17 Jones (1997).
18 The term was first used by Sweet (1888: 22).
19 Jones (1954).
20 Andrésen (1957).
21 For an account of vowels in unaccented syllables in Early Modern English, see Dobson (1957).
22 Frequencies are conflated from Fry (1947) and Knowles (1987). See also French *et al.* (1930), Carterette & Jones (1974) and Mines *et al.* (1978).

Chapter 9

The English consonants

9.1 The distinctive consonants

We find by commutation (see §5.3) that there are twenty-four distinctive units which are consonantal both in terms of their position in syllables (see §5.6) and in terms of their phonetic nature (i.e. they have, at least in some of their occurrences, articulations involving the obstructions or narrowings which produce, acoustically, a noise component—see §4.2).

The twenty-four consonantal phonemes shown in Table 9 can be classified in two general categories:

(A) Those articulations in which there is a total closure or a narrowing causing friction, both groups being typically associated with a noise component (OBSTRUENTS); in this class there is a distinctive opposition between voiceless and voiced types.
(B) Those articulations in which there is only a partial closure or an unimpeded oral or nasal escape of air; such articulations, typically voiced and frequently frictionless, i.e. without a noise component (SONORANTS), may share many phonetic characteristics with vowels.

Table 9 The distinctive consonants of English.

	Plosive	*Affricate*	*Fricative*	*Nasal*	*Approx.*
Bilabial	p,b			m	(w)
Labiodental			f,v		
Dental			θ,ð		
Alveolar	t,d		s,z	n	l
Post-alveolar					r
Palato-alveolar		ʧ,ʤ	ʃ,ʒ		
Palatal					j
Velar	k,g			ŋ	w
Glottal			h		

Notes

(1) In some types of GB it may be necessary to include the labial-velar voiceless fricative [ʍ] as a phoneme, e.g. in words like *which*, *what*, *whether*, but most GB speakers pronounce these words with a /w/.
(2) In practical teaching it may sometimes be convenient to treat /tr/ and /dr/ as distinctive affricates as well as /ʧ/ and /ʤ/ (see §9.3).
(3) The glottal stop [ʔ] has been excluded, since it is not phonemically distinctive in GB; its use as a reinforcement for vowels and its allophonic association with /p,t,k/ is dealt with in §9.2.8.
(4) The sonorants /m,n,l,n,ŋ/ can sometimes constitute syllables without a vowel, i.e. they are SYLLABIC. In phonemic transcriptions (slant-bracketed) this is only marked when both syllabic and non-syllabic are possible, e.g. *maddening* as /ˈmadn̩ɪŋ/ or /ˈmadnɪŋ/. In other case where /n/ has to be syllabic, e.g. *maddened* /ˈmadnd/, it is not marked.
(5) In the description of each consonant, reference is made to the videos on the companion website, e.g. video 1.15 refers to point 15 on video number 1.

It will be seen from Table 9 that:

(a) the plosive and nasal phonemes fall into three contrastive groups as far as the place of articulation is concerned, i.e. bilabial, alveolar and velar;
(b) the affricates, lateral and /r/ phonemes have an alveolar basis;
(c) the fricatives have five areas of articulation, i.e. labiodental, dental, alveolar, palato-alveolar and glottal.

These basic areas of articulation, convenient for labelling the phonemes, will need to be extended when the various allophonic realisations are discussed, but in any particular context the number of oppositions involving the place of articulation remains unchanged; thus, the allophones of /t/ may be dental or post-alveolar and an allophone of /k/ may be palatal, without being additional distinctive areas of articulation, since such variants are conditioned by the context.

CLASS A: OBSTRUENTS

9.2 Plosives

The complete articulation of a pulmonic egressive plosive, or stop, consonant consists of three stages:

(1) the CLOSING stage, during which the articulating organs move together in order to form the obstruction; in this stage, there is often an on-glide (a TRANSITION) audible in a preceding sound segment and visible in an acoustic analysis as a characteristic curve of the formants (see §9.2.2 below) of the preceding sound;

(2) the COMPRESSION or hold stage, during which lung action compresses the air behind the closure; this stage may or may not be accompanied by voice, i.e. vibration of the vocal cords;
(3) the RELEASE stage, during which the organs forming the obstruction part, allowing the compressed air to escape abruptly (i.e. with an explosion, hence 'plosive'); if stage (2) is voiced and if a vowel follows, the vocal fold vibration will continue in stage (3); if stage (2) is voiceless, stage (3) may also be voiceless (aspirated) before silence or before the onset of voice (as for a following vowel), or stage (3) may coincide with the onset of vocal fold vibration, as when a voiceless plosive is followed without intervening aspiration by a vowel; again, an off-glide (TRANSITION) associates the plosive with a following sound.

Since a condition of plosive articulation is that the whole of the speech tract behind the primary closure should form a chamber sealed to the escape of air, and since the primary closures are made in the oral cavity, it follows that the soft palate is held in its raised position in the compression stage and usually also during the closing stage (the exception being when a nasal consonant precedes).

9.2.1 The phonetic features of English plosives

The GB plosive phonemes comprise three pairs: /p,b/; /t,d/; /k,g/. Table 10 illustrates oppositions in word-initial, medial and final positions.

These oppositions may be realised by means of one or several of the following phonetic features:

(1) *Place of articulation*—/p,b/, generally bilabial; /t,d/, generally alveolar; /k,g/, generally velar.
(2) *Force of articulation*—/p,t,k/ tend to be pronounced with more muscular energy and a stronger breath effort than /b,d,g/; the former are known as relatively strong or fortis, the latter as relatively weak or lenis.[1]

Table 10 Minimal oppositions among English plosives.

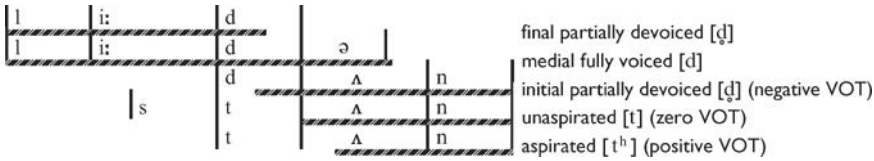
	/p/	/b/	/t/	/d/	/k/	/g/
Initial	pole	bowl	toll	dole	coal	goal
Medial	riper		writer	rider		
			bitter	bidder	bicker	bigger
	caper	caber	cater			
		rubber		rudder		rugger
	lopping	lobbing			locking	logging
Final	rip	rib	write	ride	rick	rig

(3) *Aspiration*—The voiceless series /p,t,k/, when initial in an accented syllable, are usually accompanied by ASPIRATION, i.e. there is a voiceless interval consisting of strongly expelled breath between the release of the plosive and the onset of a following vowel, e.g. *pin*, *tin*, *kin* [pʰɪn, tʰɪn, kʰɪn]. When /l,r,w,j/ follow /p,t,k/ in such positions, the aspiration is manifested in the devoicing of /l,r,w,j/, e.g. in *please*, *pray*, *try*, *clean*, *twice*, *quick*, *pew*, *tune*, *queue*; some devoicing may also occur in relatively unaccented situations, e.g. *apricot*, *atlas*, *applicant*, *heckler*, *buckram*, *vacuum*. In other positions, i.e. preceding a vowel in an unaccented syllable and finally, such aspiration as may occur is relatively weak, e.g. /p/ in *polite*, *lip*; in absolute final positions, i.e. preceding silence, /p,t,k/ may have no audible release (see §9.2.4(1)). Where a plosive follows /s/ within the same syllable the distinction between /p,t,k/ on the one hand and /b,d,g/ on the other is neutralised (see §5.3.4); the resulting plosives are unaspirated (i.e. similar to /b,d,g/ in all other positions), although they have no voicing in the compression stage (similar to /p,t,k/ in all other positions); only the apparent fortis nature of these articulations suggests a preferred transcription of *spin*, *stop*, *skɪn* as /spɪn, stɒp, skɪn/ rather than /sbɪn, sdɒp, sgɪn/.[2] This is confirmed by sequences of /s/ plus /p,t,k/ which cross morpheme or word boundaries where the aspiration of /p,t,k/ may be lost but where nevertheless a distinction may remain between /p,t,k/ and /b,d,g/ based on strength of articulation alone, cf. *discussed* vs *disgust*.

(4) *Voicing*—The voiced series /b,d,g/ may be voiced during their second stage when they occur in positions between voiced sounds, e.g. in *labour*, *leader*, *eager*, *windy*, *rub out*, *read it* and *to be*, *to do*, *to go*. In initial and especially in final positions, i.e. following or preceding silence, /b,d,g/, while remaining lenis, may be only partially voiced or completely voiceless, e.g. in *bill*, *done*, *game*, *cub*, *lid*, *bag*. In these positions /b,d,g/ are realised as [b̥,d̥,g̊], vocal cord vibration beginning only in the last portion of the compression stage in initial position and finishing in the first portion of the compression stage in final position (or having no voicing at all in this stage). Even in the intervocalic positions mentioned at the beginning of this section /b,d,g/ may sometimes be subject to devoicing, particularly where a word boundary is involved.[3] It has also been claimed that, even when vocal cord vibration is not present, glottographic and laryngoscopic studies show that whisper-like narrowing typical of /b,d,g/ is present.[4]

Aspiration and voicing in syllable-initial position can together be regarded as involving differences in VOICE ONSET TIME (or VOT), i.e. the interval between the release burst and the onset of voicing. VOT differences, and the voicing of [d] in other positions, are shown schematically in Table 11. Note that an initial fully devoiced [d̥] as in *done* has approximately the same VOT value as an initial unaspirated [t] as in *stun*. VOT values for aspirated voiceless stops are generally around 40–75 msecs[5] whereas VOT for voiced plosives varies from a

Table 11 VOT differences in English in *lead, leader, done, stun, ton.*



much smaller positive value or has a negative value (i.e. voicing starts before the point of plosion). VOT in voiceless plosives has been shown to increase as the place of articulation moves from labial to velar.[6]

(5) *Length of preceding sounds*—When the GB plosives occur finally in a syllable, their value is determined largely (since the voicing factor is not strongly operative) by the length of the syllable which they close. It is a feature of English (and to varying extents universally in languages) that syllables closed by voiceless consonants are considerably shorter than those which are open, or closed by a voiced consonant.[7] We have seen in the chapter on vowels that this variation of length is particularly noticeable when the syllable contains a 'long' vowel or diphthong, cf. the fully long vowels or diphthongs in *robe, heard, league* (closed by voiced /b,d,g/) with the reduced values in *rope, hurt, leak* (closed by voiceless /p,t,k/). Preceding consonants, notably /l,n,m/, are also shortened by a following /p,t,k/, especially when the consonants are themselves preceded by a short vowel, e.g. compare the relatively long /l/ in *killed, bulb*, /n/ in *wand* and /m/ in *symbol* with the reduced varieties in *kilt, help, want, simple*. A phonemic transcription of *rope, robe*, as /rəʊp, rəʊb/ is, therefore, to be interpreted as indicating that the words are distinguished not only or even primarily by a difference of the final consonant, but rather by a combination of length and quality extending over the whole of the rhyme of syllables. The same effect of reduction also operates when /p,t,k/ occur medially in a word, cf. the length of /aɪ/ in *rider, writer*, although in this situation voicing throughout the compression stage is also likely to be present in /b,d,g/ as another cue to the voiced series.

(6) *Summary*—The GB plosives may, therefore, be said to be distinguished:

  (a) by means of a three-term series in respect of place of articulation—bilabial vs alveolar vs velar;
  (b) at each point by a phonological feature labelled 'voice' which phonetically consists of a complex of phonetic features, each feature being more prominent in certain positions:

    (i) aspiration operates where /p,t,k/ are in syllable-initial position. It is most apparent initially in accented syllables, cf. *pole* vs *bowl*. This aspiration is much less apparent initially in unaccented

syllables, particularly those preceding accented syllables. So in *potato* we have three degrees of aspiration: most following the plosion of the /t/ of the second syllable, much less for the /t/ of the third syllable and even less for the initial of /p/. Indeed /p,t,k/ in pre-accent unaccented positions like the /p/ in *potato* are auditorily almost indistinguishable from /b,d,g/.

(ii) shortening of vowels and sonorants operates where /p,t,k/ are in syllable-final position, cf. *rope* vs *robe*, *kilt* vs *killed*.

(iii) full voicing of /b,d,g/, i.e. voicing throughout the compression stage, applies only in word-medial positions between voiced sounds (in other positions voicing usually occurs only at the very beginning or end of the compression stage when adjacent to a voiced sound), cf. *rabid* vs *rapid*. This phonetic feature of voicing may operate in addition to the features of length and (lack of) aspiration in (i) and (ii) above; so in *sordid* the /d/ will be preceded by an unshortened vowel of the same length as in *sword*, (and will of course have no aspiration) as well as having voicing through the compression stage (i.e. it is behaving in all ways as an 'inter-syllabic' consonant).

(7) *Advice to foreign learners*—If aiming at GB particular attention must be paid to the aspiration of /p,t,k/ when these phonemes occur initially in accented syllables. If a word such as *pin* is pronounced [pɪn] (without aspiration), instead of [pʰɪn], there is the danger that English listeners may understand *bin*, since they interpret lack of aspiration as a mark of the voiced /b/. The danger is particularly great for speakers of those languages, e.g. many in the Romance and Slav groups, where oppositions between pairs of plosives rely purely upon presence or absence of voice. Although Hindi speakers have a phonemic distinction between /p,t,k/ and /pʰ,tʰ,kʰ/, they tend to identify English /p,t,k/ with their unaspirated series (and hence native speakers of English may interpret their production of /p,t,k/ as /b,d,g/. On the other hand speakers of Cantonese tend to overaspirate /p,t,k/ in all positions (e.g. at the beginning of unaccented syllables where there is little aspiration in English, e.g. in *supper*, *polite*, etc.).

The aspiration cue for /p,t,k/ should also be retained, when /p,t,k/ are followed by /l,r,j,w/, by the devoicing of these latter, e.g. compare *plight*, *try*, *crate*, *tune*, *twelve*, with *blight*, *dry*, *great*, *dune*, *dwell*.

Speakers of some languages, e.g. Cantonese, German and Russian, neutralise the oppositions between /p,t,k/ and /b,d,g,/ in syllable-final positions, using only voiceless plosives. Such speakers should concentrate on the vowel preceding the plosive remembering that vowels and sonorants are shortened before /p,t,k/ while keeping their full length before /b,d,g/ so, for example, the /iː/ of *beat* is shortened compared with the same vowel in both *bee* and *bead*.

9.2.2 *Acoustic features of English plosives*

Perceptual cues, capable of being expressed in acoustic terms, may be provided by all three stages of plosive articulations, so that it is possible to distinguish: (1) plosives from other consonants, (2) /p,t,k/ from /b,d,g/, (3) the bilabial, alveolar and velar types.

(1) Plosives differ from other consonants mainly in the stage corresponding to the articulatory compression or hold. This part of the consonant is generally characterised acoustically by a perceptible period of silence throughout the whole spectrum or, in the voiced /b,d,g/, an absence of energy except at a low frequency as in (2).

(2) /b,d,g/ may be distinguished from /p,t,k/ by means of a low-frequency component present in the former, i.e. voice; such a 'voice bar' is generally below 250 Hz. For /p,t,k/ there is also usually a higher onset or offset in fundamental frequency to a following or from a preceding vowel.[8] Moreover, there is likely to be a marked rising bend of F1 of the adjacent vowel in the case of /b,d,g/, which is not as marked in the case of /p,t,k/.[9] However, as we have seen, /b,d,g/ may often be voiceless, in which case they are distinguished from /p,t,k/—initially, by the comparatively weak burst of noise associated with the onset of the release stage and by the longer VOT (see §9.2.1(4) and Table 10) characterising /p,t,k/; finally, by their influence on the duration of the preceding sounds; medially, by the longer closure period (absence of energy) required for /p,t,k/.[10] Although there is a tendency for the greater length of the vowel before /b,d,g/ and the longer closure for /p,t,k/ to produce a similar overall vowel plus consonant duration, the sequences of vowel plus /b,d,g/ are usually somewhat longer.[11]

(3) Cues to the distinction between bilabial, alveolar and velar plosives are provided by the frequency of the NOISE BURST at the onset of the release stage together with characteristic bends of F2 and F3 (called FORMANT TRANSITIONS) towards following vowels and from preceding vowels.[12] Before /a/ bilabial /p,b/ have MINUS TRANSITIONS, i.e. transitions which start from and go to a point (called a LOCUS) lower than the steady-state formants for the vowel, while alveolar /t,d/ have PLUS TRANSITIONS, i.e. transitions which start from and go to a higher locus. Velar /k,g/ have a plus transition for F2 and a minus transition for F3. The formant transitions accord with the location of the noise bursts associated with the various places: low for bilabials (maximum around 800 Hz), high for alveolars (maximum around 4,000 Hz) and intermediate for velars (maximum around 2,000 Hz). See Figure 32 for a diagram of formants and noise bursts before /a/ and Figure 33 for spectrograms of /b,d,g/ before /aɪ/.

The outline of noise bursts and formant transitions given in the preceding paragraph applied to cases with a following or preceding /a/. There is, however, considerable variation when other vowels are involved. This applies particularly

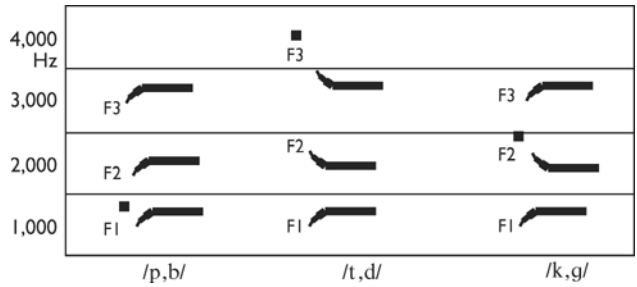


Figure 32 Noise bursts and formant transitions for plosives before /a/. The F1 transition applies only to /b,d,g/.

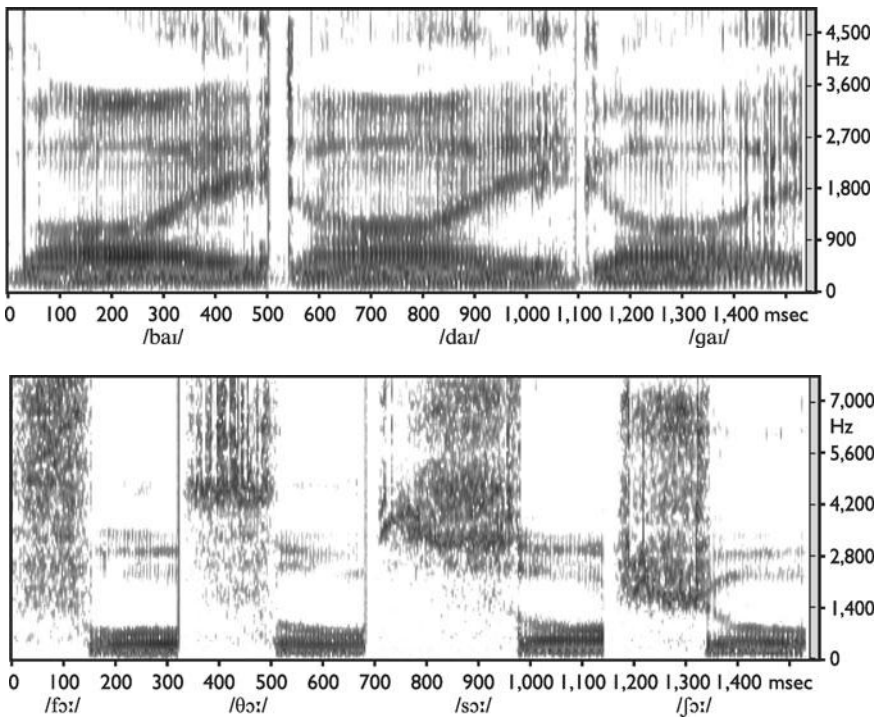


Figure 33 Spectrograms of /baɪ/, /daɪ/, /gaɪ/ and of /fɔː/, /θɔː/, /sɔː/, /ʃɔː/ as spoken by male speaker of GB (the full length of /ɔː/ is not displayed).

to the velars (and, to a lesser extent, the alveolars) and reflects the different articulation of these consonants in different vocalic environments, e.g. before /iː,ɪ,i,e/, /k,g/ may be considerably fronted and on the verge of being palatal [c,ɟ] and thus their noise bursts will approach those for /t,d/ and both F2 and F3 may have plus transitions.

Formant transitions do not extend fully from the formants of the vowel to a locus in the noise burst of the plosive, but merely point in the direction of the latter. Best recognition is achieved in synthetic speech if the first half of the transition from plosive to vowel consists of silence; if the transition is extended too far (so that the total period of voiced transition exceeds 30 msecs), then glides of the type [j,w] may be perceived.

Duration of VOT is usually in the order labials < alveolars < velars[13] and this may constitute an additional, although weak, cue to the recognition of the place of articulation.

9.2.3 Acquisition of plosives by native learners

Plosives, along with nasals, are the first consonants to be acquired. They are the most frequent consonants in babbling (which occurs during the latter half of the first year) and occur regularly in the first words (which occur between 0;9 and 1;6). During early babbling labials and velars occur most frequently but in late babbling and early words it is more usually labials and alveolars which predominate, the velars being replaced by alveolars (although a minority of children may show a preference for velars). Like most consonants plosives are generally acquired first in syllable-initial positions; final plosives in adult words are often completely omitted in children's early words. In all languages it is the the plosive series with zero VOT (i.e. where voicing starts simultaneously with the release) which is acquired first: in English (see Table 10) this means that /b,d,g/ precede /p,t,k/. When /p,t,k/ are first differentiated from /b,d,g/, it is aspiration which is the main distinguishing cue; at first children may make an uncertain use of such aspiration,[14] either underaspirating (and hence the distinction not being perceived by adult listeners) or overaspirating (and hence the plosives sounding as if they are being followed by an /h/).

9.2.4 The release stage of English plosives

It is not always the case that plosives in English have a third stage consisting of a sudden oral release of air, either in the form of aspiration or as an immediately following vowel. The main variants are:

(1) *No audible release in final positions*—In syllable-final positions (particularly before a pause), as in *map*, *mat*, *mack* or *robe*, *road*, *rogue*, the closure stage may be maintained, the air compression becoming weak and the release being achieved by a gentle, delayed and relatively inaudible opening of the oral closure; or the compressed air may be released nasally and relatively inaudibly by lowering the soft palate and delaying the separation of the organs forming the oral closure. When an audible third stage is missing, the plosive is sometimes termed 'incomplete'. The absence of an audible release stage entails the loss of the release noise burst as a cue to the identification

of the plosive. Unreleased final bilabial, alveolar and velar plosives will, therefore, be distinguished mainly by the transitional features of the preceding sound. The sensitivity of English listeners to such cues is proved by the high percentage of correct discrimination between such pairs as *mat*, *mack*, or *road*, *rogue*, presented without a context, even when the final plosive is not released. The voiceless series /p,t,k/ will, of course, be distinguished in final positions from the voiced series /b,d,g/ either by the reduction of length of the sounds preceding /p,t,k/ or by the presence of some voicing in /b,d,g/, or by a combination of both factors. The non-release of final plosives is a feature of GB. Careful speakers, however, tend to release such plosives audibly and those who, in ordinary conversational style, use the unexploded variety will often use an audible release in more careful speech. Velar stops are more prone to non-release than bilabial and alveolar stops.[15] (See further under §12.5 on stylistic variation.)

(2) *No audible release in stop clusters*—It is also a feature of GB that in a cluster of two stops (plosive+plosive, or plosive+affricate) either within a word or at word boundaries, the first plosive has no audible release, e.g. in *dropped* (/p/ + /t/), *rubbed* (/b/ + /d/), *white post* (/t/ + /p/), *good boy* (/d/ + /b/), *locked* (/k/ + /t/), *big boy* (/g/ + /b/), *object* (/b/ + /ʤ/), *great joke* (/t/ + /ʤ/), *big chin* (/g/ + /ʧ/). In those languages where plosives in such situations are released audibly, the result is an intervening [ʰ] in the case of voiceless plosives and a vowel of the [ᵊ] type in the case of voiced plosives. In English the closure for the second stop is made before the release of the first,[16] forming a further obstacle to the airstream if the second closure is at a more advanced point, e.g. /t/ + /p/ in *white post*, or checking the air pressure if the second closure is at a more retracted point, e.g. /t/ + /k/ in *white cat*. No separate release of the first plosive is made in cases of GEMINATION, i.e. sequences of identical stops, e.g. *top people*, *good dog*, *big girl*; in such cases one closing stage and one release stage are involved together with an approximately double-length compression stage. Much the same applies when plosives which are homorganic but different in voicing occur in sequence, e.g. *top boy*, *white dog*, *big car*; in these cases, cues to recognition of the voiced or voiceless series are provided by the onset or cessation of voice, by the aspiration of the second stop if voiceless and by the duration of preceding vowels or sonorants. It should also be noted that, in addition to the omission of an audible third stage of the first plosive in clusters, the first stage (on-glide, transition) of the following stop is also inaudible. Thus, in sequences of three plosives, e.g. *wept bitterly* (/p/ + /t/ + /b/), *locked door* (/k/ + /t/ + /d/), *jogged by* (/g/ + /d/ + /b/), the central plosive has no audible first or third stage; when this position is occupied by /p,t,k/, the plosive is manifested only by a silence of a certain duration, i.e. the length of its second stage. Alternatively, the middle plosive in such sequences may be dropped completely (see §12.4.6).

(3) *Glottal reinforcement of final* /p,t,k/. It is increasingly typical of many types of British English that final /p,t,k/, in such words as *shop*, *shot*, *shock*, have GLOTTAL REINFORCEMENT, meaning that the oral closure is reinforced by a glottal closure [ʔ]. In some cases this glottal coincides in time with the oral closure, inhibiting much of the air pressure behind the oral closure, whether or not this latter is released audibly; in others the glottal closure may slightly anticipate the articulation of the oral obstruction so that the closing stage of a glottal closure is heard followed by the audible release of an oral plosive. In other, rarer, cases there may be some compression of the air between the glottal and oral closures by means of the raising of the larynx and a constriction of the pharyngeal cavity, resulting in a potential ejective release. In such a case the plosive is no longer glottally reinforced or glottalised but is instead produced using the egressive glottalic (or pharyngeal) airstream mechanism (see §4.3.9). This is rather more common in some dialects (e.g. south-east Lancashire) than in GB. In certain cases, too, [ʔ] may replace /p,t,k/, see §9.2.8.

(4) *Nasal release*—When a plosive is followed by a homorganic nasal consonant, either syllabic or initial in a following syllable, the release of air is normally effected not by a removal of the oral closure, which is retained, but by the escape of the compressed air through the nasal passage, i.e. by the lowering of the soft palate for the nasal consonant, e.g. /p/ + /m/ *topmost*, /p/ + [m̩] sometimes in *happen* [ˈhapm̩], /b/ + /m/ *submerge*, /b/ + [m̩] sometimes in *ribbon* [ˈrɪbm̩], /t/ + /n/ *chutney*, /t/ + [n̩] *cotton*, /d/ + /n/ *madness*, /d/ + [n̩] *sudden*; and, more rarely, /k/ + [ŋ̍] *thicken* [ˈθɪkŋ̍], /g/ + [ŋ̍] *organ* [ˈɔːgŋ̍], *token* [ˈtəʊkŋ̍], *pagan* [ˈpeɪgŋ̍]. The same release takes place when the plosive and homorganic nasal occur at word boundaries, e.g. *cheap meat*, *robe mistress*, *not now*, *red nose*, etc. (Since /ŋ/ does not occur initially in syllables, this last generalisation does not apply to /k/ and /g/.) Although absence of NASAL RELEASE has generally been characteristic of child or child-like pronunciations, there has recently been a trend away from nasal release among adults (e.g. to pronunciations like [ˈkɒtən, ˈsʌdən]).

A different kind of nasal release occurs when the nasal consonant following a plosive is not homorganic, e.g. in *cheap nuts*, *rub now*, *nutmeg*, *bad man*, *black magic*, *big nose*, *big man*, etc. In these cases the plosive closure is not normally released until the articulatory movements for the nasal consonant, i.e. the second oral closure and the lowering of the soft palate, have been accomplished. Thus the plosion will be more or less inaudible, depending on which of the two closures is more forward.

(5) *Lateral release*—The most frequent tongue contact for English /l/ being alveolar, the sequences /t/ or /d/ + /l/ are homorganic (i.e. made at the same place of articulation). /t/ and /d/ in such situations normally have LATERAL RELEASE, i.e. one or both sides of the tongue are lowered to allow the air to

escape, the tongue tip contact remaining. Such a release occurs whether the following /l/ is syllabic, e.g. in *cattle* [katl̩], *medal* [medl̩], or if it is initial in the next syllable or word, e.g. in *atlas*, *at last*, *regardless*, *bad light*. Such homorganic lateral release is to be distinguished from sequences of /p,b,k,g/ + /l/, e.g. in *apple*, *up late*, *bubble*, *blow*, *rub lightly*, *tackle*, *clean*, *blackleg*, *glow*, *eagle*, *big lad*. In these cases, the partial alveolar contact for /l/ is made before or at the time of the release of the plosive and, in this sense, the escape of air is lateral; but since /p,b/ and /k,g/ may be released in a truly lateral way, i.e. by the removal of one or both sides of the bilabial or velar closure, the term 'lateral release' is best reserved in English for the homorganic alveolar + /l/ sequences. Such true lateral releases must be taken as typical of usage in GB, there being no intervening removal of the tongue contact on the alveolar ridge, such as would result in aspiration [ʰ] or a vowel [ᵊ]. Pronunciations of this type, e.g. [ˈlɪtʰɬ], [ˈmɪdᵊɬ] for *little*, *middle*, were until recently stigmatised as childish, but can now be heard increasingly from adults (they have always been common in other varieties of English, e.g. Scottish).

(6) *Affrication and weakening of plosive*—If the release of plosive closures is not made rapidly, a fricative sound, articulated in the same area of articulation as the plosive, will be heard; plosives made with this slow, fricative release are said to be AFFRICATED. Realisations of the English plosives /p,b,t,d,k,g/ can thus be followed by brief fricatives of the types [ɸ,β,s,z,x,ɣ]. So the alveolars /t,d/ may be heard in affricated form [tˢ,dᶻ]: in strongly accented positions, e.g. in *time*, *day*; in relatively weakly accented positions, e.g. in *waiting*, *riding*; and in final positions, e.g. in *hat*, *bed*. (Note that, in these last two examples, the forms [tˢ] and [dᶻ] differ from the realisation of the plural terminations /t/ + /s/ and /d/ + /z/ mainly in the brevity of the friction associated with the affricated plosives, cf. *bat* [batˢ] and *bats* [bats].) Affrication is also occasionally also heard with the velar plosives, i.e. [kˣ] and [gˠ], e.g. in hesitant or emphatic speech in accented situations in such words as *come*, *good*, or, more commonly with /k/, in weakly accented or final positions, e.g. in *talker*, *talk*, /p/ and /b/ are rarely affricated.

It should also be noted that in rapid, colloquial speech, where speed rather than articulatory precision is the aim, the closure of plosives is often so weak that the corresponding fricative sound, without a preceding stop, is produced, especially in weakly accented intervocalic positions, e.g. *imported* [ɪmˈpɔːsɪd], *invaded* [ɪŋˈveɪzɪd], *baker* [ˈbeɪxə], *dagger* [ˈdaɣə] (this latter heard, on the stage, in the *Macbeth* 'dagger' soliloquy) and even *pepper* [ˈpeɸə], *rubber* [ˈrʌβə].

(7) *Advice to foreign learners*—All the foregoing variants of the hold and release stages of English plosives may be heard from GB speakers. But a foreign speaker of English will be intelligible without adopting any of these features. The learner who aims at a near approximation to GB should adopt the following features at least:

(a) inaudible release of plosives preceding other plosives or affricates;
(b) nasal release of plosives followed by a homorganic nasal, especially /t,d/ + /n/, with avoidance of any intervening [ʰ] or [°];
(c) lateral release of /t,d/ + /l/, also with avoidance of intervening [ʰ] or [°];
(d) affrication of /p,t,k/ as a stage in learning aspiration of these plosives in strongly accented positions.

On the other hand speakers of most varieties of Chinese have final /p,t,k,/ unreleased or replaced by glottal stop so regularly that this may produce problems of intelligibility when introduced into English; such learners should practise releasing final /p,t,k/.

9.2.5 Bilabial plosives /p,b/

(1) *Examples*

/p/—*syllable-initial, accented, aspirated* (*or devoiced* /l,r,j/)—pin, pill, pain, appear, impatient; play, pray, pew
syllable-initial, accented, after /s/, *unaspirated*—spin, spill, Spain, spear; splay, spray, spew (but see §5.3.4)
unaccented, slightly aspirated (*or slight devoicing of* /l,r,j/)—upper, capable, opportunity, gospel; simply, apricot, champion
syllable-final (*often with no audible release*)—cheap, lip, lap, shape, lisp, pulp, pump; upright, chaplain, upward
followed by another plosive or affricate, with no audible release—captain, topcoat, wiped, hip pocket, top boy, top girl, top dog, ripe cheese
nasal release, followed by nasal consonant—topmost, happen, cheap meat, top notch
lateral release, followed by lateral consonant—apple, couple, please, up late

/b/—*word-initial, partially devoiced*—big, boast, banana, begin; blow, brain, beauty
between voiced sounds, fully voiced—rubber, labour, harbour, husband, symbol
final, fully devoiced—rib, ebb, sob, robe, bulb
followed by another plosive or affricate, with no audible release—object, obtain, rubbed, subconscious, sob bitterly, rib cage
nasal release, followed by nasal consonant—submerge, tube maker, ribbon
lateral release, followed by lateral consonant—bubble, blow, rub lightly

Compare /p/, /b/—post, boast; peach, beach; rapid, rabid; dapple, dabble; sopping, sobbing; simple, symbol; cup, cub; rope, robe; plead, bleed; pray, bray; puke, rebuke; mopped, mobbed.

Spellings of /p,b/

/p/	*Examples*	*TF*	*LF*
p	cup, pencil, piper, praise, ramp, surprise		95%
pp (excl. before -ed, -ing)	apple, apply, opportunity, opposite, pepper		5%
Note (1): hiccough Note (2): Silent <p> in *pneumonia, psychology, psalm, ptarmigan, receipt, cupboard, raspberry*			
/b/			
b	bike, brain, fibre, hubris, jibe, tube	98%	96%
bb (excl. before -ed, -ing)	rabbit, ribbon	1%	3%
Note: Silent <b> in *limb, lamb, bomb, thumb, comb, debt, subtle, doubt*			

(2) *Description*—The soft palate being raised and the nasal resonator shut off, the primary obstacle to the airstream is provided by the closure of the lips. **(See videos 1.12, 5.18, 6.1, 14.6.)** Lung air is compressed behind this closure, during which stage the vocal cords are held wide apart for /p/, but may vibrate for all or part of the compression stage for /b/ according to its situation in the utterance. The air escapes with force when the lip closure is released, unless the airstream has been blocked by a second closure at a point behind the lips (as for a following /t/) or has been diverted through the nose by the lowering of the soft palate (as for /m/); when a lateral sound follows, the airstream will have a lateral escape round the point of alveolar closure. In those cases where a bilabial plosive precedes a labiodental sound (/f,v/), as in *cupful*, *obvious*, the stop is often made by a labiodental rather than a bilabial closure, in anticipation of the following fricative articulation, thus [ˈkʌp̪fʊl], [ˈɒb̪vɪəs]. Tongue movements involved in vowels or consonants adjacent to the bilabial stop are made independently of the lip closure, e.g. the /ɔː/ tongue position is maintained through the /b/ closure in *four balls* and the /l/ alveolar contact through the /p/ closure in *helpless.*

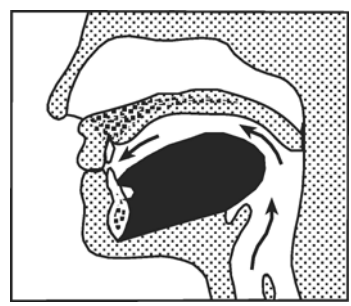


Figure 34 Section of /p,b/.

No important variants of /b/ occur within GB, except in respect of the amount of voicing in initial and final positions, full voicing in either position being rare. On the other hand, some speakers may also devoice in intervocalic positions, particularly across word boundaries. In the same way, the amount of aspiration given to /p/ varies between speakers, though the accented form will always tend to be more strongly aspirated than the unaccented form (see §9.2.1(3)).

(3) *Regional variants*—The only regional variation associated with /p,b/ concerns the amount of aspiration of /p/. Some dialects have very little aspiration (e.g. some parts of Lancashire) while others have more aspiration than GB (e.g. southern Irish, Highland Scottish).

Sources of /p,b/

OE [p,b,pp,bb]	apple, blow, ebb pin, stop
OF [p,b]	abbey, appear, peel, pump, robe

Note (1): In some cases /b/ derives from earlier /p/, e.g. *lobster*, *pebble*, or /p/ from earlier /b/, e.g. *pudding*, *purse*, *gossip*

Note (2): [b] was sometimes lost after [m] in ME, e.g. *climb*, *lamb*, but also sometimes inserted, e.g. *bramble*, *slumber*, *thimble*

(4) *Advice to foreign learners*—See general remarks in §§9.2.1(7), 9.2.4(7) and examples for practice in (1) of this section. Most languages have some sort of /p,b/ although they are notably absent in Vietnamese, and Arabic has no /b/. Spanish learners commonly substitute [β] for /b/. The languages of India typically have a distinction between an aspirated and an unaspirated series, but the aspirated series has much more aspiration than the /p,t,k/ of GB; hence Indian speakers of English tend to import their unaspirated series into English.

9.2.6 Alveolar plosives /t,d/

(1) *Examples*

/t/—*syllable-initial, accented, aspirated* (*or devoicing of* /r,j,w/)—take, tall, tone, attend, obtain; try, tune, between

syllable-initial, accented, after /s/, *unaspirated*—steak, stall, stone (but see §5.3.4)

syllable-initial, unaccented, slightly aspirated (*or slight aspiration of* /l,r,w/)—butter, letter, after, taxation, phonetic; antler, entry, outward

syllable-final (*often with no audible release*)—beat, boat, late, past, sent, halt, tuft

followed by another plosive or affricate, with no audible release—outpost, hatpin, football, catgut, white tie, that dog, white chalk, great joke

with homorganic nasal release—cotton, button, eaten, not now

nasal release, followed by /m/—nutmeg, utmost, that man[17]

with homorganic lateral release—little, cattle, atlas, at least

/d/—*word-initial, partially devoiced*—do, dog, double, date; dry, dwindle, duke

between voiced sounds, fully voiced—leader, order, adorn, hiding, London, elder, under, middle, sundry, fiddler, endways

final, fully devoiced—bid, mad, road, rubbed, bend, old, loved, bathed, raised, judged

followed by another plosive, with no audible release—head boy, head girl, bad pain, red car, good dog, bedtime, good judge, good cheese

with homorganic nasal release—sudden, madness, red nose

nasal release followed by /m/—admit, road map

with homorganic lateral release—middle, padlock, headless, badly, good luck

Compare

/t/, /d/—town, down; latter, ladder; water, warder; written, ridden; metal, medal; fated, faded; sat, sad; wrote, road; kilt, killed; bent, bend; train, drain; twin, dwindle; tune, dune

/t/, /θ/—tin, thin; taught, thought; eater, ether; fort, fourth; tent, tenth; welt, wealth

/d/, /ð/—dough, though; day, they; den, then; udder, other; loading, loathing; breed, breathe; side, scythe

Spellings of /t,d/

/t/	*Examples*	*TF*	*LF*
t	bait, beauty, cot, fighter, soft, tall, tap		96%
tt (except -ed, -ing)	attack, attitude, attract, battle, cassette, matt		3%
th	Anthony, Esther, posthumous, Thames, Thomas		
-ed	jumped, laughed, looked		
tz = /ts/	blitz, intermezzo, pizza, quartz, scherzo, schizophrenia		

Note: Silent <t> in *castle, Christmas, hasten, mortgage, soften*

/d/		
d	body, die, dawn, load, lido, side, wooden	98%
dd (except -ed and -ing)	add, middle, puddle, sudden	2%
-ed	banged, bombed, logged	

Note (1): *Buddha, dhow*
Note (2): silent <d> in *grandfather, handkerchief, handsome, landscape, sandwich*

(2) *Description*—The soft palate being raised and the nasal resonator shut off, the primary obstacle to the airstream is usually formed by a closure made between the tip and rims of the tongue and the upper alveolar ridge and side teeth (although in a minority of speakers the blade of the tongue rather than the tip may be used).[18] **(See videos 3.0, 3.15, 3.23, 4.8, 12.10, 13.0, 14.22, 15.9.)** Lung air is compressed behind this closure, during which stage the vocal cords are wide apart for /t/, but may vibrate for all or part of the compression stage for /d/ according to its situation in the utterance. The lip position for /t/ and /d/ will be conditioned by that of the adjacent sounds, especially that of a following vowel or semi-vowel, e.g. spread lips for /t/ in *teeth*, anticipatory lip rounding for /t/ in *tooth*, *twice*. The air escapes with varying force upon the sudden separation of the alveolar closure, unless the airstream has been blocked by a second closure either behind the alveolars (as for /k/) or forward of the alveolars (as for /p/), or unless it has been diverted through the nose by the lowering of the soft palate (as for /n/); if the release is lateral, only part of the alveolar obstruction is removed, the tongue-tip contact remaining. Nasal plosion will be heard in sequences of /t/ or /d/ plus /n/ and lateral plosion will be heard in sequences of /t/ or /d/ plus /l/.

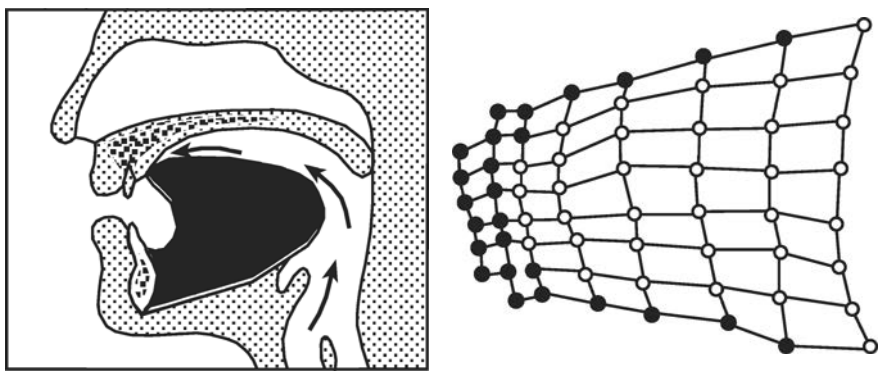


Figure 35 Section and palatogram of /t,d/.

The alveolar stop contact is particularly sensitive to the influence of the place of articulation of a following consonant. Thus, followed by /r/ as in *try*, *dry*, the contact may be post-alveolar [t̠,d̠] (although, alternatively, the /r/ may accommodate to the /t,d/ and become alveolar) and followed by a /θ,ð/ as in *eighth*, *not that*, the contact will be dental [t̪,d̪]. In addition, word-final /t,d/ assimilate readily to /p,k/ and /b,g/, when followed by word-initial bilabial and velar consonants (see §12.4.5). The instability of alveolar articulations is further

demonstrated by the ease with which /t/ or /d/ may be elided in consonantal clusters (see §10.8 for examples within words and §12.4.6 for examples at word boundaries).

In addition to the general plosive variations commented on in §§9.2.1, 9.2.3, it should be noted that /t,d/ are especially liable to affrication and even replacement by the equivalent fricative in weakly accented situations, e.g. *time* [tˢaɪm], *important* [ɪmˈpɔːtˢənt] or even [ɪmˈpɔːsənt].

/t/ in syllable-final positions is commonly reinforced or replaced by a glottal closure unless a vowel or syllabic [n̩] or [l̩] follows, e.g. *late*, *want*, *cricket*, *outright*, *chutney*. Even before a following vowel the use of [ʔ] for word-final /t/ before a following vowel is now acceptable as a form of London RGB (Estuary English), e.g. in *get off*, *got it*, *right order*. An alternative pronunciation before a vowel, voicing of /t/ to [d], is increasingly reported for a minority of GB speakers, e.g. in *British*, *hot enough*, *not unusual*, *fat or thin*. Some GB speakers will also use [ʔ] to realise /t/ when syllabic [n̩] follows, e.g. *cotton*, *certain*. It is a feature of CGB that /t/ is neither reinforced nor replaced by glottal closure.

(3) *Regional variants*—The use of [ʔ] for /t/ preceding syllabic [l̩], and more particularly in unaccented intervocalic word-medial positions, is typical of some regional varieties of English (e.g. those of Cockney and Glasgow), as in *kettle*, *butter*, *later*; in Cockney these become [keʔʊ, bʌʔə, leɪʔə] (see §9.7.1 for /l/→[ʊ]). Such pronunciations are not acceptable as part of London RGB. (See §9.2.8 for further detail on [ʔ])

The amount of aspiration associated with /t/ varies considerably across dialects, some, like Irish English and Welsh-influenced English, having more aspiration than GB, others, like Lancashire and South Africa having very little aspiration. Scottish English generally has little aspiration also, although in the Western Highlands, where Gaelic influence is strong, there is very strong aspiration. See also the comments on aspiration in Indian English in §9.2.5(4) above. In General American /t/ in unaccented intervocalic positions (post-accentual) is generally realised as a tap [ɾ], e.g. in *butter*, *latter*, *put it*; for some speakers the closure may be long enough to produce neutralisation with /d/. Similar realisations may be heard in South African English and in southern Irish English. Also in the unaccented intervocalic position following a short vowel and across a word boundary, /t/ may be realised as [ɹ] in a number of urban varieties including some in south Lancashire and west Yorkshire, e.g. *get off* [geˈɹɒf]; in the same position in Cockney /t/ may be realised as a tap [ɾ] as an alternative to [ʔ]. In Indian English and among speakers of ethnic Indian origin /t/ will generally be realised as retroflex [ʈ].

Sources of /t,d/

OE [t,tt,d,dd]	ME [t,d]	adder, boat, butter, dew, road, turn
OF [t,d]		adamant, attend, bend, button, doubt, try
ON [t,d]		down, take

Note (1): Some words with present /θ/ had [t] until eModE, e.g. *authority, diphthong, orthography, throne*

Note (2): [t,d] were elided in many (usually homorganic) clusters in eModE, e.g. *castle, Christmas, fasten, handsome, hasten, often, Wednesday*

Note (3): [t,d] have been added in some (mainly French) words after voiceless fricatives and [n], e.g. *against, amongst, astound, graft, parchment, peasant, sound*

Note (4): The earlier suffix [əd] > [t] after voiceless sounds, 16c., e.g. *blessed, missed, pierced, wrapped*

(4) *Advice to foreign learners*—In addition to the general remarks in §§9.2.1, 9.2.3 and the examples for practice given in (1) of this section, it is to be emphasised to foreign learners that the general articulation of /t,d/ is an alveolar one, made with the tongue tip raised. The corresponding phonemes of many other languages, e.g. Arabic, French, Italian, Portuguese, Spanish, have a dental rather than an alveolar point of contact. Those learners who carry over from their own language a dental articulation should practise the slightly affricated forms of /t,d/, i.e. [t^{s}] [d^{z}] in words such as *time, day*. If the closure point remains dental, the affrication produced will be clearly of the [t$^{\theta}$], [d$^{\eth}$] type. Those learners who, in their own language, have two varieties of stop closure made with the tongue tip, e.g. speakers of Indian languages, having dental and post-alveolar or retroflex varieties, should, if aiming at a British pronunciation, avoid using their retroflexed plosives, since these sound over-retracted to British ears (but of course their target may be Amalgam English or International English as in §13.5); similarly they should also avoid using their dental [t̪,d̪] for English /θ,ð/. Learners are often prone to omit /t,d/ before /s,z/ when followed by another consonant; this particularly applies to sequences where *is* is reduced by elision and assimilation to /s/, as in *it's, what's, that's* in, for example, *it's true, what's that, that's normal*, which should not be pronounced as /ɪs `tru/, /wɒs `ðat/, /ðas `nɔːməl/.

9.2.7 *Velar plosives /k,g/*

(1) *Examples*

/k/—*accented, aspirated* (*or devoiced* /l,r,j,w/)—come, car, kin, incur, according; clean, cry, queue, quick,

accented after /s/, *unaspirated*—scum, scar, skin (but see §5.3.4)

unaccented, slightly aspirated (*or slightly devoiced* /l,r,j,w/)—income, baker, talking, biscuit, anchor; duckling, secret, dockyard, equal,

syllable final (*often with no audible release*)—leak, duck, rock, choke, bank, bulk, desk

followed by another plosive, with no audible release—locked, blackboard, thick dust, black cat, dark grey, deckchair, lockjaw
nasal release, followed by nasal consonant—acknowledge, dark night, thicken (sometimes /ˈθɪkŋ/), black magic
lateral release, followed by lateral consonant—buckle, clean, close, blackleg

/g/—*word-initial, partially devoiced*—go, geese, guess, girl; glass, grass, Gwen
between voiced sounds, fully voiced—eager, hunger, figure, ago, begin, eagle, juggling, angry, anguish, argue
word-final, fully devoiced—dog, leg, rogue, vague
followed by another plosive, with no audible release—rugby, begged, bagpipes, wagtail, big game, eggcup, big jaw, big chin
nasal release, followed by nasal consonant—dogma, ignore, quagmire, big man, drag-net
lateral release, followed by lateral consonant—bugle, struggle, glow, wriggling, dog lead

Compare /k/, /g/—cap, gap; coat, goat; clue, glue; decree, degree; bicker, bigger; stacker, stagger; lacked, lagged; ankle, angle; hackle, haggle; pick, pig; back, bag; duck, dug; crate, great

Spellings of /k,g/

/k/	*Examples*	*TF*	*LF*
k	bank, break, kept, kettle, king, monk, revoke, sky, turkey, walk	21%	10%
c	alcohol, carpet, caught, circus, clique, cord, crew, disc, maniac	59%	69%
cc	accommodation, account, accused, occasion, occupy, occur	1%	1%
q	bouquet, cheque, conquer, liquor, mosquito, racquet, unique		
ch	chaos, character, chemist, choir, chorus, echo, orchid, stomach	2%	3%
ck	buttocks, chicken, creaky, hemlock, mackerel, neck, tacky	6%	5%
qu = /kw/	acquire, queer, quest, quiet, quilt	4%	4%
x = /ks/	climax, larynx, six, X-ray		

Note: Silent <c,k> in *knave, knew, knight, knit, knob, knowledge, muscle*

/g/			
g	agree, bugle, congratulate, geese, go, good, glum, gourd, grow	86%	92%
gg	aggravate, aggressive, egg, waggon (also wagon)	6%	2%
gh	dinghy, ghastly, ghost, spaghetti	1%	1%
gu, gue	guerdon, guest, guide, guilt	4%	3%
x (= /gz/)	exempt, exhaust, exist	4%	4%

Note (1): Silent <g> in *diaphragm, gnash, gnaw, gnu, reign, sign*

(2) *Description*—The soft palate being raised and the nasal resonator shut off, the primary obstacle to the airstream is formed by a closure made between the back of the tongue and the soft palate. Lung air is compressed behind this closure, during which stage the vocal cords are wide apart for /k/, but may vibrate for all or part of the compression stage for /g/ according to its situation in the utterance. **(See videos 4.21, 7.0, 12.4, 14.11.)** The lip position will be conditioned by that of adjacent sounds, especially following vowels or semi-vowels, e.g. spread lips for the plosives in *keen, geese*, and somewhat rounded lips for the plosives in *cool, goose, quick*. The air escapes with force upon the sudden separation of the linguo-velar closure, unless the airstream has been blocked by a second closure forward of the velum (as for /p/ or /t/), or has been diverted through the nose by the lowering of the soft palate (as for /ŋ/); when a lateral sound follows, the airstream will have a lateral escape round the point of alveolar closure.

The velar stop contact is particularly sensitive to the nature of an adjacent vowel (especially a following vowel). Thus, when a front vowel follows, e.g. /iː/ in *key, geese*, the contact will be made on the most forward part of the soft palate and may even overlap on to the hard palate. **(See videos 5.0, 11.0.)** When a back vowel follows, e.g. /ɒ/ in *cot, gone*, the contact on the soft palate will be correspondingly retracted; a contact in the central region of the soft palate is made when a vowel of a central type follows, e.g. /ʌ/ or /ɜː/ as in *come, gun, girl* (see Figs 36 and 37).

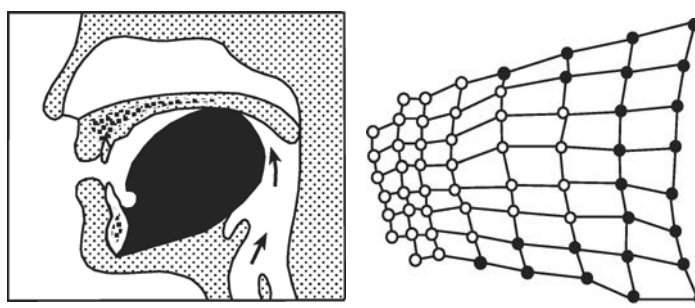


Figure 36 Section and palatogram of /k,g/ + /iː/.

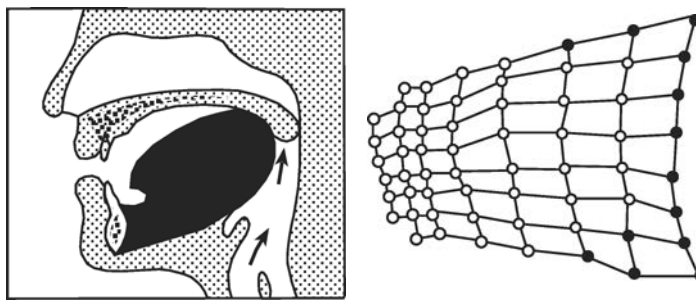


Figure 37 Section and palatogram of /k,g/ + /ɑː/.

Since the initial clusters /kl,gl/, as in *clean*, *glean*, are not in opposition with /tl,dl/ which do not occur initially, a substitution of /tl,dl/ for /kl,gl/ in such positions may occasionally be heard both in GB and in other forms of English. (For other variations affecting all plosives, see §§9.2.1, 9.2.3.)

(3) *Regional variants*—As for /p,b/ and /t,d/ the velar plosives vary in the amount of aspiration not only positionally but also regionally. More aspiration than in GB is heard in many areas where there has been Celtic influence: in the Scottish Highlands, in Wales, and in southern Ireland. Lesser aspiration than in GB is heard in Lancashire; see also the comments on aspiration in Indian English in §9.2.5(3) above. Southern Irish also shows a tendency to palatalise /k,g/.

Sources of /k,g/

OE [k,g]	ME [k,g]	back, keen, king, sick; again, go, grunt
OF [k,g]		catarrh, case, cause, cave; agree, grain, gutter, rogue, vague
ON [k,g]		bag, rag, skate (fish), skill, skip, skirt, sky
AN [k,g]		pocket, carpenter, catch

Note (1): Early imports of [kw] from OF keep the /w/, e.g. *quit*, *squadron*, whereas recent imports have no /w/ (like Modern Fr.), e.g. *bouquet*
Note (2): The <c> in *perfect*, *subject* is an insertion since eModE due to 'learned' spelling
Note (3): /k,g/ initially before /n/ (*know*, *knowledge*, *gnaw*, *gnash*) were finally lost in late 17c. (cf. recent *gnu*.)
Note (4): /g/ after /n/ was lost in *sing*, *rung* in 17c., though it is kept medially in GB *finger*, *longer*, *strongest*, *single* and remains in all positions in north-west Midlands. See §9.6.3

(4) *Advice to foreign learners*—Note the general remarks in §§9.2.1, 9.2.3 and the examples for practice given in (1) of this section. French learners should be particularly careful not to over-palatalise /k,g/ both before and after front vowels; Spanish learners should avoid reducing intervocalic /g/ to a fricative [ɣ] or pronouncing initial /g/ (especially before a back vowel) as [gw] or [w].

9.2.8 *Glottal plosive* [ʔ]

(1) *Description*—In the case of the glottal plosive (stop), the obstruction to the airstream is formed by the closure of the vocal cords, thereby interrupting the passage of air into the supraglottal organs. The air pressure below the glottis is released by the sudden separation of the vocal cords. The compression stage of its articulation consists of silence, its presence being perceived auditorily by the sudden cessation of the preceding sound or by the sudden onset (often with an accompanying strong breath effort) of the following sound. The plosive is voiceless, there being no vibration of the vocal cords. Because the position of the vocal cords is not that associated with other

voiceless sounds (i.e. with wide open vocal cords), an alternative viewpoint regards [ʔ] as neither voiceless nor voiced. Nevertheless where [ʔ] substitutes for /p,t,k/ in English, it has the usual effect of voiceless plosives in shortening preceding vowels. The articulation of [ʔ] must be distinguished from that type of glottalisation or laryngealisation which involves tension in the laryngeal region and either an excessively slow rate of vibration of the vocal cords ('creaky voice') or a vibration of the false vocal cords situated just above the true vocal cords ('ventricular voice' or 'harsh voice').[19] In the production of these latter sounds, often heard in the lowest pitches of intonation and associated with weak intensity (though sometimes with muscular tension, e.g. at the lower level of a falling-rising tone) or on almost any pitch level in certain (often affected) voice qualities, there is no total closure of the vocal cords. Nor is there compression between the glottal and oral closures which would produce ejectives (see §4.3.9).

It is clear from the description given above that there is no acoustic manifestation of the glottal plosive other than the abrupt cessation or onset of the adjacent sounds.

(2) *Usage*—The glottal plosive, though frequently used by GB speakers, is not a distinctive sound in the GB system (i.e. it does not contrast with other plosives to produce differences of meaning). A distinction must be made between (a) the regular occurrence of glottal reinforcement in GB, (b) extended use of reinforcement in GB, (c) use of glottal replacement in GB, and (d) more extensive use of glottal replacement in other dialects.

(a) *Regular glottal reinforcement in GB*[20]—[ʔ] serves regularly for many GB speakers as a syllable boundary marker, when the initial sound of the second syllable is a vowel. Thus, a hiatus of vowels belonging to different syllables (especially when the second vowel is accented), may in careful speech be separated by [ʔ] instead of being joined by a vocalic glide, e.g. *co-operate*, *geometry*, *reaction* [kəʊˈʔɒpəreɪt, ʤiːˈʔɒmətri, riːˈʔakʃən], and even when the second vowel is weakly accented, e.g. *day after day* [deɪ ʔɑːftə ˈdeɪ]. When [ʔ] is used in this way /iː/ and /uː/ are used rather than /i,u/ which would be used when the first vowel is immediately adjacent to the second vowel. This usage of [ʔ] is extended by some careful speakers in those cases where there is a possibility of an intrusive /r/ (see §§12.4.7, 12.5) at a point of vowel hiatus, e.g. in *law and order*, *drama and music*; the glottal marker is even applied by some speakers (and in some teaching of singing) in cases where a regular linking /r/ is normal, e.g. in *later on*, *far off*, *four aces*.

Finally, any initial accented vowel may be reinforced by a preceding glottal stop when particular emphasis is placed on the word, whatever the preceding sound, e.g. in *It's* [ʔ] *empty*, *I haven't seen* [ʔ] *anybody*, *She's* [ʔ] *awfully good*; or again, any vowel, initial in an accented morpheme, may receive this glottal reinforcement, e.g. It's *un*[ʔ]*eatable*, *such dis*[ʔ]*order*.

(b) *Extended glottal reinforcement in GB*—As was pointed out in §9.2.4, in GB (although not in CGB) /p,t,k/ and also /ʧ/ may be reinforced by a glottal closure which generally precedes it. The glottal closure takes place just before the mouth closure and the glottal release just before the oral release, so that phonetically the glottal posive and the oral plosive are in a sequence just like other sequences of plosives. As such the closing stage of the oral closure and the release stage of the glottal closure are masked in the overlapping of the two closures. This type of reinforcement occurs in syllable-final position where a vowel, nasal, or lateral precedes and where a pause or a consonant follows (and, for /ʧ/, where a vowel follows as well). Reinforcement is more likely to occur at the end of an accented syllable. Some examples where glottal reinforcement may occur are: for /p/, *reap*, *limp*, *help*, *apt*, *stop me*; for /t/, *beat*, *bent*, *melt*, *atlas*, *at last*; for /k/, *beak*, *bank*, *baulk*, *chocolate*, *back down*; for /ʧ/, *rich*, *bench*, *searched*, *teaching*, *wretched*, *search me*, *reach it*.

(c) *Glottal replacement in GB*—Some GB speakers replace syllable-final /p,t,k/ by [ʔ] when a consonant follows, no oral closure being made. Such glottal replacement most commonly affects /t/ when the following consonant is homorganic, i.e. /t,d,ʧ,ʤ,n,l,r/ as in *that table*, *get down*, *that chair*, *great joke*, *witness*, *not now*, *Scotland*, *at least*, *that ring* but [ʔ] is also heard for /t/ before other non-syllabic consonants, e.g. in *football*, *gatepost*, *cat-call*, *catgut*, *not mine*, *nutmeg*, *Catford*, *not for me*, *not very*, *what thing*, *out there*, *outset*, *great zeal*, *nutshell*, *outright*, *cart-wheel*, *not yet*, *not here*. Some GB speakers may also replace the first (plosive) element of the affricate /ʧ/, e.g. in *coach*, *much*, *catch*, *couch*. Use of [ʔ] to replace /t/ in other positions, i.e. before syllabic [n̩] and [l̩], e.g. in *cotton*, *little*, *eat an apple*, *bat and ball* and before words beginning with vowels, e.g. *not on* [nɒʔ ˋɒn], *it opens* [ɪʔ ˋəʊpmz] was until recently stigmatised as non-GB but all except [ʔl̩] are now acceptable in London RGB.[21] Use of [ʔ] for /t/ word-medially inter-vocalically, as in *water*, still remains stigmatised in GB.

The replacement of final /p,k/ by [ʔ] is much less frequent among GB speakers and occurs only when the following consonant is homorganic, e.g. *soap powder*, *cap badge*, *back garden*, *bookcase*.

(d) *Glottal replacement in other dialects*—In some dialects (particularly Cockney) glottal replacement occurs in the same positions as GB although more frequently, but also occurs in a wider number of contexts. Word-medially and intervocalically a /t/ following an accented vowel may be replaced by [ʔ], e.g. in *daughter*, *butter*, *Saturday*, *Waterloo*, *writing*, *potato* [pəˋtaɪʔə], *salty*, *wanted*. In rapid speech the glottal closure is likely to be very weak, so that the /t/ in such positions may border on being elided.

In Cockney glottal replacements of /p,k/ also occur in similar situations, e.g. in *supper*, *paper*, *cup of tea* [kʌʔə`tˢəɪ], *lucky*, *joker*, *he don't like it* [əidəõʔ `lɑɪʔ ɪʔ], but there appears to be a greater tendency to retain a bilabial or velar closure. In cases of /-mpl,-ntl,-ŋkl/, as in *simple*, *mental*, *uncle*, if the nasal consonant is articulated, the [ʔ] used for /p,t,k/ is likely to be accompanied by the already formed bilabial, alveolar, or velar closure; if, however, as often happens in Cockney speech, /-ɪm,-en,-ʌŋ/ are realised as [ĩ,ẽ,ã], the following stop can only be glottal, as in the example above. [ʔ] may also occasionally replace the fricative /f/ in Cockney, especially in the phrase *half a*, e.g. *half a minute* [ɑːʔ ə `mɪnɪʔ]. It should also be noted that, initial /h/ often being elided, vowels thus becoming initial may have glottal emphatic reinforcement applied to them, especially in hiatus with a preceding vowel, e.g. *I hate him* [ɑɪ `ʔæɪ ʔɪm], *we haven't* [wi `ʔævnʔ].

Glottal replacement and glottal reinforcement are used in similar ways in East Anglia, Bristol, Glaswegian and Tyneside,[22] intervocalic (post-accentual) replacement being generally marked as characteristic of broad varieties of accents (sometimes referred to as 'basilectal'). Tyneside is unique in realising glottal reinforcement in intervocalic positions by post-glottalisation, e.g. *water* [watʔə], *keeper* [kiːpʔə], *speaker* [spiːkʔə].

(3) *History*—Since it would appear that [ʔ] has never been a separate phoneme in English, it is not to be expected that its stylistic use should have been described in detail by the early grammarians. It is, however, mentioned in the seventeenth century[23] as a feature of the onset of initial vowels and, in works dealing with singing technique, has traditionally been described as the 'hard attack'. But the substitution of [ʔ] for a voiceless plosive in regional speech is not explicitly mentioned until the nineteenth century and it is only in recent years that the phenomenon of reinforcement has been explicitly noted. Lack of descriptive evidence concerning this non-significant sound is not, however, a reason for assuming that [ʔ] is a feature of only recent occurrence in English speech. But the fact that glottal reinforcement and glottal replacement are generally absent from Australian English, which shares many features with Cockney and hence might be assumed to have been derived principally from earlier London speech, suggests that the glottal characteristics of Cockney have arisen in the last two hundred years.

(4) *Advice to foreign learners*—Many languages use [ʔ] to reinforce word-initial vowels but some do this much more regularly and frequently than English, e.g. German. Speakers should therefore generally avoid this type of reinforcement. They should also be aware that use of glottal replacement between vowels, either within words or across word boundaries, is more typical of London RGB (Estuary English) than of GB.

9.3 Affricates

(1) *Definition*—The term 'affricate' denotes a concept which is primarily of phonetic importance. Any plosive whose release stage is performed in such a way that considerable friction occurs approximately at the point where the plosive stop is made may be called an affricate. In English, apart from the exceptional affrication mentioned in §9.2.4(6), only /t,d/ may have this type of release, namely in /ʧ,ʤ,tr,dr,ts,dz,tθ,dð/.

(2) *Phonemic status*—From a phonological point of view these compound sounds may be considered either as single phonemic entities or as sequences of two phonemes. The choice of phonemic solution will depend upon the purpose of the analysis, but the following factors may be taken into account:

   (a) *The distribution of the sound sequence*, in particular in the following positions: word-initial, word-final, and word-medial with different syllable assignments (i.e. belonging to the same syllable or different syllables). A sound sequence which has a general distribution and shows an opposition in word-medial position between CLOSE-KNIT realisations and DISJUNCT realisations (i.e. with the elements in separate syllables or morphemes) may be treated as a single complex phoneme.

Table 12 shows that /ʧ,ʤ/ best fulfil these conditions, occurring in all positions with a medial distinction between close-knit /ʧ/ and disjunct /tʃ/. /tr,dr/ also have a distinction between close-knit and disjunct in medial position but do not occur in final position. /ts,dz/ do not occur initially (except in rare foreign words) and only doubtfully in close-knit medial situations. [t̪θ,d̪ð] have an occurrence restricted to the final position in very few words.

Close-knit and disjunct sequences of /t,d/ plus /ʃ,ʒ/ or /r/ involve different phonetic characteristics. In the case of /t/ plus /ʃ/ and /d/ plus /ʒ/, the fricative is shorter in close-knit sequences: thus the friction in *butcher* is of shorter duration than the friction in *lightship*. For sequences /t/ or /d/ plus /r/, the /r/ is fricative (although of course made in a different position from /ʃ,ʒ/) in close-knit sequences but approximant in disjunct sequences: additionally the /r/ is devoiced

Table 12 Distribution of homorganic sequences of plosive plus fricative.

	word-initial	*word-final*	*word-medial close-knit*	*word-medial disjunct*
[ʧ]	chap	patch	butcher	[t] + [ʃ] lightship
[ʤ]	jam	badge	aged	
[tr]	tram		mattress	[t] + [r] footrest
[dr]	dram		tawdry	[d] + [r] handrail
[ts]		cats	curtsey (?)	[t] + [s] outset
[dz]		roads	Pudsey (?)	
[t̪θ]		eighth		
[d̪ð]		(width)		

following /t/.[24] Thus the /r/ in *mattress* is fricative and voiceless while the /r/ in *footrest* is approximant and voiced. Medial close-knit sequences can be regarded as involving the two sounds within one syllable[25] while the disjunct sequence involves a syllable boundary between the two sounds.

(b) *Possibilities of commutation of the elements.*

(i) The elements of /ʧ/ may be commutated within the same syllable as follows: word-initially, the stop, commutates only with zero, cf. *chip*, *ship*, while the fricative commutates with /r,j,w/ and zero, cf. *chip*, *trip*, *tune*, *twin*, *tin*; word-finally the stop commutates with /l/ or zero, cf. *watch*, *Welsh*, *wash*, while the fricative commutates with /s/ or zero, cf. *catch*, *cats*, *cat*; and word-medially the stop commutates with zero, cf. *matches*, *mashes*, while the fricative commutates with /r/ or zero, cf. *enchants*, *entrance* (v.), *marcher*, *martyr* (syllable boundaries are assumed to occur in the following words: *welshing*, *pinching*, *outward*, *atlas*, *chutney*.)

The elements of /ʤ/ have a more restricted possibility of commutation owing to the rarity of syllable initial /ʒ/. Word-initially only the fricative commutates, with /r,j,w/ and zero, cf. *jest*, *dressed*, *dune*, *dwell*, *dam*; word-finally again only the fricative commutates, with /z/ or zero, cf. *hedge*, *heads*, *head*; word-medially the stop commutates with zero, cf. *ledger*, *leisure*, and the fricative commutates with /r/ and zero, cf. *orgy*, *Audrey*, *larger*, *larder*.

Thus the possibilities of commutation are restricted in the case of the elements of /ʧ/ to zero (and occasionally /l/) for the stop, and to zero, /r,w/ and /s/, according to the situation, for the fricative. The commutability of the elements of /ʤ/ is also restricted, i.e. with zero in the case of the stop, and with zero and /r,j,w/ or /z/, according to the situation, in the fricative. Moreover, /ʧ/ is in opposition to /ʤ/ as a complex in all positions (see §9.3.1 for examples).

(ii) /tr,dr/, on the other hand, have considerable possibilities of commutation especially in the first element: in the case of /tr/, cf. *try*, *cry*, *pry*, *fry*, *rye*; *true*, *shrew*, *drew*, *grew*, *threw*, *brew*; *tree*, *three*, *tea*; *trill*, *chill*, *twill*; *troop*, *tune; train*, *chain*; in the case of /dr/, cf. *drew*, *true*, *crew*, *grew*, *brew*, *threw*, *shrew*, *rue*, *do*, *due*, *Jew*; *dry*, *fry*, *pry*, etc.

On the basis of commutability alone, therefore, /tr,dr/ are more reasonably to be considered as consisting of separable elements than /ʧ,ʤ/.

(c) *Glottalisation*—/ʧ/ is liable to glottal reinforcement before vowels as in [ˈtiːʔʧɪŋ] where /p,t,k/ are, within GB, generally subject to reinforcement only when a consonant follows; and to glottal replacement of the [t] element alone as in [kəʊʔʃ]. Both facts suggest that the [ʃ] element of /ʧ/ is in some sense the 'following consonant' which allows glottalisation

of the preceding [t]. Contrary to sections (a) and (b) above, section (c) argues for an analysis of [ʧ] as always a sequence of [t] + [ʃ].

(d) *Native speakers' reaction*—It seems that the native speaker does not regard /ʧ,ʤ/ as composite sounds, i.e. composed of distinctive elements. He is likely, for instance, to consider that *chip*, *catch*, consist of three parts in the same way as *tip*, *ship*, or *cat*, *cash*; or again, *jam*, *badge*, as structures equivalent to *dam*, *bad*. (It is, of course, also true that GB /ʧ,ʤ/ derive in many cases from earlier (OE or OF) plosives [c] or [ɟ], although this is irrelevant in any consideration of the present structure of the language.) On the other hand, /tr,dr/ are not normally regarded as anything but sequences of /t,d/ + /r/ and, in many dialects where the /r/ has a tap or trill realisation, there is no question of affrication.

(e) *Speech errors*—Any of the elements of a consonantal cluster may be involved in a speech error, e.g. *play the game* → /peɪ ðə `gleɪm/, *came to a stop* → /skeɪm tu ə `stɒp/ (Sometimes an error will involve a transposition, sometimes just an addition). In this respect /tr,dr/ behave like clusters, e.g. *caught the tram* → /krɔːt ðə `tam/ whereas /ʧ,ʤ/ are never involved in such errors; we do not, for example, get errors like *ring the changes* → /trɪŋ ðə `ʃeɪnʤɪz/ whereas we do get /ʧɪŋ ðə `reɪnʤɪz/.[26]

(f) *Conclusion*—The criteria above on balance clearly suggest taking /ʧ,ʤ/ as phonemic affricates (despite the contrary evidence from glottalisation). On the other hand, of the other phonetic affricates only /tr,dr/ have some evidence favouring a uniphonemic analysis (i.e. the distinction between close-knit and disjunct), but even for these sequences the evidence is nowhere near as strong as for /ʧ,ʤ/. Accordingly only /ʧ,ʤ/ are here analysed as unit phonemes.

(3) *Acoustic features*—The acoustic features of affricates are those appropriate to stops (see §9.2.2) and fricatives (see §9.4.1). Thus the most essential perceptual cues will be provided by the transition between the preceding vowel and the stop and by the nature of the following friction. Nevertheless, in the case of /ʧ,ʤ/, the transition will not necessarily be that which is typical of the alveolar plosives, since the stops of /ʧ,ʤ/ will be of a palatalised type; alternatively, there may be brief intervening friction of the alveolar /s,z/ type before the [ʃ,ʒ] elements proper.[27]

9.3.1 Palato-alveolar[28] affricates /ʧ,ʤ/

(1) *Examples*

/ʧ/—*word-initial*—cheese, chain, charge, charm, choke, cheer, tune, tube
word-medial, intervocalic—feature, richer, wretched, orchard, butcher, nature, merchant
word-medial, consonant preceding—gesture, posture, mischief, juncture, capture, lecture, pilchard, culture, adventure

word-final—wretch, catch, larch, porch, much, coach
word-final, consonant preceding—inch, conch, bench, branch, filch, mulch

/ʤ/—*word-initial*—dew, duke, dune, gin, jest, jar, jaunt, Jew, jerk, joke, joist, jeer
word-medial, intervocalic—midget, ledger, margin, fragile, urgent, orgy, adjacent, agenda, major
word-medial, consonant preceding—avenger, danger, stringent, soldier, Belgian, bulges, object
word-final—ridge, edge, large, dodge, judge, huge, age, doge, gouge
word-final, consonant preceding—bilge, bulge, hinge, sponge, change

Compare

/ʧ/, /ʤ/—chin, gin; chest, jest; choose, Jews; choke, joke; cheer, jeer; catches, cadges; nature, major; a venture, avenger; riches, ridges; leech, liege; larch, large; perch, purge; lunch, lunge; cinch, singe; tune, dune; beseech, besiege

/ʧ/, /tr/—cheese, trees; chip, trip; chap, trap; chew, true; chain, train

/ʤ/, /dr/—jest, dressed; jaw, draw; Jew, drew; jam, dram

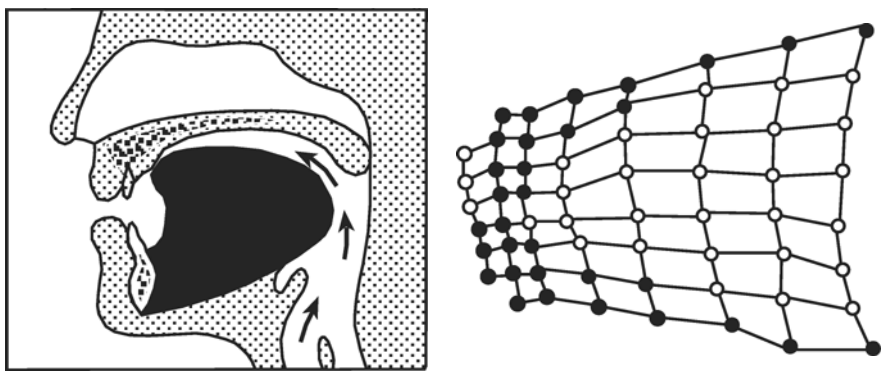


Figure 38 Section and palatogram of stop phase of /ʃ,ʤ/.

(2) *Description*—The soft palate being raised and the nasal resonator shut off, the obstacle to the airstream is formed by a closure made between the tip, blade and rims of the tongue and the upper alveolar ridge and side teeth. At the same time, the front of the tongue is raised towards the hard palate in readiness for the fricative release. The closure is released slowly, the air escaping in a diffuse manner over the whole of the central surface of the tongue with friction occurring between the blade/front region of the tongue and the alveolar/front palatal section of the roof of the mouth. **(See videos 8.15, 9.0.)** During both stop and fricative stages, the vocal cords are wide apart for /ʧ/, but may be vibrating for all or part of /ʤ/ according to the position. (/ʤ/ shares the features of devoicing in initial and final positions

exhibited by plosives, see §9.2.1(4), and fricatives, see §9.4(3).) /ʧ,ʤ/ differ from plosives in that they never lose their (fricative) release stage. The lip position will be conditioned by that of adjacent sounds, especially that of a following vowel (cf. the greater lip-rounding of /ʧ/ in *choose* in relation to that of *cheese*), though with some speakers a certain amount of lip protrusion is always present.

Spellings of /ʧ,ʤ/

/ʧ/	*Examples*	*TF*	*LF*
ch	achieve, attach, chain, choose, chunk, leech, much pinch, rich	65%	62%
tch	aitch (the letter 'h'), bitch, butcher, fetch, watch, wretched	10%	12%
ti	question, Christian, suggestion, ... etc.		
tu	actual, furniture, nature, statue, virtuous		
Note: *cello, concerto, righteous*			
/ʤ/			
j	enjoy, eject, jam, jaw, job, jostle, juice, major, pyjamas	29%	22%
g	cage, fragile, gem, imagine, magic, pigeon, village	61%	70%
dg	badge, budge, edge, fridge, judge, lodge, midget	5%	5%
dj	adjacent, adjective, adjunct	1%	2%
Note: *arduous, exaggerate, grandeur, soldier, suggest*			

In addition, it should be noted that the voiceless /ʧ/, when final in a syllable, has the same effect of reducing the length of preceding sounds as was noted for /p,t,k/ (see §9.2.1(5)); comparatively full length of preceding sounds is retained before /ʤ/. This effect must be taken as the primary perceptual cue to the /ʧ/-/ʤ/ opposition in syllable-final positions.

A minority of speakers make /ʧ,ʤ/ with the blade and front alone and with the tip of the tongue down behind the lower teeth. Otherwise there are no important variants of /ʧ,ʤ/ within GB, except in the matter of the degree of lip-rounding used. Speakers of CGB use /t/ and /d/ + /j/ in words which in GB have /ʧ/ or /ʤ/ at the onset of an unaccented syllable, e.g. *gesture*, *culture*, *virtue*, *statue*, *righteous*, *fortune*, *literature*, *question*, *posture*, *Christian*, *soldier*, *grandeur*, *actual*, *punctual*, *mutual*, *obituary*, *individual*, *gradual*, *educate*. Even in accented positions /ʧ,ʤ/ are now well established, although /tj,dj/ can still be heard in CGB and in careful speakers of GB, e.g. in *tune*, *tube*, *tumour*, *tunic*, *Tuesday*, *Turing*, *dune*, *dew*, *duty*, *duke*, *dupe*, *endure*, *during*. Some speakers omit the stop element in the clusters /nʧ,nʤ/ in word-final positions as in *pinch*, *French*, *lunch*, *branch*, *paunch*, *hinge*, *revenge*, *challenge*, *strange*, *scrounge*; and also medially in words like *pinching*, *luncheon*, *avenger*, *danger*. In accented-syllable-final position /ʤ/ is increasingly simplified to /ʒ/, e.g. in *liege*, *adagio*, *subterfuge*,

while in unaccented positions it can occasionally be reduced to /d/, e.g. *dangerous* /ˈdeɪndrəs/, *legislation* /ˈledɪsleɪʃn̩/.

(3) *Regional variants*—There is no substantial dialectal variation in /ʧ,ʤ/. But in those accents like General American which have lost the /j/ following /t,d/ in sequences like *tune* and *dune*, since the sequences /tj,dj/ do not occur, neither do the pronunciations with /ʧ,ʤ/.

Sources of /ʧ,ʤ/

Late OE [ʧ,ʤ] < earlier [c,ɟ]	ME [ʧ,ʤ]	*bridge, child, chin, church, edge, kitchen, teach*
OF [ʧ,ʤ]		*age, branch, chair, chamber, change, chief, choice, judge, major, merchant, village*
	ME [tj,tɪ,dj,dɪ] > [ʧ,ʤ] 18c.	*creature, grandeur, nature, question, soldier, virtue,* (cf. *bestial, odious, piteous, tedious* which have maintained or reverted to [tɪ,dɪ] or [ti,di])

(4) *Acquisition by native learners*—The affricates /ʧ,ʤ/ are, along with the fricatives and /r/, among the consonants which are acquired later rather than earlier (often not until the age of four). It might be expected that, being composed of a homorganic sequence of plosive plus fricative, their acquisition would depend on the prior acquisition of the plosives and fricatives of which they are composed. However, this does not always seem to be the case; in particular the fricative /ʒ/ may be of later occurrence than the affricate /ʤ/, perhaps due to its comparative low frequency of occurrence in the adult language. Like most consonants the affricates are used first in syllable-initial positions and are often omitted in final position in early words. Before they are correctly produced in initial position, they are frequently replaced by /t,d/.

(5) *Advice to foreign learners*—Some languages do not have /ʧ,ʤ/, e.g. French and Portuguese, and will replace them with /ʃ,ʒ/, or, in the case of Greek which has no /ʃ,ʒ/ either, with the affricates /ts,dz/. Good starting-points for learners from such languages are the clusters /tj,dj/; moving the tongue forward while producing these sequences will often produce the required effect. Learners from some other languages (especially Scandinavians) are apt to articulate /ʧ,ʤ/ with too much lip-spreading and over-palatalisation, producing sounds resembling [tç,dj]; these too should move the tongue forward. Some languages have /ʧ/ and no /ʤ/, e.g. Arabic, German, Russian and Spanish, and replace the one with the other. Although Cantonese speakers have neither, /ʧ/ is commonly preferred to /ʤ/, e.g. in the ending *-age*, e.g. *language*, *bridge*, *knowledge*. Weakening /ʧ/ will generally produce /ʤ/ in

such cases. Particular attention should also be paid to the shortening of sounds preceding syllable final /ʧ/, the examples in (1) of this section providing practice for this feature. In sequences of two affricates like *which chair*, *Dutch cheese*, *large jar*, it is acceptable to omit the plosive element of the first affricate e.g. /wɪʃ ˈʧeə/, /dʌʃ ˈʧiːz/, /lɑːʒ ˈʤɑː/; however, it is not acceptable to omit the fricative element.

Although only /ʧ,ʤ/ are here considered as single phonemes, special attention should nevertheless be given to the sequences /tr,dr/ (see Fig. 39) because of the nature of the often retracted [t̠,d̠] used before /r/, the friction associated with the /r/ in these sequences, and the devoicing of /r/ following /t/. Foreign learners should take care not to confuse /ʧ/ and /tr/ and /ʤ/ and /dr/ as in the minimal pairs in (1) above.

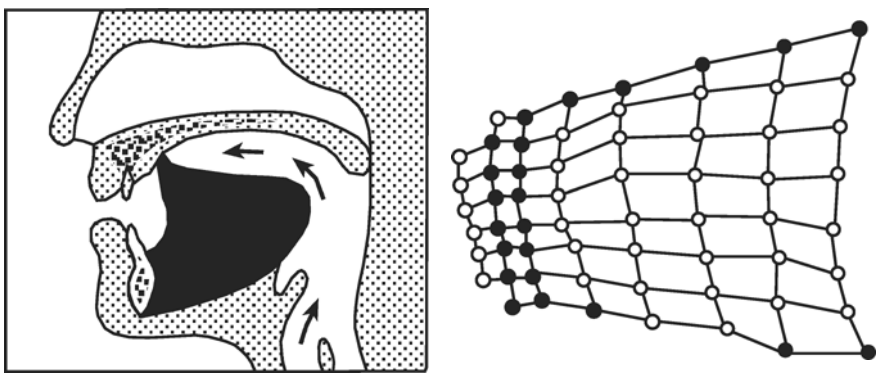


Figure 39 Section and palatogram of stop phase of /tr,dr/.

9.4 Fricatives

In the articulation of a fricative consonant, two organs are brought and held sufficiently close together for the escaping airstream to produce local air turbulence; fricatives are, therefore, like plosives and affricates, characterised by a noise component. This turbulence may or may not be accompanied by voice. There is an on- or off-glide in respect of an adjacent sound (manifested acoustically by formant transitions), most appreciable if the adjacent sound is a vowel.

The GB fricative phonemes comprise four pairs /f,v/, /θ,ð/, /s,z/, /ʃ,ʒ/ and /h/. [x], a voiceless velar fricative, occurs exceptionally in some speakers' pronunciation of Scottish words such as *loch*; for [ɸ,β,s̻,z̻,x,ɣ] occurring as the fricative element of affricated plosives, see §9.2.4(6), and for the fricative allophones of /r,l̪,j,w/, see §9.7.

Table 13 illustrates oppositions, especially between members of the fricative pairs, in word-initial, -medial and -final positions:

Table 13 Fricatives in different word positions.

	Initial	*Medial*	*Final*
/f/	feel	proofing	leaf
/v/	veal	proving	leave
/θ/	thigh	earthy, ether	wreath
/ð/	thy	worthy, either	wreathe
/s/	seal	racer	peace
/z/	zeal	razor	peas
/ʃ/	sheet	fission, Confucian	niche
/ʒ/	gigolo, genre	vision, confusion	rouge
/h/	heal	behave	

These oppositions may be realised by means of one or several of the following phonetic features:

(1) *Place of articulation*—/f,v/—labiodental; /θ,ð/—dental; /s,z/—alveolar; /ʃ,ʒ/—palato-alveolar; /h/—glottal. Such a series is relatively complex compared with most languages. The existence, in particular, of place oppositions between the dental, alveolar and palato-alveolar areas of articulation necessitates a precision of articulation in English which is not required in many other languages. Thus, for example, the lack of palato-alveolar fricative phonemes in Spanish permits the retraction of /s/; and the absence in French and many other languages of dental fricatives allows a dentalised quality in the alveolar articulations, which if introduced into English, is liable to cause confusion with /θ,ð/ or to produce a 'lisping' fricative which is considered socially undesirable. /s,z/ are made with a configuration of the tongue which allows the air to escape along a groove, whereas /θ,ð/ use a flatter configuration where the air escapes through a slit. /ʃ,ʒ/ are made with flat blade and tip but with grooving further back although even this grooving is not as deep as that for /s,z/.[29] These differences in configuration are at least as important as the different places of articulation.

(2) *Force of articulation*—Within the four pairs, /f,θ,s,ʃ/ tend to be pronounced with relatively more muscular energy and stronger breath force than /v,ð,z,ʒ/;[30] the former are FORTIS, the latter LENIS. /h/ is normally fortis in character, but may have a lenis allophone (see §9.4.7).

(3) *Voicing*—Like the voiced plosives and affricates, /v,ð,z,ʒ/ tend to be fully voiced only when they occur between voiced sounds, e.g. in *cover*, *other*, *easy*, *leisure*, *a van*, *all that*, *by the zoo*. In initial and (especially) in final positions, the voiced fricatives may be partially or almost completely devoiced,[31] e.g. initially in *van*, *that*, *zoo* (i.e. with silence preceding) only the latter part of the friction is likely to be voiced, and finally in *leave*, *breathe*, *peas*, *rouge* /ruːʒ/ (i.e. with silence following) the friction is typically voiceless, though the consonant remains lenis—[v̥,ð̥,z̥,ʒ̊]. Additionally some devoicing of the voiced series may even occur in intervocalic position. The

voiceless series remains completely voiceless in all positions. /h/, however, occurring only in word-initial and -medial situations, though voiceless in an initial position, may have some voicing medially between voiced sounds, e.g. *anyhow.*

(4) *Length*—When /f,θ,s,ʃ,v,ð,z,ʒ/ occur finally, the perception of voiceless or voiced consonants is largely determined by the length of the sounds which precede them.[32] /f,θ,s,ʃ/ have the effect of reducing the length of the preceding vowel (particularly a long vowel or diphthong) and of /l,m,n/ interposed between the vowel and the fricative; compare *fife*, *loath*, *place*, *leash*, *self*, *fence*, with *five*, *loathe*, *plays*, (*liege*), *selves*, *fens.* The same reduction in the length of vowels, nasals and laterals is operative when the voiceless fricatives occur in a medial position, cf. *proofing*, *proving*; *earthy*, *worthy*; *racer*, *razor*; *fission*, *vision.* While they shorten the vowels and continuant consonants which precede them, voiceless fricatives are themselves longer than their voiced equivalents.[33]

Summary—The GB fricatives may, therefore, be said to be phonetically distinguished:

(a) by means of a five-term series in respect of place of articulation—labiodental vs dental vs alveolar vs palato-alveolar vs glottal, and
(b) at each of the first four points of articulation, by a complex of factors including force of articulation (which applies in all positions), voicing (which applies principally word-medially between voiced sounds) and by the length of preceding vowels, consonants and laterals within the same syllable.

(5) *Advice to foreign learners*—A distinction between five places of articulation is rare in the world's languages[34] and learners aiming at GB will have to spend some effort to get the articulation at each place correct. Particular attention needs to be given to the precision of articulation required for the distinctions among dental, alveolar and palato-alveolar fricatives. Advice is given under each place of articulation below.

Learners should not attempt to rely only on voicing to make distinctions between the various pairs, but concentrate on the strength of the friction and the correct reductions in the length of vowels before the voiceless series. Additionally, many languages only have strong fricatives like [s] and [f], e.g. Malay, Norwegian and Thai, and learners from such backgrounds have to learn to produce a second series by weakening their articulation.

9.4.1 Acoustic features of English fricatives

In acoustic terms,[35] our perception of the various types of fricative (whose characteristic feature is a continuous noise component) appears to depend upon the following factors (for spectrograms, see Fig. 33):

(1) *Extent and position of noise component*—Continuous noise in the spectrum is appropriate to articulatory friction regions:

alveolars	—	3,600–8,000 Hz
palato-alveolars	—	2,000–7,000 Hz
labiodentals	—	1,500–7,000 Hz
dentals	—	1,400–8,000 Hz
glottal	—	500–6,500 Hz

(2) *Intensity of noise component*—/s,ʃ/ have relatively high intensity; /f,θ,h/ relatively low intensity. The voiced series has an overall lower intensity than that of the voiceless series.
(3) *Low-frequency component*—The voiced series may have a periodic low-frequency component (voicing) which is absent in the voiceless series.[36] Voicing may also manifest itself in more extensive transitions of the first formant adjacent to voiced fricatives.[37]
(4) *Formant transitions*—Especially in the case of the low-intensity labiodentals and dentals, much information regarding place of articulation comes from the nature of the adjacent vocalic glide. In the case of /h/ (often an anticipatory voiceless version of the following vowel), the spectral pattern is likely to mirror the formant structure of the following vowel.
(5) *Duration of fricative noise*—The friction of the voiced series is shorter than that of the voiceless series.

Of these factors noise position (1), or location of a spectral peak or mean for such noise, seems to be the most important for identification of the place of articulation.[38]

9.4.2 Acquisition of fricatives by native learners

The fricatives constitute the largest area of difficulty for native learners in the area of consonant acquisition. The distinction of five places of articulation is particularly difficult: three of the places (dental, alveolar, palato-alveolar) depend on different and delicate adjustments of the tip/blade of the tongue and it is in this area that most of the difficulty occurs. The first fricative (generally /f/ or /s/) occurs later than plosives and nasals and, unlike them, may occur at first just as frequently in medial or final position as in initial position. The /s/ will often be misarticulated, sometimes only slightly, sometimes to the extent of being a voiceless alveolar or dental lateral fricative [ɬ]. The distinction between the three apical/laminal pairs will, for many children, not be complete and/or correctly articulated until the age of five or six. The voiceless members of the pairs are generally acquired before the voiced members; this may be due to their higher frequency of occurrence in the adult language or to the greater perceptibility of the stronger friction in the voiceless series. Before any fricatives have been acquired, they may be replaced in initial position by the corresponding plosives, i.e. /f,v/→/p,b/ and /θ,ð,s,z,ʃ,ʒ/→/t,d/. Once /f/ and /s/ have been acquired, the

voiced series may continue to be replaced by plosives, while /θ,ʃ/ are replaced by /s/. The glottal fricative /h/ (which of course is not paired) is very variable in acquisition, reflecting its varying presence in the fricative systems of different dialects and hence in the speech with which a child is surrounded.

9.4.3 Labiodental fricatives /f,v/

(1) *Examples*

/f/—*word-initial*—feet, fit, fat, father, fool, fail, photo
word-medial—affair, defend, offer, tougher, loafer, suffer, selfish, comfort
word-final—leaf, laugh, cough, stuff, roof, loaf, strife
in word-initial clusters—fry, fly, few, sphere
in word-final clusters—fifth(s) /fθ(s)/,[39] *raft(s)* /ft(s)/, *triumph(s)* /mf(s)/,[40] *wolf('s)* /lf(s)/, *engulfed* /lft/, *twelfth(s)* /lfθ(s)/, *soften(s,ed)* /fn(z,d)/, *baffle(s,ed)* /fl(z,d)/, *coughs* /fs/.

/v/—*word-initial*—veal, vex, vat, vast, vain, vice, voice
word-medial—ever, navy, over, silver, cover, event, canvas
word-final—leave, give, have, of, move, dove, grove
in word-initial clusters—/vj/ view
in word-final clusters—loaves /vz/, *loved* /vd/, *oven(s)* /vn(z)/, *solve(s,d)* /lv(z,d)/, grovel(s,ed) /l(z,d)/.

Compare /f/, /v/—fine, vine; fat, vat; few, view; offer, hover; surface, service; laugher, larva; camphor, canvas; leaf, leave; proof, prove; safes, saves

Spellings of /f,v/

/f/	*Examples*	*TF*	*LF*
f	comfort, fork, friend, leaf, roof, selfish, strife	84%	77%
ff	coffee, effort, offend, stuff	4%	14%
ph	epitaph, phonetics, photograph, physics, sapphire	11%	8%
gh	cough, draught, enough, laugh, rough,	2%	1%
/v/			
v	active, deliver, love, novel, savage, save, seven, view vine, vote	99%	99%

Note (1): *nephew, of*

(2) *Description*—The soft palate being raised and the nasal resonator shut off, the inner surface of the lower lip makes a light contact with the edge of the upper teeth, so that the escaping air produces friction. **(See videos 3.13, 4.14, 10.14, 13.14.)** The actual point of contact will vary somewhat according to the adjacent sound, e.g. in the case of a back rounded vowel or of a bilabial plosive (*fool*, *roof*, *obvious*), the contact on the lower lip tends to be more retracted than in the case of a front spread vowel (*feel*, *leaf*). The

tongue position of an adjacent vowel will persist or be anticipated during the labiodental friction; in the case of intervocalic /f,v/, the tongue will articulate independently for the vowels or, if the vowels are similar, e.g. in *stiffest*, *giving*, will retain its position during the labiodental friction. For /f/, the friction is voiceless, whereas there may be some vocal fold vibration accompanying /v/, according to its situation.

No important articulatory variants for /f,v/ occur among GB speakers, although word-final /v/ may change to /f/ before a voiceless consonant initial in the following word, e.g. regularly in *have to* and more rarely in such sequences as *love to*, *have some* (see §12.4.3) or may, in rapid, colloquial, speech, be elided in the case of the unaccented form of *of*, *have*, e.g. in *a lot of money*, *I could have bought it* /ə lɒt ə `mʌni, aɪ kəd ə `bɔːt ɪt/, where /ə/ is phonetically equivalent to the unaccented forms of *a* and *are* (see §12.2).[41]

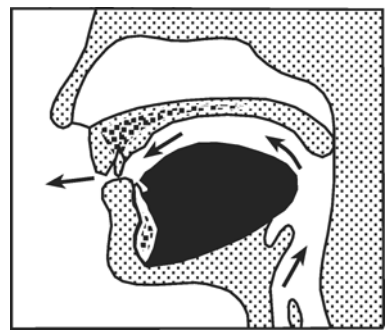


Figure 40 Section of /f,v/.

(3) *Regional variants*—In south-west England speech, the voiceless /f/ is often replaced by /v/ in word-initial position (e.g. in *fox*, *family*, *fourth*).

Sources of /f,v/

/f/		
OF [f]	ME [f]	chief, fine, fruit, profit
OE V + [x]		cough, laugh, rough
Note (1): *lieutenant* GB /lef`tenənt/ (cf. GA /luː`tenənt/)		
/v/		
OE [f] between voiced sounds	ME [v]	devil, driven, loves, wives, wolves
OF [v]		cover, serve, vain,very
SW dialect [v](cf. OE[f] & GB *fox*, *fan*)		vane, vat, vixen

(4) *Advice to foreign learners*—Some learners (particularly Indians) use too weak a contact for /v/, so that the friction is lost, giving the labiodental approximant [ʋ]; others (particularly Germans and Hungarians) use bilabial friction [β] instead of the labiodental sound. In both of these cases, there is a tendency to use the same sound for both /v/ and /w/. Care should, therefore, be taken to distinguish such pairs as *vine*, *wine*; *verse*, *worse*; *vest*, *west*, etc., using friction between the lower lip and upper teeth for /v/. Many languages have only /f/, e.g. Cantonese and Malay and need to attain /v/ by weakening the friction and paying attention to the length of preceding vowels.

9.4.4 Dental fricatives /θ,ð/

(1) *Examples*

/θ/—*word-initial*—thief, thick, thatch, thong, thought, thumb
word-medial—ether, ethics, lethal, method, author, anthem, lengthy, atheist, athletic, deathly, worthless
word-final—heath, smith, breath, path, cloth, earth, fourth, oath
in word-initial clusters—three, throw, thew, thwart
in word-final clusters—*earthed* /θt/, *mouth's* /θs/, *depth(s)* /pθ(s)/[42], *eighth(s)* /tθ(s)/, *fifth(s)* /fθ(s)/, *sixth(s)* /ksθ(s)/, *warmth* /mθ/,[43] *month(s)* /nθ(s)/, *twelfth(s)* /lfθ(s)/, *length(s)* /ŋkθ(s)/, *health('s)* /lθ(s)/, *Ethel('s)* /θl(z)/, *earthen* /θn/.

/ð/—*word-initial*—there, this, then, the, though, thy, they
word-medial—breathing, leather, gather, father, mother, northerly, southern, worthy, either, although
word-final—seethe, with, soothe, lathe, clothe, writhe, mouth (v.)
in word-final clusters[44]—*rhythm(s)* /ðm(z)/, *southern('s)* /ðn(z)/, *betrothal(s)* /ðl(z)/, *clothes* /ðz/, *writhed* /ðd/, *width* /dð/ (or /tθ/).

Compare
/θ/,/ð/—thigh, thy; ether, breather; earthy, worthy; wreath, wreathe; mouth (n.), mouth (v.); oath, clothe.
/θ/,/s/—thick, sick; thought, sort; thumb, sum; mouth, mouse; worth, worse
/θ/,/t/—thick, tick; thought, taught; three, tree; heath, heat; both, boat; fourth, fort
/ð/,/z/—seethe, seas; lathe, laze; clothe, close (v.); breathe, breeze
/ð/,/d/—then, den; though, dough; there, dare; other, udder; worthy, wordy; seethe, seed; writhe, ride

Spellings of /θ,ð/

	TF & LF
th	Both 100%

(2) *Description*—The soft palate being raised and the nasal resonator shut off, the tip and rims of the tongue make a light contact with the edge and inner surface of the upper incisors and a firmer contact with the upper side teeth, so that the air escaping between the forward surface of the tongue and the incisors causes friction (such friction often being very weak in the case of /ð/). **(See videos 6.10, 6.24. 8.8, 10.21, 12.16, 13.10, 15.11.)** The tongue being relatively flat, the aperture through which the air escapes is in the nature of a slit rather than a groove, which produces fricative noise at a lower frequency than that associated with /s,z/. For /θ/ the friction is voiceless, whereas for /ð/ there may be some vocal fold vibration according to its situation (see §9.4(3) above). The lip position will depend upon the adjacent vowel, e.g. being spread for *thief*, *heath*, *these*, and somewhat rounded for *thought*, *truth*, *soothe*.

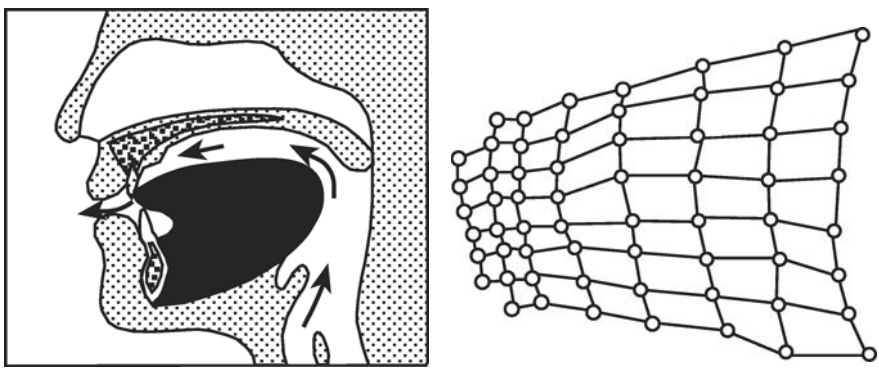


Figure 41 Section and palatogram of /θ,ð/.

(3) *Regional variants*—No important GB variants of /θ,ð/ occur. Since /θ,ð/ offer difficulties of articulation when followed by /s,z/, they are sometimes elided in clusters, e.g. *clothes* /kləʊz/, *months* /mʌns/, or /mʌnts/. In sequences of the type /s,z/ followed by unaccented /ð/ as in *Is there any?*, *What's the time?*, the preceding alveolar articulation may influence the dental fricative in rapid speech—/ˈɪz zər eni, wɒts zə ˋtaɪm/. In popular London speech, the dental articulation may be replaced by labiodental, e.g. *throw it*, *Smith* /ˈfrəʊ ɪt, smɪf/, *mother*, *breathe in* /ˈmʌvə, briːv ˋɪn/. Many reports suggest such pronunciations have become widespread in Britain in basilectal speech, particularly in urban centres.[45] Other alveolar articulations may also be heard for the weak /ð/, e.g. *all the way* /ɔːl lə ˋweɪ/, *in the morning* /ɪn nə ˋmɔːnɪn/. In southern Irish speech /θ,ð/ are often realised as dental plosives [t̪,d̪] but this does not generally lead to neutralisation with /t,d/ (i.e. the two pairs are kept as dental and alveolar; additionally [t] is aspirated while [t̪] is not).

Sources of /θ,ð/

/θ/		
OE initial and final [θ]	ME [θ]	bath, earth, think, throat, tooth, worth
OF [ð]		faith
Gk [θ]		theory, thesis
OE [t]	ME [t]	authority, catholic, theatre
/ð/		
OE /θ/ = [ð] between voiced sounds	ME [ð]	breathes, feather, other

Note: Many function words have initial [ð] rather than the expected (from OE) [θ], e.g. *than, that, the, then, they, this*

(4) *Advice to foreign learners*—Most learners will have an L1 which does not have /θ,ð/ (although Arabic and European Spanish speakers do) and will usually replace them with /t,d/, exceptions being French and German which are more likely to replace them by /s,z/ and Hindi speakers who use their [t̪,d̪]. If aiming at GB, such pronunciations are to be avoided if at all possible. In particular, those words with /ð/ which are normally unaccented, e.g. *the*, *than*, *they*, etc. should not be pronounced with /d/. The difficulty of /θ,ð/ lies not so much in their articulation, which most learners can perform correctly in isolation, as in their combination with other fricatives, especially /s/ and /z/. Learners should, therefore, practise with drills containing such combinations involving rapid tongue glides, e.g. /s + θ/ *this thing*, /k + θ/ *sixth*, /z + θ/ *his thumb*, /s + ð/ *pass the salt*, /z + ð/ *is this it?*, /θ + s/ *fifths*, /θ + s + ð/ *Smith's there*, /ð + z + ð/ *soothes them*. /s,z/ preceding /θ,ð/ in sequences like *what's that*, *is this*, *nice thing* should not be assimilated to /θ,ð/ to give /wɒð`ðɪs, ɪð`ðɪs, naɪθ`θɪŋ/.

9.4.5 Alveolar fricatives /s,z/

(1) *Examples*

/s/—*word-initial*—cease, sat, sample, soon, soap, sign, soil
word-medial—pieces, losses, essay, axes, concert, escape, pencil, whisper, wrestler, excite, useless
word-final—niece, farce, pass, puss, goose, famous, dose, ice, mouse, fierce, scarce
in word-initial clusters—*spare* /sp/, *stain* /st/, *scarce* /sk/, *smoke* /sm/, *snake* /sn/, *slow* /sl/, *sphere* /sf/, *swear* /sw/, *splice* /spl/, *spray* /spr/, *spume* /spj/, *stray* /str/, *stew* /stj/, *scream* /skr/, *skewer* /skj/, *square* /skw/
in word-final clusters—*gasp(s,ed)* /sp(s,t)/, *rest(s)* /st(s)/, *ask(s,ed)* /sk(s,t)/, *lissom* /sm/, *listen(s)* /sn(z)/, *licence* /sns/, *muscle(s)* /sl(z)/, *mince(d)*

/ns(t)/, *pencil(s)* /nsl(z)/, *whilst* /lst/, *decent* /snt/, *lapse(d)* /ps(t)/, *glimpse(d)* /mps(t)/, *helps* /lps/, *cats* /ts/, *acts* /kts/, *opts* /pts/, *faults* /lts/, *tents* /nts/, *pulse* /ls/, *drafts* /fts/, *tax(ed)* /ks(t)/, *thanks* /ŋks/, *milks* /lks/, *nymphs* /mfs/, *laughs* /fs/, *fourths* /θs/, *fifths* /fθs/, *twelfths* /fθs/, *months* /nθs/, *sixth(s)* /ksθ(s)/, *eighths* /tθs/, *midst* /dst/, *prompts* /mpts/, *pistol(s)* /stl(z)/, *pittance* /tns/, *riddance* /dns/, *grievance* /vns/, *patience* /ʃns/.

/z/—*word-initial*—zeal, zest, zinc, zoo, zone, zero

word-medial—easy, hesitate, bazaar, bosom, hawser, lazy, thousand, palsy, pansy, husband

word-final—fees, is, says, as, was, ooze, does, butchers, gaze, rose, cows, noise, ears, airs, tours

in word-final clusters[46]—*ribs* /bz/, *heads* /dz/, *legs* /gz/, *limbs* /mz/, *cleanse(d)* /nz(d)/, *hands* /ndz/, *rings* /ŋz/, *holes* /lz/, *caves* /vz/, *holds* /ldz/, *valves* /lvz/, *bulbs* /lbz/, *films* /lmz/, *kilns* /lnz/, *clothes* /ðz/, *prism(s)* /zm(z)/, *imprison(s,ed)* /zn(z,d)/, *puzzle(s,d)* /zl(z,d)/, *raised* /zd/, *dismal* /zml/, *apples* /plz/, *bubbles* /blz/, *battles* /tlz/, *saddles* /dlz/, *buckles* /klz/, *eagles* /glz/, *Rachel's* /ʧlz/, *cudgels* /ʤlz/, *camels* /mlz/, *channels* /nlz/, *Ethel's* /θlz/, *thistles* /slz/, *evils* /vlz/, *ruffles* /flz/, *officials* /ʃlz/, *kittens* /tnz/, *saddens* /dnz/, *orphans* /fnz/, *ovens* /vnz/, *hastens* /snz/, *oceans* /ʃnz/, *visions* /ʒnz/, *heathens* /ðnz/, *present* /znt/, *samples* /mplz/, *symbols* /mblz/, *thousands* /zndz/, *sandals* /ndlz/, *lentils* /ntlz/, *uncles* /ŋklz/, *angles* /ŋglz/, *pastels* /stlz/, *damsels* /mzlz/.

Compare /s/, /z/—seal, zeal; sink, zinc; passing, parsing; fussy, fuzzy; racer, razor; peace, peas; loose, lose; use (n.), use (v.); gross, grows; place, plays; ice, eyes; house (n.), house (v.); scarce, scares; pence, pens; false, falls

Spellings of /s,z/

/s/	*Examples*	*TF*	*LF*
s & se	bus, gas, goose, saw, single, skin, snow, so, stay, sun, lapse, tense		
ss	assist, cassette, class, cross, discuss, embarrass, essential, kiss, pass, waitress		
	s, se, ss	79%	78%
c & ce	advice, council, decide, exercise (n), licence, niece, receive, sauce, science	15%	15%
sc & sce	acquiesce, descend, obscene, scent, science		
x (= /ks/)	axe, axle, climax, reflex, six		
/z/			
s & se	bars, bosom, choose, cruise, dogs, news, plays, please, praise, prison, rose		
ss	dessert, dissolve, possess, scissors		
	s, se, ss	93%	69%
z	quiz, wizard, zeal, zero, zip, zoo	5%	27%
x	xenophobia, xerox, xylophone		
x (= /gz/)	auxiliary, anxiety, exact, exaggerate, exempt, exhaust, exist		

(2) *Description*[47]—The soft palate being raised and the nasal resonator shut off, the blade (or the tip and blade)[48] of the tongue makes a light contact with the upper alveolar ridge and the side rims of the tongue make a close contact with the upper side teeth. **(See videos 2.17, 5.16, 9.25.)** The airstream escapes by means of a narrow groove (cf. the slit associated with /θ,ð/ described in §9.4.4) in the centre of the tongue and causes friction between the tongue and the alveolar ridge. There is very little opening between the teeth. For /s/ the friction is voiceless, whereas for /z/ there may be some vocal fold vibration, according to its position (see §9.4(3) above). The lip position will depend upon the adjacent vowel, e.g. spread for *see*, *zeal*, *piece*, *bees* and somewhat rounded for *soon*, *zoo*, *loose*, *lose*. A lisp, i.e. a substitution of /θ,ð/ for /s,z/ or a strongly dentalised version of /s,z/, is a common speech defect.

Before /r/, the approximation of the tongue to the alveolar ridge may be more retracted, e.g. in *horse-riding*, *newsreel*. Alternative pronunciations for words beginning /str-/ are commonly heard with /ʃtr-/, in, for example, *strawberries*, *string*, *strap*. This is evidently the influence of the /r/ which retracts both /t/ and /s/. Similar alternative pronunciations are increasingly, though not as commonly, heard where initial /st,sk/ become /ʃt,ʃk/, e.g. in *stink*, *score* (/sp/ seems not to be affected). Word final /s,z/ exhibit a readiness to assimilate before /ʃ,j/ (see §12.4.5).

Few GB speakers regularly maintain the distinction between /ns/ and /nts/ although it is widespread in regional speech (and hence in RGB), e.g. distinguishing the final clusters in *mince—mints*, *tense—tents*, *assistance—assistants*, *dance—plants*, /nts/ tending to be used in all cases. This PLOSIVE EPENTHESIS, the insertion of /t/ between /n/ and /s/, results from the raising of the soft palate before the oral closure for /n/ is relaxed for the fricative /s/. Similarly, when /m/ or /ŋ/ precedes the /s/, an epenthetic plosive homorganic with the nasal may occur, e.g. *Samson* /ˈsamsən/ → /ˈsampsən/, *Kingston* /ˈkɪŋstən/ → /ˈkɪŋkstən/, such variation being reflected in the variable spellings of proper names such as *Sam(p)son* and *Sim(p)son*.[49] /nz/ and /ndz/ are more frequently kept distinct by most GB speakers, e.g. in *wins—winds*, *tens—tends*, *fines—finds*, except in the most rapid speech when the /d/ may be elided.

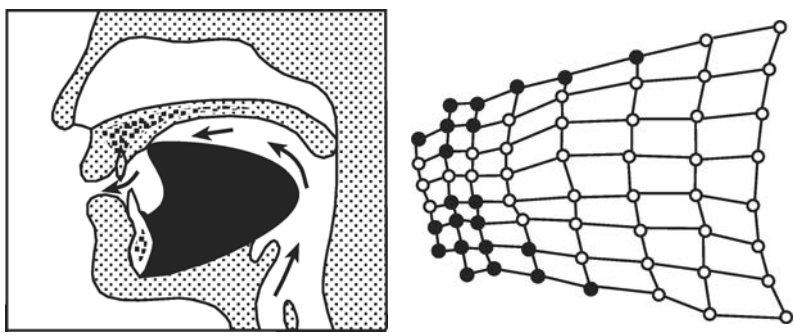


Figure 42 Section and palatogram of /s,z/.

(3) *Regional variants*—/s/ is often replaced in word-initial position (e.g. in *seven, six, serve*) in south-west England by /z/.

Sources of /s,z/

/s/		
OE [s,ss]	ME [s]	kiss, mice, soon, sun, wasp
OF [s]		beast, false, lesson, pace, strange, sudden
/z/		
OE /s/ = [z] between voiced sounds	ME [z]	rise, thousand, wisdom, wise
OF [z]		cause, dozen, easy, zeal

Note (1): When ME [əs] lost [ə], the [s] > [z] following a voiced sound, e.g. *loves, dogs, lands, stones;* where [əs] remained (following /s,z,ʃ,ʒ,ʧ,ʤ/) it became /ɪz/ or /əz/, e.g. *pages, passes, roses, rushes, touches.* Similarly [s] > /z/ in *as, was, has, his*

Note (2): [s] > [z] between voiced sounds, e.g. *disease, exact, observe, possess, resemble* but with many exceptions (often where the initial syllable is felt to be a prefix), e.g. *assist, dishonest, excite, research.* Sometimes /s/ and /z/ are alternatives, e.g. *absorb, disdain, disgust*

(4) *Advice for foreign learners*—In many languages, especially those where no dental fricatives exist, /s,z/ are articulated nearer to the teeth than the English varieties. Such a dentalised articulation is to be avoided when aiming at GB because of the danger of confusion with /θ,ð/ (both in terms of the phonemic opposition involved and of the difficulties of alveolar/dental clusters). The articulation of /s,z/ should be practised in opposition with /θ,ð/ in such pairs as: *sing, thing*; *sort, thought*; *close* (v.), *clothe*; *sees, seethe*; *mouse, mouth*; *use* (n.), *youth.* On the other hand, those whose /s,z/ are often too retracted for English, e.g. Greeks, should practise oppositions between /s,ʃ/ and /z,ʒ/: *sin, shin*; *sort, short*; *lasses, lashes*; *leased, leashed*; *mess, mesh.*

A large number of languages have /s/ but no /z/, e.g. Cantonese and Spanish. Learners from such backgrounds need to attain /z/ by a process of weakening and making vowels shorter before /s/, this being particularly important because /s,z/ occur so frequently in final positions. Hindi speakers have neither /s/ nor /z/; they should avoid substituting /ʃ,ʧ,ʤ/ and need to learn the tongue-tip articulation as completely new.

9.4.6 Palato-alveolar fricatives /ʃ,ʒ/

(1) *Examples*

/ʃ/—*word-initial*—sheet, shed, shop, sugar, charade, shout
word-medial—Asia, bishop, ashore, mission, luscious, bushel, cushion, rashly, machine

word-final—dish, cash, wash, push, douche, rush, finish, ruche
in word-initial clusters[50]—/ʃr/ shrink
in word-final clusters—welsh(ed) /lʃ(t)/, *fashion(s,ed)* /ʃn(z,d)/, *patient(s)* /ʃnt(s)/, *mention(s,ed)* /nʃn(z,d)/,[51] *pushed* /ʃt/, *marshal(s,led)* /ʃl(z,d)/; where /n/ precedes final /ʧ/, e.g. in *bench, lunch*, some speakers use a final cluster /nʃ/, with a fricative rather than an affricate.

/ʒ/—*word-initial*—(in French loan words) gigolo, gigue, jabot, genre
word-medial—pleasure, leisure, usual, confusion, decision
word-final—prestige, barrage, rouge, beige, garage
in word-initial clusters—does not occur
in word-final clusters—vision(s)/ʒn(z)/, *camouflaged* /ʒd/, *arrange(d)*/nʒ(d)/

Compare
/ʃ/,/ʧ/—sheep, cheap; shore, chore; shoes, choose; leash, leech; dish, ditch; wash, watch
/ʒ/, /ʤ/—leisure, ledger; vision, pigeon
/ʃ/, /ʒ/—Aleutian (Islands)(when pronounced /əˋluːʃn/), allusion; Confucian (when pronounced /kənˋfjuːʃn/, confusion

Spellings of /ʃ,ʒ/

/ʃ/	*Examples*	*TF*	*LF*
sh	ashes, brush, finish, publisher, sham, shape, shed, sheep, shoe, washer, wish	37%	28%
ch, chs	brochure, chalet, chateau, chef, fuchsia, machine, parachute, sachet	1%	2%
s, ss + u,	assure, censure, sugar, sure		
ce-, ci-, sci-, si-, ti-	appreciate, conscience, conscientious, fascist, mansion, mission, nation, ocean, special	55%	64%
Note: *schedule, luxury*			
/ʒ/			
g	genre, gigolo		
ge, gi	beige, blancmange, bourgeois, fuselage, garage, massage, regime, sabotage		
	g, ge, gi	4%	23%
si-	allusion, conclusion, division, occasion, vision		
s, ss, z + u	azure, casual, closure, leisure, measure, pleasure, usually, seizure		
	si, s, ss, z + u	91%	74%

(2) *Description*[52]—The soft palate being raised and the nasal resonator shut off, the tip and blade of the tongue make a light contact with the alveolar ridge, the front of the tongue being raised at the same time in the direction of the

hard palate and the side rims of the tongue being in contact with the upper side teeth. **(See videos 1.0, 11.23.)** The escape of air is diffuse (compared with that of /s,z/), the friction occurring between a more extensive area of the tongue and the roof of the mouth. The articulation is also laxer than that of /s,z/ and what grooving there is is further back than that for /s,z/ (see §9.4(1) above). The palatalisation effect (i.e. the [i]-ness caused by the raising of the front of the tongue) is less marked than in sounds of the [ʃ,ʒ] type in some other languages, indicating either that the front raising is less close or that the tongue as a whole is slightly more retracted. In the case of /ʃ/, the friction is voiceless, whereas for /ʒ/ there may be some vocal fold vibration according to its situation (see §9.4(3)). Some speakers use slight lip-rounding for /ʃ,ʒ/ in all positions; for others, lip-rounding is an effect of the adjacent vowel, e.g /ʃ/ of *shoe* tends to be lip-rounded whereas /ʃ/ of *she* has neutral or spread lips.

Apart from the degree of palatalisation or lip-rounding used, no important articulatory variants occur. But medially in certain words /ʃ,ʒ/ are not used by all speakers: (a) before /uː/ or /ʊə/, there is often variation between /ʃ,ʒ/ and /s,z/ + /j/, e.g. in *issue*, *sexual*, *tissue*, *seizure*, *usual*, *azure*; (b) before other vowels, a similar variation between /ʃ/ and /si/ or /sj/ may occur, e.g. *ratio*, *appreciate*, *negotiate*; (c) before /ə/ in certain words the sequences /s,z/ + /i/ or /j/ are more common, e.g. *hosier*, *axiom*, *gymnasium*, *Parisian*, and especially in comparatives, e.g. *easier*, *lazier*. In (a) and (b) CGB will usually use the sequences /s,z/ + i,j/.

The lack of words distinguishable by /ʃ/ and /ʒ/ results in possible alternations between /ʃ/ and /ʒ/, e.g. in *Asia*, *Persia*, *transition*, *version.* In word-final position, where /ʒ/ exists only in comparatively recent French loanwords, e.g. *beige*, *rouge*, *prestige*, *garage*, etc., a variant with /dʒ/ is possible and is the fully anglicised form. It will be seen that /ʒ/, rare word-initially, replaceable by /dʒ/ finally and sometimes varying with /ʃ/ medially, has a particularly weak functional load in English.

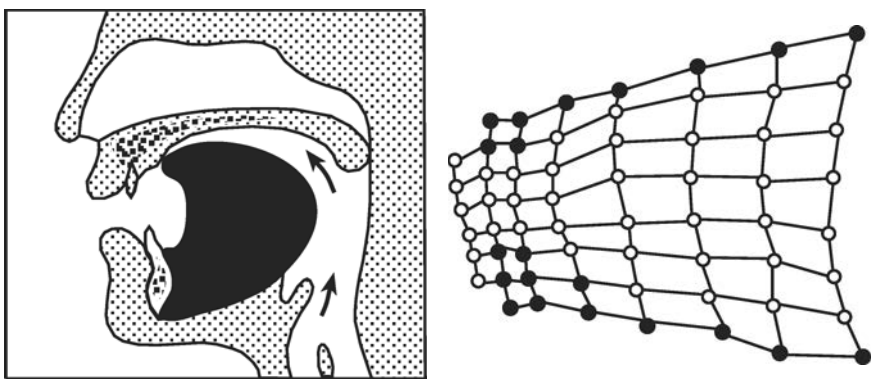


Figure 43 Section and palatogram of /ʃ,ʒ/.

(3) *Regional variants*—there are no significant variations dialectally apart from the variations within GB mentioned above.

Source of /ʃ,ʒ/		
/ʃ/		
OE [ʃ] < [s,k] + [e] OF palatalised [s]	ME [ʃ]	bishop, English, fish, shadow, ship cash, cushion, finish, radish
	ME [s] + [j,ɪ] 17c.	ambition, ocean, patient, special, sugar, sure
OF [ʧ]	MF [ʃ]	charlatan, chemise, chic, machine, moustache
/ʒ/		
	ME [z] + [j,ɪ] 17c.	measure, occasion, treasure, usual
OF [ʤ]	MF [ʒ]	beige, bijou, prestige, rouge

(4) *Advice to foreign learners*—Many languages do not possess palato-alveolar fricatives, e.g. Cantonese, Greek and Spanish; others have only /ʃ/. The usual substitutes are /s,z/ although Hindi speakers substitute /ʤ/. Good results can generally be achieved by starting from /sj,zj/ and fronting the tongue. The weak character of /ʒ/ should be taught, although oppositions between /ʃ/ and /ʒ/ are rare.

Other languages have fricatives in this region but of a more strongly palatalised kind, e.g. German; a slight retraction of the tongue will often suitably 'darken' the quality of the friction.

9.4.7 Glottal fricative /h/

(1) *Examples*

word-initial—heat, hen, ham, hot, horse, who, hate, hoe, high, how, here, hair, halo, halibut

word-medial—ahead, behave, perhaps, behind, anyhow, manhood, abhor, adhere

Compare /h/+ vowel vs initial vowel—heat, eat; hill, ill; hedge, edge; harbour, arbor; haul, all; hate, eight; hold, old; hear, ear

Spellings of /h/

/h/	*Examples*	*TF*	*LF*
h	abhor, adhere, ahead, anyhow, behave, behind, ham, heat, hen, horse, hot, perhaps	99%	99%
wh	who, whom, whole, whore, whose		

Note: Silent <h> in *exhaust, exhibit, exhilarate, honest, honour, heir, heiress, hour, shepherd, vehement, vehicle*

(2) *Description*—Since English /h/ occurs only in syllable-initial pre-vocalic positions and has no necessary narrowing in the mouth, it may be regarded as a strong, voiceless onset to the vowel in question. **(See videos 7.17, 10.0.)** The air is expelled from the lungs with considerable pressure, causing some friction throughout the vocal tract, the upper part of which is shaped in readiness for the articulation of the following vowel (i.e. as regards the position of the tongue, lips, soft palate and the configuration of the pharynx). Thus differing types of friction (patterns of resonance) will be heard for /h/ in the sequences /hiː/, /hɑː/, /huː/. With the onset of the vocal fold vibration of the vowel, the air pressure is reduced. There is no distinctive voiceless/voiced opposition such as characterises the other English fricatives. (For sequences of /h/ + /j,w/, see §9.7.3.)

Although /h/ functions in English essentially as a voiceless syllable-initial phoneme, some speakers use a voiced (or slightly voiced) allophone medially between voiced sounds when initial in an accented syllable, e.g. in such words as *ahead*, *perhaps*, *behind* and less frequently in an unaccented syllable, e.g. in *anyhow.* In such pronunciations, the strong airstream of /h/ is accompanied by vocal cord vibration, the result being a kind of breathy vowel or voiced glottal fricative [ɦ].

Some words have a silent <h> in their spelling, e.g. *hour*, *honest* /ɑʊə, ˋɒnɪst/ and are preceded by the forms of the indefinite and definite articles used before a vowel, e.g. /ən ɑʊə, ðiˋɒnɪst/. In some other words the <h> is pronounced, e.g. *history*, *hysterical*, *hotel*, and these can be preceded by the pre-consonantal forms of the articles, e.g. /ə həʊˋtel, ðəˋhɪstəri/. But even with these words many speakers drop the /h/ and use the pre-vocalic forms /ən, ði/, i.e. /ən əʊˋtel, ðiˋɪstəri/. Yet others, usually older speakers or speakers of CGB, use /ən, ði/ but keep the /h/ i.e. /ðiˋhɪstəri/, /ən həʊˋtel/.

(3) *Regional variants*—In basilectal forms of most accents of England,[53] Wales and Australia, /h/ is lost in all words, so that no distinction is made between such GB minimal pairs as *hill, ill; high, eye; hair, air.* Usually in such speech, the /h/ words will behave as if they had an initial vowel, the pre-vocalic

forms of the definite and indefinite article being used before them, e.g. *a hill* /ən `ɪl/, *the house* /ðɪ `aʊs/. But alternatively an initial [ʔ] may replace the /h/, e.g. *a hill* [ə `ʔɪl], *the hospital* [ðə `ʔɒspɪtl]. Overcorrections may also occur whereby forms of the article used before a vowel are not used and a weak glottal stop or glottal fricative is inserted, e.g. *an egg* [ə `ˀeg] or [ə `ʰeg], *the end* [ðə `ˀend] or [ðə `ʰend].

Such loss of /h/ is usually considered socially unacceptable, but certain function words (especially *have*, *has*, *had*, pronouns and pronominal adjectives) frequently lose /h/ in GB in unaccented, non-initial, positions in connected speech (see §11.3), e.g. *he pushed him on his back* /hi pʊʃt ɪm ɒn ɪz `bak/, *I could have hit her* /aɪ kəd əv `hɪt ə/.

Sources of /h/

OE /h/ (= [h,x,ç])	ME /h/	help, high, home, horse
OF /h/ (< Germanic)		hardy, haste, herald
OF /h/ (< Latin)		habit, harass, herb, heretic, horror, hospital, host, humour

Note (1): OE had initial clusters /hn,hl,hr,hw/ where the /h/ has now been dropped
Note (2): Both in OF and ME the pronunciation of /h/ was erratic; this is reflected in the GB pronunciation of *heir*, *heiress*, *honest*, *honour*, *hour*, without an /h/

(4) *Advice to foreign learners*—Many languages do not possess a phoneme of the /h/ type. Speakers of these languages should, in learning English, practise the examples given in (1) above, making a correct distinction between words with initial /h/ + vowel and those with an initial vowel, e.g. *hill* vs *ill*. Those aiming at GB should also learn to elide the /h/ of *he*, *him*, *his*, *her*, *have*, *had*, *has* when these words occur in weakly accented, non-initial, positions.

Those learners who in their own language have no /h/ but do have a /x/, e.g. Spaniards and Greeks, should try to avoid using any velar friction in English and should practise the English /h/ as a voiceless onset to the following vowel. Japanese learners aiming at GB should avoid using [ɸ].

9.5 Voiced and voiceless as phonological categories

It will be seen from the preceding sections that in various ways the members of the class /p,t,k,f,θ,s,ʃ,ʧ/ behave similarly to each other and differently from their counterparts in the class /b,d,g,v,ð,z,ʒ,ʤ/. This difference has generally been labelled as one of voicing; however, it will also have been seen that the realisation of the distinction between the two classes varies according to position. To

summarise, (i) members of the voiceless series are indeed voiceless in all positions, while those in the voiced series are potentially fully voiced only in word-medial positions between voiced sounds and are regularly devoiced in word-initial and word-final positions; (ii) the voiceless series /p,t,k/ are aspirated in syllable-initial positions (particularly in accented syllables), while voiced /b,d,g/ are unaspirated; (iii) the voiceless series cause a reduction in length in preceding vowels, nasals and laterals while the voiced series has no such effect; (iv) the voiceless series are generally longer than their voiced counterparts; (v) the voiceless series are made with greater muscular effort and breath-force (and hence are referred to as fortis) while the voiced series are made with lesser effort and force (and are referred to as lenis).

CLASS B: SONORANTS

Although voiceless fricative allophones of sonorants occur, their most common realisations are voiced and non-fricative.

Note that /m,n,ŋ,l,r/ can be syllabic or non-syllabic. The syllabicity is marked in phonemic transcriptions (slant brackets) only when syllabic or non-syllabic realisations are both possible, e.g. /ˈfɪd̩ŋ/ vs /ˈfɪdlŋ/ whereas in /ˈlɪtl/ the /l/ can only be syllabic. Syllabicity is always marked in square bracketed transcriptions.

9.6 Nasals

(1) *Articulatory features*—Nasal consonants resemble oral plosives in that a total closure is made within the mouth; they differ from such plosives in that the soft palate is in its lowered position, allowing an escape of air into the nasal cavity and giving the sound the special resonance provided by the naso-pharyngeal cavity. Since the airstream may escape freely through the nose, nasal consonants are continuants; they differ, however, from continuants such as fricatives in that no audible friction is produced and from the fact that they are usually voiced, without significant voiced/voiceless oppositions. In many respects, therefore, being normally frictionless continuants, they resemble vowel-type sounds.

(2) *Acoustic features*[54]—Voiced nasal consonants have no noise component such as results from the burst of plosives or the friction of fricatives, nor the silence gap associated with plosives. Moreover the weak intensity of nasals (particularly in non-syllabic positions) and the considerable damping caused by the soft walls of the nasal cavity generally makes any formant structure difficult to identify. The key acoustic feature of all nasals is a low-frequency 'murmur' below 500 Hz which precedes transitions to following sounds and follows transitions from preceding sounds. Moreover there is generally an absence of energy around 1,000 Hz. Place of articulation is identifiable by the direction of the transitions to and from F2 and F3, these being the same

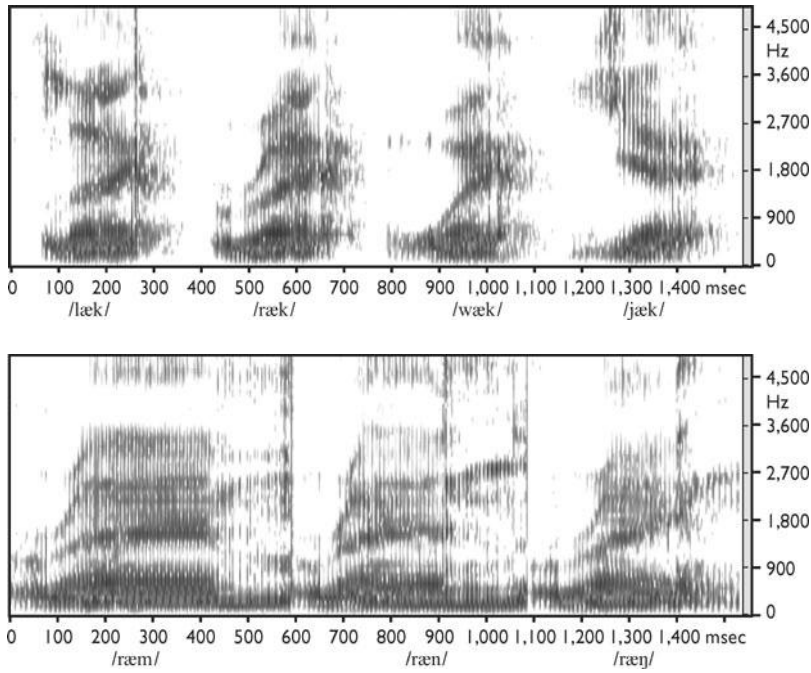


Figure 44 Spectrograms of /læk/, /ræk/, /wæk/, /jæk/ and of /ræm/, /ræn/, /ræŋ/ as said by male speaker of GB.

as for the homorganic plosives (see §9.2.2(3)), i.e. minus transitions for /m/, slight plus transitions for /n/ and plus transition of F2 and minus transition of F3 for /ŋ/. More recent research has identified a key characteristic of labial vs alveolar nasals as being the relative proportion of energy present in two spectral bands ('barks'), 395–770 Hz for the labials and 1,265–2,310 Hz for the alveolars.[55] Spectrograms of /m,n,ŋ/ in *ram*, *ran*, *rang* are shown in Figure 44.

(3) *The English nasal consonants*

(a) Three nasal phonemes correspond to the three oral plosive areas of articulation: bilabial /m/-/p,b/; alveolar /n/-/t,d/; velar /ŋ/-/k,g/. If, in the articulation of a nasal consonant, the nasal passage is blocked as, for instance, often happens during a cold, /m,n,ŋ,/ will be realised as /b,d,g/, e.g. *morning* /ˈbɔːdɪg/, *some nice lemons* /səb daɪs ˈlebədz/. Oppositions among the nasals may be illustrated as follows:

	Bilabial /m/	*Alveolar* /n/	*Velar* /ŋ/
Initial	might	night	—
Medial	simmer	sinner	singer
Final	sum	sun	sung

It will be seen that, since /ŋ/ does not occur initially in a word or morpheme, a complete series of oppositions is found only where the nasals occur in post-vocalic positions in the same syllable or morpheme.

(b) The vocalic nature of the nasals is underlined by the fact that they readily perform the syllabic function of vowels: most often /n/, e.g. *mutton* [ˈmʌtn̩]; less commonly /m/ e.g. *rhythm* [ˈrɪðm̩]; occasionally, with some speakers, /ŋ/, e.g. *bacon* [ˈbeɪkŋ̍].

(c) Although no opposition occurs between voiced and voiceless nasals in English, a somewhat devoiced allophone of /m/ and /n/ may be heard when a voiceless consonant precedes, e.g. *smoke*, *smart*, *topmost*; *snake*, *sneeze*, *chutney*. The distribution of /ŋ/ being restricted, it is only rarely—in a syllabic situation as in *bacon*—that a voiceless consonant precedes, with the consequent partial devoicing.

(4) *Acquisition of nasals by native learners*—Bilabial and alveolar nasals, along with plosives, are among the most frequent sounds in children's pre-linguistic babbling and regularly occur in their first words. The velar nasal /ŋ/, limited in adult words to syllable-final position, is acquired later but is nevertheless among the first sounds to occur in post-vocalic positions. Voiceless bilabial and alveolar nasals can be heard in the speech of some children, replacing the clusters /sm-/ and /sn-/ of the adult language, e.g. *sneeze* [n̥iː], *smile* [m̥aɪ].

9.6.1 Bilabial nasal /m/

(1) *Examples*

word-initial—meal, mat, march, move, mirth, make, mouse
following word-initial /s/—smack, smock, smite, smoke, smear
word-medial—demon, glimmer, lemon, salmon, among, gloomy, summer, sermon, commit, omen; jumper, timber, empty, comfort, hamlet, simple, symbol, dismal, camel, dimly, asthma
word-final (including in final clusters)—seem, lamb, harm, warm, tomb, game; worms, harmed, film(s), warmth, glimpse, prompt(s), nymph(s); (syllabic) rhythm(s), prism(s), lissom

Spellings of /m/

	Examples	*TF*	*LF*
m	amber, ample, damage, famine, gum, moon, morning, number, sample, woman	96%	
mm	ammonite, committee, dimmer, dimming, immense, immoral, programme, summer	3%	
mb	bomb, climb, comb, crumb, lamb, numb, plumber, womb		
mn	autumn, column, hymn, solemn		

(2) *Description*—The lips form a closure as for /p,b/; the soft palate is lowered, adding the resonance of the nasal cavity to those of the pharynx and the mouth chamber closed by the lips; the tongue will generally anticipate or retain the position of the adjacent vowel or /l/. **(See videos 3.8, 6.14, 10.6, 12.11, 12.24.)** Except when partially devoiced by a preceding voiceless consonant, e.g. initially—*smoke*, medially—*topmost*, finally—*happen*, /m/ is voiced. (Normal breathing through the nose with the lips closed may be described as a weak [m̥]; where, because of some organic defect such as cleft palate, the nasal cavities cannot be shut off, /p/ may be realised as [m̥] and /b/ as [m].) When followed by a labiodental sound /f,v/, the front closure may be labiodental [ɱ] rather than bilabial, e.g. in *nymph, comfort, triumph, come first, circumvent, warm vest.* Additionally pronunciations of *infant, enforce, unforced,* etc. with assimilation of [n] to [ɱ] can be regarded as having an allophone of /m/.

In connected speech /m/ frequently results from a final /n/ of the citation form before a following bilabial, e.g. *one mile* /wʌm `maɪl/, *more and more* /mɔːr əm `mɔː/, *ten pairs* /tem `peəz/, *gone back* /gɒm `bak/; sometimes /m/ is a realisation of word-final /ən/ or /n/ following /p/ or /b/, e.g. *happen* /`hapm/, *ribbon* /`rɪbm/, or, in context, *cap and gown* /kap m `gaʊn/ (see §12.4.5).

Figure 45 Section of /m/.

(3) *Regional variants*—There are no important regional variants of /m/ articulations.

Sources of /m/

OE [m,mm]	ME [m]	hammer, home, man, swim
OE [mb] finally		climb, lamb
OF [m]		family, master, solemn, sum

Note: In ME [m] was inserted before [b] when [l,r] followed, e.g. *bramble, thimble, slumber*

(4) *Advice to foreign learners*—This phoneme should present no difficulty.

9.6.2 Alveolar nasal /n/

(1) *Examples*

word-initial—neat, knit, net, gnat, knot, gnaw, none, nurse, name, know, near

following word-initial /s/—sneeze, snatch, snore, snug, snake, snow, sneer

word-medial—dinner, many, hornet, monitor, annoy; wonder, hunter, unless, unrest, answer, pansy, infant, invoice; chutney, madness, amnesty, walnut, fastener, evening

word-final (including in clusters)—mean, pen, gone, soon, learn, melon, down, coin; pint(s), pond(s), inch, hinge, final(s), pence, pens, month(s), kiln(s), rental(s), bundle(s), pencil(s), against

syllabic /n/—cotton, sudden, often (= /ɒfn/), oven, earthen, southern, listen, dozen, mission, vision; maddening (or with non-syllabic /n/), reasonable (or with non-syllabic /n/ or /ən/), ordinary (or with non-syllabic /n/ or /ən/ or /ɪn/), southerner (or with /ən/)

Spellings of /n/

	Examples	*TF*	*LF*
n	barn, bend, bent, keen, new, now, nonce, noon, number	97%	
nn	annoy, connect, funny, inn, innate, innocent, sinner, sinning	1%	
gn	alignment, campaign, champagne, gnat, gnaw, gnu, reign, sign		
kn	acknowledge, knee, knickers, knife, knob, knot, know, knowledge, knuckle	1%	
pn	pneumatic, pneumonia		

(2) *Description*—The tongue forms a closure with the teeth ridge and upper side teeth as for /t,d/; the soft palate is lowered, adding the resonance of the nasal cavities to those of the pharynx and of that part of the mouth chamber behind the alveolar closure; the lip position will depend upon that of adjacent vowels, e.g. spread lips in *neat*, *keen*; neutrally open lips in *snarl*, *barn*; somewhat rounded lips in *noon*, *soon*. **(See videos 4.11, 6.8, 8.6, 8.22, 9.15, 11.14.)** Except when partially devoiced by a preceding voiceless consonant, e.g. initially—*snug*, medially—*chutney*, finally—*cotton*, /n/ is voiced. (Where, because of an organic defect such as cleft palate, the nasal cavity cannot be shut off, /t/ may be realised as [n̥] and /d/ as [n].) The place of articulation of /n/ is particularly liable to be influenced by that of the following consonant, e.g. when followed by a labiodental sound /f,v/, as in *infant*, *invoice*, *on fire*, *in vain*, /n/ may be realised as [ɱ]—and thus may be regarded as

an allophone of the /m/ phoneme (see §9.6.1(2) above); /n/ before dental sounds /θ,ð/ is realised with a lingua-dental closure [n̪], as in *tenth*, *when they*—and sometimes when following /θ,ð/ (*earthen*, *southern*); before /r/, /n/ may have a post-alveolar contact, as in *unrest*, *Henry*; in addition word-final /n/ frequently assimilates to a following word-initial bilabial or velar consonant, being realised as /m/ or /ŋ/, e.g. *ten people*, *ten boys*, *ten men*, where the final /n/ of *ten* may assimilate to /m/, and *ten cups*, *ten girls*, where the final /n/ of *ten* may assimilate to /ŋ/ (see §12.4.5).

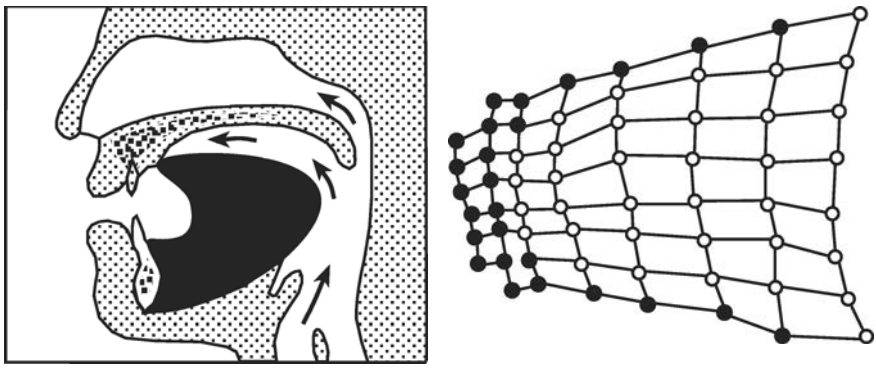


Figure 46 Section and palatogram of /n/.

(3) *Regional variants*—There are no important regional variants of /n/.

Sources of /n/

OE [n,nn]	ME [n]	man, many, name, spin
OE [hn]		nut
OF [n]		dinner, noble, plain
OF [ɲ]		line, mountain, onion, reign, sign
OE [kn,gn]	ME [kn,gn] > [n] 17c.	gnat, gnaw, knit, know

Note (1): An excrescent [t,d] has been added to *ancient*, *sound*, *tyrant* (pre-ME) and *pheasant*, *pound* (post-ME)

Note (2): An [n] has sometimes become affixed to a noun from the indefinite article *an* as in *newt*, *nickname*, and in other cases the [n] has moved from the noun to produce *an* as the indefinite article as in *adder*, *apron*, *umpire*

(4) *Advice to foreign learners*—If aiming at a native-like GB, care should be taken that /n/, like /t,d/, is normally given an alveolar rather than a dental articulation (see practice examples in (1) above).

9.6.3 Velar nasal /ŋ/

(1) *Examples*

word-medial—singer, hanger, longing, anxiety
word-medial + /g/—finger, anger, angry, hunger, strongest, single, angle, bungle, nightingale
variation between /ŋg/ *and* /ŋ/ *before* /r,l,w/ *with* /ŋg/ *more common*—language, England, English, Ingram
word-medial + /k/—tinker, anchor, banquet, monkey, donkey, conquer, wrinkle, ankle, uncle, anxious
word-final—sing(s), hang(s, ed), wrong(s, ed), tongue(s, ed), among
word-final + /k/—sink(s), rank(s,ed), conch (sometimes /kɒŋk/), chunk(s), monk(s), distinct, amongst (/ŋgst/ or /ŋst/), strength (/ŋkθ/, /ŋθ/, or /nθ/)
word-final syllabic—(occasionally) bacon, taken, thicken, blacken, organ
variation between /ŋ/ *and* /n/—income, conclude, encourage, concrete, bronchitis, engage, enquiry

Compare
/ŋ/, /n/—sing, sin; rang, ran; hanged, hand; sung, sun; mounting, mountain; gong, gone; robbing, robin
/ŋ/, /ŋk/—thing, think; rang, rank; sung, sunk; singing, sinking; hanger, hanker

Spellings of /ŋ/

	Examples	*TF*	*LF*
ng (excluding participial -ing)	longing, sing, singer, singing, tongue	75%	60%
n (+ /k,g/)	ankle, anxious, bangle, income, sink, uncle	25%	40%

(2) *Description*—A closure is formed in the mouth between the back of the tongue and the velum as for /k,g/ (the point of closure will depend on the type of vowel preceding, the contact being more advanced in *sing* than in *song*); the soft palate is lowered, adding the resonance of the nasal cavities to that of the pharynx and that small part of the mouth chamber behind the velar closure; the lip position will depend upon that of the preceding vowel, e.g. somewhat spread in *sing* and relatively open in *song*. **(See videos 10.4, 15.22.)** /ŋ/ is normally voiced, except for partial devoicing in the possible, though uncommon, case of syllabic /ŋ/ in such words as *bacon*, *thicken*. (Where, because of an organic defect such as cleft palate, the nasal cavity cannot be shut off, /k/ may be realised as [ŋ̊] and /g/ as [ŋ].) Word final /ŋ/ may result in context from citation forms of /n/, e.g. *ten cups*, *been cut* (see §12.4.5). Except in such assimilations /ŋ/ occurs only after the short vowels /ɪ,a,ɒ,ʌ/; rarely after /e/.

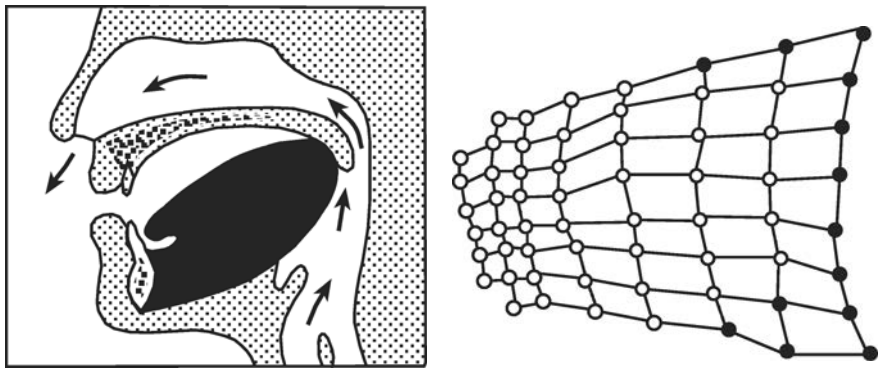


Figure 47 Section and palatogram of /ŋ/ in *song*.

(3) *Regional variants*—Earlier [ŋg] forms are retained, instead of GB /ŋ/, in many regional types of speech, notably in the north-west Midlands of England (e.g. Staffordshire, Derbyshire, Cheshire and south Lancashire), e.g. *singing* [ˈsɪŋgɪŋg] for GB /ˈsɪŋɪŋ/. If /g/ is always pronounced in such situations, [ŋ] must be counted an allophone of /n/ rather than a separate phoneme.

In most regions where /n/ and /ŋ/ are in contrast (*sin*, *sing* being distinguished only by the final nasal), the *-ing* of the present participle varies between /ɪn/ and /ɪŋ/, such variation being dependent on both social and stylistic factors. /ɪn/ is commonly used by speakers at the lower end of the socio-economic spectrum and /ɪŋ/ at the top end, while speakers in intermediate classes often vary stylistically, using /ɪŋ/ in more careful speech (e.g. when reading aloud).[56] Contrastively /ɪn/ was fashionable in the eighteenth and nineteenth centuries and was only ousted as the fashionable pronunciation in the twentieth century.

In broad London, in which /ŋ/ is phonemic (cf. *sin*, *sing*), the word *-thing* in compounds is often pronounced /-fɪŋk/ e.g. in *something*, *anything*, *nothing*; the verbal termination *-ing* may be /-ɪŋ/ or /-ɪn/ without /k/. These forms are tending to spread more widely.

Sources of /ŋ/

OE [ŋ] before [k,g]	ME [ŋ] before [k,g]	hunger, sing, thank, tongue
OF [ŋ] before [k,g]		conquer, frank, rank, language

Note (1): Word-final [g] was lost after [ŋ] around 1700. Loss of [g] gave [ŋ] phonemic status with minimal pairs such as *sin* vs *sing*. ([k] has not been lost following [ŋ])

Note (2): Substitution of [ɪn] for [ɪŋ] in the suffix *-ing* was fashionable in 18c. and 19c. (and today occurs in many dialectal forms)

(4) *Advice to foreign learners*—Many languages do not have /ŋ/ or have it only before /k,g/. Those learners whose own language has [ŋ] only as an allophone of /n/ before /k,g/, e.g. Arabic, Hindi, German and Spanish, should, if aiming at GB, avoid using a /g/ (or more rarely a /k/) in those cases where /ŋ/ occurs in English without a following plosive, especially in sequences where final /ŋ/ is followed by a vowel, e.g. in *singing*, *reading out*, *a long essay*. In practising, the nasal /ŋ/ should be given exaggerated length and sequences such as /ŋiː,ŋɑː/ repeated in order to obtain a succession of nasal+vowel without a plosive. Some other learners may substitute palatal /ɲ/, e.g. French and Spanish; while this does not lead to unintelligibility, it does give a strong foreign accent and should be avoided if a native-like accent is aimed at.

9.7 Oral approximants

For this group of phonemes the airstream escapes through a relatively narrow aperture in the mouth without friction but with voice (apart from the allophones mentioned below). In many respects their articulatory and/or acoustic characteristics are sufficiently different to need a separate description under each phoneme. Nevertheless their distributional characteristics are very similar: (i) they appear in consonantal clusters in similar ways (a consonant plus /l,r,w,j/ is one of the two common types of two-consonant cluster (see §10.10.1) which occur syllable-initially in English (as in *play*, *broad*, *queen*, *pure*) the other being /s/ plus consonant); (ii) when they occur in such clusters they are all similarly devoiced if the preceding consonant is voiceless (e.g. /k/ produces devoicing in *clay*, *crawl*, *queer* and *cure*).

9.7.1 *Lateral approximant /l/*

(1) *Examples*

(a) *Clear* [l] (before vowels and /j/)
word-initial—leave, let, lock, look, late, loud, leer, lewd
in word-initial clusters—blow, glad, splice
word-medial—silly, yellow, alloy, collar, caller, pulley, foolish, sullen, sailor, island, oily, million, failure, allow, select; medley, ugly, nobly, gimlet, inlay, bachelor, specially (with [l] or [əl])
word-final, before following vowel or /j/—feel it, fall out, all over, will you

(b) *Devoiced clear* [l]:
fully devoiced clear [l̥] (following voiceless plosives in accented syllables)—play, please, plant, apply, aplomb, clean, close, climb, click, acclimatise
partially devoiced [l̥] (following voiceless plosives in unaccented syllables or across syllable boundaries)—placebo, aptly, butler, antler, ghastly, short loan, simplest, couplet, rope ladder, hopeless, sprinkler, clarinet, clandestine, dark lake

partially devoiced [l̥] (following voiceless fricatives)—sloppy, slow, slink, gas leak, fling, flow, flick, flak, half life, earthly, wash load

(c) *Dark* [ɬ] (in all other positions)

word-final, after vowel—feel, fill, fell, canal, snarl, doll, call, bull, pool, dull, pearl, pale, pole, pile, owl, oil, royal, real, cruel

after vowel, before consonant—help, bulb, salt, cold, milk, filch, bilge, film, kiln, self, solve, health, else, bills; alpine, elbow, halter, elder, alchemy, almost, illness, alphabet, silver, wealthy, although, ulcer, palsy, Welsh, always

syllabic [ɬ̩]—table, middle, eagle, cudgel, camel, final, quarrel (or with [əɬ]), oval, easel, usual, spaniel (or with [-jəɬ]), equal, tumble, fondle, angle, doubled, tables, measles, finally (as [ˈfaɪnɬi], cf. *finely* [faɪnli])

syllabic [ɬ̩], *partially devoiced following voiceless consonant*—apple, little, buckle, satchel, awful, parcel, special, simple, mantle, uncle, sinful, pistol.

variations in inflected forms of verbs having [ɬ̩] *in the uninflected form*—[ɬ̩], or [əl] (more rarely [l])—pommelling, tunnelling, cudgeling; [l] (more rarely [ɬ̩] or [əl])—fondling, doubling, circling, wriggling, settling, coupling, whistling, puzzling, scuffling, shovelling. Some speakers have minimal pairs dependent on the presence of clear [l] or syllabic dark [ɬ̩] or even non-syllabic dark [ɬ]; *gambling* [ˈgamblɪŋ] vs *gambolling* [ˈgambɬ̩ɪŋ] or [ˈgambɬɪŋ]; *codling* [ˈkɒdlɪŋ] vs *coddling* [ˈkɒdɬ̩ɪŋ] or [ˈkɒdɬɪŋ]

possible syllabic [ɬ] occurring in syllable-initial position in accented syllables—fallacious, believe, select, lots of. This use of dark [ɬ] gives special emphasis to the words.

Spellings of /l/

	Examples	*TF*	*LF*
l (inc. le)	balance, deal, droplet, fault, italic, leave, middle, polish, salad, symbol, talent	83%	90%
ll	allow, balloon, collide, illegal, intelligent, million, parallel	17%	10%

Note (1): British/American spellings in *dial(l)ing, distil(l), enrol(l), fulfil(l), instal(l), signal(l)ing, travel(l)ing*

Note (2): Silent <l> in *calm, could, folk, half, salmon, should, talk, would*

(2) *Description*[57]

(a) *Articulatory and distributional features*—The soft palate being in its raised position, shutting off the nasal resonator, the tip of the tongue is in contact with the upper teeth ridge, allowing the air to escape on both sides, or on one side, when there is a unilateral tongue-rim closure with

the upper side teeth. For clear [l], the front of the tongue is raised in the direction of the hard palate at the same time as the tip contact is made, thus giving a front vowel resonance to the consonant; this resonance is often of the [ë] type, but may be closer or more open according to the following vowel, cf. *lick*, *lack* (Fig. 48). **(See videos 7.9, 8.0, 9.8, 11.17.)** For dark [ɬ], the tip contact is again made on the teeth ridge, the front of the tongue being somewhat depressed and the back raised in the direction of the soft palate, giving a back vowel (or velarised) resonance (Fig. 49). **(See videos 1.20, 2.9.)** Variations in the quality of the back vowel resonance associated with [ɬ] are found among GB speakers, with a range in closeness from [ŏ], [ʊ] or [ɤ], to [ɔ̈] or [ʌ].

Many GB speakers and especially those of London RGB (= Estuary English) will use [ʊ] alone for [ɬ] in words such as *careful*, *people*, *table*, etc., i.e. especially when a consonant involving a labial articulation precedes; they will, moreover, not recognise such a vocalic allophone as unusual when they hear it. The use of a vocalic allophone seems somewhat less usual in GB when other consonants precede, e.g. in *uncle*, *Ethel*, *parcel*, *special*, *spaniel*, and is generally avoided, as a childish pronunciation, after alveolar plosives, e.g. *little*, *middle*, where the consonants are regularly released laterally (although pronunciations like /ˈlɪtəl, ˈmɪdəl/ are increasingly heard).

The lips' position is influenced by the nature of the adjacent vowel, cf. *leap*, *feel* (with spread lips), *loop*, *pool* (with somewhat rounded lips); in the case of [ɬ], and especially [ɬ̟], there is, with some speakers, always a tendency to lip-rounding. Both [l] and [ɬ] are voiced except when the preceding consonant is voiceless.

The GB distribution of [l] and [ɬ] is: [l] when a vowel or /j/ follows and [ɬ] in all other positions. In word-final positions following a consonant (*fiddle*, *final*, *parcel*), syllabic dark [ɬ̩] occurs. When an affix beginning with a vowel is added or the next word begins with a vowel, (*fiddling*, *fiddle it*, *finally*, *parcel of books*), the lateral may remain as dark and may remain syllabic or become non-syllabic; alternatively the lateral may become clear, in which case it is usually non-syllabic. The lateral is less likely to become clear in those cases where the following word begins with an accented syllable, where a [ʔ] may intervene, as in *real ale* [riːɬ ˈʔeɪɬ], cf. *real estate* [ˈriːl esteɪt]. The actual point of contact of the tongue for [ɬ] is conditioned by the place of articulation of the following consonant; thus, in *health*, *will they*, the [ɬ̪] has a dental contact (to a lesser extent, a preceding /θ,ð/ may cause a dental articulation [l̪], e.g. in *a month late*, *with love*); or, before /r/ in, e.g. *already*, *ultra*, *all dry*, the contact for [ɬ] is likely to be post-alveolar. [ɬ] may also be strongly nasalised by a following nasal consonant, e.g. *elm*, *kiln.*

The velarisation of [ɬ] often has the effect of retracting and lowering slightly the articulation of a preceding front vowel, e.g. *feel*, *fill*, *fell*, *canal*; in the case of /iː/+[ɬ], a central glide between the vowel and [ɬ] is often noticeable, and the [ɪ] element of /eɪ,aɪ,ɔɪ/ tends to be shortened or dropped, e.g. in *pail*, *pile*, *oil.* /uː/ before [ɬ] tends to be more monophthongal and nearer to C.[u], e.g. in *tool*, *spool*, *stool.*

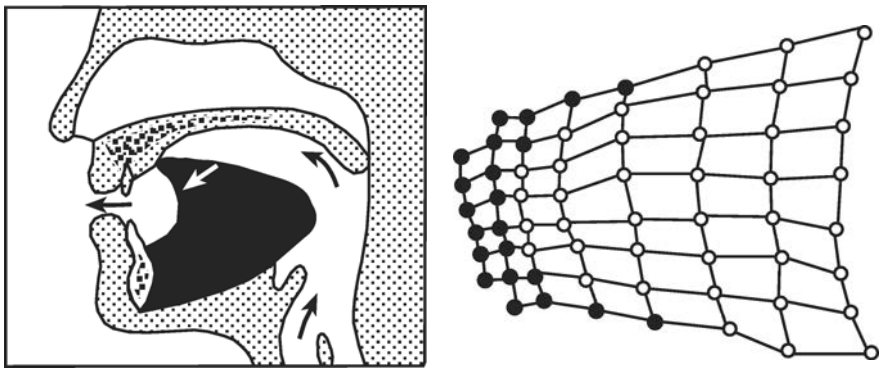


Figure 48 Section and palatogram of clear [l].

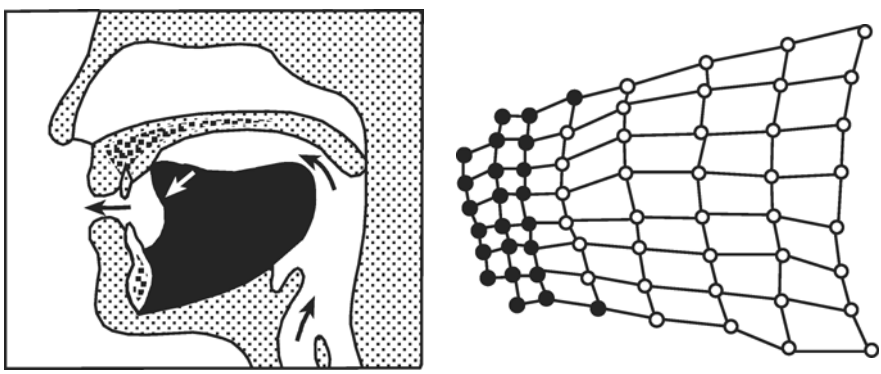


Figure 49 Section and palatogram of dark [ɬ].

(b) *Acoustic features*[58]—The English voiced lateral is similar to nasals and /r/ in its low intensity and hence a formant structure is often only weakly apparent. There is a 'murmur' below 500 Hz (similar to nasals but of even lower intensity) which is generally considered as F1 and an F2 commonly in the range 900–1,600 Hz, a value at the low end of this range indicating a dark [ɬ]. Transitions to and from vowels are generally slower than those for nasals although faster than those for glides. A duration for [ɬ] of greater than 50 to 60 msecs produces an effect of syllabicity. A spectrogram of clear [l] is shown in Fig. 44.

(3) *Regional variants*—In the speech of London and the surrounding areas,[59] the tongue-tip contact for [ɬ] is omitted, this allophone of /l/ being realised as a vowel (vocoid) in the region of [ö] with weak lip-rounding or as [ɤ̆] with neutral or weakly spread lips, thus *sell* [seö] or [seɤ̆], *fall* [fɔö] or [fɔɤ̆],

table [ˋtaɪbö] or [ˋtæɪbɤ̈]. In such speech, the lowering of /iː/ and /uː/ before [ö] is so marked that *meal*, *mill* and *pool*, *pull*, may become homophonous or distinguished merely by the length of the central syllabic vowel element, i.e. [mɪˑö] vs [mɪö], [pʊˑö] vs [pʊö]; other confusions are likely, e.g. *rail* (GB [reɪɬ], London [ræö]) and *row* (GB [rəʊ], London [ræö]); and *dole* (GB [dəʊɬ], London [dɒö]) and *doll* (GB [dɒɬ], London [dɒö]). Such pronunciations have become part of London RGB as noted under (2) above.

In other dialects of English the GB distribution of [l] and [ɬ] may not obtain. In General American, in Standard Scottish English, in Australian and in New Zealand English, as well as in large parts of the north of England (e.g. Manchester) and North Wales, dark [ɬ] may occur in all positions. Reports suggest the occurrence of other types of /l/ in the U.S., in particular a velar or uvular [ʟ], where the airstream escapes laterally around a velar or lateral closure; they also suggest that a vocalised /l/ may be heard even in initial position. In southern Irish English, in West Indian English, as well as in South Wales and on Tyneside, clear [l] may occur in all positions. Note, too, that American English has syllabic [ɬ] in words such as *fertile*, *futile*, *missile*, *reptile*, etc., where GB retains a prominent preceding vowel [-aɪɬ]; a reduction of the vowel, similar to the present American form, occurred in nineteenth-century British English.

Sources of /l/

OE [l.ll]	ME [l]	all, apple, climb, land, tell
OE [hl]		ladder, loaf
OF [l]		able, close, colour, lamp, veal

Note (1): Pre-consonantal [ɬ] before back or open vowels was vocalised to [ʊ] in 15c., giving modern *walk*, *talk*, *half*, *folk*, but not in *halt*, *salt*, *malt*. In some words it has been re-introduced in spelling and pronunciation, e.g. *fault*, *falcon*, *emerald*, *soldier*, *realm*, and sometimes only in the spelling, e.g. *calm*, *palm*, *balm*

Note (2): The loss of /l/ in *could*, *would*, *should* occurred in eModE

(4) *Acquisition of /l/ by native learners*—The lateral /l/, along with /j/ and /w/ but not /r/, is usually among the first sounds added to the nasals and plosives of children's early words. It is only rarely a problem in acquisition and is regularly present by the age of 3;6. For a short period before its acquisition it may be replaced by /j/ in syllable-initial, clear [l] positions. Dark [ɬ] may often be replaced by vocalic [ʊ], this tendency being reinforced by the same tendency in adult English in those accents mentioned above. A voiceless [ɬ] may sometimes be heard in children's speech as a replacement for the initial clusters /sl-/ and /fl-/, e.g. *sleeve* [ɬiːv], *fling* [ɬɪŋ].

(5) *Advice to foreign learners*—Few foreign learners will possess in their own language [l] and [ɬ] sounds with the GB distribution and many will have

only clear [l], e.g. French, German, Hindi and Spanish. It is true that, since there is no phonemic opposition between [l] and [ɬ] in English, learners will be perfectly intelligible if they use only [l]. But those high-flyers whose English otherwise conforms to a GB pattern should learn to make the dark [ɬ]. In the articulation of [ɬ] there should be no 'curling back' of the tongue, as is so often advised in books on English. To overcome such a habit already acquired, the tongue-tip may be gripped between the teeth during practice. The essential feature of [ɬ] may be said to be the accompanying weakly rounded [o] or [o̜] quality; learners should, therefore, begin by pronouncing a vowel of the [o] or [ɔ] type for the syllabic [ɬ] in words such as *bubble*, *people*, *awful*, i.e. where a labial consonant precedes [ɬ̩], thus—[ˈbʌbo], [ˈpiːpo], [ˈɔːfo]. A pure vowel of this kind is likely to occur in their own language. Such a pronunciation will come near to that used by many English speakers (see (2) and (3) above). The same sound sequence should then be attempted with the tongue-tip touching the upper teeth ridge, thus producing a lateral sound with the correct velarised quality. The relationship of [ɬ] and [o] can further be established by practising the alternation of [o]-[ɬ]-[o]-[ɬ], only the tongue-tip moving and the [o] resonance continuing. The [ɬ] thus achieved should then be used in the examples of [ɬ] given in (1) above, first the syllabic cases and then the non-syllabic.

Foreign learners from some language backgrounds, in particular Slav languages, may use an over-velarised lateral in pre-vocalic positions. This should be particularly avoided, as such over-velarisation is not even typical of those varieties of English which have a dark [ɬ] in all positions.

Care should also be taken to use a sufficiently devoiced [l̥] after accented (aspirated) /p,k/. Accented /p,k/ are distinguished from /b,g/ mainly by their aspiration; it is important that this aspiration cue should be made clear in the sequences /pl,kl/ by the voicelessness of the /l/. If this is not done, such a word as *plot*, pronounced with a fully voiced /l/, may be understood as *blot.* Pairs for practice, relying largely for the opposition on voiceless vs voiced [l], are: *plot*, *blot*; *plead*, *bleed*; *plight*, *blight*; *clad*, *glad*; *class*, *glass*; *clean*, *glean*; *clue*, *glue.*

9.7.2 Post-alveolar approximant /r/

(1) *Examples*

word-initial—reed, rag, raw, rude, rut, road, royal, rear
word-medial, *intervocalic*—mirror, very, arrow, sorry, hurry, furry, arrive, diary, dowry, dairy, eery, fury
word-final (/r/-link with following word beginning with a vowel (see §12.4.7))—far away, poor old man, once and for all, here at last, there are two

In consonantal clusters

fully devoiced [ɻ̥] *following accented voiceless plosive*—price, proud, tree, try, cream, crow; expression, surprise, attract, extremely, decree

somewhat devoiced [ɹ] *following voiceless fricative, unaccented voiceless plosive, or accented voiceless plosive preceded by* /s/ *in the same syllable*—fry, afraid, throw, thrive, shrink, shrug; apron, mattress, nitrate, buckram, cockroach; sprint, sprat, street, strain, scream, scrape, history /ˈhɪstri/.

fully voiced [ɹ] *following voiced consonant in the same syllable* (*fricative* [ɻ] *after* /d/)—brief, bright, dress, dry, dream, address, tawdry, grey, grow; umbrella, hungry; sovereign, general

words containing more than one /r/—brewery /ˈbruəri/, library (/ˈlaɪbrəri/, /ˈlaɪbɻi or /ˈlaɪbri/), retrograde, rarer, treasury, gregarious, procrastinate

Compare

/r/, /l/—raft, laughed; rush, lush; red, led; right, light; pirate, pilot; sherry, Shelley; two rocks, two locks; crash, clash; pray, play; fry, fly; grew, glue; bright, blight

/tr/, /dr/—trip, drip; trench, drench; tram, dram; trunk, drunk; troop, droop; try, dry.

/tr/, /ʧ/—trees, cheese; trip, chip; trap, chap; true, chew; train, chain.

/dr/, /ʤ/—drill, gill (liquid measure); dressed, jest; draw, jaw; drew, Jew; dram, jam; drear, jeer; Drury, jury.

Spellings of /r/

	Examples	*TF*	*LF*
r	afraid, apron, attract, brewery, buckram, cream, crow, dairy, diary, dowry, eery, fry, fury, history, library, mattress, price, proud, rag, red, reed, round, scream, shrink, strain, street, throw, tree, try	94%	95%
rr	arrest, arrive, arrogant, arrow, barrister, carry, correct, hurry, mirror, narrative, sorry	4%	4%
wr	wreath, wriggle, wrinkle, wrist, write, wrong, wrote	2%	1%
rh	rheumatism, rhetoric, rhinoceros, rhododendron, rhyme, rhythm		

Note: Linking /r/ in e.g. *far away, for all, here at last, poor old, there are*

(2) *Description*

(a) *Articulatory and distributional features*—The most common allophone of GB /r/ is a voiced post-alveolar approximant [ɹ]. The soft palate being raised and the nasal resonator shut off, the tip of the tongue is held in a position near to, but not touching, the rear part of the upper teeth ridge; the back rims of the tongue are touching the upper molars; the central

part of the tongue is lowered, with a general contraction of the tongue, so that the effect of the tongue position is one of hollowing and slight retroflexion of the tip (Fig. 50). **(See videos 2.4, 4.2.)** The airstream is thus allowed to escape freely, without friction, over the central part of the tongue. The lip position is determined largely by that of the following vowel, e.g. *reach* with neutral to spread lips, *root* with rounded lips. This allophone of the GB phoneme is, therefore, phonetically vowel-like, but, having a non-central situation in the syllable, it functions as a consonant.

GB /r/ usually occurs before a vowel, the above description being applicable to the realisations: syllable-initially before a vowel; following a voiced consonant (except /d/), either in a syllable-initial cluster or at word or syllable boundaries; word-final /r/ linking with an initial vowel in the following word (see §12.4.7). The limited distribution applies also to other non-rhotic accents. (See under (3) below.)

When /d/ precedes /r/, the allophone of /r/ is fricative, the /d/ closure being released slowly enough to produce friction, e.g. in *drive*, *tawdry* and, in rapid speech, at syllable or word boundaries, e.g. *headrest*, *bedroom*, *wide road.* **(See video 3.2.)**

A completely devoiced fricative [ɻ̥] may be heard following accented /p,t,k/, e.g. *price*, *try*, *cream*, *oppress*, *attract*, *across.* A partially devoiced variety of /r/ occurs: when /r/ follows an unaccented voiceless plosive initial in a syllable and, in rapid speech, at syllable boundaries, e.g. *upright*, *apron*, *paltry*, *nitrate*, *beetroot*, *cockroach*, *acrobat* (though in these positions the homorganic sequence /-tr-/ will involve more devoicing than /-pr-/ and /-kr-/); in the syllable-initial sequences /spr-,str-,skr-/, e.g. *spring*, *string*, *scream*; and after other voiceless consonants in accented syllables, e.g. *fry*, *thrive*, *shrink.* Slight devoicing may also occur, in rapid speech, following these latter voiceless fricatives, when they are in unaccented positions, e.g. *belfry*, *saffron*, *necessary* /ˈnesəsri/, *surf riding*, *birthright*, *horse race*, *cockroach*, *mushroom.*

In CGB, the approximant variety [ɹ] can be replaced by an alveolar tap [ɾ] in intervocalic positions, e.g. *very*, *sorry*, *marry*, *Mary*, *forever*, following /θ,ð/, e.g. *three*, *forthright*, *with respect*, and also, with some speakers, after other consonants, especially /b,g/, e.g. *bright*, *grow.* In the case of intervocalic [ɾ], a single tap is made by the tip of the tongue on the alveolar ridge, the side rims usually making a light contact with the upper molars. The articulation of [ɾ] differs from that of /d/ in that the contact for [ɾ] is of shorter duration and less complete than that of /d/, the central hollowing of the tongue typical of [ɾ] being distinctive; *carry* with [ɾ] and *caddie* with /d/ are, therefore, phonetically distinct. In the case of [ɾ] following /θ,ð/, a tap is made by the tongue-tip on the teeth ridge as the tongue is withdrawn from its dental position; again, the contact is of very brief duration and some tongue hollowing is present. A lingual trill (or roll) [r] may also be heard among GB speakers, but usually only in highly stylised speech, e.g. in declamatory verse-speaking.

In GB, the degree of labialisation varies considerably. Although for perhaps the majority of GB speakers the lip position of /r/ is determined by that of the following vowel, some speakers labialise /r/ whatever the following vowel. In some extreme cases, lip-rounding is accompanied by no articulation of the forward part of the tongue, so that /r/ is replaced by /w/ and homophones of the type *wed, red,* are produced. Alternatively a labiodental approximant [ʋ] may be heard as a realisation of /r/ or even for both /r/ and /w/. Pronunciations of this sort were a fashionable affectation in the nineteenth and early twentieth century; and can still be heard as such from some elderly people educated at major public schools. More recently there are reports that the [ʋ] is spreading more widely, essentially in a similar way to t-glottaling (/t/→[ʔ]) and th-fronting (/θ,ð/→[f,v]), i.e. starting out from basilectal London, moving into the south-east and then further afield (e.g. Derby, Milton Keynes, Middlesborough).[60] At the same time [ʋ] for /r/ is well known as a feature of early child language and has often been regarded as a speech defect in adults.

The /ə/ in the sequence of /ər/ is frequently reduced in rapid speech by the elision of the schwa. This may leave non-syllabic /r/ pre-vocalically or it may result in a syllabic /r̩/. Both are possible in *conference, misery, camera, reverie, malingerer, binary, commentary, memory, victory.* The elision of both /r/ and /ə/ in *library* has similar effects. A similar elision of /ə/ can take place in the sequence /rə/ and this may result in the introduction of pre-consonantal /r/ into GB, e.g. the elision of /ə/ in *parrot, barrel* may leave syllabic or non-syllabic /r̩/ (see further under §10.8(1)(b)).

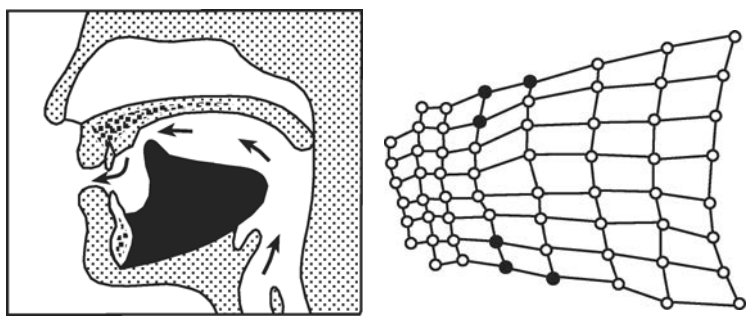


Figure 50 Section and palatogram of /r/ = [ɹ].

(b) *Acoustic features*[61]—The voiced post-alveolar approximant /r/ has a formant structure like vowels but, like the nasals and /l/, this structure is only weakly apparent. F1 is between 120 and 600 Hz, the lower the frequency the greater the perceived impression of lip-rounding; F2 is between 700 and 1,200 Hz; F3 is notable by being very close to F2. However, since the steady-state formants are likely to be very weak, /r/ is more easily identifiable on spectrograms by its steeply rising transitions (for F1, F2, F3 and F4) to a following vowel. See spectrograms in Figure 44.

(3) *Regional variants*—A trill, i.e. a rapid succession of taps by the tip of the tongue on the alveolar ridge, is often considered typical of some Scottish types of English, though a single tap or the approximant [ɹ] are more common. A tap is also the regular realisation of /r/ in Liverpool and Newcastle.

A uvular articulation, either a trill [ʀ] or a fricative [ʁ], may be heard in rural areas in the extreme north-east of England and also among some Lowland Scottish speakers and as a defective substitution for [ɹ].

In some dialects the degree of retroflexion of the tongue for [ɹ] may be greater than in GB—[ɻ], e.g. in the speech of the south-west of England and some American English. The retroflexion of the tongue may anticipate the consonant and colour the preceding vowel articulation; such 'r-coloured' vowels may occur in this type of speech in such words as *bird*, *farm*, *lord.*

A perceptual effect similar to retroflexion is often achieved by a bunching of the front and central parts of the tongue towards the roof of the mouth.[62] In this type of articulation the tip of the tongue is not retroflexed but approaches the base of the teeth. This was first reported in American English but has also been shown to be used in certain environments in GB, e.g. before front vowels as in *dream*, *curious.* **(See video 5.11.)**

/r/ differs in various types of English not only in its phonetic realisation but also in its distribution. Many dialects of English, including General American, most types of Irish English, Standard Scottish English and much of the rural south and south-west of England, retain the earlier post-vocalic (both pre-consonantal and pre-pausal) usage of /r/, distinguishing between such GB homophones as *pour*, *paw*; *court*, *caught* (SSE can also have distinct vowels before /r/, e.g. in *horse* and *hoarse*).[63] The quality of the post-vocalic /r/ used will correspond to the types given above according to the region. A retroflexed continuant, of somewhat greater duration than the pre- or post-vocalic form, may also have syllabic function, e.g. in *water*, *father*, *ladder*, *paper* [ˈwɔːtɻ̩, ˈfɑːðɻ̩, ˈladɻ̩, ˈpeɪpɻ̩]. For the use of word-final, post-vocalic /r/ as a linking form in GB, see §§12.4.7 and 12.5.

Sources of /r/

OE [r]	ME [r]	green, nearer, rise, rope
OE [hr]		ring, roof
OF [r,rr]		carry, fruit, remain, rule, very
OE [wr]	ME [wr] > [r] 17c.	wrap, wrest, wretch, write

Note (1): The quality of [r] was a trill or tap in OE and ME. It became a fricative and then an approximant, the changes occurring first in non-pre-vocalic and unaccented positions

Note (2): Loss of [r] before consonants and pause was completed by 18c., leaving an [ə] which attached to a preceding vowel to form a diphthong or a long vowel

(4) *Acquisition of /r/ by native learners*—The post-alveolar approximant, unlike the other approximants, is commonly a late acquisition, often not being contrastive until the age of 5;0. It is frequently replaced by /w/ and even when a contrast between /r/ and /w/ is present, the /r/ may have an incorrect articulation, commonly [ʊ].

(5) *Advice to foreign learners*—GB /r/ has a quality which is rarely encountered in other languages, the usual approximant variety having much in common with a vowel. Any strongly rolled *r*-sound, whether lingual or uvular, is not acceptable in GB, although there is no loss of intelligibility. A weak tongue tip tap is the least objectionable substitution for GB [ɹ] and is acceptable if Amalgam English or International English is the target (see §§13.4 and 13.5); but a uvular sound, trill or fricative, as so often used by French or German learners, is generally taken as a characteristic of a marked foreign accent, despite the fact that a uvular sound is not unknown in English regional speech. It is also important that those whose own *r*-sound is of the uvular type should not make a double articulation—uvular and post-alveolar at the same time.

A foreign learner should, therefore, try to abandon his own prejudices as to what an /r/ sound should be and approach the GB [ɹ] as if it were a vowel. Any central vowel, either English /ə/ or GB /ɜː/ or a similar vowel in the learner's own language, may be used as a starting-point. An approximation to the correct quality can then be achieved by maintaining the vowel sound while curling the tip of the tongue backwards. This sound can then be linked to the following vowel in a word. It is important that [ɹ] should be made unusually long in this position until the tongue articulation is established, e.g. [ɹːed].

Alternatively, practice may start from /ʒ/, in the articulation of which the tongue has a position somewhat similar to that of [ɹ], although the sound is fricative, the narrowing between tongue and roof of the mouth made too far forward and the tongue hollowing and lateral contraction missing. From the /ʒ/ position, the tongue should be retracted, hollowed and slightly lowered, so that the friction is lost. With both methods, it is often helpful to hold the jaws widely separated and the lips somewhat rounded. The post-alveolar affricates /tr,dr/ may also be related to /ʧ,ʤ/, applying the same principles of retraction as just described (see also §9.3.1).

Examples for practice should be chosen according to the degree of difficulty and the phonetic nature of the /r/ allophone used. Thus, the fricative variety of the second element of the affricates /tr,dr/ may be the first to be practised (to establish the post-alveolar position), but the sequence /str-/ will give greater difficulty. Intervocalic [ɹ] usually presents relatively little difficulty, especially as a one-tap [ɾ] is always permissible; the approximant in initial position may be the most troublesome articulation of all.

If aiming at an English like that in England, learners should not be misled by the spelling into pronouncing the letter <r> in pre-consonantal and pre-pausal

positions. In words such as *there*, *car*, *arm*, *horse*, *hurt*, the <r> may be taken as a sign indicating length of the preceding vowel and in those such as *fear*, *tour*, as a sign of the [ə] element of the diphthong. Nevertheless, in connected speech, the final linking /r/ form should normally be used. (See examples for practice in (1) above.)

As in the case of /l/, it should be remembered that in the syllable-initial sequences /pr-,br-,tr-,dr-,kr-,gr-/ the oppositions between voiceless and voiced plosives are indicated mainly by the degree of voicing in the following /r/. Thus, /pr-,tr-,kr-/ should have [ɻ], especially when accented, if they are not to be confused with /br-,dr-,gr-/; cf. such pairs as *pray*, *bray; try*, *dry; crow*, *grow.*

Many languages, including Japanese, many varieties of Chinese, Tagalog and some Bantu languages, have no distinction between /l/ and /r/. This contrast is often difficult to establish, the problem being as much perceptual as productive. Any attempt to teach the correct articulation of the sounds should therefore go hand in hand with drills to reinforce correct recognition.

9.7.3 Palatal and labial-velar approximants (or semi-vowels)

(1) *Articulatory and distributional features*—A semi-vowel is a rapid vocalic glide onto a syllabic sound of greater steady duration. In English the semi-vowels /j/ and /w/ glide from positions of approximately /iː/ (with spread or neutral lips) and /uː/ (with rounded lips) respectively. The actual point at which the essential vocalic glide begins depends on the nature of the following sound, e.g. the glide of /j/ to /iː/ in *yeast* has a closer beginning than that of /j/ to /ɒ/ in *yacht* and the starting-point of /w/ before /uː/ in *woo* is closer than that before /ɒ/ in *what.* In English, however, it is never necessary for the starting-point of /j/ + /iː/ or /w/ + /uː/ to be so close that it falls within the fricative region beyond the vowel area, since English /iː/ and /uː/ are both sufficiently relaxed for a perceptible non-fricative glide to be made from a closer position within the vowel area.

Despite the fact that semi-vowels are, in phonetic terms, generally vocalic, they are treated within the consonant class, because their function is consonantal rather than vowel-like, i.e. they have a marginal rather than a central situation in the syllable. /j/ and /w/ occur in the onset position of syllables either singly or as part of a consonantal cluster (see §8.2 for the treatment of the final [ɪ] and [ʊ] elements of English diphthongs as an integral part of the diphthongal glide, rather than as separable—consonantal—/j/ and /w/ occurring in the coda). Their consonantal function is emphasised by the fact that the articles have their pre-consonantal form when followed by /j/ and /w/, i.e. *the yard*, *a yacht*, *the west*, *a wasp*, with /ðə/ or /ə/ rather than with /ði/ or /ən/. Moreover the allophones of /j/ and /w/ following a voiceless consonant are voiceless and fricative, as in *cue*, *quick* [kçuː], [kʍɪk], i.e. they fall within the phonetic definition of a consonant.

(2) *Acoustic features*[64]—Since /j/ and /w/ are vocalic glides (except in the case of the fricative allophones mentioned above), they may be expected to have acoustic features similar to those of vowels, i.e. a characteristic two- or three-formant structure similar to that of /iː/ or /uː/. In fact, as for vowels, two formants are sufficient for good recognition. Compared with /r,l/, the steady state of the semi-vowels is even shorter, e.g. of the order of 30 msecs. F1 starting-point of the glide is that of /iː/ or /uː/, i.e. about 240 Hz; F2 has a starting-point within the range 2,280–3,600 Hz for /j/, depending on the following vowel and within the range 360–840 Hz for /w/, depending on the following vowel. The transition duration of F2 is of the order of 50–100 msecs for both /j/ and /w/, with that of F1 of the same or shorter duration. Spectrograms of /j,w/ are shown in Figure 44.

9.7.4 Unrounded palatal approximant /j/

(1) *Examples*

word-initial—yield, yes, yard, yacht, yawn, union, young, yearn, yokel, year, Europe

following accented /p,t,k,h/ (*only before* /uː,ʊə/) = [ç]—pew, tune, queue, cure, pure, huge; accuse, secure, peculiar, attuned

following /sp,st,sk/, *voiceless fricatives*, *or unaccented* /p,t,k/ = *slightly devoiced* [j̊]—spurious, stew, askew; enthusiasm, refuse; opulent, spatula, oculist; help you, kick you

following voiced consonant = [j]—beauty, duty, music, new, value, view; abuse, endure, argue, manure, onion, failure, familiar, residue, senior, behaviour

Spellings of /j/

	Examples	*TF*	*LF*
y	beyond, lawyer, yacht, yak, year, yearn, yeast, yes, young, yours	19%	4%
i	behaviour, brilliant, familiar, onion, opinion, saviour, senior, spaniel, view		
u (as part of /juː,jʊə/)	abuse, accuse, attuned, cure, congratulate, duty, endure, enthusiasm, huge, manure, muse, music, nebulous, oculist, opulent, peculiar, pure, presume, refuse, secure, spatula, spurious, tune, use		
ue (as part of /juː/)	argue, avenue, barbecue, pursue, queue, residue, revenue, revue, subdue, value		
ew, eu (as part of /juː/)	adieu, askew, eulogy, feud, mildew, nephew, new, pew, spew, stew		

Note: *beauty*

(2) *Description*—The vocalic allophones of GB /j/ are articulated by the tongue assuming the position for a close-mid to close front vowel (depending on the degree of openness of the following sound) and moving away immediately to the position of the following sound; the lips are generally neutral or spread, but anticipate the lip-rounding of the following vowel in such cases as *you* and *yawn*. **(See videos 5.5, 14.14.)** When /j/ follows a voiceless consonant, devoicing takes place; when /j/ follows accented /p,t,k,h/, the devoicing is complete, with the result that a voiceless palatal fricative [ç] is produced. (In these cases, it is the friction rather than the glide which identifies the phoneme.)

When /j/ is the final element of accented clusters, only /uː/, /ʊə/ or sometimes /ɔː/ may follow /j/ (*pew*, *cure*); in unaccented clusters, /j/ may be followed by /uː,ʊ,ʊə/ or /ə/ (*argue*, *opulent*, *tenure*, *senior*). The sequence /h/ + /j/ as in *hue* /hjuː/ [hçuː] may reduce to [ç] giving [çuː]. Such a realisation entails oppositions between /j/, /h/ and [ç], e.g. *you*, *who*, *hue*, raising the possibility of phonemic status for [ç]. The number of words offering the sequence /h/ + /j/ → [ç] is, however, restricted (e.g. *hew*, *hue*, *human*, *humour*) and alternative pronunciations with /h/ + /j/ or /h/ + [ç] (on the pattern of /p,t,k/ + /j/) are possible. [ç] is, therefore, more conveniently treated as a realisation of /h/ + /j/.

In many cases of GB /j/ + /uː/, an alternative pronunciation without /j/ exists. Earlier /juː/ or /ɪu/ sequences (see §8.9.11) have regularly been reduced to /uː/ in GB after /ʧ,ʤ,r/; /juː/ is retained after plosives, /f/, /v/ and /h/ (*pew*, *beauty*, *queue*, *argue*, *tune*, *dune*, *few*, *view*, *nephew*, *huge*) and when /l/ is preceded by an accented vowel (*value*, *curlew*); but in other cases, more variation is possible, both /uː/ and /juː/ being heard, e.g. in *absolute(ly)*, *lute*, *salute*, *revolution*, *enthusiasm*, *pursuit*, *suit*, *suitable*, *superstition*, *supermarket*, though /uː/ grows increasingly common in such words, being generally more usual after /s,z,θ,l/ (apart from words ending in *-sume* like *consume*, *assume*, *resume*). Increasingly pronunciations without /j/ are also heard following /n/ in accented syllables, e.g. *neutral*, *new*, *news*.

In some unaccented syllables there is often variation between /ɪə/ and /jə/, e.g. in *immediate*, *India*, *audience*, *tedious*, *idiot*, *hideous*. In such cases as *Romania*, *Bohemia*, *Australia*, *morphia*, /ɪə/ tends to be retained in careful speech, as well as in those suffixes where /ə/ has a separable morphemic value, e.g. in *easier*, *heavier* (see §8.12.1 for those sequences of [ɪ] or [i] plus [ə] which are better regarded as bisyllabic).

Many unaccented sequences of /tj,dj,sj,zj/ coalesced in an earlier state of the language into /ʧ,ʤ,ʃ,ʒ/ (see §§9.3.1, 9.4.6). In some cases, e.g. *statue*, *residue*, *issue*, *seizure*, *Christian*, *immediate*, *educate*, *gratitude*, *usual*, *visual*, *Jesuit*, the earlier pronunciation with /tj,dj,sj,zj/ has now been re-instated by careful speakers. On the other hand, coalesced forms are increasingly heard in the onset of accented syllables, e.g. /ʧ,ʤ,ʃ,ʒ/ in *tune*, *dune*, *assume*, *presume*. Such coalescences also occur in rapid speech at word boundaries, e.g. in *not yet* /nɒˈʧet/, *would you* /ˈwʊʤu/, *this year* /ˈðɪʃɪə/, *sees you* or *seize you* /ˈsiːʒu/ (see §12.4.5(2)).

Thus some words with /dj,tj,sj,zj/ may have three alternative pronunciations, e.g. *immediate* /ɪ`miːdɪət, ɪ`miːdjət, ɪ`miːdʒət/, *Christian* /`krɪstɪən, `krɪstjən, `krɪstʃən/, *idiot* /`ɪdɪət, `ɪdjət, `ɪdʒət/, *hideous* /`hɪdɪəs, `hɪdjəs, `hɪdʒəs/, *assume* /ə`sjuːm, ə`suːm, ə`ʃuːm/, *presume* /prɪ`zjuːm, prɪ`zuːm, prɪ`ʒuːm/.

A junctural [ʲ] glide may sometimes be heard between /iː,i,eɪ,aɪ,ɔɪ/ and a following vowel, e.g. *seeing* [`siʲɪŋ], *saying* [`seɪʲɪŋ], *sighing* [`saɪʲɪŋ], *enjoy it* [en`dʒɔɪʲɪt], *see ants* [si `ʲants], *say all* [seɪ `ʲɔːl], *my aunt* [maɪ `ʲɑːnt], *toy arm* [tɔɪ `ʲɑːm], resulting from the relatively close quality of [i] and [ɪ] and the subsequent glide to the following, more open, vowel. However, such a glide is rarely equivalent in nature to a phonemic /j/, the finishing point of the diphthong not being sufficiently prominent, nor the glide being long enough. The difference between phonemic /j/ and junctural [ʲ] can be seen in the opposition between *my ear* /maɪ `ɪə/ (= [maɪ `ʲɪə]) and *my year* /maɪ `jɪə/ (= [maɪ `jɪə]) and *we earn* /wi `ɜːn/ (= [wi `ʲɜːn]) and *we yearn* /wi `jɜːn/ (= [wi `jɜːn]). A junctural [ʲ] always has the alternative of a glottal stop, e.g. [maɪ `ʔɪə] and [wi `ʔɜːn] (see §9.2.8).

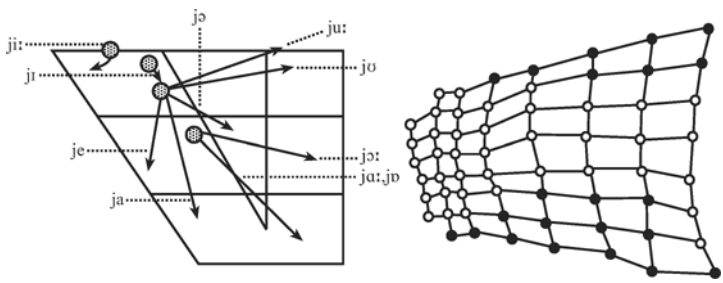


Figure 51 Vowel diagram and palatogram for /j/.

(3) *Regional variants*—In General American /j/ is regularly absent following /t,d,θ,ð,n/ in accented syllables (i.e. /j/-deletion in clusters has progressed wider than in GB), e.g. in *tune*, *tunic*, *dune*, *duty*, *enthusiasm*, *news*. In East Anglia /j/ may be dropped following all consonants, e.g. *beauty*, *music*, *view*, *argue*. The sequence /h/+/j/ is reduced to /j/ alone in some accents, e.g. in parts of Wales, e.g. in *huge*, *humour*.

Sources of /j/

OE [j]	ME [j]	yard, year, yield, yoke, young
	ME [i,e,ɛ] + [u] > [j] + [uː]	few, hue, new (see §8.9.11)
OF /ɲ,ʎ/	ME [nj,lj] + V	familiar, onion, opinion, pavilion, William

(4) *Acquisition of* /j/ *by native learners*—The palatal approximant, along with /l/ and /w/, is usually among the first consonants added to the plosives and nasals of children's first words. It is only rarely a problem in acquisition and is regularly present by 3;6.

(5) *Advice to foreign learners*—GB /j/ presents little difficulty except where it occurs before a following close front vowel as in *yeast, yield, Yiddish, year*, where there may be a tendency to omit the /j/ altogether. In such cases it can be helpful to make the learner say an additional [iː] instead of the [j] at the beginning of the word, e.g. [iːiːst], [iːiːld], [iːɪdɪʃ], [iːɪə] and then gradually shorten the initial [iː]. Spanish learners should avoid using a palatal plosive [ɟ] in accented syllables, e.g. in *yes, young* [ɟes, ɟʌŋ]. Speakers of languages like French having unaspirated /p,t,k/ should be sure to correctly devoice a following /j/, e.g. in *pew, tune, queue*. If GB is the model rather than GA, learners should avoid dropping the /j/ following /t,d,θ,n/, e.g. in *tune, dune, enthuse, news.*

9.7.5 Rounded labial-velar approximant /w/

(1) *Examples*

word-initial = [w]—weed, wet, wag, wasp, wood, womb, one, word, wave, woke, wire, weird, wear

following accented /t,k/ = [ʍ]—twig, twelve, twin, twice, queen, quell, quick, quite, quaint, acquaint

following /sk/, *accented voiceless fricative, or in unaccented syllable following* /p,t,k/ = slightly devoiced [w̥]—square, squash, squirrel; thwart, swim, swear, swoon; upward, outward, equal; `pump water, `that word, `take one

intervocalic, or following voiced consonant = [w]—away, aware, inward, always, language; dwindle, dwarf, guano

possible oppositions /w/, /ʍ/—witch, which; weather, whether; wine, whine; Wales, whales; wear, where

Compare /w/, /v/—west, vest; wine, vine; worse, verse; wail, veil; weir, veer

Spellings of /w/

	Examples	*TF*	*LF*
w	dwindle, outward, swear, sweep, swim, swoon, thwart, twelve, twice, twig, twin, upward, wag, wagon, walk, wave, weather, wear, weird, wasp, weed, west, wet, wink, wire, wit, womb, wood, word	64%	59%
wh	what, wheel, when, where, whether, which, whisky, whisper, whist, whistle, white	5%	5%
qu (= /kw/)	acquaint, adequate, colloquial, equal, queen, quell, quick, quiet, quite, square, squash, squirrel	27%	31%
u (after <g,s>)	anguish, language, linguist, penguin, persuade, sanguine, suede, suite	4%	4%

Note: *choir, anyone, no one, once, one, someone*

(2) *Description*—/w/ is articulated by the tongue assuming the position for a back close-mid to close vowel (depending upon the degree of openness of the following sound) and moving away immediately to the position of the following sound **(see video 15.5)**; the lips are rounded (more closely when followed by /uː,ʊ/ or /ɔː/ than when preceding a more open or front vowel—cf. *woo*, *wood*, *war*, with *what*, *west*, *we*; in those cases where /w/ precedes /uː/, the lip-rounding for /w/ is closer and more energetic than that associated with /uː/, permitting a distinction between such a pair as *ooze*, *woos*). /w/ is an example of double articulation, the narrowing of the articulators at the bilabial and velar places of articulation constituting two strictures of equal rank. The soft palate is raised and the vocal cords vibrate; but when /w/ follows a voiceless consonant, devoicing takes place: when /w/ follows accented /t,k/, the devoicing is complete = [ʍ], a voiceless labial-velar fricative—the friction being bilabial. In this latter case, it is the bilabial friction rather than the glide which identifies the phoneme; such words as *swoop*, *swoon*, are distinguished from *soup*, *soon*, not only by the stronger lip action associated with /w/ but also by its devoiced friction.

Consonants preceding /w/, especially initially in an accented syllable, will be lip-rounded in anticipation of /w/, e.g. in *twist*, *queen*, *swing*, *language*, *conquest*; such rounding occurs to a lesser extent at syllable or word boundaries, e.g. in *onward*, *bindweed*, *front wheel*, *this one.*

The main variant, both in GB and in other types of British English, concerns the pronunciation of the spelling <wh>. In CGB and in GB speech in a more formal style (e.g. in verse-speaking), words such as *when* are pronounced with the voiceless labial-velar fricative [ʍ]. In such speech, which contains oppositions of the kind *wine*, *whine*, shown in (1) above, /ʍ/ has phonemic status. Among GB speakers the use of /ʍ/ as a phoneme has declined rapidly. Even if /ʍ/ does occur distinctively in any idiolect, it may nevertheless be interpreted phonemically as /h/ + /w/ (cf. the treatment of [ç] in §9.7.4(2)).

A juncture [ʷ] glide may sometimes be heard between /uː,ʊ,əʊ,aʊ/ and a following vowel, e.g. *doing* [ˈduːʷɪŋ], *following* [ˈfɒləʊʷɪŋ], *allow it* [əˈlaʊ ʷɪt], *who asked* [huː ˈʷɑːst], *follow on* [fɒləʊ ˈʷɒn], resulting from the relatively close quality given to /uː/ or [ʊ] and the subsequent glide to the following, more open, vowel. However, such a glide is rarely equivalent in nature to a phonemic /w/, the finishing point of the vowel not being sufficiently prominent, nor the glide long enough. The difference between phonemic /w/ and juncture [ʷ] can be seen in the opposition between *two-eyed* [tuː ˈʷaɪd] and *too wide* [tuː ˈwaɪd] and between *no air* [nəʊ ˈʷeə] and *no wear* [nəʊ ˈweə]. A juncture [ʷ] always has the alternative of a glottal stop, e.g. [tuː ˈʔaɪd] and [nəʊ ˈʔeə] (see §9.2.8).

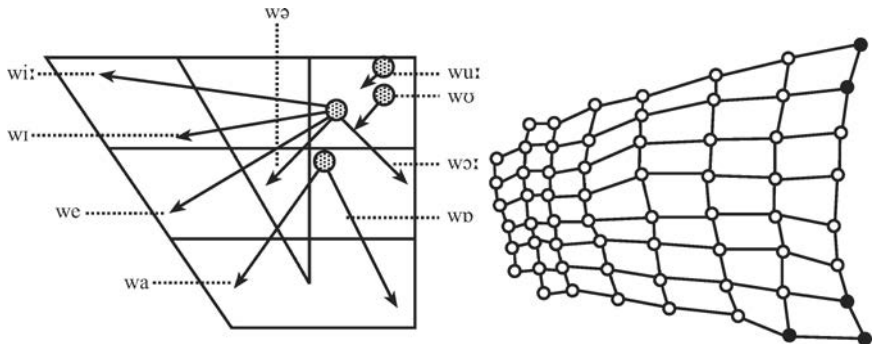


Figure 52 Vowel diagram and palatogram for /w/.

(3) *Regional variants*—The only regional variation concerns the more regular use of [ʍ] in words with <wh> in the spelling. This happens in Standard Scottish English, in most varieties of Irish English and is often presented as the norm in the U.S., although the change from [ʍ] to /w/ seems to be more common than is thought by some.[65]

Sources of /w/

OE [w]	ME [w]	dwarf, twin, wash, way, widow, wolf
AN [w]		wage, war, ward, warrant
OF (k,g) + [u] + V		squadron, squire, squirrel
OE [hw]	ME [hw] > [w] 18c.	whale, wheel, when, where, which, whistle

Note (1): Earlier [w] was lost in *answer, so, such, thong, two, sword* in late ME and in the cluster [wr] in *write, wreck, wrist* in 17c.
Note (2): In the case of *who, whom, whose* it was the [w] that was lost (by eModE), the [w] merging with the folowing [u:]
Note (3): In *once, one, someone, anyone* forms with initial [w] replaced those without /w/ in 17c.

(4) *Acquisition of* /w/ *by native learners*—The labial-velar approximant is often the first approximant to be acquired, following fairly rapidly on the prior acquisition of nasals and plosives. It rarely presents a problem and is usually present by at least 3;0.

(5) *Advice to foreign learners*—It is important for those aiming at GB that the vocalic allophone of /w/ should not be replaced by a consonantal sound, i.e. either a voiced bilabial fricative [β] (as in Hungarian), or a voiced labiodental fricative [v] (as in German), or a labiodental approximant [ʋ], in which there is a loose approximation (without friction) between the lower lip and the upper teeth (as in Hindi). All such substitutions will be interpreted by the English ear as /v/. The learner should protrude and round his lips, ensuring

that the teeth play no part in the articulation; if necessary, in practice, an energetically rounded full [uː] vowel should be used, e.g. *wine* being pronounced as [uːaɪn], and a clear distinction being made between this word and *vine* (see examples in (1) above). The same protruded and rounded lip action (and absence of lower teeth contact) applies to the voiceless allophone [ʍ], as in *quite*, *twin*, etc. As in the case of the voiceless allophones of /l,r,j/, it is important that /w/ should be devoiced especially after accented /t,k/, despite the fact that there are no exact pairs depending on the opposition [dw,gw]-[tʍ,kʍ], but cf. *dwell*, *twelve*; *distinguish*, *relinquish*; *dwindle*, *twin*; *Gwen*, *quench*.

9.8 The frequency of occurrence of GB consonants[66]

Text frequencies for consonants in GB are shown in Table 14. The alveolar consonants are the most frequent in English, a fact which applies to many languages. As is to be expected from its historical origins and its restricted contextual distribution, /ʒ/ occupies the lowest position. In any general text frequency count such as this, the order obtained will reflect the occurrence of such 'common' words as *the*, *that*, *which*, giving preponderance to /ð,w/, for example, as against /θ,j/. There are notable discrepancies between the occurrence of voiceless and voiced members of homorganic pairs of phonemes: thus, /s,ð,k/ occur more frequently than their counterparts. Discrepancy in frequency of occurrence is only important when combined with the frequency of minimal pairs, the so-called 'functional load' of contrasts. By this measure the contrasts of /θ/ vs /ð/ and /ʃ/ vs /ʒ/ carry a very low functional load, with minimal pairs being almost non-existent (some possible are: *thigh* vs *thy*, *ether* vs *either*, *teeth* vs *teethe*; *Aleutian* vs *allusion*, *illusion* vs *Illuyshin*, *leash* vs *liege*, *Confucian* vs *confusion*).

Table 14 Text frequencies of consonants in GB showing percentages of consonants among all phonemes and among consonants only.

	%All	%C		%All	%C
/n/	7.62	12.59	/v/	1.97	3.25
/t/	6.95	11.49	/p/	1.92	3.15
/s/	4.79	7.92	/f/	1.73	2.86
/d/	4.63	7.65	/h/	1.23	2.03
/l/	3.79	6.26	/j/	1.07	1.77
/r/	3.57	5.79	/ŋ/	1.04	1.72
/ð/	3.47	5.73	/g/	0.99	1.64
/k/	2.99	4.94	/ʃ/	0.89	1.46
/m/	2.76	4.55	/ʤ/	0.62	1.02
/z/	2.75	4.55	/ʧ/	0.47	0.78
/w/	2.67	4.41	/θ/	0.47	0.78
/b/	2.07	3.78	/ʒ/	0.07	0.42

Total all consonants: 60.6%

Notes

1 Lower intraoral pressure for /b,d,g/ was reported by Subtelny *et al.* (1966) and Malécot (1968).
2 Wingate (1982) also shows that the fundamental frequency of the following vowel equates with /p,t,k/ rather than /b,d,g/.
3 Suomi (1976, 1980) reported only 11 out of 144 instances of interruptions in the voicing of voiced plosives in word-medial position compared with 76 out of 213 such interruptions in word-final plosives preceding a vowel. Docherty (1992) found interrupted voicing in the compression stage in 97 per cent of word-initial voiced plosives following vowels and in 46 per cent of word-final voiced plosives preceding vowels.
4 Catford (1977: 112).
5 Przedlacka (2012) found less aspiration in two British speakers in 1933 than in two speakers in 2008.
6 See Docherty (1992), Volatis & Miller (1992).
7 Peterson & Lehiste (1960) found vowels up to one and a half times as long preceding voiced consonants as preceding voiceless consonants.
8 Ohde (1984).
9 Liberman *et al.* (1958) and Stevens & Klatt (1974).
10 Lisker (1957a) showed that an intervocalic /b/ has an average duration of 75 msecs while an intervocalic /p/ has an average of 120 msecs. See also Malécot (1968) and Subtelny *et al.* (1966).
11 See Laeufer (1996).
12 Cooper *et al.* (1952), Stevens & Blumstein (1978) and Lieberman & Blumstein (1988).
13 Docherty (1992) finds word-initial /p/ having a VOT of around 40 msecs and /t,k/ a VOT of around 60 msecs. See also Gonet & Różańska (2003).
14 Macken & Barton (1980).
15 Byrd (1992b).
16 For articulatory overlap in plosive clusters, see Byrd (1994).
17 If the alveolar plosive is articulated as such. See §§9.2.8, 12.4.5.
18 Bladon & Nolan (1977).
19 Catford (1964, 1977), Laver (1980).
20 Christophersen (1952), O'Connor (1952), Andrésen (1958, 1968), Higginbottom (1965), Roach (1973).
21 Fabricius (2002b).
22 Wells (1982: 341, 344, 374, 416).
23 Abercrombie (1948).
24 The different length of friction as between the fricative element of an affricate and a fricative following a plosive is shown by a comparison of the affricated /t/ in *cat* [kat^{s}] and the longer friction of the plural form *cats* /kats/ or between *ratchet* /ˈraʧɪt/ and *rat shit* /ˈrat ʃɪt/. Dialectal affrication of /t,d/ is, however, more common initially (where /t,d/ + /s,z/ is rare) than finally, being inhibited in final positions by the risk of confusion with the inflected forms.
25 In words like *mattress* /tr/ may be analysed as one complex unit having ambisyllabic status (see §5.5.2).
26 Fromkin (1971).
27 Strevens (1960).
28 In the latest versions of the chart of the International Phonetic Alphabet (see Table 1) the fricatives [ʃ,ʒ], and hence by implication the affricates [ʧ,ʤ], are labelled 'post-alveolar'. In this book the former label 'palato-alveolar' is retained as more closely indicating the palatalised alveolar articulation of these sounds. The term 'post-alveolar' is kept for GB /r/ (= [ɹ]) which is simply labelled 'alveolar' on the new chart (see further under §9.7.2).
29 Stone (1990), Stone *et al.* (1992).

30 Subtelny *et al.* (1966), Malécot (1968).
31 Haggard (1978), Docherty (1992).
32 Denes (1955), Wiik (1965).
33 Subtelny *et al.* (1966), Malécot (1968).
34 Maddieson (1984: 43) found only 3.5 per cent of the 317 languages in his survey had 11 or more fricatives.
35 Hughes & Halle (1956), Strevens (1960), Jongman (1989), Amerman & Parnell (1992), Scully *et al.* (1992), Stevens *et al.* (1992).
36 Stevens *et al.* (1992) found that an interval of at least 60 msecs was necessary for an intervocalic fricative to be perceived as voiceless.
37 Stevens *et al.* (1992).
38 Jongman *et al.* (2000).
39 Clusters with a /θ/ are often simplified by its omission.
40 An epenthetic /p/ may be inserted, thus /traɪʌmpfs/. Cf. §§9.4.5(2) and 10.8(3).
41 Note the accepted forms of *o'clock*, *will-o'-the-wisp* and the variants of *man-of-war*, *tug-of-war*, with /ə/ rather than /əv/ for *of*. (See §12.4.6(2).)
42 Clusters with a /θ/ are often simplified by its omission.
43 An epenthetic /p/ may be inserted, thus /wɔːmpθ/. Cf. §§9.4.5(2) and 10.8(3).
44 /ð/ does not occur in word-initial clusters.
45 See Kerswill (2003) which gathers reports showing it as early as the eighteenth century in London and Bristol and in the second half of the twentieth century in places as far apart as Glasgow, Newcastle, Norwich and Plymouth.
46 /z/ does not occur in an initial cluster apart from /zj/ in *zeugma* and *Zeus* (in which /ˈzjuːgmə/ and /zjuːs/ alternate with /ˈzuːgmə/ and /zuːs/).
47 See Stone (1990) for the grooving of /s,z/.
48 Bladon & Nolan (1977) found a majority of speakers using a blade articulation.
49 Similar epenthesis may occasionally take place in sequences of nasals + other voiceless fricatives. The epenthetic plosive is always homorganic with the nasal, e.g. *confusion* /kəmˈfjuːʒn/, *convert* /kəmbˈvɜːt/ (= [kəm̥bˈvɜːt]), *anthem* /ˈæntθəm/ (= [ˈæn̪t̪θəm]), *mansion* /ˈmæntʃən/. See §10.8(3).
50 /ʧ,ʤ/, having been treated as single complex phonemic entities, are not considered here as initial or final clusters.
51 An epenthetic /t/ may be inserted, thus /ˈmentʃn(z,d)/. See §§9.4.5(2) and 10.8(3).
52 See Stone (1990) for the grooving of /ʃ,ʒ/.
53 See Trudgill (1999).
54 Liberman *et al.* (1954) and Malécot (1956).
55 Kurowski (1987), Kurowski & Blumstein (1987), Harrington (1994), Repp (1986) and Ohde (1994).
56 See e.g. Trudgill (1974, 1999).
57 See Stone (1990), Stone *et al.* (1992) for the articulation of /l/.
58 O'Connor *et al.* (1957), Lisker (1957b), Dalston (1975).
59 See Sivertsen (1960), Wells (1982), Trudgill (1999).
60 Foulkes & Docherty (2000).
61 O'Connor *et al.* (1957).
62 See Hagiwara (1995).
63 The distinction between those dialects with pre-pausal and pre-consonantal /r/ and those without is often referred to as 'rhotic' vs 'non-rhotic'. But, in view of the fact that some accents have variable degrees of /r/ in these positions both in terms of frequency and in the amount of tongue retroflexion, it would be more precise to describe dialects in terms of their degree of rhoticity. See Windsor Lewis (2008).
64 O'Connor *et al.* (1957).
65 Wells (1982: 229 and 2008: xiii).
66 Frequencies are conflated from Fry (1947) and Knowles (1987). See also Carterette & Jones (1974) and Mines *et al.* (1978).

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Part III

Words and connected speech

Despite our detailed descriptions of individual vowels and consonants in Chapters 8 and 9, it is in practice by no means easy to analyse articulatory or acoustic data from natural speech into discrete, successive units. In reality speech is an ever-changing continuum of qualities, quantities, pitches and intensities. The units with which we describe speech are largely derived (consciously or unconsciously) from a knowledge of the meaningful distinctions found in a language, i.e. the different words, morphemes and phonemes. A useful phonetic/phonemic account of speech describes those articulatory or auditory features which compose the phonemes of a language. But it must not be forgotten that such a linear sequence of phonemes is an abstraction from the continuously changing material of speech. In this respect, the sophisticated written form of English differs from the spoken manifestation of the language, for our writing explicitly represents a succession of discrete linguistic units—phonemes (nowadays only imperfectly because of our many spelling irregularities) and words.

If, however, for convenience, our analysis is based on discrete phonemic units, it is necessary to take into account the way in which such units combine in speech —both in words and in connected speech; thus, the aim of the following chapters is to show how phonemes combine in words and how varying accentual patterns apply to the syllables of words (Chapter 10), how accentual and intonational patterns occur on groups of words and sentences (Chapter 11) and how the citation forms of words change in connected speech (Chapter 12).

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Chapter 10

Words

10.1 Accent

Words are made up of phonemes as shown by meaningful contrasts, e.g. the /t/ and /d/ contrast in *writer* /raɪtə/ and *rider* /raɪdə/. Polysyllabic words have an additional identity determined by the relationship of their parts. Thus *writer* and *rider* have a pattern consisting of a strong syllable followed by a weak syllable. But in the case of *return* /rɪˈtɜːn/ the pattern is reversed: we have a weak syllable followed by a strong syllable. The identity of *return* compared with *writer* and *rider* depends not only on the different sequence of phonemes but also on the different patterns produced by the varying prominence of their syllables. The syllable or syllables of a word which stand out from the remainder are said to be accented, to receive an ACCENT.

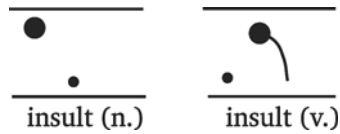
The accentual pattern of English words is fixed, in the sense that the primary accent always falls on a particular syllable of any given word,[1] but free, in the sense that the primary accent is not tied to any particular point in the chain of syllables constituting a word, as it is in some languages, e.g. to the penultimate syllable in Polish, to the first in Czech and to the last in French. Thus, in English the primary accent falls regularly on the first syllable in such words as *finish*, *answer*, *afterwards*; on the second syllable in *behind*, *result*, *together*, *impossible*; on the third syllable in *understand*, *education*; or later in *articulation*, *palatalisation*, etc.

The accentual shape of a word, in terms of the degree of prominence associated with its parts, is a reality for both the speaker and the listener; but the speaker's impression of the factors which produce such a pattern of varying prominences may differ from the actual auditory cues by which the listener perceives the prominence pattern. It is, therefore, necessary to examine the factors which in English are significant both for the speaker and for the listener in producing the communicated effect of accent.

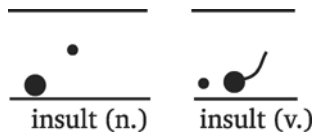
10.2 Accent and prominence

Any of four factors, pitch, loudness, quality and quantity, may help to render a syllable more prominent than its neighbours. But it is principally pitch change which marks an accented syllable.

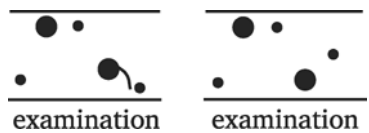
(1) *Pitch change*—The principal cue to accent is pitch prominence, which depends as much upon pitch change as pitch height. The different accentual patterns of *insult* (noun) and *insult* (verb) are easily distinguished by their pitch patterns. If a falling intonation is used, the fall occurs on the first syllable of the noun and on the second syllable of the verb:



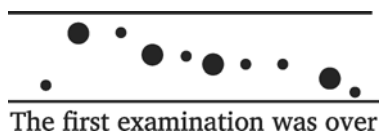
similarly, if a rising intonation is used, the rise begins on the first syllable and the second syllable respectively, (in these so-called 'interlinear' diagrams syllables are indicated by dots and accented syllables by large dots):



Pitch changes may make prominent more than one syllable in a word; thus *examination*:



or, within a phrase like the following, where the first three accented syllables show a change of pitch level while the last accent involves a change of pitch direction:



The final pitch accent in a word or in a group of words is usually the most prominent (and hence referred to as the PRIMARY ACCENT) while a pitch accent on an earlier syllable is usually somewhat less prominent (and referred to as SECONDARY ACCENT).

(2) *Loudness*—Accented syllables are often assumed to be louder than unaccented syllables and in most cases this is so. Greater loudness is carried principally by voiced sounds, in which greater amplitude of vibration of the vocal cords, together with the reinforcing resonance of the supraglottal cavities, results in acoustic terms in relatively greater intensity. This strong intensity and the perceived loudness on the part of the listener results from the relatively greater breath effort and muscular energy expended on the articulation of a sound by the speaker. This effort and energy is frequently referred to as 'stress' although, because of the many different ways in which this word has been used, it is avoided in this book. Loudness is not by itself an efficient device for signalling the location of the accent in English. When they are said on a monotone and without undue lengthening of accented syllables, it is difficult to distinguish by loudness alone *in`sult* (v.), *im`port* (v.), *be`low*, from *`insult* (n.), *`import* (n.), *`billow*, words in which different accentual patterns are not backed up by qualitative differences in the vowels.

(3) *Quantity and quality*—While accent is principally achieved by pitch change, sometimes assisted by extra loudness, among unaccented syllables some will be more prominent than others due to the quality and quantity of the vowels at their centre. (For varying prominence among sounds more generally, see §5.5). Long vowels and diphthongs are generally more prominent than short vowels, while among the short vowels themselves /ɪ,i,ʊ,ə/ are the least prominent and, when not accented by pitch or loudness, are often referred to as REDUCED (non-reduced vowels are said to be FULL). As far as prominence is concerned, syllabic consonants are considered to be sequences of /ə/ plus /l,m,n,ŋ/ and hence are equivalent to reduced vowels. The reduced vowels are so lacking in prominence that they have a high frequency of occurrence in unaccented as opposed to accented syllables, with /ə/ occurring in citation forms only in unaccented syllables (though it may sometimes be accented in connected speech). Despite the lesser prominence of all short vowels, a long vowel in an unaccented syllable is sometimes longer than a short vowel in an adjacent accented syllable, e.g. *pillow* /`pɪləʊ/, *ally* /`alaɪ/, *frontier* /`frʌntɪə/, *placard* /`plakɑːd/, *record* /`rekɔːd/, *expert* /`ekspɜːt/. In similar cases where the unaccented syllable precedes the accent there is often alternation between a full and reduced vowel, e.g. *July* /ʤuː`laɪ/ /ʤə`laɪ/, *November* /nəʊ`vembə/ /nə`vembə/, *proceed* /prəʊ`siːd/ /prə`siːd/, *September* /sep`tembə/ /səp`tembə/. Some dialects, e.g. those of parts of northern England, are more likely to retain the full vowel in these positions, particularly in monosyllabic prefixes, e.g. *obtain* /ɒb`teɪn/ /əb`teɪn/, *contain* /kɒn`teɪn/ /kən`teɪn/, *continue* /kɒn`tɪnju/ /kən`tɪnju/, *expect* /ek`spekt/ /ɪk`spekt/ or /ək`spekt/. In some disyllables (both in GB and in other dialects) there may be alternation in the position of the primary accent with consequent alternation in the use of a full or reduced vowel, e.g. *adult* /`adʌlt/ vs /ə`dʌlt/, *contact* (v.) /`kɒntakt/ vs /kən`takt/.

(4) *Conclusion*—There are therefore four degrees of prominence in English:

(a) primary accent, marked by the last major pitch prominence in a word (or longer utterance);
(b) secondary accent, marked by a non-final pitch prominence in a word (or longer utterance);
(c) a minor prominence produced by the occurrence of a full vowel without pitch prominence;
(d) a non-prominent syllable containing no pitch prominence and one of the reduced vowels /ɪ,i,ʊ,u,ə/.

10.3 Word accentual patterns[2]

Although many longer words contain primary accented syllables, secondary accented syllables and prominent syllables based on vowel quality alone, it is the position of the primary accent which contributes most to a word's accentual pattern (and which will be the principal cue to the nuclear tone (see §11.6.1.2)). Attempts to reduce the placement of primary accent in English words to a set of rules are bedevilled by the existence of large numbers of exceptions to almost any rule. The following sections should therefore be regarded as stating tendencies rather than absolute rules. The status of the final syllable as strong or weak (together with the grammatical class of the word) often governs primary accent placement. Syllables are here counted as STRONG when they contain a long vowel or a diphthong or a short vowel plus two consonants; otherwise they are WEAK.

English words may be divided into ROOTS which are can stand alone as words and which have no AFFIXES attached, e.g. *fool*, *be`gin* and *under`stand*. Affixes include both SUFFIXES like *-ative* in *argu`mentative* and PREFIXES like *mis-* in *misrule*. STEMS are the base to which an affix is attached, which can be a root as in *nation-al*, sometimes referred to in what follows as a free stem; or the stem can be one which cannot stand alone, as in *ephemer-al*, *tremend-ous*, *hospit-able*, referred to below as a bound stem.

10.3.1 Roots

Somewhat different tendencies apply to verbal, adjectival and nominal roots. Among other word classes, adverbs are generally derived from adjectival roots with no alteration to the accentual pattern, while the remaining classes consist of many monosyllabic words, with those few of more than one syllable having no regularity in their accentual patterns.

(1) *Verbs*

(a) If the final syllable is strong, it is accented, e.g. /rɪ`leɪt/, /ʧas`taɪz/, /ə`raɪv/, /meɪn`teɪn/, /ə`kɜː/, /pə`siːv/, /wɪð`həʊld/, /wɪð`stand/, /pə`sweɪd/,

/entə`teɪm/, /rɪ`fjuːz/, /ə`griː/, /kən`vɜːt/, /kən`vɪkt/, /kən`teɪm/, /ɪŋ`kluːd/, /əʊvə`teɪk/, /rɪ`dʒekt/, /ʌndə`stand/, /dɪs`laɪk/, /ə`dɔːn/, /bɪ`liːv/, /priːsə`pəʊz/, /ɪm`vɒlv/, /rekə`mend/, /rɪ`maɪnd/, /ɪn`tend/

(b) Otherwise accent falls on the penultimate syllable, e.g. /sə`rendə/, /`wɪspə/, /`pɒlɪʃ/, /`pʌnɪʃ/, /dɪ`veləp/, /`wɜːʃɪp/, /`vɪzɪt/, /`galəp/, /`travəl/, /ə`stɒnɪʃ/, /ɪg`zamɪn/, /`lɪsən/, /ɪ`madʒɪn/, /rɪ`zembəl/

Some exceptions:

unaccented strong final syllables: /`rekəgnaɪz/, /`rɪəlaɪz/
accented weak final syllables: /ɪm`pres/, /pə`zes/, /bɪ`gɪn/, /fə`get/, /fə`bɪd/, /pə`mɪt/

(2) *Adjectives*

(a) If the final syllable is strong, it is accented, e.g. /mə`tjʊə/, /sɪ`kjʊə/, /ə`freɪd/, /ə`sliːp/, /kəm`pliːt/, /ɪk`striːm/, /ə`brʌpt/, /sə`blaɪm/, /ə`ləʊn/

(b) Otherwise accent falls on the penultimate syllable or (with reduced vowel on the penultimate) on the antepenultimate, e.g.

penultimate: /ɪk`sesɪv/, /`njuːtrəl/, /`sɒlɪd/, /`klevə/, /`feɪməs/, /`rɪdʒɪd/, /ɪk`splɪsɪt/, /kɒnfɪ`denʃəl/
antepenultimate: /`nesəsri/, /`deɪndʒərəs/, /`dɪfɪkəlt/, /`defɪnət/, /`ɪntrəstɪŋ/, /`pɒsəbəl/, /`mɑːvələs/, /`ɪntɪmət/

Some exceptions:

strong final syllables, unaccented: /`mɒrɪbʌnd/, /`tantəmaʊnt/, /`arəgənt/, /`ɪmpɔːtənt/

(3) *Nouns*

(a) If the final syllable is strong, it is *optionally* accented, e.g. /dɪs`pjuːt/, /ɑːftə`nuːn/, /kaŋgə`ru/, /ka`ʃɪə/, /aɪ`dɪə/, /ʃam`peɪn/, /kə`tɑː/, /bə`luːn/, /pə`liːs/, /mə`ʃiːn/

(b) Otherwise primary accent falls on the penultimate syllable or (with reduced vowel on the penultimate) on the antepenultimate or, rarely, on the ante-antepenultimate, e.g.

strong final syllable, penultimate accent : /`prəʊfaɪl/, /tə`mɑːtəʊ/, /tə`bakəʊ/, /pə`teɪtəʊ/, /`wɪndəʊ/, /`pɪləʊ/, /`arəʊ/, /`feləʊ/, /`wɪləʊ/, /`wɪdəʊ/, /sə`prɑːnəʊ/, /`məʊmənt/, /`sʌfɪks/, /`barəks/, /`ɪnɪŋz/
strong final, antepenultimate accent: /`anəkdəʊt/, /`farənhaɪt/, /`pedɪgriː/, /`apətaɪt/, /`katərakt/, /ə`setɪliːn/, /`teləfəʊn/, /`antɪləʊp/
weak final, penultimate accent: /ɪŋ`kaʊntə/, /`laŋgwɪdʒ/, /`patən/, /kəm`plekʃən/, /`peɪpə/, /`feɪvrɪt/, /`ʧɒklət/, /`vɜːmɪn/
weak final, weak penultimate, antepenultimate accent: /`kwɒntɪti/, /`dɪsəplɪn/, /`kamərə/, /`hɪstəri/, /ə`naləsɪs/, /`evɪdəns/, /raɪ`nɒsərəs/, /`ɪməsəns/

weak final, weak penultimate and antipenultimate, ante-antepenultimate accent: /ˈhelɪkɒptə/, /ˈteləvɪʒən/

Some exceptions:

weak final accented: /həʊˈtel/, /pɜːsəˈnel/ (*personnel*), /sɪgəˈret/ (but /ˈsɪgəret/ in GA)
weak penultimate accented: /vəˈnɪlə/, /ɪnˈsɪpɪd/, /ˈmɪnɪt/

It should particularly be noted that there are two competing accent patterns for nouns with strong final syllables, one with final accent and one with an earlier accent. The final syllable in the case of (3)(b) is sometimes said to be 'extrametrical', i.e. outside the rhythm of the word.

Cigarette illustrates the problem of deciding whether to treat a word as a single root or as a sequence of stem plus affix, e.g. treating it as an unanalysed root produces an exceptional accentual pattern for GB, i.e. *ˈcigarette* but one which is correct for GA. Whereas an analysis into stem *cigar* plus suffix *-ette* (next section) produces the correct accentual pattern *ciga'rette* for GB in the same way that *disk* becomes *dis'kette*.

10.3.2 Suffixes

Suffixes may be added to a root as stem, e.g. *nation~national*, or the stem may consist of an already combined root plus suffix, e.g. *national~nationalist~nationalistic*. Many suffixes have no effect on the accentual pattern of stems and hence are called ACCENT-NEUTRAL; the primary accent remains where it is in the stem, e.g. *ˈbitter~ˈbitterness*. Many other suffixes regularly take the accent themselves (are ACCENT-ATTRACTING), e.g. *ˈdisc~dis'kette*. A smaller and less predictable number of suffixes have the effect of fixing the accent on a particular syllable of the stem (are ACCENT-FIXING). The accent can be fixed on the final syllable of the stem, e.g. *ˈsensitive~sensi'tivity*, or on the penultimate syllable of the stem, e.g. *ig'nore~ˈignorance*. Where more than one suffix is applied to a stem, the last suffix determines the word's accentual pattern, e.g. *fa'miliar~famili'arity~familiari'sation*. There are some endings deriving principally from Greek which are like suffixes but which are attached to beginnings also from Greek and in which neither element has a greater claim to be considered as the stem, e.g. *phonograph, microscope*. These are not treated in this section, but dealt with under §10.3.5 as compounds, since their accentual patterning is similar to compounds.

It should be remembered again that the following sections deal only in tendencies and not absolute rules. A distinction is made between inflexional suffixes, which do not change the word class, e.g. *full~fuller*, and derivational suffixes which do change the word class, e.g. *lead~leader*.

(1) *Accent-neutral suffixes*—Included in this category are all inflexional and many common derivational suffixes. Some inflexions are non-syllabic like

plural, possessive and third person singular *-s* (but these are syllabic following /s,z,ʃ,ʒ,ʧ,ʤ/—see §10.10.4) and past tense *-t* (this is syllabic following /t,d/—see again §10.10.4); other inflexions are monosyllabic like *-er*, *-est* (comparative, superlative) and *-ing* (progressive). Most derivational suffixes ending in *-y* (or *-ie*) (e.g. *-ary*, *-ery*, *-ory*, *-cy*, *-acy*, *-ty*, diminutive *-y* or *-ie*, adjectival *-y* and adverbial *-ly*) are accent-neutral, e.g. *in`firm~in`firmary*, *`celibate~`celibacy*, *`difficult~`difficulty*, *`pot~`potty*, *`bag~`baggy*, *`usual~`usually*. Other suffixes in this category include *-ish*, *-ism*, *-ist*, *-ise*, *-ment* and agentive *-er* and *-ess*, e.g. *`fool~`foolish*, *`alcohol~`alcoholism*, *`separate~`separatist*, *`circular~`circularise*, *disa`gree~disa`greement* (but note in particular the irregular *`advertise~ad`vertisement*), *lead~`leader* and *`lion~`lioness*. The suffix *-ative* generally belongs here, e.g. *`quality~`qualitative*, *pre`serve~pre`servative*, *repre`sent~repre`sentative*, *de`rive~de`rivative*. But there are exceptions which usually involve rightward movement, e.g. *`demonstrate~de`monstrative*, *`argument~argu`mentative*, *in`terrogate~inter`rogative*, *`alternate~al`ternative*.

(2) *Accent-attracting suffixes*. Some common derivational suffixes in this category are *-ade*, *-eer*, *-esque*, *-ette* and *-ation*, e.g. *es`cape~esca`pade*, *`mountain~mountai`neer*, *`picture~pictu`resque*, *`usher~ushe`rette*, *`private~privati`sation*. Verbal *-ate* belongs here in disyllables, e.g. *mi`grate* (where *mi-* is a bound stem) (cf. GA *`migrate*).

(3) *Accent-fixing suffixes*.

(a) On final syllable of stem. Here belong *-ic*, *-ion* and *-ity*, e.g. *`chaos~cha`otic*, *de`vote~de`votion*, *`curious~curi`osity*. In the case of *-ion* most words are formed from free disyllabic verbal stems accented on the second syllable and *-ion* could therefore equally well be regarded as accent-neutral.

(b) On penultimate syllable of stem. The number in this category is small, the most important being verbal *-ate* in words of more than two syllables, most involving bound forms, e.g. *in`augurate*, *exco`mmunicate*, *`operate*. Here also belongs *-itive*, e.g. *intu`ition~in`tuitive*, *po`sition~`positive*.

(c) On final or penultimate syllable of stem according to the weight of the final syllable. Here are *-ency* and adjectival *-al*, e.g. *`presidency* but *e`mergency*, *`pharynx~pha`ryngeal* but *`medicine~me`dicinal*.

(d) A number of suffixes vacillate between two patterns. A common one is *-able* which is in most cases accent-neutral e.g. *a`dore~a`dorable*, *com`panion~com`panionable*, *`question~`questionable*, *`realise~`realisable*, *`reconcile~`reconcilable*. However, in a number of disyllabic stems with accent on the final syllable the accent may be shifted to the first syllable of the stem: *`admirable*, *`applicable*, *`comparable*, *`despicable*, *`disputable*, *`lamentable*, *`preferable*, *`reputable*, *(ir-)`reparable*. But the general pressure from the accent-neutrality of *-able* often leads to alternative pronunciations of these words with the accent on the final syllable of the stem, e.g.

ad`mirable, a`pplicable, com`parable, de`spicable, di`sputable, la`mentable, pre`ferable, re`putable, re`parable.* To add to the confusion there are some changes (again optional) in the opposite direction, e.g. *`demonstrate~de`monstrable; `extricate~(in-)ex`tricable, `realise~rea`lisable, `reconcile~recon`cilable (all of which have an alternative form with initial accent). The simplest statement is that it is possible to treat all as accent-neutral.

10.3.3 Prefixes

Prefixes are generally accent-neutral, e.g. *de-*, *dis-*, *in-* (and various assimilated forms like *il-*, *im-*, *in-*, *ir-)*, *mal-*, *mis-*, *pseudo-*, *re-*, *sub-* and *un-*, e.g. *de`foliate, disin`genuous, inco`rrect, i`lliterate, imma`ture, i`rreverent, mal`function, misre`port, pseudoscien`tific, rede`sign, sub`standard, un`necessary.* In general such prefixes result in a doubled consonant when the prefix-final and the stem-initial consonant are identical, e.g. *un`necessary* is pronounced with a double length [n:]. (This rule does not apply to *in-* and its variants, so, for example, *i`llogical* is pronounced with only a single /l/.)

10.3.4 Secondary accent[3]

When words have more than one syllable before or after the main accent, a general rhythmical pattern is often apparent, there being a tendency to alternate more prominent and less prominent syllables. Syllables made prominent in this way will retain a full vowel; additionally syllables before the primary accent will often receive a secondary accent involving pitch prominence (see §10.2(1) above). If there is only one syllable before the primary accent, this is usually unaccented and has a reduced vowel[4] e.g. *a`pply, con`cern, a`round, de`ceive,* etc. If there are two syllables before the primary accent, the first will often receive a secondary accent, e.g. *'rhodo`dendron, 'medi`eval, 'repre`sent, 'maga`zine.* Indeed as indicated by pattern (3) under §10.3.1, primary accent shows a tendency to move to the position of the secondary accent, producing, for example, *maga`zine* in GB but *`magazine* in GA (see also alternating accent under §10.4). Where there are more than two syllables before the primary accent, a secondary accent will fall two or three syllables back according to the presence of a full vowel, e.g. *in'feri`ority, en'thusi`astically,* but *'circumlo`cution, 'characte`ristically.* As in everything concerned with word accent in English, all of this section should be taken as indicating tendencies rather than rules that are without exception.

10.3.5 Compounds

COMPOUNDS are composed of more than one root morpheme but function grammatically and/or semantically as a single word.[5] In most cases the two roots are free morphemes themselves, e.g. as in *blackbird*: the largest type of exception

to this concerns the PSEUDO-COMPOUNDS under (3) below. Compounds are grammatically unitary when the combination of the grammatical classes of its two elements would not normally function as the type of constituent which the compound does, e.g. *daybreak* is composed of the noun *day* plus the verb *break* but such a combination noun-verb does not normally constitute a noun phrase functioning as the subject of a sentence as the compound does in *Daybreak comes early in summer.* A compound is semantically unitary because it has a meaning representing a specialised conjunction of the meanings of its two components, e.g. *glasshouse* is indeed loosely a type of house and is made of glass but the compound cannot be used to describe any sort of glass house. Compounds may be written as one word as with *daybreak* and *glasshouse*, or with a hyphen as in *clear-cut*, or with a space between the two elements, as in *working party*; there is no systematic practice in the choice among these three ways, although there is a tendency for compounds with primary accent on the first element to be written as one word or with a hyphen and for those with the primary accent on the final element to be written as two words.

The primary accent in compounds is most commonly on the first element, e.g. *ˋdaybreak*, *ˋglasshouse* and in some cases this type of accentuation will distinguish the compound from a more productive phrasal pattern, e.g. *glass ˋhouse* (but note that a contrastive accent within the phrase will produce the same pattern as the compound, e.g. *This is a ˋbrick house, not a ˋglass house*). There are, however, many compounds (judged as such on grammatical and semantic criteria) which have the same pattern as phrases, e.g. *Oxford ˋRoad.* There are also often differences between the accentuation of compounds in GB and in GA, e.g. GB *ˈhorse ˋchestnut*, *ˈstage ˋmanager*, *ˋseason ticket*, compared with GA *ˋhorse chestnut*, *ˋstage manager*, *ˈseason ˋticket.* Where the primary accent is on the second element, a secondary accent is usual on the first element. Where the primary accent is on the first element, a full vowel is usually retained in the final element. In the following sections the principal types of compound are exemplified together with their usual accentual patterns.

(1) *Compounds functioning as nouns*—This is by far the most frequent type of compound (and accounts for approximately 90 per cent). Three subtypes (a), (b), (c) can be distinguished:

(a) ˋN(oun) + N(oun) (around 75 per cent of compound nouns)—*aˋdrenaline tourism*, *ˋalcohol abuse*, *ˋbank account*, *ˋbar code*, *ˋbirthplace*, *ˋblood-money*, *ˋbomb factory*, *ˋbottle bank*, *ˋbreadcrumbs*, *car ˋboot sale*, *ˋchild abuse* (but cf. *child ˋbenefit*), *comˋpassion fatigue*, *comˋputer virus*, *conˋtrol freak*, *ˋcrime rate*, *ˋdeckchair*, *deˋsigner steroid*, *ˋdrug addict*, *ˋenterprise culture*, *ˋfun run*, *ˋgrief inflation* (three-minute rather than one-minute silences), *ˋguidebook*, *ˋkeyboard*, *ˋlager lout*, *ˋlaptop*, *ˋlifestyle*, *ˋmountain bike*, *ˋnursemaid*, *ˋozone layer*, *ˋpeace dividend*, *poˋlice force*, *ˋpressure group*, *ˋracehorse*, *ˋroad rage*, *ˋseaside*, *ˋshopping centre*, *ˋslummy*

mummy (slatternly mother), *`spin doctor*, *`stock exchange*, *`tape measure*, *`theme park*, *`toilet roll*, *`torture victim*, *`wheelbarrow*, *`yield management.* Included here are examples involving nouns in final position formed from V(erb) + *er* e.g. *`bodyscanner*, *`bricklayer*, *`cash dispenser*, *`screwdriver*, *`screensaver.*

Some general categories of exception to the accentual pattern of `N + N are:

(i) where the second item is 'made' of the first item, e.g. *apple `pie* (but cf. *`apple tree)*, *banana `split* (but cf. *`orange juice*), *brick `wall*, *chocolate `biscuit*, *clay `pigeon*, *cotton `wool* (cf. *`lambswool)*, *dirt `road* (cf. *`footpath*), *elderberry `wine*, *feather `pillow*, *fruit `salad*, *ice`cream*, *paper` bag* (cf. *`paper clip*), *rice `pudding* (but cf. *`ricepaper*)

(ii) where N1 is a name: *Bermuda `triangle*, *Euston `station*, *Christmas `pudding* (but cf. *`Christmas card*, *`Christmas cake*, the latter because *cake* generally produces a pattern of `N + N, e.g. *`carrot cake*, *`Eccles cake*, *`chocolate cake*, *`cheesecake*), *Highland `fling*, *Humber `bridge*, *knickerbocker `glory*, *Lancashire `hotpot*, *London `Road* (*Road* always induces this pattern whereas *Street* induces `N+N, e.g. *`Oxford Street*), *Manchester U`nited*, *Mexican `wave*, *Neanderthal `man*, *Norfolk `terrier*, *Piccadilly `Circus*, *Thames `estuary*, *Turkish de`light.* (An exception to the exceptional category is *Ale`xander technique.*)

(iii) where both N1 and N2 are equally referential: *acid `rain*, *aroma`therapy*, *banner `headline*, *barrier `reef*, *boy so`prano*, *cauliflower `cheese*, *fridge-`freezer*, *garden `suburb*, *infant `prodigy*, *junk `food.*

(iv) where N1 is a value, e.g. *100% `effort*, *dollar `bill*, *fifty p. `change*, *pound `coin*, *five pound `note*, *ten p. `piece.*

Some other particular exceptions to the `N + N pattern are: *bay `window* (and all involving *window* in final position), *Channel `ferry*, *combine `harvester*, *county `council*, *daylight `robbery*, *day re`lease*, *keyhole `surgery*, *kitchen `sink*, *morning `paper*, *office `party*, *star `turn*, *trade `union*, *week`end.*

(b) `A(djective) + N, `N's + N, `N + V, `V + N, `N + Ving, `Ving + N—*`batting average*, *`boardsailing*, *`bridging loan*, *`building society*, *`bull's eye*, *`chargecapping*, *`crow's nest*, *`drinking water*, *`ear-splitting*, *`eating apple*, *`faintheart*, *`fly tipping*, *`hack saw*, *`handbagging*, *`job sharing*, *`joy riding*, *`landfill*, *`mind boggling*, *`pay cut*, *`pickpocket*, *`poll capping*, *`search party*, *`shop lifting*, *`skateboarding*, *`statesperson*, *`windsurfing.* (There are many exceptions, particularly in the case of `Ving + N, e.g. *alternating `current*, *flying `saucer*, *living `memory* and also *black `economy*, *compact `disc*, *insider `dealing.*) Compounds involving these patterns are much less productive than those under (a) above.

(c) Phrasal and prepositional verbs used as nouns—*`burn-out, `buyout, `cock-up, `lay-offs, `let-down, `melt-down, `rave-in, `ring-around, `run around, `set-up, `showdown, `work-around.* Note also *`bypass.*

(2) *Compounds functioning as adjectives and verbs*—These are much more limited in number than those under (1). They divide fairly evenly between those with initial accent and those with final accent:

(a) Adjectives:

(i) with initial accent: *`bloodthirsty, `gobsmacked, `headstrong, `hen-pecked, `ladylike, `moth-eaten, `seasick, `sell-by* (*date*), *`dumbstruck, `trustworthy, `waterproof, `workshy.* Those compound adjectives where N is a special application of A generally take this pattern, e.g. *`carefree, `lovesick,* as do those involving N + past participle, e.g. *`bedridden, `sunlit, `time-honoured, `weather-beaten.*

(ii) with final accent: *deep-`seated, faint-`hearted, good-`natured, ham-`fisted, long-`suffering, long-`winded, rent-`free, skin `deep, sky `blue, stone `dead, tax `free, tight-`knit, user-`friendly.* Those compound adjectives where N modifies an A generally take this pattern, e.g. *dirt `cheap, stone-`deaf,* as do sequences of A + V + ing and A (or ADV) + A, e.g. *easy `going, high `flying, long `suffering, over`ripe, over`due, red`hot.*

(b) Verbs—The number of compounds functioning as verbs (if we exclude phrasal and prepositional verbs) is very small. They usually involve initial accent, e.g. *`babysit, `backbite, `badmouth, `browbeat, `headhunt, `sidestep, `sidetrack, `wheelclamp, ring`fence.* The sequence ADV or PREP + V generally takes final accent, e.g. *back`fire, out`number, out`wit, over`sleep, under`go.*

(3) *Pseudo-compounds*—There are some complex words (often of Greek origin) made up of two bound forms which individually are like prefixes and suffixes and it is thus difficult to analyse such words as prefix plus stem or stem plus suffix, e.g. *`microwave, `telegram, `thermostat, an`tithesis, `circumflex, `fungicide, ka`leidoscope, `monochrome, `prototype.* Since they have no clear stem, these sequences are here referred to as pseudo-compounds. From these examples it can be seen that, as with compounds generally, the primary accent usually falls on the first element (but not invariably, e.g. it falls on the second element of *homo`phobic, hypo`chondriac*). The accentual patterns of pseudo-compounds are affected by suffixes as if they were simple stems, thus *`telephone, tele`phonic, te`lephonist; `photograph, pho`tographer, photo`graphic.*

Finally, it should be pointed out that the dividing line between phrase and compound is often difficult to draw. It is particularly difficult in those cases where the sequence of word classes involves regular constituents of a phrase

(and where the primary accent is kept on the second item) but where the collocation has become idiomatic (i.e. semantically specialised), as, for example, in *ethnic `cleansing, global `warming, third `world*, where A and N are regular constituents of a noun phrase but where the sequence has acquired a specialised meaning.

10.4 Word accentual instability

Variation in the accentual patterns of particular words occurs as the result of rhythmic and analogical pressures, both of which often also entail changes in vowels and, to a lesser extent, consonants.[6]

(1) *Rhythmic changes*—In some words containing more than two syllables there appears to be a tendency to avoid a succession of weak syllables, especially if these have /ə/ or /ɪ/. Thus, in words of three syllables, there is variation between [`--] and [-`-] patterns, e.g. *exquisite* /`ekskwɪzɪt/ or /ɪk`skwɪzɪt/*, *deficit* /`defɪsɪt/* or /dɪ`fɪsɪt/, *integral* /`ɪntɪgrəl/* or /ɪn`tegrəl/, *mischievous* /`mɪʃʧɪvəs/* or /mɪʃ`ʧi:vəs/ (or even /mɪʃ`ʧi:vɪəs/), *inculcate* /`ɪŋkʌlkeɪt/* or /ɪŋ`kʌlkeɪt/, *acumen* /`akjʊmən/* or /ə`kju:mən/, *kilometre* /`kɪləmi:tə/ or /kɪ`lɒmɪtə/*, *sonorous* /`sɒnərəs/* or /sə`nɔ:rəs/, *precedence* /`presɪdns/* or /prɪ`si:dns/, *inventory* /`ɪnvəntərɪ/* or /ɪn`ventərɪ/. There is variation between [-`-] and [--`] in *importune* /ɪn`pɔ:ʧu:n/ or /ɪmpə`ʧu:n/* and between [`--] and [--`] in *premature* /`premətʃə/* or /premə`ʧʊə/.

Similarly, in words of four syllables, there is variation between first and second syllable accenting, e.g. *controversy* /`kɒntrəvɜ:si/ or /kən`trɒvəsi/*, *hospitable* /`hɒspɪtəbl/ or /hɒ`spɪtəbl/*, *despicable* /dɪ`spɪkəbl/* or /`despɪkəbl/, *formidable* /fə`mɪdəbl/* or /`fɔ:mɪdəbl/, *capitalist* /`kapɪtəlɪst/* or /kə`pɪtəlɪst/, *aristocrat* /`arɪstəkrat/* or /ə`rɪstəkrat/, *metallurgy* /`metələ:ʤi/ or /mə`taləʤi/*; and variation in second and third syllable accenting in *centrifugal* /sen`trɪfjʊgl/ or /sentrɪ`fju:gl/*. *Television* now has the pattern /`telɪvɪʒn/* predominantly, the variant /telɪ`vɪʒn/ being less common.

Longer words, too, often exhibit a tendency towards the alternation of accented and unaccented syllables with various rhythmic patterns, e.g. /ɑ:`tɪkjʊlətri/* or /ɑ:tɪkjʊ`leɪtəri/, *Caribbean* /kə`rɪbɪən/ or /karɪ`bi:ən/*, *necessarily* /`nesəsərɪli/ or /nesə`serɪli/*, *inexplicable* /ɪnɪk`splɪkəbl/* or /ɪn`eksplɪkəbl/.

Many compounds are subject to the accentual shift described in §12.3, e.g. *after `noon* but *'afternoon `tea*. Many others may vary in their accentual pattern between GB and GA, e.g. *Adam's `apple* (GB) vs *`Adam's apple* (GA), *peanut `butter* (GB) vs *`peanut butter* (GA), *shop `steward* (GB) vs *`shop steward* (GA), *stage `manager* (GB) vs *`stage manager* (GA), *vocal `cords* (GB) vs *`vocal cords* (GA), *`season ticket* (GB) vs *season `ticket* (GA). As can be seen, nearly all of these involve a shift from final accent in GB to initial accent in GA.

(2) *Analogical changes*—It sometimes happens that a word's accentual pattern is influenced not only by rhythmic pressure but also by the accentual structure of a related word of frequent occurrence. Thus, the ANALOGY of the root forms *apply* /ə`plaɪ/, *prefer* /prɪ`fɜː/, *compare* /kəm`pɛː/, is responsible for the realisation of *applicable*, *preferable*, *comparable* (see also §10.3.2(3)(d)), as /ə`plɪkəbl, prɪ`fɜːrəbl, kəm`pɛːrəbl or kəm`parəbl/ rather than /`aplɪkəbl, `pref(ə)rəbl, `kɒmp(ə)rəbl/*. Again, the existence of *contribution*, *distribution* /ˌkɒntrɪ`bjuːʃn, ˌdɪstrɪ`bjuːʃn/ may account for the pronunciation /`kɒntrɪbjuːt, `dɪstrɪbjuːt/ (*contribute*, *distribute*) instead of the more usual /kən`trɪbjuːt, dɪs`trɪbjuːt/*, where the first syllable is reduced and the last retains only a prominence based on its full vowel. In the case of *dis`pute* (n.) the verb form has generalised (contrary to the usual direction of influence noted in §10.5(2) below).

10.5 Distinctive word accentual patterns

The accentual pattern of a word establishes the relationship of its parts; it may also have a distinctive function in that it opposes words of comparable sound structure (and identical spelling). Such word oppositions (for the most part disyllables of French origin) may or may not involve phonemic changes of quality.

(1) A relatively small number[7] of pairs of noun and verb may differ only in the location of the primary accent, this falling on the first syllable in the nouns and on the second in the verbs. In most cases (though not all) the differing accentual patterns for nouns and verbs can be related to the accentual tendencies of roots given under §10.3.1. Some speakers may reduce the vowel in the first syllable of the verbs to /ə/:

	Noun	*Verb*
accent	/`aksent/ or /`aksnt/	/ak`sent/ or /ək`sent/
digest	/`daɪdʒest/	/daɪ`dʒest/ or /dɪ`dʒest/
torment	/`tɔːment/	/tɔː`ment/
transfer	/`transfɜː/[8]	/trans`fɜː/[8] or /trəns`fɜː/
transport	/`transpɔːt/[8]	/tran`spɔːt/[8] or /trən`spɔːt/

(2) In a somewhat larger number of pairs the occurrence of /ə/ or /ɪ/ in the first syllable of the verb is more regular (although the full vowel may be kept in some dialects outside GB, in particular in northern England). In a few cases there may be a reduction of the vowel in the second element of the noun:

	Noun/Adjective	*Verb*
combine	/`kɒmbaɪn/	/kəm`baɪn/
compress	/`kɒmpres/	/kəm`pres/
concert	/`kɒnsət/	/kən`sɜːt/
conduct	/`kɒndʌkt/	/kən`dʌkt/
consort	/`kɒnsɔːt/	/kən`sɔːt/

contract	/ˈkɒntrakt/	/kənˈtrakt/
contrast	/ˈkɒntrɑːst/	/kənˈtrɑːst/
convict	/ˈkɒnvɪkt/	/kənˈvɪkt/
desert	/ˈdezət/	/dɪˈzɜːt/
export	/ˈekspɔːt/	/ɪkˈspɔːt/
object	/ˈɒbdʒɪkt/	/əbˈdʒekt/
perfect	/ˈpɜːfɪkt/	/pəˈfekt/
permit	/ˈpɜːmɪt/	/pəˈmɪt/
present	/ˈpreznt/	/prɪˈzent/
proceeds	/ˈprəʊsiːdz/	/prəˈsiːdz/
produce	/ˈprɒdʒuːs/	/prəˈdʒuːs/
progress	/ˈprəʊgres/	/prəˈgres/
project	/ˈprɒdʒekt/	/prəˈdʒekt/
protest	/ˈprəʊtest/	/prəˈtest/
rebel	/ˈrebl/	/rɪˈbel/
record	/ˈrekɔːd/	/rɪˈkɔːd/
refuse	/ˈrefjuːs/	/rɪˈfjuːz/[9]
segment	/ˈsegmənt/	/segˈment/
subject	/ˈsʌbdʒɪkt/	/səbˈdʒekt/
survey	/ˈsɜːveɪ/	/səˈveɪ/

Several disyllables do not conform to the general noun/verb accentual patterns or exhibit instability, e.g. *comment* /ˈkɒment/ for both noun and verb; *contact* /ˈkɒntakt/ (n.) and /ˈkɒntakt/, /kɒnˈtakt/ or /kənˈtakt/ (v.); *detail* /ˈdiːteɪl/ (n.) and /ˈdiːteɪl/ or /diːˈteɪl/ (v.); *contrast* has a verbal form /ˈkɒntrɑːst/ in addition to the more usual form given above. The verb *survey* may have the same accentual pattern as the noun in the particular sense of 'to carry out a survey'. In all these cases the noun form is tending to supersede the verbal pattern (but note /dɪsˈpjuːt/, mentioned in §10.4(2) above, where the verb form has been generalised).

Some words containing more than two syllables also exhibit distinctive patterns (in some cases the distinction lies only in the reduced or full vowel in the last syllable):

	Noun/Adjective	*Verb*
associate	/əˈsəʊsjət, -siət, -ʃət/	/əˈsəʊsieɪt, əˈsəʊʃieɪt/
attribute	/ˈatrɪbjuːt/	/əˈtrɪbjuːt/
compliment	/ˈkɒmplɪmənt/	/kɒmplɪˈment/ /ˈkɒmplɪment/
envelope/envelop	/ˈenvələʊp/	/ɪnˈveləp/
estimate	/ˈestɪmət/	/ˈestɪmeɪt/
interchange	/ˈɪntəʧeɪnʤ/	/ɪntəˈʧeɪnʤ/
prophecy/prophesy	/ˈprɒfəsi/	/ˈprɒfɪsaɪ/
reprimand	/ˈreprɪmɑːnd/	/reprɪˈmɑːnd/
supplement	/ˈsʌplɪmənt/	/sʌplɪˈment/ /ˈsʌplɪment/

A small number of adjectives and verbs show a similar relationship in accentual pattern (again with some pairs having only a difference in the last full or reduced vowel):

	Adjective	*Verb*
abstract	/ˈabstrakt/	/abˈstrakt/
absent	/ˈabsənt/	/abˈsent/
frequent	/ˈfriːkwənt/	/friːˈkwent/
alternate	/ɔːlˈtɜːnət/	/ˈɔːltəneɪt/
intimate	/ˈɪntɪmət/	/ˈɪntɪmeɪt/
separate	/ˈsepərət/	/ˈsepəreɪt/

There is alternation between noun and adjective between *compact* /ˈkɒmpakt/ (n.) and *compact* /kəmˈpakt/ (adj.) and between *minute* /ˈmɪnɪt/ (n.) and *minute* /maɪˈnjuːt/ (adj.)

10.6 Acquisition of word accent by native learners

This area appears in general not to be a problem for native learners and, because of the complexities involved, it must be assumed that the accentual patterns of words are learnt individually as they are heard (unlike most foreign learners, young children hear rather than see such new words). This may even apply to morphologically complex words. Children generally place the primary accent on the correct syllable of words. However, they frequently omit unaccented syllables before the primary accent, e.g. *banana* [ˈnɑːnə], *guitar* [tɑː], *elastic* [ˈlati], or, alternatively, all such syllables may be reduced to a single shape, e.g. [rɪˈnɑːnə], [rɪˈtɑː], [rɪˈlati].

10.7 Word accent—advice to foreign learners

Many learners come from language backgrounds where word accent is regular, on the first syllable in Finnish and German, on the penultimate syllable in Polish and Spanish and on the final syllable in French and Turkish. But in English there is no such regular pattern and the differing accentual patterns of words are as important to their recognition as is the sequence of phonemes.

Although the accentual patterns are not as regular as in many other languages, there are nevertheless tendencies and the foreign learner can definitely be helped by learning some of these tendencies. In particular he should pay attention to the influence of suffixes on the placement of primary accent (§10.3.2), noting whether the suffix leaves the accent on the stem unchanged (as with the inflexional suffixes, with adjectival *-y*, with adverbial *-ly* and with *-er* and *-ish*), whether it takes the accent itself (as with *-ation*) or whether it moves the accent on the stem (as with *-ate* and *-ity*).

Learners should also pay particular attention to the role of accentual contrast in those cases where word classes are distinguished by a shift of accent (§10.5),

at the same time making appropriate reduction of unaccented vowels. They should not, however, extend such variation of accentual patterns indiscriminately to all disyllables, e.g. *report*, *delay*, *select*, *reserve*, *account*, which have the same pattern in both verb and noun/adjective functions.

10.8 Elision and epenthesis

Since OE, it has always been a feature of the structure of English words that the weakly accented syllables have undergone a process of reduction, including loss of vowels and consonants (see §6.3). The same process of reduction, with resultant contraction, may be observed in operation in GB. It is important, however, to distinguish between cases of ELISION which have been established in the language for some time (although the spelling may still reflect an earlier, fuller form) and those which have become current only recently. In these latter cases, the forms exhibiting elision are typical of rapid and casual speech, whereas slower, more careful speech tends to retain the fuller form under the preservative influence of the spelling. The examples of elided word forms in casual speech which are given below are independent of the type of reduction affecting unaccented words and syllables in connected speech (see §12.4.6).

(1) *Vowel elision*[10]

(a) *Historical*—Loss of weakly accented vowels in words has regularly occurred in the history of English and often shows up in discrepancies between spelling and pronunciation, e.g. in *Gloucester* /glɒstə/, *forehead* /ˈfɒrɪd/, *gooseberry* /ˈgʊzbri/.

(b) *Present*—In GB elision is likely to take place in a sequence of unaccented syllables, particularly where /ə/ and /ɪ/ are involved. Thus, in positions after the primary accent, particularly in the sequence consonant + /ə/ + /r/ + reduced vowel, the /ə/ between the C and the /r/ is regularly lost, e.g. in *preferable* /ˈprefrəbl/; similar reductions occur in *repertory*, *comparable*, *territory*, *lavatory*, *anniversary*, *vicarage*, *category*, *factory*, *robbery*, *murderer* /ˈmɜːdrə/, *customary*, *camera*, *honourable*, *satisfactory* /sasˈfaktri/, *suffering*, *beverage*, *rhinoceros*, *nursery*, *Nazareth*, *fisheries*, *treasury*, *natural* /ˈnaʧrəl/, *dangerous*, *utterance*, *history*, *ordinary*. Though generally a feature of casual speech, these elisions often occur regularly within the speech of an individual, the fuller version not forming a part of his idiolect. A more recent development[11] concerns the sequence /r/ + weak vowel + C, in which the weak vowel may be elided, leaving a preconsonantal (possibly syllabic) /r/ (even though /r/ does not normally occur before a consonant in GB), e.g. *barracking* /ˈbarkiŋ/, *borrowing* /ˈbɒrwɪŋ/, *Dorothy* /ˈdɒrθi/, *barrier* /ˈbarjə/.

In the same way, there may be an elision of a weak vowel following a consonant and preceding /l/, or the reduction of syllabic [ɬ] to syllable-marginal /l/, in words

like *grappling*, *doubling*, *fatalist*, *paddling*, *bachelor*, *specialist*, *usually*, *insolent*, *easily*, *carefully*, *buffalo*, *novelist*, *family*, *panelling*, *particular*, *chancellor*. Note, too, frequent loss of post-primary /ə/ or /ɪ/ in *university* /juːnɪˈvɜːsti/, *probably* /ˈprɒbbli/, *difficult* /ˈdɪfklt/, *national* /ˈnaʃnl/, *fashionable* /ˈfaʃnəbl/, *reasonably* /ˈriːznəbli/, *parliament* /ˈpɑːlmənt/. A similar process may apply with the loss of syllabicity in the present participles of verbs such as *flavour*, *lighten* and *thicken* where the /ə/ may be elided or the syllabic consonant [n̩] replaced by a non-syllabic consonant marginal to the syllable. Thus /ˈfleɪvrɪŋ/, /ˈlaɪtnɪŋ/ and /ˈθɪknɪŋ/ in place of /ˈfleɪvərɪŋ/, /ˈlaɪtənɪŋ/ and /ˈθɪkənɪŋ/ respectively. It may be noted that some speakers make a regular distinction between the participle with three syllables and the noun of two syllables exhibiting elision, e.g. *lightning* /ˈlaɪtnɪŋ/ and *lightening* /ˈlaɪtənɪŋ/.

In pre-primary positions, /ə/ or /ɪ/ of the weak syllable preceding the primary accent is apt to be lost in rapid speech, especially when the syllable with primary accent has initial /l/ or /r/,[12] e.g. in *police*, *parade*, *terrific*, *correct*, *collision*, *believe*, *balloon*, *barometer*, *direction*, *delightful*, *gorilla*, *government* /ˈgʌvmənt/, *ferocious*, *philology*, *veranda*, *voluptuous*, *saloon*, *solicitor*, *syringe*, *charade*; also, with a continuant consonant preceding and a consonant other than /l/ or /r/ following, e.g. in *phonetics*, *photography*, *thermometer*, *supporter*, *suppose*, *satirical*, *circumference*. Note, too, the elision of /ə/ in *perhaps* /pˈhaps/ and of /i/ in *geometry* /ˈʤɒmətri/, *geography* /ˈʤɒgrəfi/.

(2) *Consonant elision*

(a) *Historical*—The reduction of many consonant clusters has long been established, e.g. initial /w,k,g,/ in *write*, *know*, *gnaw*; medial /t/ + /n/ or /l/ in *fasten*, *listen*, *often*, *thistle*, *castle*; post-vocalic /h/ in *brought*, *night*; post-vocalic [ɬ] in *baulk*, *talk*, *walk*; and final /b,m/ in *lamb*, *tomb*, *hymn*.

(b) *Present*—In GB /t,d/ may be lost when medial in a cluster of three consonants, although retention of /t,d/ is characteristic of careful speech, e.g. *handsome*, *windmill*, *handbag*, *friendship*, *kindness*, *landlord*, *landscape*, *lastly*, *restless*, *wristwatch*, *Westminster*, *coastguard*, *dustman*, *mostly*, *perfectly*, *exactly*, *facts*. /θ/ is normally elided from *asthma* and *isthmus* and may sometimes be omitted from *months*, *twelfths*, *fifths*, as is /ð/ from *clothes*; and in rapid speech elision of /k/ in *asked* and /l/ in *only* may occur. [ɬ] is apt to be lost when preceded by /ɔː/ (which has a resonance similar to that of [ɬ]), e.g. *always* /ˈɔːwɪz/, *already* /ɔːˈredi/, *although*, /ɔːˈðəʊ/, *all right* /ɔːˈraɪt/, *almanac* /ˈɔːmənak/.

/p/ may be lost in clusters where its position is homorganic with that of a preceding plosive, e.g. *glimpse* /glɪms/. In words like *attempts* and *prompts*, both /p/ and /t/ may be elided, e.g. /əˈtems/, /prɒms/. Elision is less common in the sequence /ŋks/ in *inks*.

Where there are two /r/s in a word, one of them in an unaccented syllable may be elided, e.g. *pronunciation* /pə`nʌnsieɪʃn/, *programme* /`pəʊgram/, *secretary* /`sekətri/, *extraordinary* /ɪk`strɔːdni/. In some words whole syllables may be elided, e.g. *literary* /`lɪtri/, *February* /`febri/, *library* /`laɪbri/, *temporarily* /`temprəli/, *primarily* /`praɪmrəli/. Whole syllables may even be elided where there is only one /r/ in the full form, e.g. *temperature* /`temʧə/,

(3) *Epenthesis*[13]
The elision of /t/ in words like *vents* is sometimes counterbalanced by a type of EPENTHESIS whereby a /t/ in inserted in words like *dance*, *fence*, *sense*, *bounce*, so that *tents* and *tense* may sound the same as either /tens/ or /tents/. Epenthetic /t/ may also occur before /θ,ʃ/ as in *anthem* /`an(t)θəm/, *pension* /`pen(t)ʃən/, (but in the latter there is no coalescence to /ʧ/—see §9.3). Such alternation does not apply following /l/, so that *else* and *melts* have distinct final clusters.

While epenthetic /t/ occurs between an /n/ and /θ,s,ʃ/, similarly an epenthetic /p/ or /k/ may occur between an /m,ŋ/ and a following fricative as in *triumphs* /traɪʌm(p)fs/, *warmth* /wɔːm(p)θ/, *confuse* /kəm(p)`fjuːz/, *Kingston* /`kɪŋ(k)stən/.

Epenthesis is less common before a voiced fricative, e.g. in *lambs* /lam(b)z/, *rings* /rɪŋ(g)z/, so *wins* is rarely pronounced the same as *winds* /wɪn(d)z/. If there is epenthesis in *king-size*, note that it is a /g/ that is inserted, i.e. /`kɪŋ(g)saɪz/, suggesting that *king* has a different base form from *Kingston* /`kɪŋ(k)stən/.

10.9 Variability in the phonemic structure of words

In connected speech English words exhibit variations of accentual pattern and changes of a phonemic or phonetic kind, involving assimilation and elision, especially at word boundaries (see Chapter 12). There is also often a remarkable latitude in the choice of phonemes used in words when said in isolation by GB speakers. Even with the exclusion of cases of differing phonemic inventories —e.g. the choice between using /hw/ or /w/ for *wh* words or /ɔː/ or /ɔə/ in words of the *bore* type—there remains a high degree of variability within the same variety of pronunciation. The permissible variations concern mainly vowels but a few cases of a choice of consonant also occur. The following are examples within GB:

(1) *Vowels*
/iː/~/ɪ/ *acetylene*, *economy*; ~/e/ *economics*, *premature*, *paracetamol*; ~/eɪ/ *deity*; ~/aɪ/ *Argentine*, *iodine*
/ɪ,i/~/e/ *alphabet*, *orchestra*; ~/aɪ/ *privacy*, *dynasty*; ~/eɪ/ *magistrate*, *holiday*; ~/ə/ *believe*, *system*, *adequate*
/e/~/eɪ/ *again*, *maintain*; ~/ə/ *accent*; ~/a/ *extraordinarily* /-erili, arili/.
/a/~/ɑː/ *graph*, *translate*; ~/eɪ/ *patriot*, *apical*; ~/ə/ *agnostic*

/ʌ/~/ɒ/ *constable, combat*; ~/ə/ *bankrupt*
/ɒ/~/ɔː/ *salt, wrath, Australia*; ~/ə/ *obscure, obligatory*
/ɔː/~/ʊə/ *sure, poor*
/ʊ/~/uː/ *room, groom*
/uː/~/juː/ *suit, supreme*
/eɪ/~/ɑː/ *data, esplanade*
/əʊ/~/ə/ *allocate, phonetics*

(2) *Consonants*
/t/~/tj/~/ʧ/ *amateur*; /tj/~/ʧ/ *actual, Christian*; /dj/~/ʤ/ *educate, grandeur*; /ʤ/~/ʒ/ *garage*; /g/~/ʤ/ *pedagogic*; /nʧ/~/nʃ/ *French, branch*; /nʤ/~/nʒ/ *revenge, strange*; /k/~/kw/ *quoits*; /ŋk/~/ŋ/ *anxious*; /ŋg/~/ŋ/ *English, language, linguistic*; /sj/~/sɪ/~/ʃɪ/ *associate*; /sj/~/ʃ/ *issue, sexual*; /zj/~/ʒ/ *usual, azure*; /ʃ/~/ʒ/ *Asia*; /s/~/z/ *usage, unison*; /f/~/p/ *diphthong, naphtha*

10.10 Phonotactics

PHONOTACTICS, or the way that phonemes combine, shows that English does not exploit all the possible combinations of its phonemes in syllables and words. For instance, long vowels and diphthongs do not precede final /ŋ/;[14] /e,a,ʌ,ɒ/ do not occur finally; and the consonant clusters permitted are subject to constraints in both initial and final positions. Initially, /ŋ/ does not occur; no combinations are possible with /ʧ,ʤ,ð,z/; /r,j,w/ can occur in clusters only as the non-initial element; such initial sequences as /fs,mh,stl,spw/ are unknown. Finally, only /l/ may occur before non-syllabic /m,n/; /h,r,j,w/ do not occur in the type of phonemic analysis here used (see §§8.2, 8.5); and terminal sequences such as /kf,ʃp,lð,ʒbd/ are not used.

Although the general pattern of word-initial and word-final phoneme sequences is plain, there are certain problems:

(1) Some sequences are exemplified only by single words which are themselves of rare occurrence, e.g. /smj-/ *smew*, /gj-/ *gules*. Nevertheless such sequences are generally included in the statements of potential clusters given in Table 15.
(2) Some sequences are exemplified only by their use in certain proper names, e.g. /gw-/ *Gwen* (and various other names of Welsh origin). Again, such sequences are generally included in Table 15.
(3) Some sequences are exemplified only in recently imported foreign words, often themselves proper names, e.g. a number of words, including *schnapps* and *Schweppes*, involving initial clusters beginning with /ʃ/. If such words are judged to be in common use, the clusters they exemplify are included, but marked as such, in the statements in Table 15.
(4) Sometimes a word or a group of words have more than one accepted pronunciation, one of which provides a unique sequence of phonemes. Thus *width, breadth, hundredth* have variants with /tθ/ or /dθ/; only the

more common /tθ/ is included in Table 16, since /dθ/ is the less common pronunciation, and /tθ/ follows a common pattern whereby all final clusters involving plosives, fricatives and affricates are either wholly voiceless or wholly voiced. Words like *French*, *range* can be pronounced with /nʧ,nʤ/ or /nʃ,nʒ/; both possibilities are common and have been included here. Though many speakers do not distinguish the final clusters of *prince* and *prints* (see §10.8(3) above), the possibility is sufficiently widespread for both /-ns/ and /-nts/ to be considered as possible final clusters.

(5) An attempt to include sequences of consonant plus syllabic nasal or lateral would unnecessarily complicate the statement of word-final clusters; such sequences are therefore taken as a variant of /ə/ plus nasal or lateral.

(6) The greater complexity of final consonant clusters is largely accounted for by the fact that final /t,d,s,z/ frequently represent a suffixed morpheme (e.g. possessive <-s> or past tense <-ed>). However, because there are a few monomorphemic words like *axe* /aks/, *text* /tekst/, the statement of word-final clustering possibilities would not be significantly simplified by excluding such suffixes. It would, however, be simplified if /t,d,s,z,θ/ were treated as appendices or 'extrametrical' to the basic syllable structure (particularly since the sonority hierarchy is often violated—see §§5.5.1–5.5.3). Such treatment of /s/ as an appendix could be extended to its occurrence in word-initial position, which would eliminate all three-member clusters in that position. But, in the interests of keeping as near as possible to a statement of actually occurring sequences, these simplifications are not applied here.

10.10.1 Word-initial phoneme sequences

(1) *V*

The following ten vowels constitute monosyllabic words /iː/ the letter <e>, /ə/ *a*, /ɑː/ *are*, /ɔː/ *or*, /ɜː/ *err*, /eɪ/ the name of the letter <a>, /aɪ/ the name of the letter <i>, /əʊ/ *owe* and the name of the letter <o>, /ɪə/ *ear*, /ɛː/ *air*. In addition, /i/ occurs as a weak form of *he*, /u/ as a weak form form of *who*, /uː/ for the the exclamation *ooh* and /ɔɪ/ may occur in the exclamation *oy!*

(2) *Initial V*

All vowels occur initially. /ʊ/ and /ʊə/ occur only in such foreign proper names as *Uppsala*, /ʊpˋsɑːlə/ and *Urdu* /ˋʊədu/

(3) *Initial CV*

/ŋ/ does not occur initially. /ʒ/ occurs initially before /ə/, /ɪ/, /iː/, /a/, /ɒ/ and /ɑː/ in such foreign words as *Genet*, *gigolo*, *Zhivago*, *gigue*, *gite*, *jabot*, *genre* and *gendarme*. The other consonants generally occur before all vowels, though marked deficiencies are evident before /ʊə,ʊ,ɔɪ/.

(4) *Initial CC(V)*

Initial CC(V) are shown in Table 15.

Table 15 Initial CC(V) clusters in GB.

	l	r	j	w	p	t	k	m	n	f	v
p+	●	●	●	○							
b+	●	●	●	○							
t+		●	●	●							
d+		●	●	●							
k+	●	●	●	●							
g+	●	●	●	●							
m+			●	○							
n+			●	○							
l+			●								
f+	●	●	●								
v+	○	○	●	○							
θ+		●	●	●							
s+	●	○	●	●	●	●	●	●	●	○	○
ʃ+	○	●		○	○	○		○	○		
h+			●								

● occurs freely ○ occurs in recent imports

(1) /Cj/ occurs almost only before /uː,ʊə/, e.g. *cute, cure*; it also occurs before /ɔː/ in words when /ɔː/ is preferred as an alternative to /ʊə/, e.g. *moor, poor, sure*. /mj-/ occurs in *music, museum, mutiny*.

(2) /Cw/ clusters are heard in a number of recent imports from French, e.g. *puissance* /ˈpwiːsəns/, *boite* /bwat/, *moi* and *moire* both /mwɑː/, *(bête) noire* /nwɑː/, *voyeur* /vwaɪˈɜː/. Initial /tw,dw,gw/ only occur before a restricted set of vowels. /hw/ is no longer current as an initial GB sequence (though it persists in some other accents, e.g. Scottish).

(3) /vl-/ and /vr-/ occur in *Vladivostok* and *vroom*, /sr-/, /sf/ and /sv-/ in *Sri Lanka*, *sphinx* and *svelte*, and /ʃl-, ʃw-, ʃp-, ʃt-, ʃm-, ʃn-/ in a number of imports mainly from German and Yiddish, e.g. *Schlesinger, schwa, spiel, shtook, schmalz, schnapps*.

(5) *Initial CCC(V)*
/s/ is the essential first element of CCC clusters; the second element is a voiceless stop; the third element must be one of /l,r,j,w/. Of the 12 potential CCC sequences, /spw-, stl-, stw-/ do not occur. /CCj/ occurs only before /uː/ or /ʊə/, e.g. *scuba, skewer*; /skl-/ occurs only before /ə/, though the items *sclerosis, sclerotic* admit the variants /skle-, sklɪ-, sklɪə-/. The name of the bird *smew* provides a single example of the initial sequence /smj-/.

10.10.2 Word-final phoneme sequences

(1) *Final V*
No short vowels apart from /i,u/ occur in final position.

(2) *Final (V)C*
/r,h,j,w/ do not occur finally in the present phonemic analysis of GB (see note to §8.2). /ʒ/ occurs finally only after /iː,ɑː,uː,eɪ/ in words of recent French origin, like *liege, camouflage, rouge* and *beige*. /ŋ/ occurs only after /ɪ,a,ʌ,ɒ/.

(3) *Final (V)CC*
These are shown in Table 16.

Table 16 Final (V)CC clusters in GB.

	p	b	t	d	k	ʧ	ʤ	m	n	f	v	θ	s	z	ʃ	ʒ
p+			●									●	●			
t+												●	●			
k+			●										●			
b+				●										●		
d+												●		●		
g+				●										●		
ʧ+			●													
ʤ+				●												
m+	●			●						●		●		●		
n+			●	●		●	●					●	●	●		●
ŋ+				●	●									●		
l+	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
f+			●									●	●			
v+				●										●		
θ+			●										●			
ð+				●										●		
s+	●		●		●											
z+				●												
ʃ+			●													
ʒ+				●												

Final CC clusters fall into two groups:

(i) Nasal, lateral, or /s/ plus another consonant, e.g. *jump, bend, dent, think; quilt, bulk; whist, cask, cusp*

(ii) A plosive or fricative plus one of the apicals /t,d,s,z,θ/. The majority of such clusters arise from suffixation of /t,d/ or /s,z/, e.g. *laughed, behaved, cat's* or *cats, dog's* or *dogs, hits, leads*. Such clusters also arise from ordinal and noun marking /θ/, e.g. *fifth, depth*. There are a small number of monomorphemic words of these sorts, e.g. *act, axe, adze, convict, corpse, fact, gift, lapse, ox, product, quartz, sect*

/g,ŋ/ do not occupy the second position in a final CC cluster. /θ/ is of limited occurrence in this position: /-pθ/ occurs only in *depth*, /-mθ/ only in *warmth*, and /-fθ/ only in *fifth* and *twelfth*. /-lm, -ln/ occur only in *elm, film, helm, kiln* and *realm*, /-lʃ/ only in *Welsh* and possible in *squelch* and *belch* (both of which may also have /-lʧ/).

(4) *Final (V)CCC*
These are shown in Table 17.

(5) *Final (V)CCCC*
Final CCCC clusters occur only rarely, as a result of the suffixation to CCC of a /t/ or /s/ morpheme, e.g. /-mpts/ *prompts, exempts*; /-mpst/ *glimpsed*; /-lkts/ *mulcts*; /-lpts/ *sculpts*; /-lfθs/ *twelfths*; /-ntθs/ *thousandths*. Such clusters are regularly reduced from CCCC to CCC by omission of the third element of the cluster. In cases like /-ksts/ *texts*, /-ksθs/ *sixths* there is less likelihood of reduction though even these may become [teksːs], [sɪksːs] with a double length representing /ss/.

(6) Final clusters involving /t,d,s,z,θ/, as well as initial clusters beginning with /s/, violate the sonority hierarchy (see §5.5.1 above) and a much simpler

Table 17 Final (V)CCC clusters in GB.

p+			ts								θs	st
t+											θs	st
d+												st
k+			ts									st,sθ
m+	pt,ps									fs		
n+			tθ,ts	dz		ʧt	ʤd				θs	st,zd
ŋ+					kt,kθ,ks				nd			st
l+	pt,ps	bz	ts	dz	kt,ks	ʧt	ʤd	mz	nz	fθ,fs	vd,vz	θs	st
f+			ts									θs	
s+	pt,ps		ts		kt,ks								

Final CCC clusters fall into two groups:

(i) Those which involve a combination of the two types of CC clusters, i.e. /m,n,ŋ,l,s/ plus C plus /t,d,s,z,θ/. These nearly all involve suffixes, e.g. *jumps*, *cults*, *lists* but there are a few monomorphemic words, e.g. *mulct*, *calx*.

(ii) Those which involve the double application of /t,d,s,z,θ/; the majority again involve suffixes, e.g. *fifths* /fɪfθs/, *products* /ˈprɒdʌkts/, *acts* /akts/. These are all commonly reduced to /fɪfs/, /ˈprɒdʌks/, /aks/). There are two common monomorphemic words, *text* and *next* pronounced /tekst/, /nekst/ also commonly reduced to /teks/ and /neks/.

CCC clusters predominantly follow short vowels. 10 of the 49 CCC final clusters occur after only one vowel: 4 after /ɪ/ as in *midst*, *sixth*, *kilns*, *fifths*, 4 after /e/ as in *depths*, *lensed*, *length*, *twelfth*, 1 after /ʌ/ as in *bulged*, 1 after /ə/ *thousandth*; many of these can with elision be reduced to two consonants.

statement about English phonotactics (particularly that part concerning final clusters) can clearly be made if such consonants, which are all apical obstruents, are treated as appendices and excluded from the basic statement.

(7) With a vowel inventory of 20 items and the possible initial and final consonant clusters given above, it is clear that a large number of potential combinations are not utilised. Thus, such unused monosyllabic words as the following conform to an already existing pattern: /faʊd, saɪʤ, mɒmp, bruːʃ, pliːk, splʌk, stredʒ/. If, in addition, gaps were filled on the grounds of general patterning, it would be possible to construct words of an English phonological character with, for instance, initial /ʧʊ-, rɜː-, glɔɪ-, skɪə-, sprəʊ-/ or final /-ɔːg, -aɪʃ, -uːnt, -ɑːnʤ, -ʌkst/, etc.

10.10.3 Word-medial syllable division

Word-medial consonant sequences are of course longer than those in initial and final positions since they combine syllable-coda and syllable-onset positions. While word-initial naturally equates with syllable-onset and word-final with syllable-coda, any word-medial sequence has to be divided between coda and onset. (In this section syllable division is marked by a stop, e.g. /ə.ˈrəʊ.mə/.) Some of the criteria for dividing such sequences have already been discussed in §5.5.3. The three basic criteria are morphemic (syllable boundaries should

correspond with morpheme boundaries); phonotactic (syllable division should accord with what we know about syllable onsets and codas from word-initial and word-final positions); and allophonic (syllable division should predict correct allophonic variation). These principles sometimes conflict or give no clear answer. A further principle is sometimes applied in such cases, the maximal onset principle,[15] which sets a preference for assigning consonants to onsets on the basis that onsets are more commonly complex in languages than codas. The little experimental evidence that there is also suggests a general preference for onset syllabification.[16]

The case of single medial consonants is exemplified by *motive* (with a long vowel in the accented first syllable) and by *butter* (with a short vowel in the accented first syllable). In the case of *motive*, the phonotactic principle is satisfied either way while the application of the allophonic principle is uncertain (there is no instrumental evidence about possible shortening before /t/ although it is probable that this does not apply). So, using the maximal onset principle, *motive* is generally syllabified as /ˈməʊ.tɪv/, as are other similar words with a long vowel, e.g. *autumn*, *suitor*, *survey*. In the case of *butter*, words do not end in /ʌ/ so the phonotactic principle suggests /ˈbʌt.ə/, which accords with the allophonic shortening of /ʌ/ before /t/ and the same syllabification is generally applied to similar words with a short vowel, e.g. *bitter*, *supper*, *knickers*.

Medial CC sequences are exemplified in *sequel* (with a long vowel in the accented first syllable) and *petrol* (with a short vowel in the accented first syllable). In the case of *sequel*, both /siː.kwəl/ and /siːk.wəl/ are divisions which accord with the phonotactic principle. However, /ˈsiː.kwəl/ accords better with the allophonic principle whereby the /w/ following /k/ is devoiced. This syllabification applies to other cases of CC following a long vowel, e.g. *programme*, *perfume*, *awkward*. In the case of *petrol*, /pet.rəl/ accords with the phonotactic principle, but does not accord with the allophonic devoicing of /r/, whereas /pe.trəl/ correctly predicts the devoicing of /r/ (following /t/), but does not accord with the phonotactic principle (words do not end in /e/). Applying the maximal onset principle resolves the problem in favour of the latter solution. In *window* the phonotactic and allophonic principles would allow both /ˈwin.dəʊ/ and /ˈwɪnd.əʊ/; the maximal onset principle decides in favour of /ˈwɪn.dəʊ/. The phonotactic principle would give us /ˈplas.tɪk/ but the allophonic principle suggests /ˈpla.stɪk/ because of the unaspirated /t/ and this is endorsed by the maximum onset principle as well as being in accord with the experimental evidence.[17]

The case of longer medial sequences is exemplified by *extra* /ekstrə/. The /k/ belongs in the coda of the first syllable by both phonotactic and allophonic principles and the /tr/ belongs in the onset (/r/ is devoiced). These two principles give us no solution to the assignment of /s/, which we place in the second syllable by the maximal onset principle, giving /ˈek.strə/.

All the patterns which have been dealt with so far have concerned consonantal sequences following the primary accent. Examples preceding the primary accent most frequently involve consonants containing the typical vowels of unaccented syllables /ə/ and /ɪ/ and in such examples the phonotactic principle together with

the maximal onset principle generally leads to the whole sequence being syllabified with the following syllable, e.g. /ə.ˈkwaɪə/, /rɪ.ˈkwest/, /ə.ˈplɔːz/, /ə.ˈstjuːt/, /ə.ˈsparəgəs/. Similarly, in those, less frequent, cases where a full vowel precedes the primary accent, the phonotactic principle usually applies, e.g. /meɪm.ˈteɪm/, /sep.ˈtembə/ and /bap.ˈtaɪz/.

Most of the examples above have concerned disyllabic words. The general principles apply in similar fashion in longer words, with clusters before and after secondary accent behaving the same as those around a primary accent, e.g. /en.saɪ.kləʊ.ˈpiː.dɪə/, /ˈal.juː.ˈmɪn.ɪəm/, /ˈkaŋ.gə.ˈruː/, /ˈmak.ɪn.tɒʃ/. The morphemic principle applies regularly in compound words but note that inflexional /-ɪd/ and /ɪz/ regularly lead to resyllabification according to the patterns for monomorphemic words outlined above, e.g. /saɪt/ vs /ˈsaɪ.tɪd/, /vaɪs/ vs /ˈvaɪ.sɪz/.

An alternative solution to ambiguous medial sequences can be achieved with the notion of ambisyllabicity; by this means the /t/ in *butter*, the /t/ in *petrol* and the /s/ in *extra* are regarded as ambisyllabic, i.e. they straddle the syllable boundary. For plosives the compression stage could belong to the first syllable and the plosion and release to the second; for fricatives the boundary would simply be in the middle. Phonetically this seems a credible solution. Unfortunately it would considerably complicate the overall statement of permissible clusters.

10.10.4 Inflexional suffix formation

Inflexional suffixes (which do not normally affect accent) follow certain rules which affect segmental aspects of pronunciation. The following regularities may usefully be listed here.

(1) *Past tense*
For regular verbs in which the past tense is signalled by the addition of an *-ed* ending, the following rules of pronunciation apply:

(a) If the stem ends in /t/ or /d/, add /-ɪd/, e.g. *exclude* /ɪkˈskluːd, ɪkˈskluːdɪd/; *guard* /gɑːd, ˈgɑːdɪd/; *rot* /rɒt, ˈrɒtɪd/; *target* /ˈtɑːgɪt, ˈtɑːgɪtɪd/. Otherwise:
(b) If the stem ends in any voiced sound (apart from /d/), add /-d/, e.g. *buzz* /bʌz, bʌzd/; *hammer* /ˈhamə, ˈhaməd/; *kill* /kɪl, kɪld/; *listen* /ˈlɪsn, ˈlɪsnd/.
(c) If the stem ends in any voiceless consonant (apart from /t/), add /-t/, e.g. *arch* /ɑːʧ, ɑːʧt/; *immerse* /ɪˈmɜːs, ɪˈmɜːst/; *kick* /kɪk, kɪkt/; *sniff* /snɪf, snɪft/.

(2) *Plural/possessive/third person singular present tense*

(a) If the stem ends in a sibilant (/s,z,ʃ,ʒ,ʧ,ʤ/), add /-ɪz/, e.g. *address* /əˈdres, əˈdresɪz/; *arch* /ɑːʧ, ˈɑːʧɪz/; *graze* /greɪz,ˈgreɪzɪz/; *judge* /ʤʌʤ, ˈʤʌʤɪz/; *rush* /rʌʃ, ˈrʌʃɪz/. Exceptionally, the voicing of the fricative in *house* changes: /haʊs, ˈhauzɪz/. Otherwise:

(b) If the stem ends in any non-sibilant voiced sound, add /-z/, e.g. *blow* /bləʊ, bləʊz/; *pattern* /ˈpatn, ˈpatnz/; *regard* /rɪˈgɑːd, rɪgˈɑːdz/; *thrill* /θrɪl, θrɪlz/.

(c) If the stem ends in any non-sibilant voiceless consonant, add /s/, e.g. *laugh* /lɑːf, lɑːfs/; *pick* /pɪk, pɪks/; *resort* /rɪˈzɔːt, rɪˈzɔːts/.

(3) *Present participle*
In all cases, add /-ɪŋ/, e.g. *kill* /kɪl, ˈkɪlɪŋ/; *laugh* /lɑːf, ˈlɑːfɪŋ/; *sing* /sɪŋ, ˈsɪŋɪŋ/; *trim* /trɪm, ˈtrɪmɪŋ/. For cases where the stem ends in /ɛː,ɑː,ɔː,ɜː,ɪə,ʊə/, see (6) below. For stems ending in syllabic [n̩] or [l̩] the syllabic nature of the nasal or lateral is frequently retained, e.g. *handle* [ˈhandl̩, ˈhandl̩ɪŋ]; *widen* [ˈwaɪdn̩, ˈwaɪdn̩ɪŋ]. However, some speakers may insert a /ə/, retaining the same number of syllables, thus /ˈhandəlɪŋ, ˈwaɪdənɪŋ/; while for others the nasal or lateral may lose its syllabic function, thus [ˈhandl̩, ˈhandlɪŋ]. It should be noted that in such cases, the quality of the /l/ is usually altered, the dark, syllabic [ɬ] of [handɬ] being replaced by a non-syllabic, clear [l]. (See also §10.8(1)(b).)

(4) *Comparison of adjectives*
For those adjectives whose comparative and superlative degrees are formed by the suffixing of *-er* and *-est* respectively, the pronunciation of the stem remains unchanged except in the case of stems ending in /ŋ/ or /r/ (see (5) and (6) below). Thus /ə/ and /ɪst/ are regularly added, as in *easy* /ˈɪzi, ˈiːziə/ (or ˈiːzɪə or ˈiːzjə), ˈiːziːɪst (or ˈiːzjɪst), *great* /greɪt, ˈgreɪtə, ˈgreɪtɪst/; *big* /bɪg, ˈbɪgə, ˈbɪgɪst/. In all the superlative forms /ə/ is as common as /ɪ/, e.g. /ˈbɪgəst/.

(5) *Stems ending in* /ŋ/
When the comparative and superlative suffixes are added to stems ending in /ŋ/, a /g/ is inserted, e.g. *long* /lɒŋ, ˈlɒŋgə, ˈlɒŋgɪst/, *strong* /strɒŋ, ˈstrɒŋgə, ˈstrɒŋgəst/. In all other cases, the /ŋ/ is followed immediately by the suffix, e.g. participle *-ing* in *longing* /ˈlɒŋɪŋ/, adjectival modifier *-ish* in *longish* /ˈlɒŋɪʃ/, or agentive *-er* in *hanger* /ˈhaŋə/, *singer* /ˈsɪŋə/. It should be noted that monomorphemic words (not formed of a stem and affix) exhibit the sequence /-ŋg-/ intervocalically, e.g. *anger* /ˈaŋgə/, *finger* /ˈfɪŋgə/.

(6) /r/*-links in suffix formation*
In the case of words which end in /ɛː,ɑː,ɔː,ɜː,ə,ɪə,ʊə/ (usually corresponding to an <r> in the spelling), an /r/-link is regularly inserted between the final vowel of the stem and any initial vowel of the suffix, e.g. present participles *blur* /blɜː, ˈblɜːrɪŋ/; *secure* /sɪˈkjʊə, sɪˈkjʊərɪŋ/; *stare* /stɛː, ˈstɛːrɪŋ/; *store* /stɔː, ˈstɔːrɪŋ/; comparative and superlative adjectives (stem + /ə,ɪst/) *clear* /klɪə, ˈklɪərə, ˈklɪərɪst/. This process applies to derivational as well as to inflexional suffixes, e.g. adjectival *-y*, e.g. *star* /stɑː, ˈstɑːri/; agentive noun *-er*, e.g. *murder* /ˈmɜːdə, ˈmɜːdərə/; verb-forming *-ise*, e.g. *familiar* /fəˈmɪlɪə, fəˈmɪlɪəraɪz/. /r/-linking before inflexions where there is no orthographic <r> in the stem is unacceptable to some native speakers who have prescriptive opinions about the language, e.g. in *drawing*, *gnawing* /ˈdrɔːrɪŋ, ˈnɔːrɪŋ/ (see further in §§12.4.7(1), 12.5(3)).

10.10.5 Acquisition of phonotactics by native learners

Children often have special problems with the acquisition of consonant clusters in syllable-initial positions, even after they have acquired the individual members of the clusters. With two-term clusters consisting of fricative + C (most commonly /s/) and C + /l,r,w,j/, there is often a reduction to the single C, e.g. *smoke* → [məʊk], *spin* → [pɪn], *please* → [piː], *queen* → [kiːn]. Clusters of /s/ + /l,r,w,j/ may be reduced to either element, e.g. *slow* → [səʊ] or [ləʊ]. In the case of the fricative plus C type, a possible, somewhat later, development (which may at first glance look like a regression) involves a feature merger, whereby a single consonant replaces the two consonants of the adult cluster, the single consonant taking at least one feature from each of the two consonants, e.g. *spin* → [fɪn], *fling* → [ɬɪŋ], *sleep* → [ɬiːp], *smoke* → [m̥əʊk]. When the two elements of the cluster are used, there may still be a difficulty in timing the relationship between the two elements: for example, a short intrusive, or EPENTHETIC, vowel (typically /ə/) may be inserted, or one of the elements may be improperly lengthened, e.g. *sport* [sᵊpɔːt] or [sːpɔːt], *slow* [sᵊləʊ] or [sːləʊ].[18] Some sequences give particular problems: /st/ sometimes occurs with metathesis as /ts/ (perhaps because it is a homorganic sequence); clusters with /r/ are often very late acquisitions because /r/ as a single consonant is a late acquisition.

The course of development of syllable final clusters is less well known because the interval of time between the development of single consonants and clusters is shorter and because the development of word-final clusters is often partly a question of the learning of inflexions.

10.10.6 Phonotactics—advice to foreign learners

Foreign learners may introduce epenthetic vowels into English consonantal clusters: so a word like *sport* may be pronounced as /sə`pɔːt/ (and hence homonymous with *support*) or as /e`spɔːt/ or /ə`spɔːt/ (and hence homonymous with *a sport*). Difficult clusters can sometimes be acquired by pronouncing a sequence of consonants across a word boundary and then dropping the earlier part of the first word: thus /st/ may be acquired by practising first with a phrase like *bus stop* or even medially in a bimorphemic word, e.g. *mistake* and then reducing these to *stop* and *steak*.

Many languages have only open syllables, e.g. Hindi, Italian and Bantu languages. Speakers of such languages should be careful not to introduce a final vowel, e.g. by adding an [ə] to *bit* making it sound like *bitter*. A similar sort of problem can apply to those languages, like French, which tend to more regularly explode their final plosives.

10.11 Consonant harmony in the word structure of native learners

Many of the common variations in the structure of words as they are acquired by children have been mentioned under the various sections dealing with individual phonemes, word accent and phonotactics. However, one type of change which occurs in child language but which is generally unknown among historical changes in English and among foreign learners is the phenomenon which is usually called CONSONANT HARMONY (and which is really a type of assimilation, although within words as opposed to those assimilations occurring at word boundaries which are mentioned in §12.4.5). Such consonant harmony occurs during the period when children are using only one-word utterances. It involves the assimilation of one consonant to another across an intervening vowel. Most frequently the process involves de-alveolarisation (i.e. an alveolar sound is changed to something else) and is regressive (i.e. a later-occurring sound influences an earlier sound), e.g. *supper* → [ˈpʌpə], *duck* → [gʌk], *dog* → [gɒg], although occasionally the process can be progressive (i.e. in a forward direction), e.g. *cushion* → [ˈkʊkən], *bottom* → [ˈbɒpəm].

Notes

1 With certain exceptions, determined by the larger rhythmic pattern of the total context (see §10.4).
2 See particularly Kingdon (1958b) and Fudge (1984). For an alternative formulation involving heavy syllable as VC and extrametrical final consonants, see Giegerich (1992).
3 See Fudge (1984: 31).
4 But see §7.12.4 for use of full vowels in Northern English.
5 For a recent survey of the various factors which can be involved in the definition of English compounds, see Plag (2006).
6 These remarks apply mainly to GB and to the patterns of isolate words rather than those variants occurring in connected speech (see §12.3); they do not take into account patterns used in other dialects, e.g. in Scottish English, *enquiry* /ˈeŋkwɪri/, *realise* /rɪəˈlaɪz/, *advertisement* /advəˈtaɪzmənt/. Where there is a preferred 'correct' pattern, it is marked here with * in the transcription, usually based on Wells (2008) where informant tests are reported on some of the items.
7 The small number of disyllables involved in such accentual oppositions is shown in Guierre (1979). Out of a corpus of more than 10,000 disyllabic words, only 85 exhibited changes between verbal, nominal or adjectival functions by means of a shift of accented syllable.
8 Also with /trɑːn-/.
9 The noun and verb forms of *refuse* differ also in the final consonant and the resulting variation of vowel length of /uː/.
10 For absorption of the second element of a diphthong before another vowel (smoothing), see §8.11.
11 Windsor Lewis (1979).
12 Such elisions in word-initial syllables are more likely when the preceding word ends in a vowel, e.g. *the police* /ðə ˈpliːs/, *I believe* /aɪ ˈbliːv/, but *local police* /ləʊkl pəˈliːs/, *can't believe* /kɑːm bəˈliːv/.

13 See Fourakis & Port (1986) and Blankenship (1992). Yoo & Blankenship (2003) find epenthetic /t/ occurring in final position but not in medial position in American English; they also find epenthetic /t/ of shorter duration than 'underlying' /t/.
14 Such combinations do occur as a result of assimilation. See §12.4.5.
15 See Selkirk (1982).
16 For experimental information on syllable division word-medially, see Fallows (1981), Treiman & Danis (1988) and Treiman *et al.* (1992). Such experimentation is based principally on speakers being asked to divide up nonsense words.
17 Treiman *et al.* (1992) confirmed /s/ in the onset in such sequences but found /f/ in the coda in sequences like /fl/ in *afflict.*
18 See Gilbert & Purves (1977).

Chapter 11

Connected speech

11.1 Accent

Connected speech, i.e. an utterance consisting of more than one word, exhibits features of accentuation that are in many ways comparable with those found in polysyllabic words. Some parts of the connected utterance will be made to stand out from their environment, in the same way that certain syllables of a polysyllabic word are more prominent than others. But accentuation in connected speech differs from that in polysyllabic words because accenting in connected speech is determined largely by meaning in context. Nevertheless some words are predisposed by their function in the language to be accented. These LEXICAL words are typically main verbs, adverbs, nouns, adjectives and demonstrative pronouns. Other categories of words, such as auxiliary verbs, conjunctions, prepositions, pronouns, relative pronouns and articles (grammatical words or FUNCTION words) are more likely to be unaccented, although they, too, may be exceptionally accented if the meaning requires it.

The meaning of any utterance is largely conditioned by the situation and context in which it occurs. So freedom of accentual patterning and especially the placement of the primary accent is always curtailed by the constraints imposed by the context. In the case of an opening remark, or when a new topic is introduced into a conversation, there is very limited scope for variation of meaning produced by accentuation. Rather more accentual freedom is possible in responses; thus, in response to the statement *She came last* WEEK, an incredulous reaction might have the pattern LAST *week*? (i.e. 'Wasn't it the week before that?') or *Last* WEEK? (i.e. 'Don't you mean last month?'); or, in response to *What was the* WEATHER *like?*, the reply might be *It rained every* DAY (emphasising the continuous nature of the rain) or *It* RAINED *every day!* (where the fact of raining is emphasised). On the other hand much less accentual variation is possible in the following dialogue (potential accents marked by capitals):

Did you have a good HOLIDAY*?*
YES, VERY *good*
Was the WEATHER *all right?*

It was FINE *for the* FIRST *part, but for the* REST *of the time it was pretty* MIXED. *We* ENJOYED *ourselves though. We had the* CAR, *so we were able to do some* SIGHT-SEEING, *when it was too* WET *to go on the* BEACH.

Function words are usually unaccented (as noted above) and when unaccented they usually contain reduced vowels, e.g. *can* in /kən ju: ˈkʌm/.[1] But most function words in final position keep a full vowel even when unaccented, e.g. *can* as in /ˈʃiː kan/. Monosyllabic lexical words usually retain their full vowel value even in unaccented positions, e.g. in *We left the case in the hall, left, case* and *hall* will keep their full vowel wherever primary and secondary accents are placed.

More than one word in an utterance may receive a primary accent. A slow and careful style of speaking often exhibits a proliferation of primary accents; a more casual or rapid delivery is likely to show fewer primary accents. In an extended dialogue in a normal conversational style, the number of syllables with reduced vowels (or syllabic consonants) tends to exceed the number of those made prominent by an accent or by the presence of a full vowel.

11.2 Prominence, accent and rhythm

In most descriptions of English pronunciation over the last seventy years the notion of 'stress-timing' is invoked to explain English rhythm;[2] by such a theory 'stressed' syllables (including primary and secondary accents and other syllables made prominent by 'stress'[3] alone) govern the rhythm of English utterances, an equal amount of time being said to be taken between each two stressed syllables and between the last stressed syllable and the end of the utterance, e.g.

However, all attempts to show such timing instrumentally have been unsuccessful,[4] and such groups are often clearly far from ISOCHRONOUS (i.e. equal in duration). For example, in the above example the group containing the two-syllabled word *better* will be shorter than the three-syllabled groups *couldn't have* and *chosen a* (though probably not in the ratio 2:3), while the group *time for their* (also containing three syllables) will be longer than all three if a full vowel is used on the word *their.*

The occurrence of full vowels[5] generally predicts the rhythm of English rather more usefully than any notion of stress (besides variation of the type exemplified above, there is often difficulty in deciding whether a syllable is 'stressed' or not, when no pitch accent is present. Some might judge the full vowel on *their* above as showing stress). For rhythmical purposes the reduced vowels are /ə/,

/ɪ/ (/i/ is regarded as a variant of /ɪ/) and /ʊ/ (/u/ is regarded as a variant of /ʊ/) when they occur without a pitch accent; all other vowels are counted as full vowels. The one simple rule of English rhythm is the BORROWING RULE[6] whereby a syllable with a reduced vowel 'borrows time' from any immediately preceding syllable containing a full vowel. By the predictions of the Borrowing Rule full-vowelled syllables each take approximately an equal amount of time (although in practice this will be somewhat affected by the innate length of the vowel and the consonants in the syllable). Each syllable containing a reduced vowel is much shorter and by the Borrowing Rule a full-vowelled syllable is itself shortened if immediately followed by a syllable with a reduced vowel.

The operation of rhythm based on full-vowel timing and the Borrowing Rule is illustrated in the following examples where a full stop marks the boundary between the syllables which are numbered and glossed as F (= Full Vowel) or R (= Reduced Vowel). Syllables with full vowels are long; those with reduced vowels are short.

Sparrows aren't common
/spa.rəʊz. ɑːnt. kɒm.ən/
1 2 3 4 5
F F F F R

Syllables 1–3 each take approximately an equal amount of time. Syllable 4 is shortened because the following Syllable 5 'borrows' time from it, i.e. Syllables 4–5 together take approximately the same time as each of Syllables 1–3. Compare this with an analysis based on stress timing: there would be pitch accents on /spa-/ and on /kɒm-/ which would count as rhythmical stresses; the two inter-stress groups reckoned to be equal in time would thus be /spa.rəʊz.ɑːnt/ and /kɒm.ən/ which seems exceedingly counter-intuitive. Alternatively stress timing might consider /ɑːnt/ to be stressed, in which case the three equal groups would be reckoned to be /spa.rəʊz/, /ɑːnt/ and /kɒm.ən/; this seems to capture timing somewhat better but still leaves the two-syllabled /spa.rəʊz/ sounding much longer than the other two groups. Here are some further examples:

Sparrows are plentiful
/spa.rəʊz.ɑː plen.tɪ.fʊl/
1 2 3 4 5 6
F F F F R R

In this example Syllables 1–3 are equal but Syllable 4 is shortened because Syllable 5 borrows time from it, i.e. Syllables 4 and 5 are together approximately equal to each of Syllable 1–3. But only one syllable can borrow time and Syllable 6 just adds an additional short amount. This is unlike the timing predicted by stress timing because additional reduced syllable(s) after the first one have no effect on syllables before it.

The dark blue pattern is the best
/ðə dɑːk bluː patn ɪz ðə best/
1 2 3 4 5 6 7 8
R F F F R R R F

Syllable 1 has a reduced vowel and is hence short. Syllables 2 and 3 have full vowels and are long. Syllable 4 has a full vowel but is shortened from long because Syllable 5 with a reduced vowel borrows time from it. Syllables 6 and 7 each take the short time of syllables with reduced vowels. Finally Syllable 8 has a full vowel and is long.[7]

11.3 Weak forms

Lexical words (both monosyllables and polysyllables) generally retain their full vowels in connected speech and hence have a level of prominence above that of syllables with reduced vowels, even when no pitch prominence is associated with them.

But many function words (pronouns, prepositions, auxiliary verbs, conjunctions, articles) have different patterns according to whether they are unaccented (as is usual) or accented (in special situations or when said in isolation). Compared with the accented (STRONG) forms, the unaccented WEAK forms of these words show reductions of the length of sounds, centralisation of vowels towards /ə,ɪ,ʊ/ and the elision of vowels and consonants. The following list of examples presents the most common of these words, first in their unaccented (normal) weak form and secondly in their less usual[8] accented strong form. More common weak forms are given first (C = any consonant, V = any vowel):

	Unaccented	*Accented*
a	/ə/	/eɪ/
am	/əm, m̩, m/	/am/
an	/ən, n̩, n/	/an/
and	/an, ən, n̩, n, ənd, n̩d/	/and/
any	C + /ni/	/eni/
(e.g. *Got any money?* /gɒt ni ˈmʌni/)		
are	/ə/	/ɑː/
as	/əz, z/	/az/
at	/ət/	/at/
be	/bi/	/biː/
because	/bɪkəz/, /bəkəz/, /kəz/	/bɪkɒz/
been	/bɪn/	/biːn/
but	C + /bət/, V + /bt/ + V	/bʌt/
can (aux.)	C + /kən/, V + /kn̩/	/kan/
could	C + /kəd/, V + /kd/	/kʊd/
do (aux.)	/də/ + C, /dw, du/ + V	/duː/
(e.g. *do that* /də ˈðat/, *do it* /dwɪt/)		

does (aux.)	/s, z, dəz/	/dʌz/
(e.g. *What's he do?* /wɒts iː `duː/, *When's he arrive?* /wenz iː ə`raɪv/)		
for	/fə/	/fɔː/
from	/frəm, frm̩, fm̩/	/frɒm/
(e.g. *The man from the . . .* /ðə man fm̩ ðə/		
had (aux.)	/həd, əd, d/	/had/
(e.g. *what he'd done*, *what John had done*)		
has (aux.)	/həz, əz, z, s/	/haz/
(e.g. *What's he got*, *When's he got time?*)		
have (aux.)	/həv, əv, v/	/hav/
(e.g. *What've you done*, *I've done it*)		
he	/hi, i/	/hiː/
her	/hə, ɜː, ə/	/hɜː/
herself	/hə`self, ɜː`self, ə`self/	/hɜː`self/
him	/ɪm/	/hɪm/
himself	/ɪm`self, ɪz`self/	/hɪm`self
(*he did it himself* /hi dɪd ɪt ɪz`self/)		
his	/ɪz/	/hɪz/
is	/s, z/	/ɪz/
(e.g. *it's not* /ɪts `nɒt, *he's coming* /hiːz `kʌmɪŋ/)		
just	/ʤəs, ʤəst/	/ʤʌst/
me	/mi/	/miː/
must	/məs, məst/	/mʌst/
not	/nt n̩/	/nɒt/
of	/əv, v, ə/	/ɒv/
(e.g. *one of my . . .* /`wʌn ə maɪ/)		
shall	/ʃəl, ʃl̩/	/ʃal/
she	/ʃi/	/ʃiː/
should	C + /ʃəd/, V + /ʃd/	/ʃʊd/
Sir	/sə/	/sɜː/
some (adj.)[9]	/səm, sm̩/	/sʌm/
than	/ðən, ðn̩/	/ðan/
that (conj. and rel. pron.)[10]	/ðət/	/ðat/
the	/ði/ + V,[11] /ðə/ + C	/ðiː/
them	/ðəm, ðm̩, əm, m̩, m/	/ðem/
(e.g. *Tell them to do it* /tel əm tə `duː ɪt/)		
themselves	/ðəm`selvz/	/ðem`selvz/
there (indef. adv.)[12]	/ðə/	/ðɛː/ (rare)
(e.g. *There were lots of them* /ðə wə `lɒts ə ðəm/		
to (and *into*, *onto*, *unto*)	/tə/ + C /tu, tw/ + V	/tuː/
us	/əs, s/	/ʌs/
was	/wəz/	/wɒz/

we	/wɪ/	/wiː/
were	/wə/	/wɜː/
who	/hu, u/[13]	/huː/
will	/əl, l̩, l/	/wɪl/
would	C + /wəd, əd/, V + /d/	/wʊd/
you	/ju/	/juː/
your	/jə/	/jɔː, jʊə/
yourself, yourselves	/jə`self, jə`selvz/	/jɔː`self, jɔː`selvz/

Particularly common uses of reduced forms involve auxiliary verb plus *not*. Auxiliary verb plus *not* are shown, for example, in the combinations *he, she, it* + *isn't* and *we, you, they* + *aren't* (note also the question form *aren't I?* /ˈɑːnt aɪ/); similarly *wasn't, weren't, can't* /kɑːnt/, *couldn't* /kədnt/, *doesn't, don't* /dəʊnt/ but note *don't know* /dəʊ`nəʊ, də`nəʊ/, *hasn't, haven't, shan't* /ʃɑːnt/, *shouldn't* /ˈʃədnt/, *won't* /wəʊnt/, *wouldn't* /ˈwədnt/. Additionally a final /t/ may be lost before a word beginning with a vowel (sometimes with assimilation), e.g. /kɑːn `liːv/, /dʌzn `ʃəʊ/, /wəʊŋ `gəʊ/.

Reduced forms in pronoun plus auxiliary combinations are shown in *I'm, he's, she's, we're* /wɪə/, *you're* /jɔː/, *they're* /ðɛː/ and all subject pronouns plus *will, would, have, had*, e.g. /wiːl/, /juːd/, /ðeɪv/, plus sequences like *you would have* /ˈjuːdəv/. Note also the question forms: *do you* /ʤuː/ or /ʤə/, *don't you* /ˈdəʊnʧu/, *did you* /ˈdɪʤu/, *didn't you* /ˈdidnʧu/, *`would you* /ˈwʊʤu/, *`wouldn't you* /ˈwʊdnʧu/. Note also the mild imperative *let us* /lets/.

The only weak forms which can end sentences are those of pronouns. Thus auxiliary verbs (and those main verb forms identical to auxiliaries) such as *am, are, be, can, could, do, does, had, has, have, is, must, shall, was, were, will, would* retain a strong form when they occur finally even though they are unaccented, e.g. *Who's got it? `I have* /ˈaɪ hav/; *he's not sure, but I am* /hiːz nɒt `ʃʊə bət `aɪ am/.

Some prepositions, e.g. *to, from, at, for, of*, apart from having a strong form when receiving a primary accent, also keep a strong form when final and unaccented, e.g. *Where have they gone to?* (/tuː/, also /tu/, but not /tə/); *Where's he come from?* (/frɒm/ rather than /frəm/); *What are you laughing for, at?* (/fɔː, at/); *What were you thinking of?* (/ɒv/). This applies, too, when prepositions and auxiliary verbs occur finally in a rhythmic group including at a 'deletion site' where the following item is understood, e.g. *He looked at* /at/ *and solved the problem*; or *people who can afford to* /tuː/ (= 'do so'), *buy luxuries*, cf. *People who can afford to* /tə/ *buy luxuries, do so.*

Some function words, not normally possessing an alternative weak form for unaccented occurrences, may show such reductions in rapid or casual speech, e.g. *I* (/ə/) *don't know*; *I go by* (/bə/) *bus*; *Do you know my* (/mə/) *brother?*; *for love nor* (/nə/) *money*; *two or* (/ə/) *three*; *ever so* (/sə/) *many*; *Scotland or* (/ər/) *England.* These weak forms are often common only in a limited number of phrases, e.g. *What are you doing?* /wɒt ə jə `duɪŋ/ or even /wɒʧə `duɪŋ/; and, in

the case of *or*, particularly occur in linking two numbers as in the example above. In the case of the disyllables *any*, *many*, a qualitative prominence may be retained on the first syllable, i.e. /eni, meni/, but fully reduced, unaccented, forms may be heard following a vowel in rapid speech, e.g. *Have any more come?* /havni `mɔː kʌm/; *How many do you want?* /haʊ mni dʒu `wɒnt/. Other monosyllabic function words normally retain their strong vowels in unaccented positions, e.g. *on*, *when*, *then*, *one*, *between*, but again, although rather less commonly, reduced vowel forms may be heard in rapid speech, especially when the word is adjacent to a strongly accented syllable, e.g. *What on* (/ən/ or /ɳ/) *earth!*; *When* (/wən/) *all's said and done*; *Then* (/ðən/) *after a time*; *One* (/wən/) *always hopes*; *Between* (/twɪn/) *you and me.*

The more rapid the speech the greater the tendency to reduction and centralisation of unaccented words.[14] Even monosyllabic lexical words may be reduced in rapid speech, if they occur in a relatively unaccented positions adjacent to a primary accent and especially if they contain a short vowel, e.g. /ʌ/ in *He'll come back* /ˈhiːl kəm bak/ and /e/ in *Don't get lost* /dəʊnt gət `lɒst/. /ɪ/ and /ʊ/ may themselves be further reduced to /ə/, e.g. *You sit over here* /ju sət əʊvə `hɪə/, *He put it there* /hi pət ɪt `ðɛː/. The more prominent short vowels /a,ɒ/ are only occasionally liable to reduction, e.g. /a/ in *They all sat down on the floor* /ðeɪ ɔːl sət daʊn ən ðə `flɔː/, /ɒ/ in *We want to go* /ˈwiː wənt tə gəʊ/. Finally, the diphthong /əʊ/, with its dominant central [ə] element, is readily reducible to /ə/ under weak accent, e.g. *You can't go with him* /ju kɑːnt gə `wɪð ɪm/; *He's going to do it* /hiːz gənə `duː ɪt/; *I don't know* /aɪ də`nəʊ/ (the last two often spelt *gonna and dunno* in the representation of rapid speech).

11.4 Acquisition of rhythm and weak forms by native learners

Such little evidence as there is suggests that some children often start off by using the strong forms of function words. They also tend towards a constant length for each syllable and do not apply the Borrowing Rule (see §11.2 above), or, in more traditional terms, they have a syllable-timed rhythm.

11.5 Rhythm and weak forms—advice to foreign learners

Rhythmical shortening of full vowels occurring before /ə,ɪ/ should be attended to; such shortenings can be practised in pairs like *short* vs *shorter*, *lead* vs *leading*, *bus* vs *buses*, *wet* vs *wetted*, *John* vs *John looked ill*, *one* vs *one for tea*, *John* vs *John'll go* etc. Those with a syllable-timed L1 like Cantonese, French, Hindi, Italian, Spanish and Bantu languages, must give particular attention to such shortenings.

Learners who aim at a native English accent (British or American) must learn[15] the weak forms of function words and regard them as the regular pronunciations, using the strong forms only on those limited occasions where they are used (e.g.

under special emphasis or contrast and in final positions). The reduction to /ə/ in these words will not automatically follow from the teaching of rhythm. Even advanced learners often do not use as many weak forms as native speakers.

11.6 Intonation[16,17]

The acoustic manifestation of intonation is fundamental frequency (see §3.2.1) which is perceived by listeners as pitch. Pitch changes in English have three principal functions: (i) they signal the division of utterances into INTONATIONAL PHRASES (besides pitch change, other phonetic cues often mark such boundaries, in particular, pause, final syllable lengthening and changes in the speed with which unaccented syllables are produced)—boundaries between intonational phrases generally correspond syntactically with clause and major syntactic phrase boundaries (see further in §11.6.1.1 below); (ii) they signal syllables with primary and secondary accent, both in the citation of isolated words as already mentioned in §§10.1–10.2 and in the longer utterances of speech; (iii) the shape of the tunes produced by pitch changes can carry various types of meaning, primarily discoursal (i.e. establishing the links between various parts of utterances) and attitudinal; particularly important is the pitch pattern beginning at the primary accent and ending at the end of the intonational phrase—often called the NUCLEAR TONE. It should be noted that, while the variation in intonation between languages (and between dialects of English) is not as great as that involved in segments, it is nonetheless sufficient to cause a strong foreign accent and in some cases lead to misunderstanding. The intonation of GB is described in the following sections. Differences between GB and GA are relatively limited; differences between GB and that of a number of northern British cities are considerable (see under §11.6.3 below).

11.6.1 The forms of intonation[18]

11.6.1.1 Intonational phrases

The boundaries between intonational phrases may be indicated by a combination of internal and external factors. Most obvious among the external ones is pause: in the following example pauses can occur at the points where boundaries are indicated by / (we omit standard punctuation marks but continue to use capitals at the beginning of sentences):

> In the past five years / the way that services are delivered to the public / from both state enterprises / and private companies / has changed almost out of recognition / If we wish to make an enquiry by telephone / we have to choose between a number of options / and then between a further series of options / and so on / Even after this series of choices / we may have to listen to canned music / for a short time / or a long time / or a very long

time / So we may ring off and try the internet / and look up a company's website / only to be told / that if we want more information / we should ring the number we have already tried.

Often, as an alternative to pause, speakers may lengthen the final syllable before the boundary: in the piece above, for example, *years*, *-ic*, *-ses*, *-nies* and *-tion* may be lengthened (such lengthening can apply both to accented and unaccented syllables and to full and reduced vowels). A boundary can also be marked by an increase in the speed of unaccented syllables following the boundary. So, for example, the intonational phrase beginnings *and then be-* and *that if we* are likely to be pronounced very rapidly and hence such syllables are also very likely to involve reduced vowels. These cues to boundaries of intonational phrases are not unambiguous: pause and final syllable lengthening may also be used as hesitations, for example when a speaker has a word-finding difficulty (see §11.7 below). The 'external' cues to boundaries are supported by internal factors: in particular (i) if one of the pitch patterns associated with a nuclear tone is completed at a certain point this in itself may indicate a boundary (see §11.6.1.3 below) and (ii) a jump up in the pitch height of unaccented syllables will generally only occur at boundaries. Thus the syllables *So we may* above are not only likely to be said at a rapid tempo but will be said at a higher level than the pitch of the preceding *very long time.* This is part of the tendency for intonational phrases to be susceptible to a DECLINATION effect, i.e. to decline in pitch from their beginning to their end, so that what are felt to be low-pitched syllables at the beginning of an intonational phrase will in fact be higher than low-pitched syllables at the end.

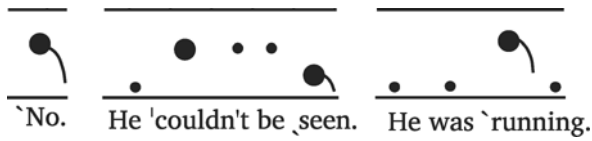
11.6.1.2 Primary accents

The pronunciation of single words and of longer intonational phrases are both described in terms of an obligatory PRIMARY ACCENT and an optional SECONDARY ACCENT. The realisation of primary accent has already been discussed in §10.2 in relation to single words. There it was stated that the final pitch accent in a word is usually the most prominent (and hence is referred to as the primary accent) while a pitch accent on an earlier syllable is referred to as a secondary accent. The same sequence of secondary accents and primary accents applies to intonational phrases. The final pitch accent identifies the syllable which is called the NUCLEUS and begins one of a number of pitch patterns known as NUCLEAR TONES.

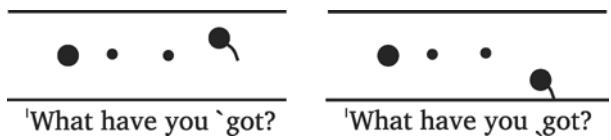
11.6.1.3 Types of nuclear tone

(1) *Falling nuclear tones* (ˋ ˎ)—A falling glide may start from the highest pitch of the speaking voice and fall to the lowest pitch, marked ˋ (a HIGH FALL) or from a mid pitch to the lowest pitch, marked ˎ (a LOW FALL). Where there are high syllables before the primary accent, a high fall will involve a step-up

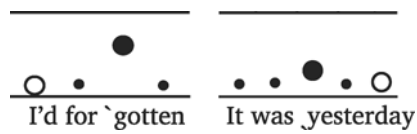
and the low fall a step-down. The falling glide is most perceptible when it takes place on a syllable containing a long vowel or diphthong or a sonorant (e.g. /m,n,ŋ,l,r,w,j/) ('indicates a high-level secondary accent—see §11.6.1.4 below), e.g.[19]



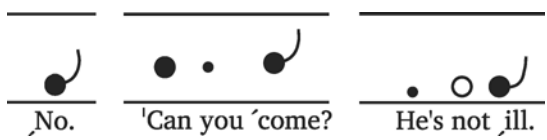
When a fall occurs on a syllable containing a short vowel followed by a voiceless consonant (especially the plosives /p,t,k/), the glide is often truncated and so rapid that it is not easily perceptible, e.g.



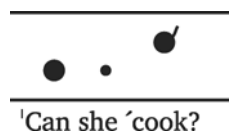
When syllables, collectively called the TAIL, follow the nucleus, the fall may be spread over a relatively high pitch on the nuclear syllable and low pitches on the syllables of the tail, e.g.



(2) *Rising nuclear tones* (´ ˌ)—Rising glides may extend from low to mid, or from low or mid to high. When the rise ends at a high point, it is marked by ´ (a HIGH RISE); when it ends at a mid point, it is marked by ˌ (a LOW RISE). Rising glides are more easily perceptible when they occur on a syllable containing a long vowel or diphthong or a sonorant, e.g.



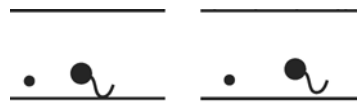
When a rise occurs on short syllables, particularly where the vowel is followed by a voiceless consonant (especially the plosives /p,t,k/), it must necessarily be accomplished much more rapidly, e.g.



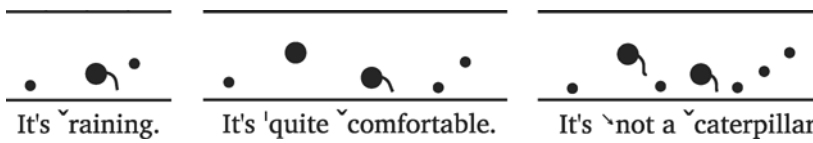
With a tail, the rise is achieved by means of a lower pitch on the nuclear syllable with an ascending scale on the following syllables, e.g.

When the tail is a long one, the ascending sequence of syllables of a high rise may be interrupted by a middle level plateau before a final upward kick e.g.

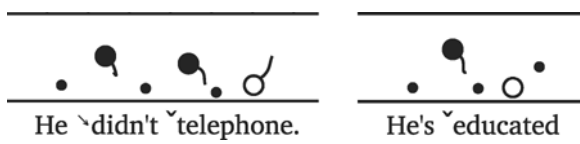
(3) *Falling-rising nuclear tones* (FALL-RISE) (ˇ)—The fall and rise may be confined within one syllable, the glide beginning at about mid level and ending at the same level (or slightly above or below); in the case of a short syllable, the dip in pitch is made extremely rapidly, e.g.

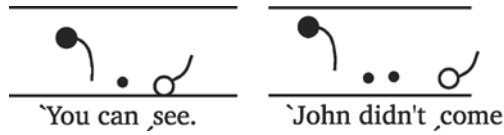


When unaccented syllables follow the nucleus, the fall occurs on the nuclear syllable and the rise is spread over the tail (ˋindicates a falling secondary accent—see the section on secondary accents in §11.6.1.4 below), e.g.

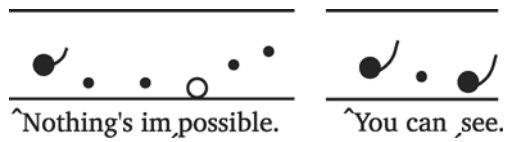


When full vowels occur in tails, the fall takes place on the nuclear syllable and the rise is initiated on the last syllable carrying a full vowel. Where the fall and the rise are on separate words, the fall-rise is indicated by a fall mark followed by a rise mark (i.e. ˋ and ˌ), e.g.

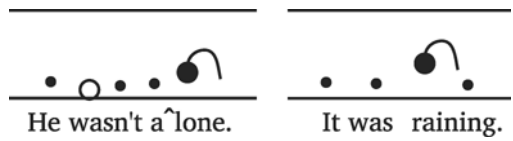




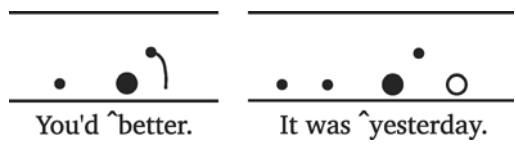
Sometimes a fall-rise is accompanied by an added initial rise, giving a RISE-FALL-RISE variant of the tone, e.g.



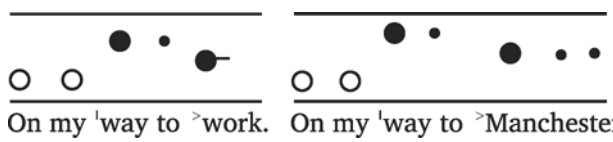
(4) *Rising-falling nuclear tones* (RISE-FALL) (^)—A fall may be reinforced by an introductory rise, being realised as a continuous glide on a long syllable (which may be given extra length), e.g.



A rise-fall on a short syllable followed by a tail may be realised as a low accented nuclear syllable followed by a fall on the tail, e.g.

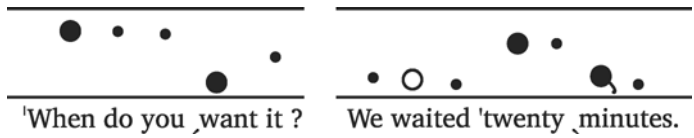


(5) *Level nuclear tones* (>)—The most common level tone is a MID LEVEL, which is a very frequent tone in intonational phrases which are non-final in a sentence. If it occurs on a single syllable that syllable will be lengthened; if a tail follows the nucleus, then the unaccented syllables remain on the same level, e.g.

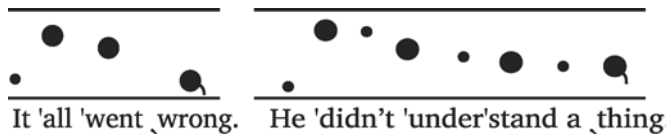


11.6.1.4 Secondary accents

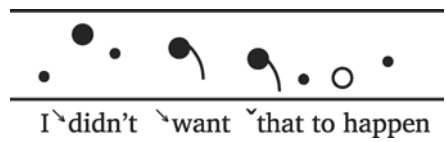
A secondary accent occurs in the pre-nuclear section of an intonational phrase. It usually involves a high-level pitch prominence, marked ['] e.g.



More than one secondary accent may occur in the pre-nuclear position, marked with a series of ['']. To achieve prominence each succeeding secondary accent involves a slightly lower level, e.g.

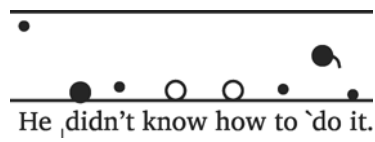


A variant of high level(s) uses one or a series of glides-down, marked [ˋ], rather than levels, e.g.

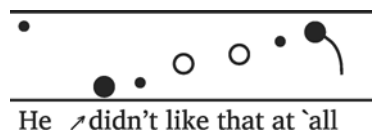


Glides-down of this sort are more prominent than steps.

A pitch prominence (and hence a secondary accent) may also be achieved by a step down to low pitch(es), marked [ˌ], following initial high unaccented syllables, e.g.



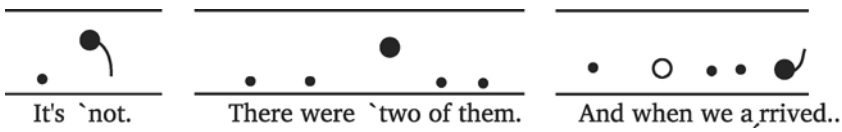
Sometimes the low-level pitch is replaced by a glide-up, marked [↗]. This is particularly common before falling nuclear tones, e.g.



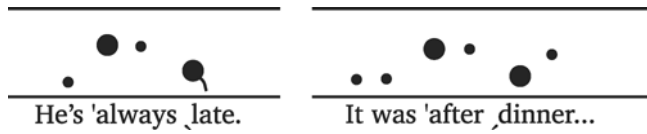
11.6.1.5 The pitch of unaccented syllables

Unaccented syllables, in addition to the fact that they are said very quickly and usually undergo some reduction, do not normally have any pitch prominence. They may occur before the first accent (primary or secondary), between accents, or after the last (primary) accent (the nucleus).

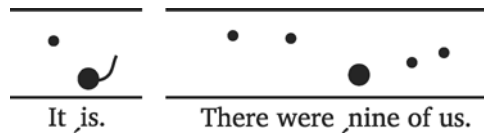
(1) *Pre-nuclear*—Unaccented syllables occurring before a nucleus (where there is no secondary accent) are normally relatively low, whether the nucleus is a fall or a rise, e.g.



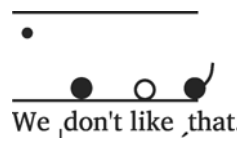
Unaccented syllables before a secondary accent are also usually said on a relatively low pitch, the accent having prominence in relation to them, e.g.



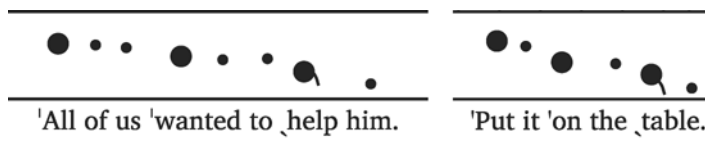
If pre-nuclear unaccented syllables, their weak quality remaining, are said on a relatively high pitch, the effect is more emphatic and animated than if they are low in pitch, particularly if they are followed by a low nuclear tone, e.g.

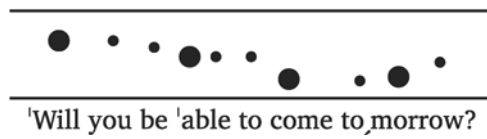


And, as mentioned under §11.6.1.4 above, high unaccented syllables may sometimes be used to give pitch prominence to a low accented syllable,[20] e.g.

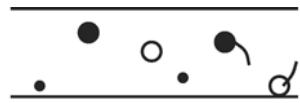


(2) *After syllables with secondary accent*—Unaccented syllables usually remain on almost the same pitch as a preceding syllable with secondary accent, e.g.





Additional prominence is often given to secondary accents by having a descending rather than a level series of unaccented syllables following; this is particularly common before a fall-rise nuclear tone, e.g.



(3) *Post-nuclear*—Unaccented syllables following a falling nucleus remain on a low level, e.g.

After a rising nucleus, unaccented syllables continue (or effect) the rise; similarly the rise of a falling-rising nucleus may be spread over the following unaccented syllables, e.g.

11.6.2 The functions of intonation

11.6.2.1 Intonational phrasing

Most commonly intonational phrases correspond with clauses. The clause may constitute a simple sentence or it may be part of a compound or complex one (a forward slash / marks the boundary between two intonational phrases), e.g.

He usually comes at ten o'clock.
He worked hard / and passed the exam.
Because he worked hard / he passed the exam.
It's nice / isn't it?

But often intonational phrases correspond with smaller syntactic constituents than the clause. The subject of a clause may receive a separate intonational phrase of its own, e.g.

The workers / have got a rising standard of living.
A competitive society / is defensible.
A lot of industry's profits / go in taxation.

Sentence adverbials and adverbials of time and place often receive separate intonational phrases, particularly when they occur at the beginnings and ends of clauses, e.g.

I go to London / regularly.
The government's got to give in / apparently / to every pressure from the City.
In my view / the argument should be / how to build a partnership / between public and private sectors.
Seriously / it seems to me / that the crucial issue / is . . .

Only in rare cases is it obligatory for subjects and sentence adverbials to take a separate intonational phrase; but it is an option which is often taken up, particularly when the subject is long or its status as a new topic is highlighted, or when the speaker wishes to make an adverbial prominent.

Other, less common, types of structure which commonly form a separate intonational phrase are parentheticals (including vocatives and appositives) and parallel constructions, e.g.

Lucy / will you please stop making that noise.
Professor Bull / the Head of the Department / declared his support.
John / this will really amaze you / actually got the highest marks.
This will be achieved by hard work / by brainpower / by interactive subtlety / and by keeping to deadlines.

Non-restrictive relative clauses, which are of course semantically similar to parentheticals, also regularly take a separate phrase, while restrictive relatives do not, e.g.

The old man / who was clearly very upset / denied the charge.
The man who appeared in the dock / looked very ill.

Although there are tendencies, and some obligations, in the assignment of intonational phrases, there remains considerable flexibility. Where clauses are short, they may be combined into one group, e.g.

/I don't think he will/

While subjects are often separate phrases, objects are generally not. Nevertheless a fronted object or an object in a parallel structure may be so phrased, e.g.

This / you really ought to see.
I like him / but I loathe / and detest / his wife.

Besides the probabilistic correlations with grammatical units there also seems to be a length constraint; studies have suggested that in conversation and in lectures around half the intonational phrases will be 3–4 words in length and only in under 10 per cent of cases will they be over 8 words in length.[21] In reading aloud from prepared texts, intonational phrases are likely to be longer and are likely to be at least partly governed by punctuation.

11.6.2.2 Primary accents and new information

In previous sections intonational phrases were said to have one primary accent (= nucleus), at which point begins one of a number of nuclear tones. In very general terms the nucleus falls on the most prominent syllable (and hence the most prominent word) in an intonational phrase. In more particular terms the nucleus marks the end of the NEW INFORMATION. Old (sometimes referred to as 'given') information is that which has either been mentioned before in the preceding intonational phrases or which is in the listener's consciousness because of its presence in the surrounding physical environment.

Sometimes intonational phrases consist wholly of new information. Very often such phrases occur out-of-the-blue or in response to 'What happened?' In cases where the intonational phrase is wholly new the nucleus falls on the relevant syllable of the last lexical item[22] (lexical item here means nouns, verbs, adjectives, adverbs and the word 'item' rather than 'word' has been used because sometimes lexical phrases like *wind up* and *child abuse* are involved), e.g.

Jane's had a `baby.
Something happened on Sunday which was quite un`usual.
I don't really want to at`tend.
He was accused of `dividend stripping.

There are some exceptions to the rule of the last lexical item. One group of exceptions concerns intonational phrases having an intransitive verb or verb phrase whose subject is non-human or which loosely involves (dis)appearance, e.g.

That `building's falling down.
A `doberman's on the prowl.
The `dog barked. (cf. The man `swore.)
I heard a `bird sing.

Another group of exceptions concerns certain types of adverbial in final position. Sentence adverbials (i.e. those which modify the whole sentence) and adverbials of time usually do not take the nucleus in this position, e.g.

I go to `Manchester usually.
It wasn't a very nice `day unfortunately.
There's been a `mix-up possibly.
He didn't suc`ceed however.

An alternative in some cases to having the adverb at the end of a sentence without an accent is to divide the sentence into two intonational phrases with the adverb getting a separate phrase on its own, e.g.

I go to `Manchester / ˌusually.
It was a very nice `day / unˌfortunately.

Those sentence adverbials which are usually classified as conjuncts, e.g. *incidentally*, *therefore*, cannot take a sole nucleus in this way, but must have a separate nucleus of their own or are non-nuclear, i.e.

I go to Manchester inciˌdentally. (not possible)
Inci`dentally I go to Manchester. (not possible)
Inci`dentally / I `go to Manchester. (possible)
I went to `Manchester incidentally. (possible)

Some other types of expression, which are similar to adverbials in that they are in the nature of afterthoughts, are also common in final position with no accent; for example, vocatives and direct speech markers, e.g.

Don't you a`gree, Peter?
Don't be a `fool, he said.

When old information occurs at the end of the sentence, then this will be unaccented, e.g.

(Why don't you invite John to the party?)
Because I don't `like John.

(We had a long `wait.)
You mean we had a `very long wait.

In the last example there is obviously some element of contrast present—between *long* and *very long*. Sometimes the nucleus may fall on a contrasted item even though a later item in the intonational phrase is new, e.g.

John is quite a `tall man / but his brother's very `short.

In certain, very limited, cases, the whole of an intonational phrase comprises old information. One such case concerns ECHOES, i.e. where a second speaker echoes something a first speaker has just said; and the accentuation of the second speaker will follow that of the first, e.g.

(I couldn't `do it). You couldn't ´do it?
(This time we went to `Ireland). Oh you went to `Ireland / ˌdid you?

11.6.2.3 Primary accents on function words

At the beginning of this section it was noted that the primary accent usually falls on a lexical item (nouns, verbs, adjectives, adverbs). There are, however, some special cases when the primary accent falls on a function word; this most commonly applies to auxiliary verbs and prepositions. Sometimes an auxiliary word highlights a contrast of tense or negation (sometimes the negation is just presupposed):

(Why haven't you `phoned me?) But I `have phoned you.
(Why don't you `love me?) But I `do love you.
(I wish I was in ˇEngland.) But we `are in England.
(This book ought to be re`printed.) But it's `been reprinted.

Preposition accenting is another way of giving special emphasis. There is usually an alternative accenting which is much less emphatic; in the following examples compare the accents on *to*, *or*, *with* and *of* with more unmarked accenting on *sensible*, *name*, *belongings* and *many*:

(Why are you doing `that?) It's the only sensible thing `to do.
`Acted a lot / ˌdid you? / Can't say I remember your `face / `or your name.
[*Announcement*] Please make ˌsure / you have all your belongings `with you.
The mistakes you made were not ˇbig / but there were a great many `of them.
(I a`greed with the decision.) But do you accept that there were special aspects `to the case?

In question word questions extra emphasis (showing greater interest or urgency) is often produced by putting the nucleus on the verb *be* or an auxiliary verb, e.g.

(We can't let ˇthat happen.) What `should be done?
(That's a very expensive `ring.) How much `is it?
(I expect the `family to come to ˌnight.) How `is your wife?
[*Thinking you recognise someone*] Who `is that man over there?

11.6.2.4 Focusing adverbs

There are a number of focusing particles (i.e. those which FOCUS or highlight particular words or group of words) which govern where the nucleus occurs, either taking the nucleus themselves or projecting it onto a following item.

(1) Nucleus on *too* and *as well* in their meaning 'in addition'
Too with the meaning 'in addition' takes the nucleus and often takes a separate intonational phrase (IP), particularly when final in the IP. In its own IP, *too* will copy the tone of the preceding IP. *As well* (with virtually the same meaning) also occurs in final position and must take a nucleus (on *well*).

I'm a vege`tarian / `too.
`I'm a vegetarian / `too.
I discovered `too / that no `women were coming.
I think John's going `too.
Quite right `too.
Did ˌyou live in that area / ˌtoo?
In Africa `too they do that.
In this area `too he showed his mettle.
John `too agreed to come.
`I'm a vegetarian / as `well.

As well also occurs in the verb phrases *might/may as well* where it can be non-nuclear

He might as well have done it `anyway.
I may as well finish `now.

(Note that *too* also functions as an intensifier as in *too hard*)

(2) *Either*
Either is used rather than *too* following a negative:

`I'm not a vegetarian / `either.
I'm not a vege`tarian / `either.

(Note that *either* may also occur as a conjunction, e.g. *Either you can do `this / or you can do `that*)

(3) *Even, not even* (inclusive adverbs)
Even focuses on all that occurs between *even* and a following nucleus (which may be immediate or at a distance):

Even `John agreed.
Not even `John agreed.
He didn't even say good`bye.
He even pawned his wife's `jewels.
Not even a hundred `pounds would make me do that.
He didn't even say he was `sorry.
I'm not even `slightly amused.

(4) *Not . . . at all* (emphatic negative)
Not . . . at all can be non-nuclear or nuclear but, if it is nuclear, the nucleus falls on *all* rather than *not*:

It's not like that at `all.
He's not at `all friendly.

(5) *Only*, *not only*, *if only*, *only because* (as restricting adverbs)
Only and *only* phrases are commonly non-nuclear and forward-looking; the scope of focus stretches from the *only* up to the nucleus:

Only `three.
Only `I know how to do that.
Only ten of them turned `up.
He only did it for `your sake.
It's not only `John who said that.
If only we'd thought of that be`fore.
I'll a`gree / but only because it's `you that's putting it forward.

On the other hand *only* can be nuclear and backward-looking, e.g.

We were allowed two tickets `only.

(6) *Also* (additive)
Like *only*, *also* is commonly non-nuclear and the scope of focus stretches up to the nucleus whereas a nucleus on *also* is backward-looking, i.e. it focuses on the matter that precedes:

He's also written to the `chairman.
Also under scrutiny was the `president of the company.
He also passed the e`xam.
He `also passed the exam.

(7) *Enough* (reinforcing adverb or adjective)
In initial position *enough* often follows a sentence adverb (most commonly *strangely*, *curiously* and *oddly*) and takes the nucleus, whereas in other positions it is usually non-nuclear:

Strangely e˘nough / it doesn't `work like that.
Oddly e˘nough / I a`gree with you.
He wasn't big enough to `reach it.
He be`haves nicely enough.
There wasn't enough `space.

(Note that *enough* may also be a pronoun, *I've had `more than enough. That's e`nough.*)

11.6.2.5 Some special accentings

In cleft sentences the nucleus may fall on the focused item but it may also fall post- or pre-focally, cf.

It was `Tom who suggested it.
It was Tom who su`ggested it.
It's `always Tom who suggests things.

A related type of focusing puts the nucleus on a pronoun, e.g.

The real IRA said that `they planted the bomb.
The TUC said `it was responsible.

Reflexive pronouns are commonly nuclear:

The gears on my bike shift them`selves.
Honda—the car that sells it`self.

There are a number of generally vague words (which may nevertheless be precise in a particular context) which commonly take the primary accent when it might be expected to be placed on a more specific (preceding) word. Chief among these is *thing*, e.g.

I don't as a regular `thing.
Get your `things.

Thing accenting also shows up in the phrases *that's the `thing*, *a close-run `thing*, *do the right `thing*. Similar accenting commonly occurs on *stuff*, *matter*, *person*, *creature* and *place* in phrases like *where's my `stuff*, *what's the `matter*, *she's a very nice `person*.

Ordinal numerals are also commonly accented and take precedence over the vague words just mentioned, e.g. *the `first thing to do*, *the `next time you come*.

11.6.2.6 The meanings of tones

Almost all primary accents in words and longer utterances have up to now been exemplified using the high fall nuclear tone (marked `). This is the way in which individual words are usually cited in isolation. Moreover, in all styles of English speech, simple falls in pitch (whether from a high or mid starting-point) account for the majority of nuclear tones (generally estimated around 50 per cent).[23] Simple rises and fall-rises are generally estimated to account for a further 40 per cent of tones. The preponderance of falls is usually slightly higher in conversation than in other types of speech, e.g. in scripted reading. Since rises and fall-rises are often used as a cohesive device signalling more to follow, it is not surprising that they are more frequently used in reading where they will often indicate that a sentence is not yet finished.

The meanings of nuclear tones are sometimes more DISCOURSAL in nature (e.g. they indicate links or the absence of links between successive intonational phrases), sometimes more ATTITUDINAL (e.g. they indicate the speaker's doubt or certainty about what he is saying) and sometimes more SEMANTIC (e.g. they co-occur with lexical meanings which are reinforcing or limiting—this is particularly the case with adverbials). In general the meanings of tones are not directly grammatical, but grammar may indirectly be involved in two ways: (i) some

attitudes are inherently more associated with questions; in particular, high rise, which often has a meaning of surprise, frequently marks an echo question (see also previous section); and (ii) the attitudinal and discoursal meanings conveyed will vary somewhat according to the syntactic sentence-type (e.g. declarative, wh-interrogative, yes/no-interrogative) with which the intonational phrase co-occurs.

Because of the variation in meaning according to sentence-type just mentioned, the description of the meanings of nuclear tones[24] which follows is divided according to the following categories: (1) major declaratives, (2) minor declaratives, (3) yes/no-interrogatives, (4) wh-interrogatives, (5) tag-interrogatives, (6) imperatives, (7) exclamatives, (8) social formulas. In general falling nuclear tones (whether ˌlow fall, `high fall, or ˆrise-fall) are separative, matter-of-fact and assertive; whereas ˌlow rise, ´high rise and ˇfall-rise are continuative, implicative and non-assertive. Level tones (most common among these being the mid level) belong with the rising tones in the sorts of meanings they convey.

The examples are given as isolated utterances or preceded by a bracketed 'setting'. It should be remembered that the attitudinal meaning of an utterance must always be interpreted within a context, both of the situation and also of the speaker's personality. It may well happen that an intonation which is polite in one set of circumstances might, for instance, be offensive or patronising when used by another person or in other circumstances.

(1) *Major declaratives*

Major declarative refers to those cases where the intonational phrase correlates with an independent clause, with the main clause in complex sentences, with the last clause in compound sentences, and with that part of any of these which is remaindered when a separate intonational phrase is given to an adverbial or a subject or some other part of the clause, e.g.

He didn't go.
I took an overcoat / because it was raining.
I took the car / *and drove to London.*
The first man on the moon / *was Neil Armstrong.*
Usually / *we do it this way.*
We do it this way / usually.

In major declaratives falling tones are the least attitudinally marked of the tones with the high fall expressing more liveliness and involvement than the low fall, cf.

It's a very nice `garden.
Of `course it is.
It's a very dull ˌbook.
The parcel arrived on ˌThursday.

Fall-rise is common on major declaratives with a variety of meanings, in particular, reservation, contradiction, contrast and warning as in:

I like his ˇwife / even if I don't like him.
(It's the twenty fifth today, isn't it?) Twenty ˇsixth.
John didn't succeed / but ˇPhilip did.
If you don't do it / John'll be very ˇcross.

High rises are common on echoes (as already mentioned at the end of the previous section) and on declarative questions:

(I did it in blue.) You did it in ´blue?
So you didn't ´go?

Other tones are less common. The low rise with only other low syllables before it (i.e. with no preceding pitch accent) is complaining:

You mustn't go a¸way.

Whereas, with a high pitch before it, it is encouraging or even patronising (this sequence is very common in speech to children):

You'll 'only over¸do things.
There's 'no point in ¸rushing.

This sequence is frequent on imperatives (see below) with a similar sort of meaning. Finally, the least common nuclear tone[25] is the rise-fall. Its meaning usually involves an element of being very impressed, or, conversely, being very unimpressed and hence indignant or even sarcastic:

He's the head of a big firm in ˆLondon.
Oh inˆdeed / How ˆnice for you.

Rise-fall is often used for gossip:

Have you heard? / Jill's ˆpregnant.

(2) *Minor declaratives*
Under minor declaratives are included all those parts of declarative sentences which were excluded under (1) above. Most of these occur in sentence non-final positions, e.g. subjects, adverbials, the first clause of compound sentences and often the subordinate clause of complex sentences.

The tones used on these intonational phrases are usually from the rising group: fall-rise, low rise and mid level. Fall-rise again carries its common meaning of 'contrast'. The difference between the other two tones in non-final position has to do with style: low rise is the most oratorical and is also typical of reading aloud, whereas the mid level carries no other meaning other than that of non-finality, which is perhaps why it alone of these three tones occurs only in non-final position:

What I'd ˇlike / is a drink of tea.
The ˇbest person to do it / would be Bill Bailey.
The ˇcrucial issue / is that . . .
We took the ˌcar / and drove to Birmingham.
On my way to ˃work / it started to rain.
Un˃fortunately / it doesn't work like that.
(cf. Unˇfortunately / it doesn't work like that.)

Most adverbials which have a separate intonational phrase will take a rising tone but there are a number of adverbials of a particularly assertive kind which more commonly take a falling tone (e.g. *literally*, *certainly*, *honestly*, *by the way*, *of course*, *besides*):

Be`sides / he's had time to think about it.
By the `way / what do you think of the new chap?

As indicated by the last example, some adverbials can occur before interrogatives as well as declaratives. Adverbials also frequently occur following the main clause; in these cases the rise which occurs is almost always low rise (but the falling type again takes a fall):

I went to Canada / last ˌyear.
It didn't work / unˌfortunately.
He turned bright red / `literally.

In the case of final subordinate clauses two sequences of tones are possible. If the previous main clause has a fall, then the subordinate clause will take a low rise. Alternatively the main clause may take a fall-rise and the subordinate clause the fall, cf.

I began to feel `ill / because I hadn't had enough to ˌeat.
I began to feel ˇill / because I hadn't had enough to `eat.

(3) *Yes/no-interrogatives*
In GB the more usual and more polite way of asking yes/no questions is with the low rise (although a high rise is more frequent in General American); if a potentially accented syllable is available before the nucleus, then this will take a high pitch:

(It's going to rain I'm afraid.) Do you 'really ˌthink so?
(I'm really enjoying myself.) Is 'this your ˌfirst visit to London?
(The large size costs a pound.) Is 'that the ˌnew price?

A falling tone (high fall or low fall) on a yes/no-interrogative marks it as gently pressing:

(Can you remember where I left my new shoes?) Are they in the `wardrobe?
(Tom explained it all to me.) But do you under`stand it?
(I can't find my pen anywhere.) Are you sure you brought it `with you?

A rise-fall is often used to mark a yes/no-interrogative as an exclamation:

(He didn't even leave a message.) Now isn't that pe^culiar!
(I'm going to Spain tomorrow.) Aren't you ^lucky!
(He refused to help me.) Would you be^lieve it!

(4) *Wh-interrogatives*
The usual tone on wh-interrogatives is falling (low fall or high fall):

(She wants you to send an apology.) What's it got to do with `her?
(You mustn't tell her.) Why `not?
(She didn't get the job.) How do you ˌknow?

The alternative tone on such interrogatives is the low rise (like yes/no interrogatives, it is more likely to be a high rise in General American). The use of the rise is more tentative:

(We're off on Thursday.) What time do you ˌstart?
(I'm afraid it didn't work.) Why did you do it ˌthat way?

Wh-interrogatives can be used with high rise to ask for repetition:

(He's completely irresponsible.) ´What did you say?
(Her name was Pettigrew before she was married.) ´What did you say she was called?

(5) *Tag-interrogatives*
Tag-interrogatives consist of a sequence of an auxiliary verb and a pronoun appended to a preceding declarative. They are most commonly negative if a preceding statement is positive, and *vice versa* (called 'reversed polarity' tags). Such tags have two common alternatives; a falling tone (high fall or low fall) or a rising tone (usually low rise). Both types of tone expect agreement, the fall inviting or demanding it, the rise leaving open the possibility of disagreement:

(It's a long way from the shops.) It's right on the outskirts / `isn't it?
(I had a lovely time.) Yes / The day did go well / `didn't it?
(Lend me your copy of Shakespeare.) You will look after it / `won't you?
(Where did I put my golf clubs?) You left them in the garage / ˌdidn't you?
(He asked me to drive him there.) But you won't be able to go / ˌwill you?
(Who was that woman he was with?) It was his sister / ˌwasn't it?

Another type of tag has constant polarity. This type only has low rise (falling tones are impossible). The meaning conveyed is in the nature of a thoughtful echo of a statement from the preceding speaker:

(I think he's going to emigrate.) So he won't marry her / ˌwon't he?
(Rachel's gone away with John.) She's still seeing him / ˌis she?

A variation on this type involves a pronoun and auxiliary verb omitted from the previous main clause (it is heard on TV or radio as a detective's interrogation technique), e.g.

Watch a lot of television / ˌdo you?
Come on his bike / ˌdid he?
Didn't give it any thought / ˌdidn't you?

(6) *Imperatives*
Abrupt imperatives have a falling tone. Polite imperatives, which are at least suggesting that the listener has a right to refuse, are said with a rising tone (most frequently low rise and sometimes fall-rise):

(I've decided to lend him my car.) Don't be such a silly `fool.
(What should I do now?) Go and wash the `car.
(You shouldn't have spent all that money.) Don't be ˌangry about it.
(I'm afraid I've had enough of you.) Give me another ˌchance.
(I have a very delicate job to do here.) Be ˇcareful.

The use of a rising tone rather than a falling tone softens the imperative. Sometimes the rising tone is combined with a tag:

(Can I have some more wine?) Help your`self / ˌwon't you?
(Her nerves are terrible.) See if you can `help / ˌwill you?
(I'm doing my best.) ˃Well / hurry `up / ˌcan't you?

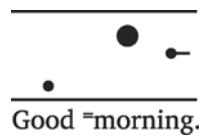
(7) *Exclamatives*
Exclamatives (i.e. those sentences having the syntactic form of an exclamative, i.e. an initial question word and no verb) take a falling tone (including rise-fall):

What a beautiful `day! How `stupid he is! What a very silly thing to `do!
What a paˆlaver!

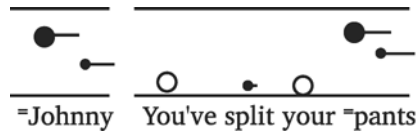
Similarly individual words, particularly nouns and adjectives, can be given exclamatory force by the use of a falling tone, e.g.

`Nonsense! You `idiot! `Marvellous!

(8) *Social formulas*
It is difficult to give rules for the intonation of social formulas because it is an area where native speakers of English often have idiosyncratic habits. It is, however, generally true that falling tones generally show sincerity, while rising ones are used in situations where a formulaic pleasantry is appropriate. Thus *thank you* is appropriately said with a rise on being given a ticket, while a high fall is more likely if a genuine favour has been done, and a low fall if the matter in hand is boring. *Good morning* with a high fall is sincere-sounding (and sometimes inappropriately so!), with a low fall is brusque and with a low rise is polite (and possibly overly so!). This greeting (and many others) can also be said with the 'stylised' tone which involves a step from high level to mid level beginning on the accented syllable, thus;



This tone is a special one often used on vocatives and on jocular sentences,[26] e.g.



(9) *Tonal sequences*
In the preceding subsections it has become apparent that some tonal sequences are very common in successive intonational phrases, particularly those within one sentence. The most common sequence involves a tone from the rising group (low rise, fall-rise or mid level) followed by a fall (high fall or low fall); and the syntactic sequences are sentence adverbial or noun-clause subject followed by a clause remainder and an initial subordinate or co-ordinate clause:

Un˃fortunately / it didn't ˋwork.
The ˇusual excuse / is that there's not enough ˋtime.
Because he gave up too ˇearly / he lost two thousand ˋpounds.
He staked everything on ˏwinning / and ended up with ˋnothing.

A second sequence involves a falling tone (high fall or low fall) followed by a rising tone (almost always low rise, occasionally fall-rise): the syntactic sequences are main clause plus adverbial or main clause plus 'open' tag:

I deny the whole ˋthing / ˏusually.
That's the best way to ˋdo it / ˏisn't it?

A third common sequence is a falling tone (low fall, high fall) plus another falling tone (low fall, high fall); this is common with sentence adverbials of the reinforcing type, with 'closed' tags, and with co-ordinate clauses which are very independent of one another:

I go to `London / `regularly.
It was a beautiful `day / `wasn't it?
(What should I do?) Take up `singing / write a `book / do an `evening class / buy a `bicycle / `anything!

11.6.2.7 The use of secondary accents

Secondary accents are produced by pitch prominences which occur before the nucleus, i.e. they are pre-nuclear accents. As the name implies they contribute less to meaning than primary accents. The first secondary accent in an intonational phrase often serves to mark the beginning of the new information, e.g. *We 'ran all the 'way to the `station.* Where there is a series of secondary accents (prominence being achieved by 'stepping' the pitch—see §11.6.1.4 above), the later accent(s), like that on *way* in the example above, serve only to divide the new information into chunks. This sequence of secondary accents which steps down is the most common type of pre-nuclear accenting in GB and can occur before all nuclear tones. The other most frequent type of sequence involves one or a series of slides (see §11.6.1.4 above); this gives more emphasis to the words taking the accents and is particularly common before the fall-rise nuclear tone, e.g. *It `wasn't `really like ˇthat.*

11.6.3 Regional variation in intonation

Within the UK the most marked variation compared with GB concerns the more extensive use of rising tones in many northern cities (sometimes referred to as URBAN NORTH BRITISH); it is reported for Belfast, Birmingham, Glasgow, Liverpool, Manchester and Newcastle.[27] Rises in these cities are more frequent on declaratives than in GB and indeed in some of them may typically be the most frequent tone on declaratives. The rise may be a continuous one or may consist of a rise followed by a plateau (with an optional downdrift at the end). Belfast[28] (and Derry)[29] has both types and has the most regular use of rises of all the cities, falling tones being much less frequent than rising ones in speakers of all educational classes (where in the other cities the typical rising tones may be lost in more educated speakers). In the south of England, intonation does not vary much from GB, but one type of tag intonation usage, particularly common in popular London, concerns the use of a falling tag purely as a response, as in

(A: What's all this `mess?) B: I've been doing the `cleaning / `haven't I
(A: Why did you get up so early?) B: Because the `postman came banging on the door / `didn't he
(A: [Pointing to a bottle] What's all this?) B: I use it for cleaning the silver / `don't I?

General American has less difference from GB than that in northern British cities mentioned above; one notable difference is the increased use of high rise as opposed to low rise, particularly for yes/no-interrogatives. Australia and New Zealand are most notable for the intonational change whereby a high rise is increasingly used on declaratives;[30] it seems to be used as a check (hence 'checking tone') by the speaker that the listener is paying attention and understanding, particularly when the speaker is presenting information. This usage is now commonly heard in England:[31] often high rises are used when falls might be expected, e.g. *I met 'Sonia in town yesterday / and she didn't look very 'well / and she told me she had 'shingles.*

11.6.4 Pitch range

In preceding sections §11.6.1.3 and §11.6.2.3 falls were divided into high falls and low falls and rises were divided into low rises and high rises. This sort of variation in the height of tones concerns accent range. However, there is another sort of variation in height which refers to the pitch of the whole intonational phrase, measured as the interval between the lowest and highest pitches. Speakers may increase the width of the normal pitch range of their intonational phrases by raising the pitch of the highest pitches. Such variation in the width of the pitch range of intonational phrases is often referred to as KEY. The most common use of key concerns the delimitation of PARATONES (the spoken equivalent of written paragraphs), a new paratone being marked by a wide key in the first IP and the end of a paratone by a narrow key in the last IP[32] (and often followed by an extended pause). Paratones often correspond with topics (defined in the widest sense); the most obvious use of such differences of key, paratones and topics, is in newsreading.

There is yet another sort of variation in pitch range which involves raising or lowering both low and high pitches, so that the pitch overall is lower or higher but not wider. A low register is used for parentheticals (marked here by doubling the boundary marker), e.g.

I ran into Jane last week // by the way / did you know she has three children? // and she said. . . .

High register is in general associated with greater emotional tension but nevertheless has to some extent become conventionalised. For example, the adoption of a 'little girl voice' may be used to signal helplessness.

11.6.5 Intonation and punctuation

Punctuational usage is generally prescribed in manuals of punctuation (particularly those put out by publishing houses) according to grammar rather than intonation. Indeed in some cases a punctuation mark has no correlate in intonation, e.g. the apostrophe marking possession or elision, and the use of spaces between words. However, in many cases punctuation is as related to intonation as to grammar.

Punctuation marks serve both to delimit, e.g. to mark the end of a sentence or to specify, e.g. that a sentence is a question. In both areas there are clear correlations between punctuation and intonation. The use of any of the six marks, comma, semi-colon, colon, full stop, question mark and exclamation mark, always correlates with a boundary between intonational phrases. However, there are syntactic positions where such an intonational break is very common but where the use of a punctuation mark (especially the comma) is generally proscribed. This applies particularly to the position between subject and verb. As remarked in §11.6.2.1 above, this is a very common position for an intonational break if the subject is either particularly long or contrastive. Hence, although a comma in this position is generally proscribed by manuals of punctuation, there will nevertheless be the tendency to insert a comma here because of the writer's intuition about intonational-punctuational correlations, e.g.

The best way to do this, would be to ask him first.

Specification concerns the marking of a sentence-type as a question, or an exclamation (the use of the full stop marks the sentence as a non-question and non-exclamation, but may be used for different sentence-types, e.g. statement, command and request). Such specifiers have poor correlations with nuclear tones. The full stop usually correlates with a fall but by no means always. The question mark correlates regularly with a high rise in the case of 'declarative questions' (§11.6.2.6(1)), frequently with a low rise in yes/no-questions and approximately half the time in tag-questions and frequently with a falling tone in wh-questions. Only in the case of the exclamation mark is there a regular correlation with at least an overall category of tone—it always correlates with a falling tone (usually high fall or rise-fall).

11.6.6 Acquisition of intonation by native learners[33]

Many babies are excellent mimics of intonation and may produce English-sounding intonation patterns on nonsense syllables (often called 'jargon intonation') in the late stages of their pre-linguistic babbling.[34] At this same time they may also have a distinction of meaning in their use of a fall versus a rise on single syllables—typically the fall is naming while the rise is requesting. Even those children who do not have this distinction during the babbling period will generally acquire it during the period of one-word utterances (which typically lasts

for six to nine months during a child's second year). At the two-word stage children are capable of varying nucleus placement, although whether this is already signalling new and old information or whether it is more rigidly tied to different types of sentence is not clear. (It is, for example often the case that possessives have the accent on the possessor while locatives have it on the location, cf. *`Daddy car* 'Daddy's car' vs *Daddy `car* 'Daddy's in the car'). Little is known about the later acquisition of intonation, although it is likely that some uses of the fall-rise tone are learnt early. But a full mastery of the more subtle nuances of intonational meaning may not be acquired until the age of ten or even later.[35]

11.6.7 Intonation—advice to foreign learners

The foreign learner should pay particular attention to:

(1) Achieving a better style in reading aloud by appropriately dividing his speech into intonational phrases. Such division may be done in English in ways very similar to his native language (especially in the case of most other European languages) but nevertheless the learner should note the frequency with which sentence adverbials and the subjects of sentences are given their own intonational phrases.
(2) Putting the nucleus on the focal point in the sentence. Some languages (like French, Italian and Spanish) more regularly have the nucleus on the last word in the intonational phrase. This may sometimes mean accenting old information occurring at the end of a phrase, which is incorrect in English, e.g.

    A: Would you like to come to London with me tomorrow?
    B: No/I don't like LONdon.

(3) Using appropriate nuclear tones. Learners should note that the fall-rise (especially on a single word) is rare in most languages but very frequent in English for a range of attitudinal meanings on declaratives and for subjects with their own intonational phrase. Fall-rise is also frequent on sentence adverbials in initial position, although low rise is the usual tone in final position (but those exceptional falling adverbs, like *definitely*, which take low fall or high fall in any position must also be noted).

An overuse of simple falling tones (especially high falls), together with an overuse of glides-down in pre-nuclear positions, will produce an excessively aggressive effect, while conversely an overuse of simple rising tones (including fall-rises and glides-up in pre-nuclear position, which are uncommon in GB) will sound excessively tentative. The overuse of falls is typical of north Germans while an overuse of rises is typical of Scandinavians.

11.7 Hesitations

Pause was stated in §11.6.1.1 to be one of a number of phonetic features which are used to mark boundaries between intonational phrases. But pause can also occur in other positions: (a) before words of high lexical content or which have a low probability of occurrence in a particular context (and where the speaker is often searching for the right word); and (b) after the first word in an intonational phrase, where it appears to be a pause for planning, i.e. the speaker has decided that he has something to say but has not yet planned it in detail.[36] Both (a) and (b) may be also used more deliberately as ways of attempting to prevent interruption. Both differ from pauses at intonational phrase boundaries in frequently being filled rather than unfilled (i.e. silent) pauses. In GB filled pauses are generally filled with [ə] or [m] or a combination of the two, e.g.

I don't agree with that / I [əː] think it would be better if . . .
You see / the myth is / and I'm [əː] I can see from the applause . . .
Well [əmː] I don't think I will.

This type of filled pause used in GB is not necessarily the type of filled pause used in other dialects of English or in other languages. Scottish English uses [eː], French uses [øː] and Russian uses [nː]. A quite dramatic change can be produced in the degree to which a person's speech sounds native-like by adopting the correct type of filled hesitations.

11.8 Voice quality[37]

The area of voice quality has very little scientific work associated with it, particularly on a cross-linguistic basis and this section is perforce not very systematic. Some reference has already been made to the topic under §5.8 above. The term 'voice quality' refers to positions of the vocal organs which characterise speakers' voices on a long-term basis. Long-term tendencies in positioning the tongue and the soft palate are referred to as ARTICULATORY SETTINGS; those referring to positions of the vocal cords are called PHONATION TYPES. In some tone languages a phonation type may co-occur with a lexical tone (e.g. two tones may be distinguished in some varieties of Vietnamese, one simple high rise and one high rise with accompanying creak). But more generally a particular voice quality may be characteristic of an individual, of a particular language or dialect, or may be used within a language to convey a particular attitude or emotion.

The articulatory setting of a language or dialect may differ from GB. So some languages like Spanish may have a tendency to hold the tongue more forward in the mouth, while others like Russian may have a tendency to hold it further back in the mouth. Nasalisation may be characteristic of many speakers of American English, while denasal voice (which may lead to a low-grade nasal resonance in nasal consonants) is frequently said to occur in Liverpool. Tense and lax are labels which apply to the muscular tension in the whole of the vocal

tract:[38] GB is generally said to be lax (making it sound 'mellow'), while French and German are said to be tense (making them sound 'metallic' or 'strident').

The most commonly described phonation types are creaky voice, breathy voice, ventricular voice (sometimes called harsh voice and involving the false vocal cords just above the vocal cords), whispery voice, falsetto (dividing the vocal cords into two halves and hence raising the pitch by an octave), and raised-larynx and lowered-larynx voices. Breathy voice is said to be used by many speakers of Danish and Dutch, creaky voice is used by many speakers of GB and particularly by speakers of CGB, while ventricular voice is a characteristic of many speakers of Scottish English and speakers of Cockney. Within GB (and possibly wider in English) some phonation types are associated with certain styles of speech and emotions: breathy voice is often called 'bedroom voice', whispery voice is sometimes called 'stage whisper' or 'library voice', ventricular voice is associated with anger and lowered-larynx is called sepulchral or 'vicar's voice'.

Notes

1 Note that the sign ` here and throughout the book shows the place of the primary accent. As the symbol ` implies, in the citation forms of words this is usually a falling accent. In this chapter a falling accent becomes one of a number of different tones forming the intonational system. See §11.6.1 and note 16.
2 Pike (1945), Abercrombie (1967), Halliday (1967) and numerous TESOL textbooks.
3 Syllables made prominent by stress alone refers to a subset of full-vowelled syllables judged to be prominent rhythmically.
4 Thompson (1980), Roach (1982) and Dauer (1983).
5 Full vowel rhythm has affinities with Metrical Phonology (Liberman & Prince, 1977; Hayes, 1995) which has a level of strong and weak syllables and extrametricality.
6 Full-vowelled rhythm and the Borrowing Rule were first put forward in Bolinger (1981) and applied to TESOL in Faber (1986). Instrumental confirmation is given in Thompson (1980).
7 Some varieties of English, notably Caribbean English as an L1 and Indian English as an L2, are marked by a much lesser use of reduced syllables and hence the rhythm is nearer to that traditionally labelled 'syllable-timed'.
8 All the words listed with weak forms above occur in the two hundred most frequent words in the spoken part of the British National Corpus (Leech *et al.*, 2001).
9 *Some* does not occur in a weak form when used as a pronoun, e.g. /sʌm maɪt `seɪ/, /aɪd `laɪk sʌm/.
10 *That* as a demonstrative adjective or pronoun takes a full vowel, e.g. *that man* /ðat `man/, *that's the one* /ðats ðə `wʌn/.
11 There may be new tendency to use /ðə/ before vowels among younger speakers. This was first reported for American speech in Todaka (1992). Windsor Lewis (2013: §3.7.I.3) discusses its possibility of occurrence but only with an obligatory [ʔ] before the vowel.
12 As a demonstrative adverb, *there* will have a full vowel, e.g. *there's the book* /ðɛːz ðə `bʊk/.
13 A weak form with /h/ would normally be used when unaccented but following a pause.
14 See Shockey (2003) for many instances of hyperreductions in casual or rapid speech.
15 See Windsor Lewis (2013: §4.7) for priorities for foreign learners in the learning of function words.

16 Much recent work on the form of English intonation has been done in an American tradition represented by Pierrehumbert (1980/87) and Pierrehumbert & Hirschberg (1990), which decomposes pitch contours into sequences of high and low tones and also detaches phrase tones and terminal tones at the end of intonational phrases. However, the treatment of intonational meaning in this newer framework has remained at a general level and the nuclear tone approach is retained here because it remains easier to treat in this setting the local meanings produced by associations between tones and syntactic types.
17 Refer to the companion website for a reading of all the examples in this section.
18 When combined with text, tones are marked using what are usually called 'tonetic-stress marks', though in this book they are more accurately called 'tonetic-accent marks'. All marks indicate a following accented syllable. Individual marks (which are iconic) indicate pitch patterns starting at the accent. For a more complete treatment of the intonation of GB, see O'Connor & Arnold (1973), Cruttenden (1997) and Wells (2006).
19 The type of transcription used in the diagrams is called 'interlinear tonetic'. Each ring indicates a syllable. A large filled dot indicates a pitch accent, either primary or secondary. A filled ring sometimes has a tail indicating pitch movement on the accented syllable itself. A large unfilled ring indicates a syllable made prominent by having an unreduced vowel. Small rings indicate unaccented syllables.
20 These high unaccented syllables are sometimes marked with a high-level mark ¯. We have not used this mark because we prefer to preserve the general rule that the tone marks in the text always apply to accented syllables.
21 Quirk *et al.* (1964: 683), Crystal (1969: 256) and Altenberg (1987: 25).
22 Altenberg (1987: 174) found the nucleus occurring on the last lexical item in 78 per cent of cases.
23 Quirk *et al.* (1964: 681), Crystal (1969: 225) and Altenberg (1987: 36). But see also the somewhat higher figure reported in §12.5(1).
24 For further information on the meanings of tones, see Halliday (1967), O'Connor & Arnold (1973), Cruttenden (1997) and Wells (2006).
25 For the frequency of nuclear tones, see Quirk *et al.* (1964: 681), Crystal (1969: 225) and Altenberg (1987: 37).
26 For details of this tone in English, see Ladd (1978b).
27 Cruttenden (1995, 2001, 2007).
28 Lowry (2002).
29 McElholm (1986).
30 Guy *et al.* (1986), Britain (1992).
31 Bradford (1997), Shobbrook & House (2003).
32 See, in particular, Brazil (1975, 1978, 1985).
33 Crystal (1986).
34 Peters (1977).
35 Cruttenden (1974, 1985).
36 Cruttenden (1997: 30–32).
37 See Laver (1980) and Henton & Bladon (1988).
38 The terms are also often used to distinguish between the short and long vowels of English (see §8.4.1(9) above and Chomsky & Halle (1968)).

Chapter 12

Words in connected speech

12.1 Citation forms and connected speech

Words as separable linguistic units are recognised in the sophisticated written form of English by the use of spaces between words. Although in the continuous stream of speech there are no pauses between words corresponding to such written spaces, words nevertheless show their independence by their ability to stand alone, e.g. as replies to questions and when being referred to or cited. Differences often exist between the pronunciation of words in their cited, isolate forms and their pronunciation in connected speech, when they are subject to influences from other, surrounding sounds and from larger accentual and rhythmic patterns. The differences may concern the word as a whole, e.g. weak forms in an unaccented situation; or they may concern a word's accentual pattern, e.g. loss or movement of an accent due to its position in a larger accentual pattern; or they may involve the sounds used at word boundaries as in ASSIMILATIONS, ELISIONS and LIAISONS. This variation between isolate forms and context-influenced forms often depends on the style of speech. The style generally described in this book is slow but casual, i.e. it is not rapid and it is not careful. A rapid style will produce many more changes from citation forms than are described in this chapter (although they are sometimes mentioned as such) while a careful style will produce fewer changes than are described.

12.2 Neutralisation of weak forms

We have seen already (§11.3) that a number of function words may have different pronunciations when they are accented (or said in isolation) and when, more typically, they are unaccented. Such is the reduction in the unaccented forms that words which are distinct when said in isolation may be neutralised (see §5.3.4 above) when unaccented. Such neutralisation generally causes no problem to listeners because of the high rate of redundancy (see §1.3.1) of meaningful cues; only rarely does the context allow a variety of interpretations of an unaccented form. The examples of neutralisation which follow might occur in casual speech and are almost certain to occur in speech which is both casual and rapid.

/ə/ = unaccented *are*, *a* (and, in rapid speech, *her*, *or*, *of*)

The 'plays *are* `poor
He 'plays *a* `poor man
She 'wants *a* `dog
She 'wants *her* `dog
'One *or* 'two *of* them *are* `coming
'Two 'books *are* `mine
'Two 'books *of* `mine

/əv/ = unaccented *have* (aux.), *of*[1]

'Some *of* ˌone (piece) . . .
'Some *have* ˌwon . . .
The 'boys *of* 'Eton `fish
The 'boys *have* 'eaten `fish

/ər/ = unaccented *are*, *or*

'Ten *or* `under
'Ten *are* `under

/ðə/ = unaccented *the* (and, in rapid speech, *there*)

The 'seams are `crooked
There 'seems a `chance

/s/ = unaccented *is*, *has*, *does*

'What's ('s = *does* or *is*) he `like?
'What's ('s = *has*) he `lost?

/z/ = unaccented *is*, *has*, *does*

'Where's ('s = *has*) he `put it?
'Where's ('s = *is*) he `going?
'Where's ('s = *does*) it `go? (rapid speech)

/əz/ = unaccented *as*, *has*

'How 'much *has* he `done?
As 'much *as* he `can

/ən/ = unaccented *and*, *an*

'On *and* `off
'On *an* `off-chance

/n/ = unaccented *and, not*

'Didn't he ˌdo it? /'dɪdn i ˌduː ɪt/
He 'did and he `didn't /hi 'dɪdn i`dɪdnt/

/d/ = unaccented *had, would*

I'd ('d = *had, would*) 'put it `there

12.3 Variation in the accentual patterns of words

When a word (simple or compound) pattern consists in isolation of a primary accent preceded by a secondary accent, the primary accent may be lost completely, if, in connected speech, another primary accent follows closely in the next word, e.g.

'thir`teen, *but* 'thirteen `pounds
'West`minster, *but* 'Westminster `Abbey
'full-`grown, *but* a 'full-grown `man
'after`noon, *but* 'afternoon `tea

The secondary accent in the word rather than the primary may be lost when another word with a secondary accent immediately precedes, e.g.

'eight thir`teen; 'near West`minster; 'not full `grown; 'Friday after`noon

Such examples, and the others in this section, confirm the tendency in English to avoid adjacent accented syllables.

It is in order to avoid accents on adjacent syllables that 'accent shift' occurs in phrases such as *'Chinese `restaurant* (but *Chi`nese*), *'outside `world* (but *out`side*). Where the accents are separated by unaccented syllables, the accent shift is variable (though pronunciations with the shift are probably more common than those without), e.g. *diplo`matic*, *diplo'matic `incident* or *'diplomatic `incident*; *aquama`rine*, *aquama'rine ti`ara*, *'aquamarine ti`ara.*

This tendency to the alternation of accented and unaccented syllables is so strong that the accent may be shifted in the case of certain words whose citation form contains only one, later, accent but where a full vowel occurs in the preceding syllable, e.g. *or`nate* but *'ornate `carvings*; *u`nique* but *'unique `features*; and *di`rect* but *'direct `access*. The alternation tendency extends into longer utterances and may be seen in examples such as *i`dea* but *The 'idea `pleases me*; *'recom`mend* but *I can 'recommend `several*; and in phrasal verbs such as *'come `out*, *'get `in*, e.g. *The 'pictures 'didn't come `out*, but *They 'came out `well* and *'What 'time will 'you get `in?* but *'What 'time will you 'get in from `work?*

12.4 Phonetic variations within words and at boundaries

Our phonological units, the phonemes, represent abstractions from actual phonetic reality. If the phoneme /t/ is given a convenient, generalised label—a voiceless alveolar plosive—it is nevertheless true that the actual phonetic realisation of this consonant depends on the nature of the context, e.g. /t/ is aspirated when before a vowel (except after /s/) as in [tʰen]; it is dental, rather than alveolar, when adjacent to /θ/ as in [wɪt̪θ]. Besides these variations within words, such variation also occurs at word boundaries (and at morpheme boundaries in compound and complex words) where tendencies towards co-articulation or ASSIMILATION have to be noted.

Assimilations at boundaries, like those within words, may be merely of an allophonic kind; or they may be of such an extent that a change of phoneme is involved, when comparing the pronunciation of a word in isolation with its pronunciation in a particular context. Influence at word and morpheme boundaries functions predominantly in a REGRESSIVE or anticipatory direction, i.e. features of one sound are anticipated in the articulation of the preceding sound; less frequently it is PROGRESSIVE or perseverative, i.e. one sound influences the following sound, or it is COALESCENT, i.e. a fusion of forms takes place.

12.4.1 Allophonic variations

Since the actual realisation of any phoneme is at least slightly different in every context, it is necessary to give examples only of those variants which exhibit striking changes. The same types of allophonic variation, involving a change of place of articulation, voicing, lip position, or position of the soft palate, may be found within the word and also at word boundaries:

(1) *Place of articulation*

(a) *within word*:
/t/—dental in *eighth* (influence of [θ])
/k/—advanced (pre-velar) in *key* (influence of [iː])
/n/—dental in *tenth* (influence of [θ])
/m/—labiodental in *nymph*, *infant* (influence of [f])
/ʌ/—retracted in *result* (influence of [ɬ])

(b) *at word boundaries:*
/t/—dental in *not that* (influence of [ð])
/d/—dental in *hide them* (influence of [ð])
/m/—labiodental in *ten forks*, *come for me* (influence of [f])

(2) *Voice*—devoicing of continuants following a voiceless consonant.

(a) *within word:*
/l,r,w,j/—devoiced following voiceless consonants, e.g *cry*, *plight*, *quite*, *queue*

/m,n,ŋ/—slightly devoiced following voiceless consonants, e.g. *smoke, snow, mutton, open* /ˈəʊpm/, *bacon* /ˈbeɪkŋ/

(b) *at word boundaries* (only in close-knit sequences):
/l,r,w,j/—devoiced following voiceless consonants, e.g. *at last* [əˈt̥ɑːst], *at rest* [əˈt̥rest], *at once* [əˈtw̥ʌns], *see to it* [ˈsiːtw̥ɪt], *thank you* [ˈθaŋkj̊uː].

Note also the devoicing of word-final voiced plosive or fricative consonants before silence, and of fricatives when followed by a voiceless consonant; and of word-initial voiced fricative or plosive consonants when preceded by silence, e.g. in *What can you give?* ([y̥]); *Can you breathe?* ([ð̥]); *It's his* ([z̥]); *near the bridge* ([d̥ʒ̊]); *They've* ([y̥]) *come*; *with* ([ð̥]) *some*; *He's* ([z̥]) *seen it*; *George* ([d̥ʒ̊]) *can*; ([y̥]) *very good* ([d̥]); ([ð̥]) *there*; ([z̥]) *Zinc does* ([z̥]).

(3) *Lip position*—under the influence of adjacent vowels or semi-vowels.

(a) *within word*:

	lip-spread	lip-rounded[2]
/p/	*pea, heap*	*pool, hoop, upward*
/t/	*tea, beat*	*two, boot, twice, outward*
/k/	*keep, speak*	*cool, spook, quite, backward*
/m/	*mean, seem*	*moon, loom, somewhat*
/n/	*knee, seen*	*noon, onward*
/l/	*leave, feel*	*bloom, fool, always*
/r/[3]	*read*	*rude, route*
/f/	*feel, leaf*	*fool, roof*
/s/	*seat, geese*	*soon, goose, sweep*
/ʃ/	*sheet, leash*	*shoot, douche, dishwasher*
/h/	*he, heat*	*who, whom, hoot*

(b) *at word boundaries*, e.g. /t,k,n,ŋ,l,s/ are somewhat labialised in such cases as *that one, thick one, thin one, wrong one, shall we, this way*; a rounded vowel (as opposed to semi-vowel) in an adjacent word does not seem to exert the same labialising influence, e.g. /uː/ does not labialise /s/ markedly in *Who said that?* nor does /ɔː/ in *this ought to.*

(4) *Nasal resonance*[4]—resulting particularly from regressive but also from progressive lowering of the soft palate in the vicinity of a nasal consonant.

(a) *within word*: nasalisation of vowel preceding /m/ in *ham* and /n/ in *and*, of vowel between nasal consonants in *man, men, innermost*, and of short vowels on each side of the nasal consonant in *any, sunny, summer, singer*; also /l/ in such situations as in *helmet, wrongly*; and possible slight nasalisation of vowel following /m,n/, as in *meal, now.*

(b) *at word boundaries*: vowels may sometimes be nasalised somewhat by the boundary nasal consonant of an adjacent word, especially when an adjacent nasal consonant also occurs in the word containing the vowel,

e.g. the first /ə/ in *bring another*, or /ɪ/ in *come in*, but sometimes also with no adjacent nasal consonant in the word containing the vowel (usually unaccented), e.g. /ə/ in *come along*, *wait for me*, /ɪ/ in *every night*. Approximants may also be nasalised by a nasal in an adjacent word, e.g. /l/ in *tell me*.

12.4.2 Phonemic variations

Different phoneme selection within the same word may occur (either between two speakers or between different styles of speech in the same speaker) depending on the degree of assimilatory pressure felt by the speaker, e.g. *length* may be /leŋθ/, /leŋkθ/, or /lenθ/, *encounter* may have /ɪn/ or /ɪŋ/ in the first syllable, *disgrace* may have final /s/ or /z/ in the first syllable, *absolutely* may have final /b/ or /p/ in the first syllable and *issue* may have medial /sj/ or a coalesced form /ʃ/. Historically a phonemic change within a word can sometimes be due to assimilation to surrounding sounds, e.g. by labialisation /wa(ː)/ → /wɒ/ or /wɔː/ (*swan*, *water*) or by coalescence /ɪr,er,ʊr/ → /ər/ → /ɜː/ under the influence of the post-vocalic /r/ (*first*, *earth*, *curse*) and /sj,zj/ → /ʃ,ʒ/ (*mansion*, *vision*).

Many phonemic changes occur in connected speech at word boundaries (i.e. changes as compared with the phonemic pattern of words' citation forms). Such phonemic variation is found in changes within the pairs of voiced/voiceless phonemes and especially in changes involving modification of the place of articulation.

12.4.3 Voiced/voiceless variations

Word-final voiced fricatives followed by a word-initial voiceless consonant may with some speakers be realised as the corresponding voiceless fricative, if the two words form part of a close-knit group. Thus the final /ð/ of *with* may be replaced by /θ/ in *with thanks*; the final /z/ of *was* by /s/ in *He was sent*; and the final /v/ of *of*, *we've*, by /f/ in *of course*, *We've found it.* Such a change to a voiceless fricative is an extension of the allophonic devoicing of such consonants mentioned in §12.4.1(2). The phonemic change in such examples will be complete in that a preceding long vowel or diphthong will be realised in the reduced form appropriate to a syllable closed by a voiceless consonant (See §8.4.1 Notes (4)–(8), 9.2.1(5), 9.4(4)).

The weak form of *is* or *has* is /s/ or /z/ according to the final consonant of the preceding word, cf. *the cat's paw*, *the cat's gone* /kats/ vs *the dog's paw*, *the dog's gone* /dɒgz/.

It is unusual in GB for word-final /b,d,g/ to be influenced in the same way by following voiceless consonants, though voiceless forms may be heard in such contexts in the speech of some parts of northern England, e.g. the /d/ of *good time* and the /g/ of *big case* may be realised as /t,k/.

It is to be noted that word- or morpheme-final voiceless consonants in English do not assimilate to their voiced counterparts: such pronunciations of *nice boy*, *black dress*, *half-done*, *they both do*, *wishbone*, *birthday*, as /'naɪz `bɔɪ, 'blag `dres, 'hɑːv`dʌn, ðeɪ 'bəʊð `duː, `wɪʒbəʊn, `bɜːðdeɪ/ do not occur in GB.

12.4.4 Nasality and labialisation

Phonemic assimilations involving nasality (i.e. anticipation or continuation of the lowered soft palate position) would be likely to show /b/ (or /v/) → /m/, /d/ (or /z/ or /ð/) → /n/, /g/ → /ŋ/, such changes being based on roughly homorganic mouth articulations; nasalisation of other sounds, e.g. /l/ or vowels, is never phonemic, there being no nasalised counterparts with approximately homorganic mouth articulation. Such phonemic nasalisation as does occur concerns mainly the alveolars, especially adjacent to the negative *not* often written *n't*. A preceding voiced consonant, most commonly a plosive, becomes a nasal (and at the same time the final /t/ may be elided). These changes are characteristic only of rapid speech, e.g.

/d/ → /n/—*He wouldn't do it* /hi 'wʊnn(t) `duː ɪt/, *good news* /'gʊn `njuːz/
/d/ → /g/ → /ŋ/—*He couldn't go* /hi 'kʊŋŋ(k) `gəʊ/
/d/ → /b/ → /m/—*Good morning* /gʊm `mɔːnɪŋ/
/v/ → /m/—*You can have mine* /jʊ kŋ ham `maɪn/
/z/ → /n/—*He doesn't know* /hi 'dʌnn(t) `nəʊ/
/ð/ → /n/—*He wasn't there* /hi 'wɒnn(t) `nɛː/

The nasalised assimilated form may itself be elided, giving /'gʊ `njuːz, gʊ `mɔːnɪŋ, hi 'wɒn `nɛː/ etc. Note also *I don't know* /aɪ də`nəʊ/, sometimes written *I dunno*.

The extension of labialisation produces no changes of a phonemic kind, since lip-position is not a distinctive feature opposing any two phonemes in GB. /ɒ/ and /ɑː/ come nearest to having an opposition of lip action, but the lip-rounding for /ɒ/ is very slight and open and, in any case, there is some difference of tongue position and a considerable difference of length. Where /w/ precedes a vowel of the /ɑː/ type (and, therefore, might be expected to exert a rounding influence), either labialisation has become established at an earlier stage of the development of the language (e.g. in *was*, *what*, *war*, *water*) or two pronunciations are today permitted, e.g. *qualm* /kwɑːm/ or /kwɔːm/, *quaff* /kwɑːf/ or /kwɒf/. Labialisation of /ɑː/ involving a phonemic change to /ɒ/ or /ɔː/ does not extend beyond word boundaries, e.g. in *two arms* or *The car won't go.* But some confusion may occur between a strongly centralised form of /əʊ/ and /ɜː/ in a labial context, cf. *They weren't wanted* and *They won't want it.* Such confusion may also occur when speakers used a labialised form of /r/ (see §9.7.2) in *They weren't right* vs *They won't write.*

12.4.5 Variations of place

The most common phonemic changes at word boundaries concern changes of place of articulation, particularly involving de-alveolarisation. Though such changes are normal in casual speech, speakers are usually unaware that they are being made. The phenomenon is essentially the same as that resulting in non-phonemic assimilation of place. Electropalatographic research[5] shows that phonemic assimilations of place are rarely complete, e.g. in an assimilation involving an apparent change from alveolar to labial, as in *bad boy* → /bab bɔɪ/, some residual articulation on the teeth ridge may accompany the labial articulation. (See §9.2.6(2), 9.6.2(2).)

(1) *Regressive (or anticipatory) assimilation: instability of final alveolars*
Word-final /t,d,n,s,z/ readily assimilate to the place of the following word-initial consonant while retaining the original voicing. /t,d,n/ are replaced by bilabials before bilabial consonants and by velars before velar consonants; /s,z/ are replaced by palato-alveolars before consonants containing a palatal feature:[6]

/t/ → /p/ before /p,b,m/, e.g. *that pen, that boy, that man* /ðap ˈpen, ðap ˈbɔɪ, ðap ˈman/
→ /k/ before /k,g/, e.g. *that cup, that girl* /ðak ˈkʌp, ðak ˈgɜːl/
/d/ → /b/ before /p,b,m/, e.g. *good pen, good boy, good man* /gʊb ˈpen, gʊb ˈbɔɪ, gʊb ˈman/
→ /g/ before /k,g/, e.g. *good concert, good girl* /gʊg ˈkɒnsət, gʊg ˈgɜːl/
/n/ → /m/ before /p,b,m/, e.g. *ten players, ten boys, ten men* /tem ˈpleɪəz, tem ˈbɔɪz, tem ˈmen/
/n/ → /ŋ/ before /k,g/, e.g. *ten cups, ten girls* /teŋ ˈkʌps, teŋ ˈgɜːlz/

(As a result of word-final assimilations, /ŋ/ may be preceded by vowels other than /ɪ,e,a,ɒ,ʌ/. Thus /ŋ/ can occur after long vowels as a result of assimilation, e.g. *I've been* /biːŋ/ *gardening, She'll soon* /suːŋ/ *come, his own* /əʊŋ/ *car*, etc.).

Assimilations to alveolars and between labials and velars may sometimes be heard in rapid speech, e.g. *same night* /seɪn ˈnaɪt/, *king Charles* /kɪn ˈʧɑːlz/, *same kind* /seɪŋ ˈkaɪnd/, *blackmail* /ˈblapmeɪl/.

/s/ → /ʃ/[7] before /ʃ,ʧ,ʤ,j/, e.g. *this shop, cross channel, this judge, this year* /ðɪʃ ˈʃɒp, krɒʃ ˈʧanəl, ðɪʃ ˈʤʌʤ, ðɪʃ ˈjɪə/.
/z/ → /ʒ/ before /ʃ,ʧ,ʤ,j/, e.g. *those young men* /ðəʊʒ ˈjʌŋ ˈmen/, *cheese shop* /ˈʧiːʒ ʃɒp/, *those churches* /ðəʊʒ ˈʧɜːʧɪz/, *has she?* /ˈhaʒ ʃi/ or /ˈhaʃ ʃi/.

Other assimilations involving fricatives may occur in rapid speech: /θ,ð/ may assimilate to /s,z/, e.g. *I loathe singing* /aɪ ləʊz ˈsɪŋɪŋ/, *What's the time?* /wɒts zə ˈtaɪm/, *Has the post come?* /haz zə ˌpəʊs kʌm/.

Alveolars have a high frequency of occurrence in word-final position, especially when inflexional, and so their assimilation leads to many neutralisations in connected speech, e.g. /raŋ `kwɪkli/ (*ran* or *rang quickly*), /raɪp `pɛːz/ (*right* or *ripe pears* or *pairs*), /laɪk `kriːm/ (*like* or *light cream*), /ˈhɒp mənjʊə/ (*hot* or *hop manure*), /parɪʃ `ʃəʊ/ (*Paris Show* or *parish show*), /wɒʧ ʃɔː `weɪt/ (*What's* or *Watch your weight*), or, with a neutralisation to a labiodental articulation, /ˈgreɪp vaɪm/ (*great* or *grape vine*), [rʌɱ fə jɔː `mʌni] (*run* or *rum for your money*).

When alveolar consonants /t,d,n/ are adjacent in clusters or sequences susceptible to assimilation, all (or none) of them will undergo the assimilation, e.g. *Don't* /dəʊmp/ *be late*, *He won't* /wəʊŋk/ *come*, *I didn't* /dɪgŋk/ *go*, *He found* /faʊmb/ *both*, *a kind* /kaɪŋg/ *gift*, *red and black* /reb m `blak/. Elision may also reduce these clusters (see §12.4.6 below).

(2) *Coalescence of* /t,d,s,z/ *with* /j/
The process which has led historically to earlier /t,d,s,z/ + /j/ giving /ʧ,ʤ,ʃ,ʒ/ medially in a word (*nature*, *grandeur*, *mission*, *vision*—§9.3.1) may operate in casual speech at word boundaries, e.g.

/t/ + /j/—*what you want* /wɒʧu `wɒnt/
/d/ + /j/—*Would you?* /ˈwʊʤu/
/s/ + /j/—*in case you need it* /ɪŋ keɪʃu `niːd ɪt/
/z/ + /j/—*Has your letter come?* /haʒɔː `letə kʌm/, *as yet* /əˈʒet/

The coalescence is more complete in the case of /t,d/ + /j/ (especially in question tags, e.g. *didn't you?*, *could you?*); in the case of /s,z/ + /j/, the coalescence into /ʃ,ʒ/ may be marked by extra length of friction, e.g. *Don't miss your train* /ˈdəʊmp mɪʃʃɔː `treɪn/.

In careful speech, some GB speakers may use somewhat artificial, uncoalesced, forms within words, e.g. *nature*, *question*, *unfortunate*, *soldier* /ˈneɪtjə, `kwestjən, ʌnˈfɔːtjʊnət, `səʊldjə/. Such speakers will also avoid coalescences at word boundaries; yet other careful speakers, who use the normal coalesced forms within words, may consciously avoid them at word boundaries. (See also §12.5 below.)

(3) *Progressive (or perseverative)*
Progressive assimilation is relatively uncommon. It may occur when a plosive is followed by a syllabic nasal and the nasal undergoes assimilation to the same place of articulation as the preceding plosive, e.g. /n/ → /m/ after /p,b/, *happen*, *urban* /ˈhapm, `ɜːbm/; and /n/ → /ŋ/ after /k,g/ in *second chance*, *organ* as /sekŋ `ʧɑːns, `ɔːgŋ/.

12.4.6 Elision

Apart from word-internal elisions (see §10.8) and those associated with weak forms, other ELISION of sounds occurs in rapid speech, especially at or in the vicinity of word boundaries.

(1) *Vowels*

(a) *Allophonic variation*—When one syllable ends with a closing diphthong (i.e. one whose second element is closer than its first, in GB /eɪ,aɪ,ɔɪ,əʊ,aʊ/) and the next syllable begins with a vowel, the second element of the diphthong may be elided. Word-internal examples of the type discussed in §8.11 (e.g. *hyaena* /haɪˈiːnə/ smoothed to [haˈiːnə]) may result in neutralisation, thus *layer* /ˈleɪə/ with smoothing is the same as *lair* /lɛː/, *mower* /ˈməʊə/ with smoothing is the same as *myrrh* /mɜː/. Similar smoothing occurs across word boundaries, e.g. *go away* /gɜː ˈweɪ/, *I may as well* /aɪ mɛːz ˈwel/, *I enjoy it* /aɪ ɪmˈʤɔː ɪt/, *try again* [tra əˈgen] or [traː ˈgen].

(b) *Phonemic elision*—Initial /ə/ is often elided particularly when followed by a continuant and preceded by a word-final consonant (compensation for the loss of /ə/ frequently being made by the syllabicity of the continuant), e.g. *not alone* [nɒt ˈl̩əʊn], *get another* [get n̩ ˈʌðə], *run along* [rʌn l̩ ˈɒŋ], *he was annoyed* [hi wəz ˈn̩ɔɪd]. When final /ə/ occurs with following linking /r/ (see §12.4.7) and word-initial vowel, /ə/ may be elided, e.g. *after a while* /ɑːftrə ˈwaɪl/, *as a matter of fact* /əz ə matrəv ˈfakt/, *father and son* /fɑːðrən ˈsʌn/, *over and above* /əʊvrən əˈbʌv/. When *any* is unaccented /e/ may be elided following a previous consonant, e.g. *don't put any . . .* /ˈpʊtn̩i/ or /ˈpʊtni/. Word-initially whole syllables containing /ə/ may be elided, e.g. *before I go . . .* /fɔːr aɪ ˈgəʊ/, *between you and me* /twiːn ju əm ˈmi/.

(2) *Consonants*—In addition to the loss of /h/ in pronominal weak forms and other consonantal elisions typical of weak forms (see §11.3), the alveolar plosives are apt to be elided. Such elision appears to take place most readily when /t/ or /d/ is the middle one of three consonants. Any consonant may appear in third position, though elision of the alveolar plosive is relatively rare before /h/ and /j/. Thus elision is common in the sequence voiceless continuant + /t/, or voiced continuant + /d/ (e.g. /-st, -ft, -ʃt, -nd, -ld, -zd, -ðd, -vd/) followed by a word with an initial consonant,[8] e.g. *next day, raced back, last chance, first light, west region, just one*; *left turn, soft centres, left wheel, drift by, soft roes*; *mashed potatoes, finished now, finished late, pushed them*; *bend back, tinned meat, lend-lease, found five, send round, dined well*; *hold tight, old man, cold lunch, bold face, world religion*; *refused both, gazed past, caused losses, raised gently*; *loathed beer*; *moved back, loved flowers, saved runs, served sherry*. Similarly, word-final clusters of voiceless plosive or affricate + /t/ or voiced plosive or affricate + /d/ (e.g. /-pt, -kt, -ʧt, -bd, -gd, -ʤd/) may lose the final alveolar stop when the following word has an initial consonant, e.g. *kept quiet, helped me, stopped speaking, jumped well*; *liked jam, thanked me, looked like, looked fine, picked one*; *reached Paris, fetched me, reached Rome, parched throat*; *robbed both, rubbed gently, grabbed them*; *lagged behind, dragged down, begged one*; *changed*

colour, urged them, arranged roses, judged fairly. (In the sequence /-skt/, /k/ rather than /t/ is often elided, e.g. *risked prison, asked them.*) The final clusters /-nt, -lt/, which are the only alveolar sequences which involve a change of voicing, are less prone to elision, the /t/ often remaining as [ʔ] e.g. *went down.* Elision of a plosive medial in three or more is to be expected, since, because of the normal lack of release of a stop in such a situation, the only cue to its presence is likely to be the total duration of closure. It will be seen that in many cases, e.g. in *I walked back, They seemed glad,* elision of word-final /t/ or /d/ eliminates the phonetic cue to past tense, compensation for which is made by the general context.

Elision of final /t/ or /d/ is rarer before initial /h/, e.g. the alveolar stops are more regularly retained in *kept hold, worked hard, East Ham, reached home, gift horse, rushed home, grabbed hold, round here, bald head, jugged hare, changed horses, raised hands, moved house.* Final /t,d/ followed by a word beginning with /j/ are usually kept in a coalesced form, i.e. as /ʧ/ and /ʤ/, e.g. *helped you, liked you, lost you, left you, grabbed you, first use, lost youth.*

The /t/ of the negative /-nt/ is often elided (see also §12.4.4), particularly in disyllables, before a following consonant, e.g. *You mustn't lose it* /jʊ mʌsn ˈluːz ɪt/, *Doesn't she know?* /dʌzn ʃi ˈnəʊ/, and sometimes before a vowel, e.g. *Wouldn't he come?* /wʊdn i ˈkʌm/, *You mustn't over-eat* /jʊ mʌsn əʊvəˈiːt/. Less common is the omission of the stops in the negative /-nt/ component of monosyllables, e.g. *He won't do it* /hi wəʊn ˈduː ɪt/.

Clusters of word-final /t/ and word-initial /t/ or /d/ are sometimes simplified in rapid speech, e.g. *I've got to go* /aɪv gɒtə ˈgəʊ/, *What do you want?* /wɒdə ju ˈwɒnt/ or /wɒʤu ˈwɒnt/, and less commonly /d/ before /t/ or /d/, e.g. *We could try* /wi kʊ ˈtraɪ/, *They should do it* /ðeɪ ʃə ˈduː ɪt/.

The elision of one of a boundary cluster of only two consonants sometimes occurs in rapid speech, e.g. *He went away* /hi wen əˈweɪ/, *I want to come* /aɪ ˈwɒnə kʌm/ (< /aɪ ˈwɒntə kʌm/, which frequently occurs), *Give me a cake* /gɪ mi ə ˈkeɪk/, *Let me come in* /lemi kʌm ˈɪn/, *Get me some paper* /gemi sm ˈpeɪpə/, as well as the very reduced forms of *I'm going to* /ˈaɪm gənə, ˈaɪŋənə, ˈaɪŋnə/. The /v/ in *of* can be elided in rapid speech before a consonant, e.g. *a piece of cake* /ə piːs ə ˈkeɪk/, (see also note 41 to §9.4.3(2)). Clusters in adverbs formed with *-ly* are also liable to reduction in casual speech, e.g. *stupidly* /ˈstjuːpɪli/, *openly* /ˈəʊpəni/, *certainly* /ˈsɜːtni/.

12.4.7 Liaison

(1) *Linking* /r/—As has been mentioned in §9.7.2(2)(a), GB introduces word-final post-vocalic /r/ as a linking form when the following word begins with a vowel (and in a some cases in morpheme-final position before a suffix as in *bore* /bɔː/ *boring* /bɔːrɪŋ/). The vowel endings to which an /r/ link may be added are /ɛː,ɑː,ɔː/ and those single or complex vowels which may

have a final [ə] (/ə,ɛː,ɜː,ɪə,ʊə/), e.g. in *far off, four aces, answer it, wear out, fur inside, near it, secure everything.* Prescriptivists seek to limit the use of linking /r/ to those cases where there is an <r> in the spelling; nevertheless many examples of linking /r/ occur where there is no <r> in the spelling, such /r/s being labelled as 'intrusive'. Such /r/s are to be heard particularly in the case of [ə] endings, e.g. *Russia and China* /rʌʃər ən ˈʧaɪnə/, *drama and music* /drɑːmər əm ˈmjuːzɪk/, *idea of* /aɪˈdɪər əv/, *India and Pakistan* /ɪndɪər ən pɑːkɪˈstɑːn/, *area of agreement* /ˈɛːrɪər əv əˈgriːmənt/; and rather less frequently after final /ɑː,ɔː/ e.g. *law and order* /lɔːr ənd ˈɔːdə/, *awe-inspiring* /ˈɔːr ɪnspaɪərɪŋ/, *raw onion* /rɔːr ˈʌnjən/. Spelling consciousness remains an inhibiting factor in the use of linking /r/, but the present general tendency among GB speakers is to use /r/ links, even—unconsciously—among those who object most strongly.[9] The comparative rarity of potential contexts for 'intrusive' /r/s following /ɑː,ɔː/ tends to make speakers more aware of the 'correct' forms; thus *I saw it* /aɪ ˈsɔːr ɪt/, *drawing* /ˈdrɔːrɪŋ/, are generally disapproved of, though those who avoid such pronunciations have to make a conscious effort to do so. The focusing of attention on 'intrusive' /r/s as an undesirable speech habit has led to the use by some speakers of a pause or glottal stop in such cases of vowel hiatus, with the result that, in avoiding 'intrusive' /r/s, they have also abandoned other linking /r/s in favour of a glottal stop or a glide between the abutting vowels, e.g. in *secure it* [siːˈkjʊə ʔɪt], *War and Peace* [wɔː ʔənd ˈpiːs]. As might be expected, in those regions where post-vocalic /r/ is pronounced and *pour, paw* are identified as separate word forms in isolation, the tendency to introduce intrusive /r/s is less marked than in GB or in GB-influenced types of speech.

The same process is in operation whether the /r/ link inserted is historically justified (linking) or not (intrusive). The examples below demonstrate that the environment is phonetically comparable whether the /r/ link is inserted before a suffix or before a separate word and whether it is linking or 'intrusive'.

stir	*stirring*	*stir it in*		
/stɜː	ˈstɜːrɪŋ	ˈstɜːr ɪt ˈɪn/		
dear	*dearer*	*my dear Anna*	*idea of it*	
/dɪə	ˈdɪərə	maɪ dɪər ˈanə	aɪˈdɪər əv ɪt/	
roar	*roaring*	*roar angrily*	*raw egg*	*strawy*
/rɔː	ˈrɔːrɪŋ	rɔːr ˈaŋgrəli	rɔːr ˈeg	ˈstrɔːri/
star	*starry*	*a star in the sky*	*the spa at Bath*	*schwaish*
/stɑː	ˈstɑːri	ə stɑːr ɪn ðə ˈskaɪ	ðə spɑːr ət ˈbɑːθ	ˈʃwɑːrɪʃ/

There appears to be some graduation in the likelihood of occurrence of inserted /r/, as follows:

(a) The insertion of /r/ is obligatory before a suffix beginning with a vowel, where the /r/ is historical, e.g. *boring*.
(b) The insertion of /r/ is optional, though generally present, before an immediately following word beginning with a vowel, where the /r/ is historical, e.g. *pour it*, *over and over again* /əʊvər ənd əʊvər əˈgen/.
(c) After [ə] an inserted /r/, even though not historical, is generally used before a following word beginning with a vowel, e.g. *vanilla essence* /vənɪlər ˈesəns/, *vodka and tonic* /vɒdkər ən ˈtɒnɪk/.
(d) After /ɑː/ and /ɔː/ an inserted /r/, when not historical, is often avoided before a following vowel, e.g. *nougat and chocolate* /nuːgɑːr ən ˈʧɒklɪt/, *straw in the wind* /strɔːr ɪn ðə ˈwɪnd/.
(e) The insertion of /r/ before a suffix, where the /r/ is not historical, is often strongly stigmatised, e.g. *strawy* /ˈstrɔri/, *gnawing* /nɔːrɪŋ/.

Phonetically (as well as historically) the resulting /r/ closes the syllable rather than being initial in the next, e.g. the /r/ of *more ice* /mɔːr ˈaɪs/ is shorter than that of *more rice* /mɔː ˈraɪs/, the latter also being associated with accent onset and possible pitch change (see further in §12.4.8 below).

(2) *Linking* [ʲ,ʷ]—In vocalic junctures where the first word ends in /iː/, /ɪ/, /i/, /eɪ/, /aɪ/, or /ɔɪ/, a slight linking [ʲ] may be heard between the two vowels, e.g. *my arms* [maɪ ˈʲaːmz], *may ask* [meɪ ˈʲɑːsk], *he ought* [hi ˈjɔːt], *annoy Arthur* [ənɔɪ ˈʲɑːθə], *beauty and* [bjuːti ˈʲənd]. But this is not sufficient to be equated with phonemic /j/; indeed there are minimal pairs which illustrate the difference between linking [ʲ] and phonemic /j/, *my ears* [maɪ ˈʲɪəz] vs *my years* [maɪ ˈjɪəz], and *I earn* [aɪ ˈʲɜːn] vs *I yearn* [aɪ ˈjɜːn]. Similarly a linking [ʷ] may be heard between a final /uː/, /əʊ/ and /aʊ/ and a following vowel, e.g. *window open* [windəʊ ˈʷəʊpən], *now and then* [naʊ ʷənd ˈðen], *you aren't* [juː ˈʷɑːnt]; and minimal pairs illustrating linking [ʷ] and phonemic /w/ can be found, e.g. *two-eyed* [tuː ˈʷaɪd] vs *too wide* [tuː ˈwaɪd]. Alternative pronunciations, more frequent in rapid speech, in the case of the sequences of diphthong plus following vowel, involve the absorption of the second element of the diphthong, i.e. of the [ɪ] in the case of /eɪ,aɪ,ɔɪ/ and of the [ʊ] in the case of /əʊ,aʊ/, giving renderings like *annoy Arthur* /ənɔː ˈɑːðə/, *my ears* /mɑː ˈɪəz/, *window open* /ˈwɪndə əʊpən/ or /ˈwɪndər əʊpən/ (see further under §8.11(8) above).

In yet another possibility, the linking [ʲ] or [ʷ] may be replaced by a glottal stop. This is most common before a vowel beginning an accented syllable, e.g. *very angry* [veri ˈʔaŋgri] (see further §9.2.8). However, a glottal stop in such cases is not so often used as in some other languages, e.g. German, and is usually associated in English with some degree of emphasis.

(3) *Other boundaries*—It is unusual for a word-final consonant to be carried over as initial in a word beginning with an accented vowel, the identity of the words being retained (see §12.4.8). Thus, *run off, give in, less often* are rarely /rʌˈnɒf, gɪˈvɪn, leˈsɒfn/ (shown because the nuclear tone, usually high fall in citation, does not begin on the consonant); and *get up, look out, stop arguing,* are not usually [geˈtʰʌp, lʊˈkʰaʊt, stɒˈpʰɑːgjʊɪŋ] (the plosives lacking the strong aspiration characteristic of an accented syllable-initial position). One or two phrases in common use do, however, show such transference, e.g. *at home, not at all* are often pronounced [əˈtʰəʊm, nɒt əˈtʰɔːɬ]; they may be considered as constituting, in effect, composite word forms.

12.4.8 Juncture

As we have seen in the previous sections words may be considerably modified at boundaries by factors like assimilation and elision. Nevertheless some phonetic features may be retained which mark word or morpheme boundaries (generally referred to as JUNCTURE). Thus, the phonemic sequence /piːstɔːks/ may mean *peace talks* or *pea stalks* according to the different word boundaries (i.e. /piːs + tɔːks/ or /piː + stɔːks/). In this case, if the boundary occurs between /s/ and /t/, the words *peace* and *talks* are established by the reduced /iː/ (in a syllable closed by a voiceless consonant) and by the aspiration of /t/; on the other hand, if the boundary occurs between /iː/ and /s/, this may be signalled by the relatively full length of /iː/ (in an open word-final syllable) and by the unaspirated allophone of /t/ (following /s/ in the same syllable) as well as a stronger /s/ word-initially than word-finally.

The following examples illustrate various ways in which phonetic cues may mark word boundaries:

(a)	*I scream*	/aɪ skriːm/	: long /aɪ/, strong /s/, little devoicing of /r/
	ice cream	/aɪs kriːm/	: reduced /aɪ/, weak /s/, devoiced /r/
(b)	*why choose*	/waɪ ʧuːz/	: long /aɪ/, short [ʃ] as element of /ʧ/
	white shoes	/waɪt ʃuːz/	: reduced /aɪ/, long /ʃ/
(c)	*a name*	/ə neɪm/	: relatively long /n/ word-initially
	an aim	/ən eɪm/	: relatively short /n/ word-finally possibility of glottal stop before /eɪ/

The glottal stop before a vowel beginning an accented syllable in the last example is optional and generally not used unless emphasis is required (see §9.2.8).

Similarly, a sequence of words may be distinguished from a single word:

(a)	nitrate	/naɪtreɪt/	: devoiced /r/
	night-rate	/naɪt reɪt/	: little devoicing of /r/
(b)	illegal	/ɪliːgl/	: clear [l] before vowel
	ill eagle	/ɪl iːgl/	: dark [ɬ] in word-final position possibility of glottal stop before /iː/

Junctural cues are only potentially distinctive and may not be present in connected (particularly rapid) speech or may have only slight phonetic value. In any case, such cues to word identification are merely additional to the large number provided by the context.

12.5 Stylistic variation[10]

All the features of connected speech discussed in this chapter are common in the casual speech of native speakers of English and the lack of such features would be abnormal. But GB is not a monolithic accent and displays considerable variation even within the speech of one speaker, particularly in the use of the features detailed here. Many factors influence this variation and a major factor is style of discourse, e.g. whether a speaker is being careful or casual, slow or rapid. Moreover the average rate of delivery[11] differs from speaker to speaker regardless of discourse style.

(1) *Intonation*
In all styles of speech, simple falls in pitch (whether from a high or a mid starting-point) account for the majority of nuclear tones, between 60 per cent and 70 per cent in most conversations.[12] The falling-rising nuclear tone accounts on average for roughly 20 per cent. Thus it may be seen that speech exhibiting a large number of rises or rise-falls is conspicuous in this respect. Casual speech has longer intonational phrases and contains fewer accented syllables than careful speech. Careful speech often shows a concentration of fall-rises or simple rises, e.g. *If you pull them ˌoff / and put them in a glass of ˌwater / they grow little ˋroots / and ˌthen / you plant them in ˌsoil / and they ˌgrow / and then you've got aˋnother spider plant.*

(2) *Weak forms*
The use of strong and weak forms does not appear to be a matter of style except insofar as the more frequent occurrence of strong forms in more careful speech results from additional accents. The use of strong and weak forms is entirely regular in both careful and casual styles of speech: weak forms occur unless the grammatical word is accented. Since IPs are shorter in careful speech, there will be more accents and hence more strong forms.

(3) *Linking* /r/
As with weak forms, linking /r/ is frequent in all styles of speech, though an /r/ link is not necessarily used on every occasion where such an insertion would be possible. (See §12.4.7.) Its occurrence is of no stylistic significance. (The avoidance of so-called intrusive /r/ results from a deliberate carefulness shown by some speakers.)

(4) *Assimilation*
Assimilations occur in all styles of speech. But unassimilated forms generally occur more often than assimilated forms, which tend to increase in frequency in the more casual style of speech. But rate of utterance on its

own does not govern the use of assimilation. One speaker who had /ʤʌʃ ˈʃʌtɪŋ/ for *just shutting* when speaking carefully, nevertheless had /ˈhɔːs ʃəʊ/ for *horse show* when speaking rapidly. Speakers use palato-alveolar assimilations (of the kind /ˈspeɪʃ ʃʌtl/ for *space shuttle*) and bilabial assimilations (of the kind /ðap ˈpɜːsn/ for *that person*) less commonly than they use velar assimilations (of the kind /ʃɔːk ˈkʌt/ for *short cut*). Such velar assimilation is also more common than coalescent assimilations (such as /d/ + /j/→/ʤ/ as in /nəʊtɪˈʤɒtsmən/ for *noted yachtsman* or /z/ + /j/→/ʒ/ as in /bɪˈkəʒu/ for *because you*). But coalescence is frequent in common phrases such as the auxiliary plus pronoun of phrases like *did you*, *can't you* /ˈdɪʤu, ˈkɑːnʧu/ and may occur even in careful speaking, e.g. *Would you like a cup of tea?* /ˈwʊʤu ˈlaɪk ə ˈkʌp əv ˌtiː/.

(5) *Elision*
Elisions do show some correlation with rate of delivery. In all styles they become more frequent as the rate of utterance increases; but, whereas in careful speech they are almost entirely regular (e.g. alveolar plosives may be elided interconsonantally, /ə/ in pre-nuclear unaccented syllables and /h/ in unaccented non-initial grammatical words—see §12.4.6), in casual speech they are less rule-bound and may contain unpredictable elisions such as those of /l/ and /ð/ in *Well, that's all right* /we ˈats ɔː ˌraɪt/.

(6) *Co-occurrence of phonemic features of connected speech*
The occurrence of /r/ links, elisions and assimilations is optional in the sense that when the appropriate phonetic environments occur, these processes may or may not operate. If such processes do operate, they will follow the regular patterns described in §§12.4.5–12.4.7. Utterances often contain both assimilation and elision in conjunction together. In word-final position, after the elision of a final /t/ or /d/ the remaining fricative or nasal may be assimilated to the initial consonant of the following word, e.g. *closed shop* /kləʊzd ˈʃɒp → kləʊz ˈʃɒp → kləʊʒ ˈʃɒp/, *hand made* /hand ˈmeɪd → han ˈmeɪd → ham ˈmeɪd/ and *just shutting* /ʤʌst ˈʃʌtɪŋ → ʤʌs ˈʃʌtɪŋ → ʤʌʃ ˈʃʌtɪŋ/.

(7) *Plosive release*
An important type of (non-phonemic) variation concerns the release of plosives, particularly the voiceless series. As noted in §9.2.4(2), a plosive usually has an inaudible release when followed by another stop consonant. But in careful speech, there is a marked increase in the number of audibly released plosives, e.g. *I looked quizzical* [aɪ lʊkt^{h} ˈkwɪzɪkəl]. Women release their final stops more than men.[13]

12.6 Frequency of occurrence of monosyllabic and polysyllabic words

The following percentages of occurrence of words with different numbers of syllables were found in one corpus of conversations:[14] 1 syllable—82 per cent;

2 syllables—15 per cent; 3 syllables—2.7 per cent; 4 syllables—0.3 per cent, 5 or more syllables—0.03 per cent. When the 1,000 most common words used were examined,[15] it was calculated that some 15 per cent admit of the kind of phonemic variability mentioned in §10.9 and §11.3. Half of such words permitting phonemic variation were monosyllables whose phonemic structure depended upon the degree of accent placed upon them, i.e. most words with phonemic variability were function words.

12.7 Advice to foreign learners

Foreign learners need not attempt to reproduce in their speech all the special context forms of words mentioned in the foregoing sections. But those aiming at native speaker competence should observe the rules concerning weak forms, should cultivate the correct variations of word accentual patterns and should make a proper use of liaison forms, avoiding in particular an excess of pre-vocalic glottal stops. In addition, they should be aware of the English assimilatory tendencies governing words in context, so as to avoid un-English assimilations such as *I like that* /aɪ `laɪg ˌðat/ (incorrect voicing) or *I was there* /aɪ wəð `ðɛː/ (incorrect dental modification of the place of articulation). In listening to native speakers, they should be aware of the types of assimilation and elision which have been described above; otherwise they will find it difficult to understand much of ordinary colloquial English. This knowledge is particularly important because a second language is often learned on a basis of isolate word forms whereas in conversation these will be frequently modified.

The foreign learner is recommended to aim at a relatively careful pronunciation of English in his own speech but to be aware of the features which characterise more casual pronunciation, particularly by native speakers. The following dialogue illustrates some of the differences which may be found between a more careful and a more casual pronunciation:

A.		What	do	you	think	we	should	do	this	evening?
	(1)	'wɒt	duː	juː	'θɪŋk	wiː	ʃʊd	`duː	ðɪs	iːvnɪŋ
	(2)	'wɒʤu			'θɪŋk	wi	ʃəd	`duː	ðəs	iːvnɪŋ

B.		How	many	of	us	will	there	be?
	(1)	'haʊ	meni	'ɒv	ʌs	wɪl	ðɛː	`biː
	(2)	'haʊ	mni	əv	əs	l	ðə	`biː

A.		There	are	the	two	of	us,	and	probably	the	two
	(1)	ðer	ə	ðə	'tuː	əv	ˌʌs/	ənd	'prɒbəbli	ðə	'tuː
	(2)	ðər	ə	ðə	'tuː	əv	ˌʌs/	m	'prɒbbli	ðə	'tuː

		girls	from	next	door.	That'll	be	four	of	us/	already
	(1)	'gɜːlz	frəm	'nekst	`dɔː/	ðatl	bi	ˇfɔːr	əv	əs/	ɔːl`redi
	(2)	gɜːlz	frm	neks	`dɔː/	ðatl	bi	ˇfɔːr	əv	əs/	ɔː`redi

	I	think	they'	re	a	nice	young	couple,	don't	you?
(1)	aɪ	'θɪŋk	ðeɪ	ər	ə	`naɪs	jʌŋ	ˌkʌpl/	'dəʊnt	ˌjuː
(2)	a(ɪ)	θɪŋk	ðɛːr		ə	`naɪʃ	ʃʌŋ	ˌkʌpl/	'dəʊn	ˌʧuː

B.	I've	only	talked	to	them	once,	but	they	seemed	nice
(1)	aiv	əʊnli	`tɔːkt	tə	ðəm	ˌwʌns/	bət	ðeɪ	`siːmd	ˌnaɪs
(2)	a(ɪ)v	əʊni	`tɔːk	tə	ðm	ˌwʌns/	bət	ðe(ɪ)	`siːm	ˌnaɪs

	I	wonder	if	we	should	go	to	the	theatre
(1)	aɪ	'wʌndər	ɪf	wiː	ʃʊd	'gəʊ	tə	ðə	θiˈetə
(2)	a(ɪ)	'wʌndr	ɪf	wi	ʃg	'gəʊ	tə	ðə	θiˈetə

	I	can	try	and	book	some	seats	round	the	corner
(1)	aɪ	kən	'traɪ	ən	'bʊk	səm	ˌsiːts/	'raʊnd	ðə	`kɔːnə
(2)	a(ɪ)	kŋ	`traː	m	'bʊk	sm	ˌsiːts/	raʊn	ðə	`kɔːnə

Notes

1 Native speakers often make written mistakes of the sort 'I could of gone' illustrating this neutralisation.
2 This will apply only for those speakers who have appreciable rounding of the vowels and semi-vowels. See §8.9.11 for the development of unrounding of /uː/.
3 For some speakers /r/ has inherent labialisation and will not be lip-spread even before a lip-spread vowel.
4 See Cohn (1990). See nasopharynx opening **videos 6.5–10, 8.11. 9.25, 10.11** on the companion website.
5 See Nolan & Kerswill (1990). They also found girls less likely to assimilate than boys and /n/ more likely to assimilate than /d/.
6 See also §12.5 for stylistic variation in the frequency of assimilation.
7 Byrd (1992b) found around 78 per cent of sequences of /s,z/ plus /ʃ/ reduced to a palato-alveolar articulation only (in the TIMIT database of American English), with no effect from syntax, sex, or dialect.
8 Deterding (2005) in a study of newsreaders on the BBC World Service found deletion common in both suffix and stem-final /t,d/ and most common before initial plosives, fricatives and nasals.
9 Noted as long ago as Sweet (1890: ix): 'Thus I know as a fact that most educated speakers of Southern English insert an /r/ in idea(r) of, India(r) Office . . . all obstinately deny it'. A century earlier Sheridan deplored intrusive /r/: 'Another vice . . . adding the letter r to all proper names ending in *a* unaccented, as Belindar, Dorindar, for Belinda, Dorinda' (1762: 46).
10 The information on speech in this section is based on Ramsaran (1978) who used data drawn from twenty hours of recorded conversation involving six GB speakers.
11 The slowest rate of utterance recorded in conversation in Ramsaran (1978) was 189 sylls/min (3.1 sylls/sec, 7.6 segs/sec) and the fastest was 324 sylls/min (5.4 sylls/sec, 13.4 segs/sec). Byrd (1992a) found men speaking 6.2 per cent faster than women.
12 These figures, taken from Ramsaran (1978) are slightly higher than those given in §11.6.2.6.
13 Byrd (1992c).
14 Berry (1953).
15 Gimson (1969).

Part IV

Language teaching and learning

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Chapter 13

Teaching and learning the pronunciation of English as an additional language

13.1 The place of pronunciation

As in every aspect of language teaching, decisions about priorities in pronunciation have to be decided upon; indeed they are probably more acute in pronunciation teaching than in other areas. Priorities in grammar are not too difficult to decide upon: as a rule of thumb the simpler the structure the earlier it is taught. Similarly early vocabulary can be semantically selected on the basis of relevance to the type of learner (i.e. child or adult, local chatting versus business meetings . . . etc . . .). But pronunciation has to take a back seat; no fixed order of teaching sounds can be used because pronunciation usually has to take second place to grammar (and to a lesser extent, to semantics). Yet some sounds are clearly more important (carry a higher 'functional load', i.e. have a higher frequency and involve more minimal pairs) than others and, even though there can be no strict order of teaching sounds, decisions can be made about which (mis)pronunciations should be corrected at any stage of acquisition.

Because of the pride of place given to grammar together with the increasingly wider use of English as an international language there has been a tendency to place less and less importance on the teaching of pronunciation. There has been a sort of implicit assumption that the standard will be set by the teacher doing the teaching (combined with what the learner picks up from watching English or American TV and film) and that learners will simply pick up their pronunciation, often with no explicit teaching of it at all. In many cases teachers know of no other model than Received Pronunciation or General American and, since this may be considered an unattainable standard, pronunciation teaching muddles through, coming sometimes near to, and sometimes far away from, these standard models.

The claim of this chapter is that some sort of model has to be set by the English teacher, that this model may in some cases be GB or GA, but that in other cases it may be a model formed by an amalgam of features from various native speaker standards (including GB and GA); and that this amalgam may be further altered by reducing the number of contrasts between sounds, and changing the usual (the 'default') realisation of sounds, to take account of likely L1 transfer and to form a possible international English *lingua franca.*[1] Teachers (or

the administrators who are setting the goals for courses) should be clear from the start of a course what model they and their students are aspiring to and should correct towards that model (but no further). Thus teachers must not avoid using some model of pronunciation and explicitly teaching towards it, but this model should be within reach of at least some members of their class.

The remainder of this chapter is used to answer three questions:

(1) What type of pronunciation is to be taken as a model?
(2) How does the model of pronunciation used as a target differ from that described in the earlier chapters of this book?
(3) What teaching methods should be used in the teaching of the various sounds?

13.2 Models and targets

13.2.1 Native speaker targets

For many years it was assumed that the target for any L2 learner of English should be a native speaker variety and, in the case of British English, this was assumed to be General British (formerly known as RP), the pronunciation described in this book. For those learners who have much contact with native (British) speakers this may continue to be the target. But GB is not the only native speaker variety which may be set up as a model. Those in countries which have traditionally been influenced by the U.S. may well use a version of General American as a model; selection of other forms such as Australian English or Caribbean English may be made for geographical or social reasons, though in the latter case no Caribbean standard has been documented. Within Britain an accent based on Scottish English ('Standard Scottish English') has sometimes been claimed to be a variety which is easier for foreign learners than GB, mainly because it is rhotic (i.e. written /r/ is pronounced in all positions) and moreover the type of /r/ used is frequently a voiced alveolar flap, which is common in the world's languages where the voiced post-alveolar approximant of GB is not.

13.2.2 GB and Regional GBs

Outside those who have English as an L1 (i.e. their native language and for many their sole language), there are those who use English as an L2 when interacting with L1 speakers; such learners will probably wish to have a native standard English as a model. GB remains the principal option for those aiming at a British pronunciation (this applies, for example, to many speakers from continental Europe). Support for this comes from the existence of good textbooks for this variety and the standard pronouncing dictionaries are based on it.[2] In §7.8 we spent some time discussing Regional GBs, i.e. versions of GB which have incorporated some socially acceptable characteristics of a regional accent; the acceptability is shown for example in the use of many such characteristics by

newsreaders on the BBC. This applies to the use of some features of accents of northern England, e.g. /a/ before voiceless fricatives (or a nasal plus another consonant) in words where standard GB has /ɑː/, e.g. *task*, *bath*, *dance*. It also applies to some features of popular London speech, particularly the use of a vocalic realisation of /l/ as [ʊ] in words where the /l/ is followed by another consonant, e.g. in *hold*, *belt*, *elbow* and the use of a different realisation of a number of vowels before /l/, e.g. a near Cardinal [uː] for /uː/. But note that some features of popular London, e.g. glottal stop replacing /t/ intervocalically in e.g. *daughter* [ˈdɔːʔə] and [aː] as a realisation of /aʊ/ in e.g. *about* [əˈbaːt], are less acceptable even in a London Regional GB (see discussion of 'Estuary English' under 7.12.3).

13.2.3 Amalgam English and International English

Since this book was first written the number of users of English as an additional language has grown exponentially. Many of these users have no realistic possibility or necessity to acquire a standard native-speaker-like accent. There are those who use it as an L2 and/or *lingua franca* within their own country (and maybe including neighbouring countries) and who may only have limited meetings with L1 speakers; such learners may wish to aim at a version of AMALGAM ENGLISH, based on an amalgam of native speaker Englishes, together with some local features arising from a local L1. There are also those speakers of INTERNATIONAL ENGLISH who use it as a *lingua franca* on a more international basis and need a minimum standard for occasional communication (e.g. non-English-speaking businessmen who use English as the common language between them). The boundary between Amalgam English and International English is fuzzy, but it is a useful simplification for giving guidance to teachers.

Although learners from European countries (and some high-flyers from Asia and South America) will usually have a type of GB as a model, sometimes a type of Amalgam English may often be a more realistic target. Amalgam English is at least a hybrid between American and British varieties and possibly varieties from the southern hemisphere and the Caribbean as well; additionally it will probably include a number of local characteristics based on transfer from the local L1(s). International English, while allowing the mixture of Amalgam English, will additionally tolerate a much wider adaptation to features common in other languages. International English is the most difficult to be precise about, but in the present world climate for English it is important to give some guidance on the possible details of such a pronunciation and the priorities in its acquisition as part of an English for International Purposes.

The terms Amalgam English and International English as used here are categories of productive or spoken competence. But all learners of English need to listen to English, even if only in films and on television, and all can develop some accomplishment in listening to different varieties of English, both standard and non-standard. Listeners have as much responsibility to improve their listening

as speakers have to improve their pronunciation. When interacting in English it is also the responsibility of listeners to indicate as often as they reasonably can that they have not understood. They should not be bound by a form of hyper-politeness as so many people so often are when listening to a foreign language.

13.3 GB and Regional GBs: priorities and tolerances

If the teacher or learner sets GB as a target he is aiming at a level of attainment in production which is equivalent to that of a native GB speaker and a level of competence in listening which allows him to understand without difficulty variation within GB. To achieve this standard the learner should be competent in all the features of current English described in Chapters 7–12. A particular teacher may have some regional characteristics, thus modifying the target to a Regional GB. As long as the learner acquires only one type of Regional GB this is perfectly acceptable as a target (as of course are other standards like General American or Scottish Standard English). A learner aiming at this high level of competence should, however, avoid the incongruity of a mixture of accents. Since aiming for this 'high acceptability' model (as it was called in previous editions of this book) does involve high achievement it is inevitable that most learners do not achieve the final target. Priorities therefore have to be borne in mind in teaching and learning.

13.3.1 Consonants

The full inventory of 24 consonant phonemes must eventually be available to the speaker, although those consonants with low frequency or few minimal pairs should accordingly be given low priority, e.g. /ʒ/, and the distinction between /θ/ (more frequent in common lexical words like *think* and *thank*) and /ð/ (more frequent in common function words like *this* and *that*).

13.3.1.1 Plosives

If a native-like standard of GB is the target, it is essential that the aspiration of voiceless /p,t,k/ in accented positions (§9.2.1(4)) should be maintained as the major factor distinguishing these phonemes from voiced /b,d,g/, i.e. aspiration constituting a more potent differentiating feature than the presence or absence of voicing. Learners whose mother tongue relies on voicing as the prime feature of opposition (e.g. most Romance and Slav language speakers) must take particular care. If, for instance, *pat* is realised as [pat] rather than [pʰat], an English listener is likely to understand *bat*, the absence of aspiration suggesting /b/ to an English ear. Moreover /l/ and /r/ following accented /p,t,k/ (and to a lesser extent /j/ and /w/ since oppositions involving preceding voiceless/voiced plosives are rare) must be devoiced so that /p/ and /b/ are distinguished, for example, primarily by [l̥] and [ɹ̥] in *plead* and *pray* versus [l] and [ɹ] in *bleed* and *bray*.

The articulation of /t,d/ must be clearly alveolar (§9.2.6) and when followed by the homorganic syllabics [n̩] and [l̩], as in *button*, *sudden*, *little*, *middle*, the release must be nasal or lateral respectively without an intrusive vowel (§9.2.4(4,5)). To be highly acceptable GB the first plosive of stop sequences should have no audible release (§9.2.4(2)), e.g. in *actor*, *black tie*, *rugby*, *big dog*. Intrusive vowels should be avoided in clusters of consonants, e.g. between /s/ and /p,t,k/ as in *sport*, *strike*, *school* or in such final sequences as /lmz/ as in *films*. Certain of the variants or allophones described in Chapter 9 may be disregarded without detriment to an impression of highly acceptable performance. Final (i.e. pre-pausal) plosives, although usually without audible release, as in *top*, *mob*, *lit*, *lid*, *stick*, *twig* may be given an explosive last stage, the resultant impression only being one of careful speech. The use of [ʔ] or glottal reinforcement (§9.2.8) in connection with the voiceless plosives and affricate is never necessary; nor is the affrication or weakening of plosives mentioned in §9.2.4(6). The devoicing of voiced consonants /b,d,g,ʤ,v,ð,z,ʒ/ in post- or pre-pausal position is not crucial: full voicing is permissible provided that an [ə] off-glide is not added finally to a word such as *big*, i.e. [bɪgᵊ], so that it is decoded as *bigger*.

13.3.1.2 Fricatives

English has a comparatively rare complexity in its set of fricative places of articulation—labiodental, dental, alveolar, palato-alveolar and glottal—which is in general more important than the distinctions between the voiceless and voiced pairs at each place of articulation (§9.4). Alveolar /s,z/ must remain clearly distinct from dental /θ,ð/ and from palato-alveolar /ʃ,ʒ/—see §9.4(1). /h/ should be a glottal fricative and not velar or uvular.

13.3.1.3 Affricates

The distinction between /ʧ/ and /ʤ/ must be insisted on, as must the distinctions between /ʧ/-/tr/, /ʤ/-/dr/, /ʧ/-/ʃ/, /ʤ/-/ʒ/—see §9.3.1(4).

13.3.1.4 Approximants

The /l/ phoneme should have the qualities and correct distribution of allophones mentioned in §9.7.1, i.e. [l,ɫ,l̥]. Similarly, /r/ should have a post-alveolar approximant articulation rather than any kind of trill or flap (§9.7.2(2,5)). High performance GB will make use of the linking /r/, e.g. for *far away* /fɑːr əˈweɪ/ is more typical than /fɑː əˈweɪ/; and for *pour out* /pɔːrˈaʊt/ is preferred to [pɔːˈaʊt] or [pɔːˈʔaʊt]. It is generally acceptable to replace syllabic [l̩,ɾ̩,m̩,n̩] by [əl,ər,əm,ən].

13.3.1.5 Nasals

The alveolarity of /n/ should be insisted on, as should the use of /ŋ/ without a following /g/ in words such as *wing*, *winger*, *among*, *strong*, *long* (but note

exceptional medial /ŋg/ in *finger*, *stronger*, *longer*) (§9.6.3). For syllabic [l̩,r̩,m̩,n̩] see section above.

13.3.1.6 Consonant clusters

English uses a large number of consonant clusters (§10.10). Consonant clusters occur, of course, in many other languages, e.g. German and Polish, but the combinations permitted may differ from those of English. There are other languages whose possibilities of consonant clustering are much more limited, e.g. Spanish or Italian, or whose syllables regularly have a simple CV shape, e.g. many Oriental and African languages. It is clear that in such cases much practice in English two- and three-consonant clusters will be needed to avoid the insertion of intrusive vowels—not only initially and finally in words (where clustering is much less common than single consonants) but also across word and morpheme boundaries.

13.3.2 Vowels

The learner should aim to have at his disposal the 20 vowel phonemes of GB (12 monophthongs and eight diphthongs) although those of low frequency, particularly /ɔɪ/ and /ʊə/, should have low priority. The quality of each vowel should take precedence over their innate length. But emphasis must be laid on the reduction in length which occurs before voiceless consonants, e.g. *beat* is shorter than *bead* and *bit* is shorter than *bid*; in fact the shorter /iː/ before /t/ is similar in length to the unshortened /ɪ/ before /d/.

Provided the contrasts between the various vowels are maintained, some latitude can be allowed in their realisations. The three front short vowels /ɪ,e,a/ vary considerably in their degree of openness in various Regional GBs (e.g. closer in London) and areas of tolerance are shown in Figure 53. Too diphthongised pronunciations of these vowels give an impression of CGB which can be

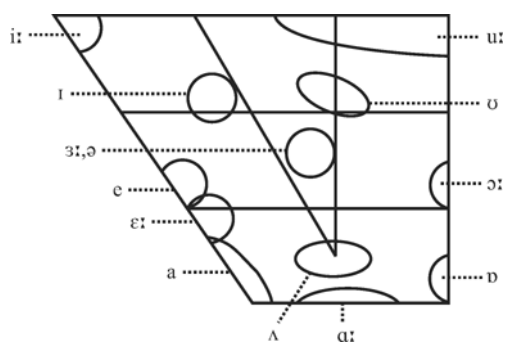

Figure 53 GB monophthongs: acceptable areas.

viewed as comic. Contrasts between /ɪ,iː/ and between /a,ʌ/ should have high priority since they carry high functional loads.

/iː/ and /uː/, which are usually pronounced in GB with a slight glide from a more open, centralised position to a closer, more fronted, position, may be given a pure vowel articulation similar to the qualities commonly associated with vowels of this type in many other languages. Though there is a danger that such pronunciations may sound hypercorrect to the native listener, especially if the vowels used are Cardinal in quality, they are to be preferred to gliding vowels whose starting-point is so open that it falls within the area typical of broad regional accents—thus introducing unwittingly a comic incongruity if the remainder of the system conforms to the GB model.

A particular decision has to be made about the final vowel (usually spelt <y>) in words like *city*, *melody*, *acceptability*. In the first edition of this book in 1962 these words were given a pronunciation with /ɪ/ but in the last fifty years or so the standard pronunciation has shifted to [i], i.e. the quality of the vowel is now similar to that of /iː/ but the length remains similar to that of /ɪ/. A learner who wishes to sound modern in his pronunciation of GB should use [i]; a pronunciation with [ɪ] sounds somewhat old-fashioned and is a characteristic of CGB.

/ɛː/ is a recent development from the earlier pronunciation [eə]; the diphthongal pronunciation is still acceptable. The theoretical areas of tolerance for /ɑː/ and /ɔː/ are extensive, the limitations being imposed by the presence of /a/ = [aː], e.g. in an opposition such as *cad-card*, and of /uː/, e.g. in *food-ford*. Of the variations shown in §8.9.7, [ɑː] and [äː] may be permitted for /ɑː/, but [aː] is likely to be too near to /a/. Of the variations for /ɔː/ in §8.9.9, [ɔː] is permissible and so is [ɔ̹ː], but in this case care must be taken to ensure that a monophthongal variant [oː] is not used for /əʊ/ (see below). Similarly, the variants for /ɜː/ shown in §8.9.12 may be safely used, provided that they do not overlap with the realisation of /ɑː/, e.g. if an open variety of /ɜː/ is used in a word such as *burn*, this will necessitate a more retracted /ɑː/ in *barn*.

Use of an open variety of /ə/ (particularly in word-final positions), like the pronunciations of /ɪ,e,a/ mentioned above, smacks of CGB and can sound comic. Pronunciation with /ə/ rather than /ɪ/ is increasingly preferred in unaccented syllables, particularly in certain suffixes, e.g. for the penultimate vowel in the termination *-ity* in a word such as *quality*, for *-ily* as in *merrily* and for *-ate* as in *fortunate*. /ə/ or /ɪ/ are equally acceptable in the terminations *-less*, *-ness*, *-ace*, *-et*, e.g. *hopeless*, *goodness*, *palace*, *cutlet*, with /ə/ gaining ground (but the words *carpet* and *bucket* generally retain /ɪ/ as does the *-age* as in *cabbage*). The inflexions *-es*, *-ed* as in *horses* and *waited* are still more commonly pronounced with /ɪ/ although pronunciations with /ə/ are gaining ground in these inflexions (besides being the norm in Australian English).

For the eight GB diphthongs, the area of the first element is more important than the second element, which is only lightly touched on and has little prominence. Acceptable areas of onset are extensive but should not overlap (see Figs 54 and 55). The regional quality of some starting-points (as described

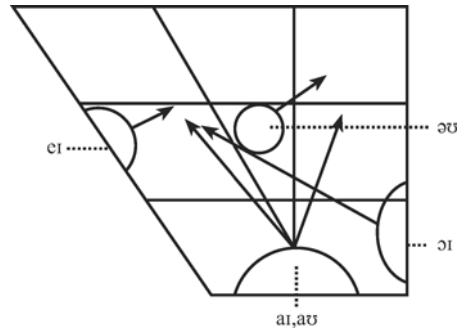

Figure 54 GB closing diphthongs: acceptable onset areas.

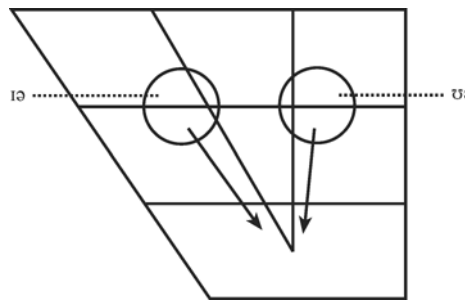

Figure 55 GB centring diphthongs: acceptable onset areas.

in §§8.10–8.12) should be borne in mind: if, for instance, /eɪ/ is said with a starting-point more open than Cardinal [ɛ], the impression given may be that of broad London speech. In the case of /aɪ,aʊ/, there can be a common (open central) starting-point. The smoothing of /aɪə,aʊə/ (§8.11), though it has long been common in southern England, is less prevalent than it was and should be avoided by the foreign learner. For /əʊ/ (§8.10.4), the GB form [əʊ] is most widespread and should thus be recommended. While the somewhat conservative [oʊ] and the regional [oː] are acceptable (though, as noted above, there is possible confusion if a close realisation of /ɔː/ is used), learners are advised to avoid the diphthong having a fronted onset [ë], this variant being regarded as excessively CGB and affected. The same applies to the finishing-point for the centring diphthongs /ɪə,ʊə/ which must not be below half-open, which would smack too much of CGB, sounding posh and affected. Like /ɛː/ above, which has developed from [eə], /ɪə,ʊə/ are increasingly heard as long monophthongs [ɪː,ʊː] and such pronunciations are entirely acceptable if aiming at GB. It should also be noted that /ʊə/ is now generally replaced by /ɔː/ in such words as *poor*, *sure*, *moor*, *tour*, etc. (§8.12.2(2)).

13.3.3 Accent and rhythm

Accenting the correct syllable of words should be a high priority for learners of GB. If the wrong syllable of a word is accented, an alternative with that accentuation and with a similar (though not necessarily exactly the same) sequence of sounds may be understood, e.g. there are two suburbs of London, one called *Kennington* /ˈkenɪŋtən/ and one called *Canning `Town* /kanɪŋ `taʊn/[3] but if either is pronounced with the other's accent pattern, it is liable to be misunderstood as the other by Londoners. The learning of word accentual patterns is not as large a task as might be imagined since in conversation monosyllables may account for more than 80 per cent of words (see §12.6). The accent of polysyllabic words should be learnt when the word is first acquired.

The weak forms of most function words occur overwhelmingly more frequently than the strong forms and should be considered the usual pronunciation. If native speakers are asked to pronounce such common words as *and*, *but*, *at*, *of* they will give the rare citation (accented) forms /and, bʌt, at, ɒv/ rather than the more common /ən, bət, ət, əv/. They will generally be unaware that such words have weak forms and will deny that they normally pronounce a phrase such as *And there was a knock at the door* as /ən ðə wəz ə ˈnɒk ət ðə `dɔː/, describing such a pronunciation as careless. Thus it is wiser to listen to the way in which a native speaks rather than to ask his opinion. Similarly, many dictionaries record the strong pronunciation of these grammatical words without giving the weak alternatives.[4] The foreign learner must regard the strong forms as being 'marked' i.e. having a special meaning compared with the 'unmarked' sense of the usual weak forms. Thus the accent of *I `can* /kan/ *come*, *I'm going `to* /tuː/ *London* with their emphatic meaning can be compared with the same phrases said neutrally with /kən/ and /tə/. But there are some uncommon reduced forms which are heard only in rapid speech (see §11.3) and these should not be imitated by foreign learners. The use of /jə/ or /mə/ in such phrases as *your mother*, *my father* will sound slangy and, if employed inappropriately by a learner, could appear comically incongruous.

Lack of use of weak forms and pronouncing a full vowel in those unaccented syllables of words that should have an /ə/ will produce a rhythm which is seriously different from that of native speaker GB (and almost all other varieties of English in the UK, Ireland, North America, Australia and New Zealand). For some learners, e.g. those with French, Italian, Spanish, Japanese, or an African tone language as background, this problem is especially great and will require prolonged attention.

The proficient learner will use variations in the accentual patterns of words which result from rhythmic pressures (§12.3). Such variation affects particularly adjectives or the adjectival element of a noun phrase, the predicative pattern (corresponding to the isolate form given in dictionaries) being regarded as normal, whereas the attributive pattern displays the variant, e.g. compare the predicative patterns in *My car's 'second `hand*, *This is 'Water`loo* and the attributive variants

A 'secondhand `car, 'Waterloo `Station. This 'accent-shift' is part of the target for those aiming at GB.

13.3.4 Sounds in connected speech

The alveolar consonant elisions mentioned in §10.8 can be adopted by the foreign learner, especially those involving the simplification of a three consonant cluster by the elision of a medial /t/ or /d/, e.g. in *restless*, *kindness*, where retention of the alveolar stop only occurs in careful speech. Alveolar stops can be elided when occurring medially in clusters of three consonants brought together at word boundaries, e.g. in *left turn*, *wind down*; included here is the omission of the past tense marker /t/ or /d/, e.g. *mashed potatoes*, *jogged by.*

It is not necessary, however, for the foreign learner (even with a high acceptability target) to seek to adopt all the native speaker habits of vowel and consonant elision detailed in §12.4.6. The examples of post-nuclear vowel elision in the words quoted in §10.8, e.g. loss of /ə/ in *comparable*, *factory*, *dangerous*, *carefully* is optional, the retention of the weak vowel being entirely acceptable. And in pre-nuclear positions, e.g. in *polite*, *solicitor*, the foreign learner should avoid the elision of the weak vowel characteristic of rapid speech.

It is assumed that the competent foreign learner will make most of the allophonic contextual assimilations mentioned in §12.4.1; these generally involve greater ease of articulation. Changes which may provide cues to meaning, e.g. the devoicing of /l/ and /r/ after accented /p,t,k/ are essential. Phonemic assimilations at word boundaries (§§12.4.2–5) are important and have stylistic implications (§12.5). Some of these follow from the elision of medial /t/ and /d/ in consonant clusters mentioned above, e.g. *shouldn't go* → /ʃʊgŋ `gəʊ/. The foreign learner must always be careful that in seeking to adopt a casual style of English speech he does not introduce assimilatory habits which are characteristic of his own native language but not of English (§12.7), e.g. voicing assimilation, e.g. *black dog* → [blag `dɒg].

13.3.5 Intonation

Intonational phrasing is similar across most languages, such phrases often corresponding with syntactic clauses. However, sentence adverbials like *incidentally* and *officially* (particularly in initial and final position) and syntactic subjects are frequently given phrases of their own in English, particularly in longer sentences (see §11.6.2.1). Learners will often neglect to divide long sentences into intonational phrases because the pressure to think of other aspects of the language makes them intone sentences in a wooden way. 'Chunking' a sentence into phrases will make pronunciation sound both more natural and more lively.

It is also true that there is a tendency in many languages to give the last lexical word in an intonational phrase a pitch prominence, just as is done in English in those cases where the phrase contains wholly new information. But

in English in those other cases where there is old information at the end of the phrase, the major pitch prominence (the nucleus) will be moved to an earlier point in the phrase (see §11.6.2.2), i.e. old information does not receive an accent when occurring at the end of an intonational phrase. This does not apply in all languages (e.g. French, Italian, Spanish) where such de-accenting is only optional, and learners from such backgrounds must be careful to de-accent appropriately.

As regards choice of nuclear tone, once again many languages will have a distribution of falling and rising tones similar to English. But the type of fall or the type of rise may vary considerably (see §11.6.1.3). The high-level learner should pay special attention to the use of the fall-rise, which occurs frequently in non-final positions in sentences (on dependent clauses, on adverbials and on subjects). In GB the low rise is much more common than the high rise, particularly on interrogatives (unlike many other languages). As for falls, high fall is more common than low fall in GB (again unlike many other languages).

Learners should note that, despite what is often stated in textbooks on English language teaching, both rises (usually low rise) and falls (usually high fall) occur frequently on yes/no-interrogatives and wh-interrogatives. In both cases the low rise is the more polite tone, while the high fall is more business-like but sometimes abrupt and demanding. With tag-interrogatives, while agreement is always expected, the high fall demands such agreement, while the low rise leaves open the possibility of disagreement. Learners can sound completely natural making use of only two tones, low rise and high fall, on all types of interrogatives (§11.6.2.6(3,4,5)).

The most difficult area of intonation for foreign learners concerns its attitudinal uses. But some effort should be made to master some of the uses of fall-rise, e.g. for warnings, reservations and contradictions (§11.6.2.6(1)).

Finally learners aiming at a native-like GB must be aware that much of the individual tonal quality of a language is due to the types of pre-nuclear patterns which it uses. The most common pattern in GB involves a descending series of plateaux (§11.6.1.4). A series of glides-down is also common but not as common as in some other languages (e.g. North German) and if used too frequently in GB may sound aggressive. On the other hand a series of glides-up (often heard in Norwegian and Swedish) will sound comically enthusiastic. But most to be avoided is a long sequence of syllables on a low level, which will sound bored or even surly.

13.4 Amalgam English: priorities and tolerances

This sort of target will involve an amalgam of native speaker varieties in which the learner aims only at easy intelligibility by native speakers rather than aiming to sound like a native speaker. This may especially be a reasonable target to set up where teachers themselves do not aspire to one homogeneous native-speaker accent. This sort of target will also be tolerant of some variations produced by the intrusion of features of a local language into English which do not interfere

with the maintenance of contrasts carrying a high functional load. Both in this model and in the one in the following section, International English, more reduction is allowable in the number of vowel contrasts than in the number of consonant contrasts.

13.4.1 Consonants

13.4.1.1 Plosives

At this level of competence effort must still be made to keep the main feature distinguishing /p,t,k/ from /b,d,g/ in initial position as aspiration, particularly at the onset of accented syllables, since for many listeners (including native speakers) making the distinction using voice alone will lead to confusion. Devoicing of /l,r,w,j/ following /p,t,k/ is similarly important as being the equivalent of aspiration in this position. In final positions learners, even at this level, must continue to learn to make the correct vowel length distinctions before /p,t,k/ and /b,d,g/. Reduction of the voiced series to the corresponding fricatives [β,ð,ɣ] must be avoided (even though this does sometimes happen even within GB—see §9.2.4(6)) which, in the case of the first two sounds, may lead to confusion with /v,ð/ (this may, for example, afflict Spanish learners). The realisation of intervocalic /t/ as a flap [ɾ], as is common in many types of American English, should preferably be avoided, because this can lead to confusion with /r/. On the other hand, considerable latitude can be given to the place of articulation of /t,d/ which can be alveolar or dental (as used in French) or retroflex (as used in most Indian languages). Palatalisation of /k,g/ before close front vowels can be allowed. Use of /ə/ replacing nasal and lateral plosion and between sequences of plosives is also acceptable in this model.

13.4.1.2 Fricatives

The place of articulation differences between the fricatives should be maintained. The distinction between the pairs at each place is less important, as mentioned in the discussion of GB as a model above: there is no necessity to use the distinction between /θ/ and /ð/ and between /ʃ/ and /ʒ/ which are both of low functional load, although some effort should be made to achieve distinctions between /f~v, s~z/, which have a higher functional load. Alternatively there is no necessity to insist on /θ,ð/ at all; they can be replaced by /t,d/. Dental or retroflex /s,z/ may be allowed. The case of /h/ is more problematic. Many learners (like many broad regional pronunciations among native speakers) will have a tendency to drop word-initial /h/. On strictly functional terms dropping of /h/ cannot be criticised: word contrasts between absence and presence of /h/, e.g. *heat~eat*, *hill~ill*, *hear~ear*, are few, so there is unlikely to be misunderstanding. But the dropping of /h/ is so stigmatised as 'uneducated' by many native speakers that anyone anticipating any sort of regular contact with native speakers should

learn to use it appropriately. On the other hand, there can be considerable tolerance in its precise articulation: uvular and velar articulations need not be worried about.

13.4.1.3 Affricates

Some latitude can be allowed in the production of the two affricates /ʧ,ʤ/: pronunciations with [tj,dj] or [tç,dj] or with greater or lesser lip-rounding or lip-spreading are permissible. But care must be taken not to confuse /ʧ,ʤ/ with the sequences /tr,dr/ since there are many minimal pairs. These distinctions can be certain to be clear if /r/ is realised as an alveolar flap as discussed in the next paragraph.

13.4.1.4 Approximants

Considerable latitude can be allowed in the realisation of /l/. As detailed in §9.7.1(3), there is much regional variation. Learners at this level of competence can have clear [l] in all positions or dark [ɬ] in all positions or any distribution of the two, and can change dark [ɬ] to [ʊ] in post-vocalic position. But a vocalic realisation in pre-vocalic position, which some language backgrounds may encourage (e.g. Polish, because of their spelling, where an <l> in their orthography indicates [w]), is to be avoided because of potential confusion with English /w/. /r/ can be pronounced in all positions where it is in the spelling (as it is in many forms of Scottish English and General American); such close adherence to the orthography may indeed reflect a majority pronunciation among the total number of native speakers and will ease learning for many learners. Moreover /r/ can be realised as a flap rather than an approximant (again, as it is in SSE and GA), the flap being more used worldwide while the approximant is a relatively rare sound. Use of [ʋ] for /w/ should be discouraged because of potential confusion with /r/ and/or with /v/.

13.4.1.5 Nasals

In the pronunciation of the nasals, latitude is allowable in the place of articulation of /n/: in particular, a dental or retroflex articulation is acceptable. In many languages (and in some varieties of English in England, particularly in the north-west Midlands) [ŋ] only occurs as an allophone of /n/ following /g/; this too is acceptable in this standard of pronunciation, e.g. *sing* and *singing* can be pronounced /sɪŋg/ and /sɪŋgɪŋg/.

13.4.1.6 Consonant clusters

Final clusters involving C + /t,d/ and followed by a C at the beginning of a following word, including past tense *-ed*, e.g. in *dropped the ball*, can lose their

/t,d/ (as indeed we suggested is allowable even in GB—see §12.4.6(2)). Correct sequencing of other clusters should be aimed at, with efforts to eliminate both cluster reduction, e.g. *spring* → [prɪŋ] and the use of epenthetic vowels, e.g. *spring* → [səprɪŋ] or [esprɪŋ].

13.4.2 Vowels

The number of vowels and vowel contrasts can be reduced. /ɛː,ɪə,ʊə,ɜː/ are not necessary if post-vocalic and pre-consonantal /r/ are used (as under §13.4.1.4 above), e.g. *bare*, *beard*, *cure* will be pronounced /beɪr/, /biːrd/ and /kjuːr/ and *burn*, *skirt* and *fern* as /bərn/, /skərt/ and /fərn/. Furthermore there may be loss of contrast between /a,e,ɛː/ before /r/, e.g. *marry*, *merry*, *Mary* may be pronounced the same (as occurs in many American varieties). Certain other vowel contrasts of low functional load can also be dispensed with if necessary. /ʊ/ is of low functional load and can fall together with /ʌ/ so that *luck* and *look* can be pronounced similarly, preferably with a vowel nearer to /ʊ/ (this will assist native speaker teachers from the north of England) or with a vowel similar to /ə/. Alternatively /ʊ/ can be pronounced with a similar vowel quality to /uː/ (or pronounced the same as in many types of Scottish English). For this target it is unnecessary to make a distinction between /ɑː/ and /ɒ/ (there is no distinction in General American), both being pronounced with a vowel more like /ɑː/ and indeed /ɑː/ itself is allowable as [aː] (as for example in Australian English) provided it is not conflated with /a/, e.g. the vowel in *father*, *calm*, *palm* must be kept distinct from that in *mat*, *mad*, *cat* and *pat*. /eɪ/ and /əʊ/ can be pronounced as pure vowels rather than diphthongs, i.e. as [eː] and [oː] a type of pronunciation usual in General American, in Scottish English, in the north of England and in other varieties of English.

Distinctions between other vowels should in general be maintained because of their high functional load and because they are ubiquitous in almost all forms of native speaker English. Many words are distinguished by the differences between /ɪ,e,a/ and between /ɪ/ and /iː/ so that the maintenance of these vowels is important, although there can be considerable tolerance in their realisation (as mentioned in §13.3.2 above). /ɔː/ should also be distinct from /əʊ/ and from /ɑː/ (particularly if the distinction /ɑː~ɒ/ is not present). /aɪ, aʊ/ can have the same starting-point or not (taking account of local language backgrounds) and this starting-point can have considerable tolerance provided it is fully open. Finally /ɔɪ/ is of very low frequency and because of this can fall together with /aɪ/, although it is present in almost all varieties of native speaker English and usually does not present a problem anyway.

Thus some vowels are no longer required (/ɛː,ʌ,ɒ,ɜː,ɪə,ʊə/), some diphthongs have been monophthongised (/eɪ,əʊ/) and considerable variation is allowed in the remainder, as shown in Figures 56, 57 and 58. In particular the short vowel /ʊ/ (> GB /ʊ,ʌ/) may be nearer to /ə/; and the quality of /ɑː/ may vary between Cardinal 4 and Cardinal 5.

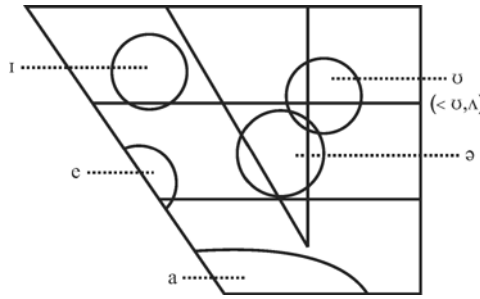

Figure 56 Amalgam English: short vowels.

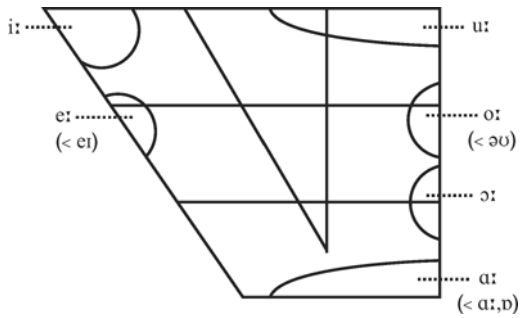

Figure 57 Amalgam English: long vowels.

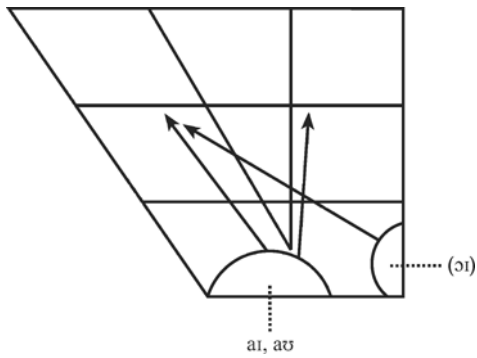

Figure 58 Amalgam English: diphthongs.

13.4.3 Accentuation, intonation and connected speech

The preservation of correct word accentual patterns remains paramount. Associated with these accentual patterns is the correct use of /ə/ in unaccented syllables in words and the correct use of weak forms involving /ə/ or syllabic consonants, particularly those which occur overwhelmingly in their weak form, which are of frequent occurrence and where there is a large change from the strong to the weak form, i.e. the articles *the*, *a*, *an*, the conjunctions *and*, *or*, *for* and the prepositions *as*, *at*, *to*, together with the composite weak forms involving *not*, e.g. *isn't*, *aren't*, *can't*, *couldn't*, *won't*, *wouldn't*, *shan't*, *shouldn't*. No attempt should be made to use native English patterns of elision and assimilation.

Intonation phrasing by foreign learners will never be too far from that of native speakers because of similarities across the world's languages; a foreign learner's tendency to speak slowly and thus to keep to short intonational phrases will not interfere with intelligibility. Some attempt should always be made to use native English patterns of nucleus placement (the primary accent) in intonation phrases. The movability of the nucleus to different places in intonational phrases (particularly one-phrase sentences) should be regarded as one of the prime features of an English accent, making it easily intelligible to native speakers. Thus a tendency to constant final nucleus placement taking no account of (de-accentable) old information (common among learners with a background in Romance languages and in tone languages, notably those of Africa and Asia) should be counteracted.

Indeed, for many speakers of tone languages, whether in Africa or Asia, the whole concept of pitch variation conveying discoursal or attitudinal meanings may be entirely novel, and besides being made aware of nucleus movement, they should practise some of the key nuclear tunes and the sentence patterns associated with them. A simplification can be made by using simple falls for declaratives and question word interrogatives; rises for polar (yes/no) interrogatives; and high rise for declarative questions (i.e. questions in the form of a declarative). But some effort should be made to use appropriate fall or rise for tag-interrogatives (fall as strongly expecting agreement and rise as allowing a distinct possibility of disagreement), as well as some of the uses of fall-rise on declaratives (e.g. the 'reservation' meaning). Speakers of 'intonation' languages will usually not need to make adjustments when aiming at this sort of target other than to remove idiosyncratic tones of their native language which are clearly inappropriate in English.

13.4.4 Summary: Amalgam English

(1) General aim: easy intelligibility by native speakers
(2) Consonants:
    (i) Insist on aspirated plosives but allow dental or retroflex /t,d/ and palatal /k,g/.
    (ii) Insist on /f,v,s,z/ but allow conflation of /ʃ,ʒ/ and /θ,ð/. /h/ required but allow velar/uvular replacements.

(iii) Insist on /ʧ,ʤ/ distinct from /tr,dr/.
(iv) Allow any variety of /l/. Allow pre-pausal and pre-consonantal /r/ and /r/ = [ɾ]. Allow insertion of /g/ following /ŋ/. Discourage /w/ = [ʋ].
(v) Insist on consonantal clusters (apart from usual reductions allowable in GB).

The inventory of 24 consonants in GB has been maintained or reduced to 22 but much allophonic variation is not insisted upon.

(3) Vowels: a possible reduction to:

(i) Short vowels /ɪ,e,a,ʊ,ə/
(ii) Long vowels /iː,eː,ɑː,ɔː,oː,uː/
(iii) Diphthongs /aɪ,aʊ,(ɔɪ)/

The inventory of 20 vowels in GB has been reduced to 14 or 15.

(4) Connected speech:

(i) Insist on nucleus movement and basic tunes.

13.5 International English: priorities and tolerances

This sort of target is likely to be the most contentious and the most difficult to be precise about.[5] It can be set up as a target for those who use English as a *lingua franca* either within their own country (and sometimes including surrounding countries) or as a means of international communication not necessarily involving native speakers at all. It involves simplifying the Amalgam English set up in §13.4 in ways to make it easier for learners from many different language backgrounds; and it will allow some variation to take account of these different backgrounds but not to an extent to make these varieties mutually unintelligible. Reduction of all contrasts which involve a low functional load is allowed. It produces what might still be an intelligible form of English given that communication using it will be in contexts where the language used has a fair degree of predictability.

13.5.1 Consonants

Almost all of what was said in 13.4.2 concerning consonants in Amalgam English applies here but more L1 intrusion is allowable.

13.5.1.1 Plosives

/p,t,k/ and /b,d,g/ must remain as contrastive sounds. Aspiration (initially) and length of preceding vowel/nasal/lateral (finally) are still the preferred features for the contrasts. But many speakers using English for international purposes may, by matching English to their L1, make these contrasts depend on voicing alone; this can be tolerated with this target. The same applies also where the

plosives are followed by /l,r,w,j/: devoicing of the approximants is still to be preferred but lack of this feature can be tolerated. Variations in the place of articulation of /t,d/ can be tolerated as they were in the previous target (i.e. they can be dental or retroflex). Use of /ə/ in place of nasal and lateral plosion and in sequences of plosives is also allowable. The realisation of /d/ as a flap [ɾ] is again not to be encouraged because of potential confusion with /r/. And it still remains important (as in the previous model) to keep the plosives as plosives and not allow weakening to fricatives.

13.5.1.2 Fricatives

As in the previous model place of articulation distinctions among fricatives should be retained. /θ,ð/ can be allowed to become dental [t̪,d̪]; replacement by alveolar [t,d] can even be tolerated though not encouraged. Such replacement is one reason why it was recommended that the weakening of plosives to fricatives should not be allowed: if it were, an actual reversal of the situation in native speaker Englishes would occur, i.e. /d/ → [ð] and /ð/ → [d]. Clearly this is likely to be a more confusing situation than only one-way replacement. For the previous model it was suggested that the distinctions between the pairs /θ,ð/ and /ʃ,ʒ/ were expendable; for the present model even the somewhat higher functionally loaded /f,v/ and /s,z/ also become expendable. Variations in the place of articulation of /s,z/ (e.g. dental or retroflex) can be tolerated. At this level there is no justification for insisting on the pronunciation of /h/ at all, i.e. it can be replaced by zero; alternatively velar and uvular realisations are acceptable.

13.5.1.3 Affricates

The same applies here as applied in the previous model: /ʧ,ʤ/ should be kept distinct from /tr,dr/ (where /r/ may be [ɾ]—see next section) but realisations as [tj,dj] or [tç,dj] are acceptable. The contrast between /ʧ/ and /ʤ/ should be maintained, but, as for the plosive distinctions discussed in §12.5.1.1 above, can be allowed to be more dependent on voicing than is usual in L1 English.

13.5.1.4 Approximants

Tolerances in this section are the same as for the previous model. All variations on /l/ are tolerable (i.e. [l] [ɬ] and [ʊ] in post-vocalic position). /r/ can be pronounced in all positions where it is in the spelling and a flap (either [ɾ] or [ɽ]) is actually preferable. The distinction between some form of /r/ and some form of /l/ should, however, be insisted upon since it is of high functional load in English. A contrast between /v/ and /w/ should receive high priority because of the high functional load, and substitution of [ʊ] for either should be avoided because of potential listener misinterpretation.

13.5.1.5 Nasals

Tolerances in this section are the same as for the previous model. Latitude is allowable in the place of articulation of /n/ (e.g. dental or retroflex). The pronunciation of a /g/ following /ŋ/ is allowable (it is usually present in the spelling).

13.5.1.6 Consonant clusters

Final clusters involving C + /t,d/ (including past tense *-ed*) may lose their /t,d/ as in Amalgam English (and indeed in GB—see §12.4.6(2)). Some further simplification of clusters can be tolerated. Initial clusters of /s/ + C and C + /l,r,w,j/ will often be simplified by learners at this level. Generally speaking, use of an intrusive vowel is to be preferred to dropping consonants[6] and a medial intrusive vowel is to be preferred to initial intrusive vowel, e.g. for *sport*, /səpɔːt/ rather than /espɔːt/ rather than /pɔːt/ (all three are of course likely to include an /r/ from the spelling as well, e.g. /səpɔːrt/).

13.5.2 Vowels

It is in this area that the requirements of International English most differ from those of Amalgam English. Vowel contrasts in general appear to be less crucial to intelligibility in English than consonant contrasts so that a major simplification of the vowel system is possible for International English. Moreover most of the world's languages have a five-vowel system, often combined with a distinction of length in each position; some of these have a minimal number of diphthongs based on a second element which equates with a pre-vocalic /j/ and /w/. The tendency to introduce such a system into English is very strong and can be tolerated in an International English. In this reduction of the native speaker systems, /ɪ,iː/ become /i,iː/; /e,eɪ/ become /e,eː/; /a,aː/ become /a,aː/; /ɔː,əʊ/ both become /oː/ (and, although not necessarily required, given that it has already been excluded from Amalgam English, the pressure to a symmetrical system may keep /ɒ/ as short /o/); and /ʊ,ʌ/ may become /u/ while /uː/ mains as /uː/. The vowel /u/ (< /ʊ,ʌ/) should be encouraged to be more open to take account of the fact that /ʌ/ (an open vowel in most native speaker varieties) is far more frequent than /ʊ/. The unaccented vowel /ə/ may well disappear altogether; this is discussed in the following section where weak syllables and weak forms are dealt with. /ɪə, ʊə/ and /ɛː,ɜː/ will be lost because post-vocalic /r/ will be used as in Amalgam English. Two diphthongs will remain: /aɪ/ (< aɪ,ɔɪ) and /aʊ/ (these may be equatable with [aj] and [aw] in a learner's L1). The 10-vowel system (excluding the two diphthongs) is shown in Figure 59.

13.5.3 Accentuation, intonation and connected speech

At this minimal level the use of weak syllable in words is expendable. So there need be no /ə/; in its place there will be a variety of other vowels, most commonly

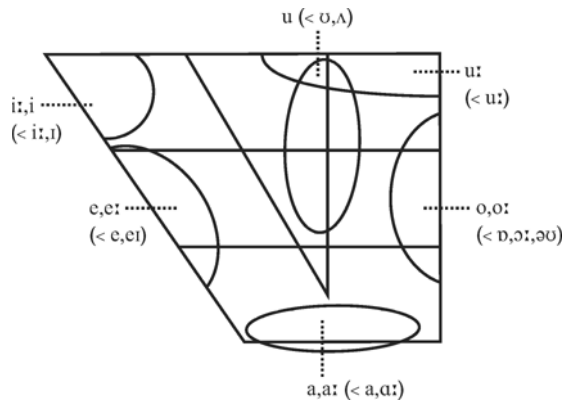

Figure 59 International English: vowels.

/a/; or replacement may be related to the spelling (assuming the speaker is literate in the Roman alphabet). The same goes for weak forms which will be replaced by strong forms (usually the forms given in non-specialist dictionaries). This will give the rhythm of what is usually referred to as a 'syllable-timed' language (see §11.2, in particular note 7). Similarly the compound weak forms (*aren't . . .*) need not be used. As in Amalgam English there need be no learning of native English patterns of elision and assimilation.

With regard to accentuation and intonation, no attempt should be made to use any native speaker patterns, with the possible exception of word accent.

13.5.4 Summary: International English

(1) General aim: minimal intelligibility in the use of English in international *lingua franca* situations.

(2) Consonants:

  (i) Allow voicing distinctions to be made using different features than those used by native speakers.

  (ii) All forms of /r/ and /l/ are allowed but distinction between the two to be given high priority (even for those speakers from Asia who find it difficult, e.g. Japanese and some Chinese). As for Amalgam English /r/ should follow the spelling and any sort of /r/ allowed.

  (iii) Distinction between /v/ and /w/ should be insisted on; use of [ʊ] for either or both discouraged.

(3) Vowels:

  (i) A reduction in the vowel inventory to five short and five long vowels is allowable. (It will be used naturally by many learners, e.g. Bantu speakers.)

(4) Connected speech:

(i) Some attempt should be made to place the accent on the usual syllable of polysyllabic words but no attempt need be made to use the weak forms of English or the weak syllables in polysyllabic words, i.e. no reductions to /ə/ need be made.

(ii) No effort need be made to learn intonation patterns of L1 English.

13.6 Teaching methods[7]

Most but not all of what is said in this section will not apply to International English where there are only a small number of targets which require overt teaching (and these are limited to the consonants). Even so learners' situations and requirements present so many variables that it is difficult to give advice of general applicability. Is the learner a child or an adult? Is learning taking place in a class with a teacher or alone with the help of recordings or broadcast lessons? Is the learning of English pronunciation part of a course extending perhaps over several years or is the intention only to acquire the essentials in a much more limited time? Whatever the answers to these and other questions, it must be accepted that in nearly all cases the student will be seeking to learn English in an artificial fashion, i.e. very differently from the natural way in which the mother tongue was acquired, with constant exposure to the language of the family environment and with strong (instinctive) motivation to learn an efficient verbal means of communication. Even with these advantages, it is some five years before proficiency in the basic skills of speech production and reception in the mother tongue is attained.

What is clear is that, in teaching pronunciation, we are concerned especially with imparting motor and auditory skills rather than with inculcating the kind of logical agility such as may be involved in the acquisition of a new syntax. Of course the advanced learner has to assimilate rules for the distribution of allophones and for the assignment of intonation patterns to the appropriate discoursal or attitudinal context; such a learner may even learn to apply rules for the derivation of word accentuation patterns from the orthography (most usefully with respect to the relation of word accent to suffixation). But at the earlier stages the emphasis is on learning to hear and produce sound contrasts and to memorise the accentual patterns of words.

Since it is generally the case that the correct pronunciation of an additional language becomes increasingly difficult to acquire after early adolescence, it is obvious that ideally it is desirable to teach pronunciation as soon as possible. With children it is often the case that the ability to mimic is retained to such a high degree that a demonstration of some feature of pronunciation, without further explanation, is sufficient (thus emphasising how the level of achievement is dependent on the language of the teacher). When this ability is no longer present, as is the case with most adult learners, there is likely to be considerable interference from the sound system of the first language, through which the new,

foreign (English) sounds are being filtered. Before attempting to produce English sounds and accentual patterns (and, at the advanced level, the intonation patterns), it is always advisable to teach and establish the relevant discriminatory skills based on (a) distinguishing between sounds of the learner's own language and those of English; (b) distinguishing the contrasting sounds of English.

The acquisition of such new auditory skills can be achieved by the use of extensive discrimination drills in which the learner is required to judge identities and differences in stimuli presented by a teacher or in a recording. Such 'ear training' is, of course, particularly important for those who aim at the higher levels of achievement in pronunciation where phonetic precision is essential. It is not generally useful to expose a learner to recorded examples without some guidance on what he is expected to perceive. Moreover, even when a minimum level of discrimination has been established, learners may need specific instruction to assist correct production. The following sections give guidance for the improvement of receptive and productive skills.

Learners with different linguistic backgrounds will experience different difficulties in acquiring the distinctive elements of English. It is for this reason that a teacher should be aware of the phonetic and phonological characteristics of the mother tongue of the students (and of their particular local variety of this first language). By contrasting the features of the two languages, the teacher will be able to predict the problems which will arise and on which he should concentrate drills; it will also be possible to make use of phonetic resemblances between the two languages which may not be readily evident to the learner.

Thus a teacher of students whose language belongs to the Germanic or Slav families will not expect to encounter problems with the basic concept of word accentuation, which will almost certainly offer difficulty to speakers of, say, French or many Indian languages, as well as to those who speak a tone language. On the other hand, as an example of the use of similarities, benefit may often be derived from relating English /ɪ/ to a vowel of the cardinal [e] type, which exists in many languages not possessing a centralised vowel such as English /ɪ/. For those aiming at a type of GB, many learners who cannot easily articulate the English 'dark' [ɬ] may in their own language have a vowel of the cardinal [o] quality, which is an excellent starting-point (or even substitute) for English [ɬ] (and is indeed used by many native speakers for [ɬ]—§9.7.1).

13.6.1 Consonants

Discrimination exercises can be used in teaching the perception of difficult features of the English consonantal system. For instance, in the case of the importance (to learners both of GB and Amalgam English) of aspiration in distinguishing initial /p,t,k/ from /b,d,g/, it will be appropriate to present the English series for recognition (after describing the aspiration feature) and then to mix these with examples of strong but unaspirated [p,t,k] sounds to be identified as non-English by the student.

Direct articulatory instruction is often possible to assist in the production of consonants. The difference between voiceless and voiced sounds is difficult to teach: it is often best to concentrate on associated factors, e.g. the shortening of vowels and approximants before voiceless consonants, the aspiration of voiceless plosives in accented positions and the greater friction associated with voiceless fricatives and affricates. For the aspiration of plosives, learners can be told to make a flame (from a match, etc.) flicker or feel air on the back of the hand. For /f,v/ the upper teeth must be placed over the lower lip (and then the learner has to blow), for /θ,ð/ the tip of the tongue can be gripped between the teeth (even though in GB the tip touches only the roots of the upper teeth) and for /s,z/ the tip or blade must be put on the underside of the teeth ridge. In other cases the articulatory instructions can involve the modification of a starting-point (which is not necessarily the sound the learner is using as a substitute). For GB /r/ a sound like [ə] or [ɜː] or [ɛ] in the learner's own language can be used as a starting-point and the learner then told to curl the tip of the tongue upwards towards the roof of the mouth. For /ʃ,ʒ/ the learner can start from [s,z] and retract the tongue. In yet other cases the correct articulation of sounds can be based on other sounds with no specific articulatory instruction: /j,w/ can be taught starting from [i,u] and shortening, e.g. [iːɔn] for *yawn* and [uːest] for *west*, /ʧ,ʤ/ can start from /tj,dj/ said rapidly and for /h/ the learner can be told to put the tongue in the position for the following vowel and then blow. One area where even those aiming only at International English may need instruction (particularly those from Japanese and Chinese backgrounds) is in the distinction between /r/ and /l/. This is commonly very difficult for foreign learners to hear and it is necessary for such learners to have discrimination exercises before attempting production. Direct articulatory instruction may then be necessary, pointing out that the tip of the tongue should be firmly on the teeth ridge for /l/ and the tip of the tongue curled back for /r/ (the degree of curling back being immaterial at this stage).

13.6.2 Vowels

Generally vowel exercises will be limited to those targeting GB or Amalgam English (i.e. the (at least) 10-vowel target of International English will not usually need to be taught). Many learners of English have difficulty with the short vowel series exemplified by *pit, pet, pat, putt, pot, put.* The series should first be presented to them, either in words having a similar consonantal frame or, preferably, in isolation. After listening, the learner can be asked to identify the items presented in a number of randomly ordered sets. (It is helpful if at this stage learners are able to relate an English sound to a phonetic symbol or to a number, so that the success of their identification can be checked without reference to orthography, which can often be ambiguous.) In the next stage, learners listen to examples of the same vowels (which by now they can identify correctly), but this time vowels of their own language are interspersed with the English ones; they must identify what is English and what is not.

It is not very helpful to give direct articulatory instruction for the production of vowels because our kinaesthetic sense of the shape of our tongue in an articulation is very limited: we are only aware of those points where the tongue contacts other articulators. Thus it is of little use to a learner to be told that, for a certain vowel articulation, the front of the tongue is raised to a close-mid position. But there are some types of auditory and articulatory instruction which may be helpful. Use can be made of sounds which learners have in their own language and they can be told to 'try to make sound *x* more like sound *y*, or 'try to superimpose *x* on *y*', or 'try to make *x* and *y* at the same time'. Adjustments in the articulation can certainly be made by getting a learner to round the lips (either slightly or considerably); this is obviously the case for rounded vowels but can also be used to adjust the position of the tongue since rounding of the lips will generally retract the tongue. Similarly spreading the lips (as opposed to simply unrounding to the neutral position) will bring the tongue closer to the roof of the mouth. Jaw movement can also be used to affect the tongue position: closing or opening the jaw will normally move the tongue into a more closed or more open position. Sometimes a specific hint can be used for a particular vowel, e.g. /ɑː/ is the sound a doctor wants you to make when he wants to look down your throat.

13.6.3 Accentuation

The auditory approach (i.e. perception before production) used in teaching segmental phonemes can also be employed in the case of accentual features. Learners (and especially those, such as tone language speakers, for whom the English concept of accentuation is quite new) must be taught to appreciate variation in the accentual patterns of English polysyllabic words and (for GB and Amalgam English) the reduction of weak syllables to /ə/.

In the case of polysyllabic words, correct pattern identification (preferably by using such nonsense sequences as ['lɪlɪ,lɪ'lɪ] or ['lɑːlələ, lə'lɑːlə] etc.) should precede drills involving differing patterns in English words, e.g. *be`hind* vs *`under*, *`evidence* vs *im`portant* vs *maga`zine* etc. (see also §10.7). The importance of the accentual pattern of a word for its identification should be stressed, a correct accentual pattern being at least as important as the correct sequence of sounds.

Particularly if the target is GB the weak forms of function words should be learnt from the beginning and their role in fluent pronunciation made clear. Exercises should be used for identifying weak forms in connected speech and particularly at the beginnings of sentences before students attempt the same sequence themselves. So too should exercises in listening and practising the Borrowing Rule (§11.2) in pairs like *bus/buses*, *conduct/conductor*, *gone/gone to*, *around/around the.*

13.6.4 Intonation

Learners may also by the same technique be led to appreciate the way in which pitch changes signal a shift of nucleus in a phrase where any word may carry primary accent. In a sentence such as 'This is my book', the nucleus may meaningfully be associated with any of the four words. Different versions should be presented to the learner until he is able to identify the nucleus placement with certainty. The more difficult exercises which must follow when the target is GB concern the recognition of the type of nuclear tone used (§11.6.1.3) and the appreciation of the pitch accents occurring before the nucleus (§11.6.1.4). As in all other drills, correct recognition must generally precede attempts at production.

13.7 Pronouncing dictionaries

Most speakers of English will make use of a bilingual dictionary (i.e. one which is bilingual between English and their L1 or at least a language which they know better than English). Those seriously concerned with pronunciation (including many teachers and those aiming at GB) will make use of a monolingual dictionary designed for non-native learners like the *Oxford Advanced Learner's Dictionary* (2011).[8] A dictionary of this sort gives information about pronunciation, in most cases using a transcription system similar to the one used in this book. Most of them have CDs and/or websites associated with them.

But those aiming at GB should also use a dedicated pronouncing dictionary, that is, a dictionary devoted entirely to pronunciation rather than meaning. There are currently three standard dictionaries of GB which also give American variants, those of Upton, Kretzchmar and Konopka (2001), Wells (2008) and Jones, Roach, Esling & Setter (2011). An older, shorter and less bulky dictionary is that of Windsor Lewis (1972) (now unfortunately out-of-print). Another useful guide to pronunciation is by Olausson and Sangster (2006); this is produced by the BBC Pronunciation Unit who provide advice on pronunciation to anyone in the BBC. It includes an 'easy-to-read phonetic respelling' as well as the usual phonemic transcription based on the IPA. The three pronouncing dictionaries give weak forms alongside strong forms and extensive pronunciations of names (personal, geographical and botanical) and trademarks.

The principal use to which a foreign learner will put such a dictionary is to look up a standard pronunciation in GB. This is generally given first for each entry, with alternative pronunciations following, including American and some 'substandard' pronunciations. The transcription systems used in the three pronouncing dictionaries are very similar to that in this book. Upton *et al.* use /a/ while Jones *et al.* and Wells continue to use /æ/. Upton *et al.* use /ɛɪ/ while the other two continue to use /eə/. All three show the pronunciation of <y> word-finally as /i/ (rather than /ɪ/), e.g. in *happy*, *usually*, *folly*; Wells and Jones *et al.* also show /i/ and /u/ (rather than /ʊ/) in pre-vocalic positions as in [ri'akt] and

[sɪʃu`eɪʃn̩] and show a possible /u/ in the weak forms of *to* and *you* pronounced [tu] and [ju]. Upton *et al.* use /ɛ/ rather than /e/, /əː/ rather than /ɜː/ and /ʌɪ/ rather than /aɪ/; they also use the composite symbols barred [ɪ̵] and [ʊ̵] for those places where [ɪ] and [ə], and [ʊ] and [ə], are alternatives. All the dictionaries also make use of additional symbols for sounds in foreign words, and primary accent (usually called 'stress') and any lower accents are marked.

It must be remembered that a phonemic system does not of itself tell a reader how to pronounce a word. It shows only the sequence of phonemes and the accentuation. A learner still needs to know how exactly each phoneme is realised phonetically, including sometimes differently in different positions. So he needs to know that /p,t,k/ are aspirated in syllable-initial position, less so in unaccented than in accented syllables and, for example, that /r/ is usually a post-alveolar approximant.

The three dictionaries mentioned also give the corresponding pronunciations in General American; this can be very useful to foreign learners where the two pronunciations are not equivalent. Wells (2008) also gives information on British pronunciations which are not part of GB; this information often indicates pronunciations which the learner will meet as part of a Regional GB, e.g. /wɒn/ for *one.* In varying degrees the dictionaries give notes on the pronunciation of particular words, notably the weak forms. Jones *et al.* have notes in text boxes on spelling and pronunciation matters. Wells has more extensive text boxes dealing with specific topics of pronunciation (e.g. 'Liquids', 'Elision', 'Affricates'), on spelling-to-sound and sound-to-spelling correspondences, and on the respective popularity of alternative pronunciations, e.g. *substantial* as [səb`stanʃl̩] 93 per cent and [səb`stɑːnʃl̩] 7 per cent. Olausson and Sangster have similar text boxes, including useful ones giving digests of the sound systems of many other languages.

Marking the division into syllables is generally a useful aid to pronunciation. In looking up the pronunciation of a word for the first time, it aids the foreign learner's initial attempt at pronunciation to be able to divide the word into chunks. Syllable division is marked in Wells just by spaces, e.g. fə 'net ɪk and in Jones *et al.* by a full stop when division is not already indicated by a stress mark, e.g. fə'net.ɪk. Upton *et al.* do not mark syllable boundaries. But see §10.10.3 for problems associated with syllable division in words.

13.8 Assessment

There remains the problem of the assessment of a learner's performance, from the point of view of both reception and production.

13.8.1 Comprehension

A learner's achievement in comprehension can obviously be tested and quantified by measuring the amount of information which has been derived from a passage

of casual speech, e.g. by scoring the number of 'information points' (mainly nouns, main verbs, adjectives and adverbs) which have been correctly received (excluding those items like proper names which have been introduced to the listener for the first time). A score of this kind can be obtained either by questions on the text or by requiring the student to write down what he has heard. Such a test should involve passages in different pronunciation styles (not only varying types of GB and various other native speaker varieties but also if possible types of Amalgam English and of International English). The test will be mainly concerned with the accented words of an utterance, and may be made easier by factors of redundancy and predictability (although it has been suggested that non-native speakers are less able to use these factors).[9] A test which involves the correct identification of intervening weak forms, grammatical items and inflexions will obviously be a fuller measure of comprehension. A test like this, though not easy to construct, will be a good one for the foreign learner (even though native speakers, because of their use of redundancy, may not listen carefully to such things).

13.8.2 Production

In the case of production, an assessment of efficiency is more difficult. An atomistic approach can be used in which phonemic oppositions are tested through the reading aloud of word lists and short sentences containing crucial minimal pairs. Similarly, lists of words exemplifying a variety of accentual patterns will test this area of the learner's proficiency. Various types of sentence (the grammatical or discoursal context being given) can also be used to assess appropriate sentence accentuation and choice of nucleus. If, however, read texts are used (even though these are specially contrived to exemplify the maximum number of segmental phonemes), the artificiality of the procedure should be recognised and allowed for, since a certain unnaturalness of style is likely whether it is a native speaker or a foreign learner who is reading aloud (it may sometimes become a test of reading ability rather than of pronunciation).

If the target is GB (or even Amalgam English), phonetic quality must also be measured, the higher the level the closer the articulation should be to the target model. Here the teacher's role is vital in judging (usually by ear) the extent to which the learner approaches the model.

The danger of an atomistic method of assessment meticulously applied is that departures from a norm will usually be found to be numerous, as much for the successful learner as for the one of lower ability. A simple aggregate of noted errors, undifferentiated in respect of their seriousness as far as communication is concerned, does not always provide a reliable indication of good or bad performance. A real assessment must be based on the general intelligibility and acceptability of a learner's performance as judged by the type of listener the speaker seeks to communicate with.

Notes

1 For a review of English as a *lingua franca* (ELF), its relationship to standard languages and ELF accent attitudes, see Jenkins (2007).
2 For example, Wells (2008), Roach (2009) and Jones *et al.* (2011).
3 For other similar examples, see Cutler (1984).
4 But note that the *Oxford Advanced Learner's Dictionary of Current English* (2011) gives weak forms as the first entry.
5 This whole section is a hypothesis about what constitute the characteristics of such a model. See in particular Jenkins (2000), who differs from the approach here in treating the nuclear accent as part of the important 'core' but word stress (= word accent) among the less important 'non-core'.
6 Lin (2003).
7 See, for example, Kenworthy (1987, 2000), Brown (1991).
8 See also the *Cambridge Advanced Learner's Dictionary* (2008), the *Collins Cobuild Advanced Learner's English Dictionary* (2012) and the *Macmillan English Dictionary for Advanced Learners* (2007).
9 Jenkins (2000).

Selective glossary

This glossary does not include most of the basic phonetic and phonological terms described in chapters 1–5. Thus, if the reader wishes to look up the definition of words like *plosive* or *voicing*, he should refer to the Index, where the page references for the main discussion of such terms are shown in bold type. But it does include terms which may have been given only a very brief description in those chapters or elsewhere and which occur only intermittently through the book. Thus it is a judgement designed to include things which might cause a reader to ask 'Now how did the author say he was using this term?' So *broad transcription* is included. It also includes terms which are defined only later in the book but which then recur regularly, e.g. *lexical frequency*. It also includes terms from outside the strictly phonetic, and which are to some extent taken to be understood, e.g. *educated*. At the end of some glosses a section is indicated where usage is further explained or exemplified.

Accentual change Some words have historically changed the syllable on which the primary accent is placed, e.g. the word *garage* when first imported from French kept its accent on the second syllable, but is now regularly heard with the accent on the first syllable. §6.2.5.

Accent-neutral, accent-attracting, accent-fixing Some **suffixes** leave the accent unchanged on the stem to which they are attached like *-ist* (e.g. *separate~separatist*), some suffixes take the accent themselves like *-ation* (e.g. *national~nationalisation*), and others like *-al* move the accent on the stem (e.g. *medicine~medicinal*). §10.3.2.

Affix, prefix, suffix These words refer to items added to a **stem** to make a word, e.g. in *republicise*, *re-* is a prefix, *-ise* is a suffix, both are affixes added to the **stem** *public*. Stems can be **bound** or **free**: in the analysis of *national* as stem *nation* plus suffix *-al* the stem is free, so-called because it can stand alone as a word, whereas in the analysis of *tremendous* as stem *tremend* plus *-ous*, the stem is bound because it cannot stand alone. Free stems are also called **roots**. §§10.3.2–10.3.3.

Analogy A process whereby a pattern, particularly an accentual pattern, is created or changed on the basis of other patterns, e.g. producing *com`parable* rather than *`comparable* on the analogy of *com`pare*.

Anterior An articulation made in front of the hard palate, e.g. the articulations in /s,t,θ,p/. §5.3.2.

Apical An articulation using the tip of the tongue, e.g. the articulations in /s,z,t,d,l/. §2.2.3.2(2).

Basilectal (also **broad**, **popular**) A distinction is made between a local pronunciation which is basilectal and one which is **educated**. The distinction refers to the socio-economic classification used for the 2001 census where the bottom four grades 5–8 ('working class' including skilled manual workers) are more likely to have a basilectal, or broad, pronunciation while the top four grades 1–4 (all middle class including clerical, managerial and professional) are more likely to have a GB or a Regional GB pronunciation. The roughly equivalent educational criterion, is that middle class is of GCE A level or above. A basilectal pronunciation is opposed to the **acrolectal** pronunciation of GB and RGB.

Broad transcription A broad transcription (enclosed in slant brackets), also called a phonemic transcription, is one whose basis is one symbol for one phoneme like that used, for example, in pronunciation dictionaries. This compares with a narrow transcription (enclosed in square brackets) where phonetic detail is indicated, cf. *proud* as /praʊd/ (broad or phonemic) and as [pɻ̈ɑ̈ʊ̯d̥] (narrow or allophonic or phonetic). §5.4.

Careful (formal) See under **Colloquial**.

Child language acquisition This refers here principally to children under the age of five learning English as a sole language (**native learners**). Children's ages are given in years and months as, for example, 3;5.

Colloquial (also **casual**, **informal**) A distinction is made between **formal** (also **careful**) speech, e.g. that used in reading aloud and in oratory, and colloquial speech, e.g. that used in conversation.

Conjuncts are one class of sentence adverbials (adverbials which modify a whole sentence) which serve to link clauses or sentences, like *incidentally*, *therefore*, *however*, *alternatively*. They differ from **conjunctions**, like *and*, *but*, and *or*, because they can occur in various positions in clauses.

Contextual sound change A historical change which only occurred in certain contexts, e.g. in the eighteenth century a change from /a/ to /ɑː/ took place when a voiceless fricative or a nasal followed, so /baθ/ became /bɑːθ/. §6.2.2.

Continuant A continuant is a sound which can be elongated. So all vowel sounds are continuants as are nasals, the 'liquids' /l/ and /r/, and fricatives. By contrast plosives are not continuant.

Coronal An articulation made by raising the tip or blade of the tongue towards the top of the mouth, e.g. /ʃ,s,t/. §5.3.2.

Discoursal A meaning which relates to the links between intonational phrases (IPs). So a rising tone may be used to indicate that the meaning in one IP is closely connected to the following IP. §11.6.2.6.

Educated (of pronunciation usage). See discussion under **Basilectal**.

Extralinguistic See under **Paralinguistic**.

Full vowel See under **Reduced vowel.**

Functional load Contrasts between vowels which produce many minimal pairs, e.g. that between /ɪ/ and /iː/, are said to carry a high functional load while those where there are few minimal pairs like /ʃ/ and /ʒ/ are said to carry a low functional load. §1.3.1.

Function words A distinction is made between function words (also **grammatical words**), i.e. words which affect meaning primarily of a grammatical kind, and **lexical words** which convey meaning of a referential or pseudo-referential kind. Function words comprise principally pronouns, conjunctions, prepositions and auxiliary verbs; while lexical words comprise principally nouns, verbs, adjectives and adverbs. Function words frequently have **weak forms.** §11.1.

Great Vowel Shift A major historical change which occurred in English in the fifteenth and seventeenth centuries. It raised all the long vowels of English, and diphthongised those at the maximum degree of raising, thus [aː] > [eː], [ɛː,eː] > [iː], [iː] > [aɪ] and [ɔː] > [oː], [oː] > [uː], [uː] > [aʊ]. Examples are *made*, *seat*, *seed*, *side*, and *boat*, *moon*, *found.* §6.5.

Homorganic refers to sounds made at the same place in the vocal tract, e.g. [k], [g] and [ŋ] are all made by the articulation of the back of the tongue with the soft palate.

Internal change A regular historical change which is not motivated by an influence from factors outside the language or dialect, like the changes involved in the **Great Vowel Shift**. §§6.2.1–6.2.3.

Intonational phrase (IP) The division of speech into phrases which contain a particular tonic sequence and one nuclear tone. The boundary between intonational phrases will be marked by one or more phonetic factors, e.g. pause, a change of tempo, or a change of pitch height. §11.6.1.1.

Lexical change A lexical change is a change of phoneme in a particular word which does not form part of a regular phonemic change. For example, our present word *wasp* derives from an earlier [wɒps] with a re-ordering of the last two consonants (called a **metathesis**). §6.2.3.

Lexical frequency The frequency of a phoneme in the words in a dictionary compared with **text frequency** which is the frequency of a phoneme in running texts. The phoneme /ð/ has a low lexical frequency but a much higher text frequency because of the frequent occurrence of words like *the*, *this*, *that, these*, *those*, *though.* §8.8.

Lexical words See **Function words**.

Morpheme The minimum unit of meaning, e.g. *tin*, *open*, the two parts *live* and *s* in *lives* and the parts *de*, *nation*, *al*, *ise*, *ation* in *denationalisation. Tin*, *open* and *nation* are **free morphemes** (they can stand on their own) while *de*, *al*, *ise*, and *ation* are **bound morphemes** (they cannot stand alone). The study of morphemes is **morphology** and the way a morpheme varies according to its surrounds is **morphophonemics**, e.g. the past tense morpheme

which is attached to verbs varies according to the sound which precedes, e.g. it is [t] in *passed*, [d] in *killed*, [ɪd] in *parted*. See also **Affixes**. §1.1.1.

Nucleus The primary accented syllable in an intonational phrase which initiates one of a number of nuclear tones. §11.6.1.2.

Obstruent Speech sounds can be divided into two major classes: obstruents where there is obstruction to the airstream sufficient to cause noise, i.e. plosives and fricatives, and **sonorants** where that obstruction is lacking, e.g. vowels, nasals, and approximants. §9.1.

Orthoepist This term meaning the art of 'correct pronunciation' has been used to describe writers of the sixteenth and seventeenth centuries who were concerned with the way words were pronounced.

Paralinguistic features are features which are present in the flow of speech but are not part of the core phonological system. They cover things like hesitations, coughs and clicks (this last in English, though they are phonemic in some other languages). **Extralinguistic features** are features which are not under the immediate control of the speaker, e.g. those conditioned by gender and age. §5.8.

Popular (of a local pronunciation) See under **Basilectal**.

Pragmatics refers to those aspects of meaning which arise from the relationship between a speaker, a listener, and their situation. Intonational meanings are often pragmatic, i.e. they can only be understood in the situation in which they occur. §1.1.1.

Prefix See under **Affix**.

Primary accent The syllable made most prominent in a word or in an **intonational phrase**. §§10.1, 10.3, 11.6.1.2.

Rapid style See under **Tempo**.

Reduced vowel /ɪ,ʊ,ə/ (and including the /i,u/ variations on /ɪ,ʊ/ finally and pre-vocalically) are considered reduced vowels, except when they occur with a pitch accent. In *You 'hardly `hit him* /ju 'hɑːdli `hɪt ɪm/ reduced vowels occur in *you*, in the last syllable of *hardly*, and in *him*; in *'Put it in the `book* /'pʊt ɪt ɪn ðə `bʊk/ reduced vowels occur in *it*, *in* and *the*. All other vowels (including /ɪ,ʊ/ in accented syllables as in *put* and *book*) are considered **full vowels**. Note that the terms strong and weak are not used for vowels (they are applied to syllables §11.2; and function words have strong forms and weak forms §11.3).

Root See under **Affix**.

Secondary accent An early pitch accent in an intonational phrase which is followed later by a primary accent. Such a secondary accent initiates a high pitch level or low pitch level, or a falling or rising sequence of pitches. §11.6.1.4.

Slow style See under **Tempo**.

Smoothing The reduction of a triphthong to a diphthong or even to a monophthong, e.g. the reduction of /aɪə,aʊə/ to [aːə] or [ɑːə], and further to [aː] or [ɑː]. Thus *tar*, *tyre*, *tower* may all be pronounced the same as /taː/ or /tɑː/. §8.11.

Sonorant See under **Obstruent**.

Stem See under **Affix**.

Strong form See **Weak form**.

Strong syllable A strong syllable is one containing a long vowel or diphthong or a short vowel plus two consonants. Other syllables are **weak**. Note that function words are also described as 'strong' or 'weak' (but vowels are not so described). §10.3.

Suffix See under **Affix**.

Syllable A syllable is divided into an onset and a rhyme. The rhyme is further divided into a peak and a coda. For example, for *string* the onset is /str-/ and the rhyme is /-ɪŋ/. The rhyme is divided into peak /-ɪ-/ and coda /-ŋ/. Onset and coda are referred to as syllable margins. §5.5.2.

Tempo Tempo refers to the rate or speed of speech. A rough division is made into **slow style** and **rapid style**. Slow style is typical of any form of rehearsed speech while rapid speech is more typical of conversation. Slow style is often (though not necessarily) accompanied by a formal style while rapid speech is very often accompanied by a colloquial style.

Text frequency See under **Lexical frequency**.

Tonetic-accent marks When marking intonation in a running text all tonetic-accent marks indicate either a primary or a secondary accent on the syllable following and the beginning of a particular tonal sequence. A primary accent represents the nucleus from which begins a number of nuclear tones indicated iconically, e.g. ` indicates a falling tone and ˇ a falling-rising tone. §11.6.1 (note 18). See also **Primary accent** and **Secondary accent**.

Weak form Many **function words** have different pronunciations, one when they are accented, the **strong form**, and others when they are unaccented, the weak forms, which, compared with the strong form, may involve **reduced vowels** and the elision of consonants. Note that the terms 'strong' and 'weak' are not used to describe classes of vowels (but they are also used to describe classes of **syllables**). §11.3.

Weak syllable See under **Strong syllable**.

References

Useful blogs on English pronunciation (chiefly about GB and aimed at foreign learners) are:

Jack Windsor Lewis at http://www.yek.me.uk/blog.html
Kraut's English phonetic blog at http://matters-phonetic.blogspot.com
John Maidment at http://blogjam.name
Graham Pointon at http://www.linguism.co.uk/
Geoff Lindsey at http://englishspeechservices.com/blog

Books and articles are either referred to in the preceding pages or are intended as a selected list of works for further reading and consultation. Advanced learner's dictionaries are listed under their titles (see Cambridge, Collins, Macmillan, Oxford). Pronouncing dictionaries are listed under the first editor (see Jones, Roach, Esling & Setter; Olausson & Sangster; Upton *et al.*; and Wells).

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