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Journal of the International Phonetic Association

Alan Cruttenden

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This seventh edition has been revised throughout with particular emphasis on those areas that have seen rapid change in recent years. A new Introduction gives an overview of phonetics, examines the notion of a standard English accent and outlines key concepts in the learning of English as a first language and as an additional language. All the central chapters have been updated, notably by checking the articulatory figures against recent MRI scans.

This new edition considers the developing status of English as an international language and discusses the current debate about the idea of a global pronunciation standard as an alternative to Received Pronunciation and General American.

The layout of the book is now more user-friendly with the use of text boxes to summarise key information and an accompanying website www.hodderplus.com/linguistics contains exercises for learners; fMRI scans of English phrases, including all the vowels and consonants; and recordings by the author of part of the book.

Since its first publication *Gimson's Pronunciation of English* has been the essential reference book for anyone studying or teaching the phonetics of English. It includes comprehensive coverage of individual vowels and consonants together with their variation and history, their articulation and acoustics, their rhythm and intonation, and how they develop in young children and foreign learners. All this ensures that *Gimson's Pronunciation of English* will remain universally acknowledged as the standard description of modern spoken English.

Gimson's Pronunciation of English

Revised by Alan Cruttenden

Seventh Edition

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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,

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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 Seventh Edition (2008)

In this new edition, Chapter 1 has been re-organized and rewritten, partly to reflect the modern setting of the book in which phonetics and phonology are part of more general language study and partly to overview phonetic variation, change and learning as well as the relationship to spelling. At the same time the style of writing in this chapter and throughout the book has been brought into line with current trends in which sentences are less complex; in particular the use of constant sentence downtoning like 'It might be said that . . .' has been much reduced.

In the same spirit of accessibility the sections on historical sources and on spellings for each vowel and consonant have been revised to fit into text boxes, which serve to break up sequences of densely packed information.

The consonantal articulatory figures in the early editions were originally drawn freehand and were subsequently redrawn on computer; since then alterations have been made piecemeal as and when any experimental evidence became available. With the help of Oxford University Phonetics Laboratory and the Churchill Hospital, Oxford, I have now checked all the figures against particular frames taken from dynamic MRI scans of the mouth during the speaking of various English phrases. The satisfying outcome has been that this has confirmed almost all the existing figures as essentially correct and only a few further alterations have been necessary. The dynamic MRI scans can be seen on the website for this book.

Apart from numerous smaller updatings and rewritings throughout the book, the other main change concerns Chapter 13, which has been almost completely rewritten and which I have retitled *Teaching and Learning English as an Additional Language*. The status of English in the world has hugely changed since the publication of the first edition in 1962 and that change has accelerated over the last ten years. I have attempted to reflect present-day usage of English as a world language in presenting two alternative targets to RP (and to other native-speaker targets) for those learning English as an additional (often official) language and for those using English as a *lingua franca*. This area is a particularly hot subject at the moment and the alternative models I have suggested will remain speculative and controversial both as models and in their details.

At the same time some form of RP remains the target for many learners. In view of the fact that this book is sometimes held to be presenting an outmoded standard pronunciation, I must point out that, although RP is here considered a

'reference accent', the book presents a relatively flexible attitude to RP, including, for example, Regional RPs (i.e. RP with some widely acceptable characteristics of a particular region—see §7.3(4)). With this flexible attitude, the percentage of speakers of RP cannot be claimed, as it often is, to be only in single figures; it is almost certainly much higher (there are no reliable figures anyway). Insofar as RP is sometimes considered outdated and a figure of fun, the variety to which reference is usually being made is one which I call Refined RP (see §7.3(4)). I agree with such judgements on this type of accent and have made this clear throughout the book.

Alan Cruttenden

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University of Oxford
December, 2007

List of Phonetic Symbols and Signs, and Abbreviations¹

a	Cardinal Vowel no. 4 (approximately as in French <i>patte</i>); also used for first element of RP diphthong /aɪ/ and /aʊ/
æ	front vowel between open and open-mid (RP vowel in <i>cat</i>) ('ash')
ɑ	Cardinal Vowel no. 5 (approximately as in French <i>pas</i>); also used for RP /ɑː/ in <i>car</i> ('script A')
ɒ	Cardinal Vowel no. 13 (RP vowel in <i>dog</i>) ('turned script A')
AN	Anglo-Norman
ANE	Australian English
b	voiced bilabial plosive (Eng. <i>b</i> in <i>labour</i>)
ɸ	voiced bilabial implosive (see §4.3.10) ('hooked B')
β	voiced bilabial fricative (sometimes heard for <i>f</i> in a sequence like <i>of blue</i>) ('beta')
C.	Cardinal Vowel
c	voiceless palatal plosive (sometimes for <i>qu</i> in French <i>qual</i>)
ç	voiceless palatal fricative (as in German <i>ich</i>) ('C cedilla')
ɔ	Cardinal Vowel no. 6 (approximately as in German <i>Sonne</i>) also used for RP /ɔː/ in <i>saw</i> and first element of diphthong /ɔɪ/ ('open O');
d	voiced alveolar plosive (Eng. <i>d</i> in <i>lady</i>)
ɖ	voiced retroflex plosive (common pronunciation of English <i>d</i> in Indian English) ('tailed D')
ɗ	voiced alveolar implosive (see §4.3.10) ('hooked D')
ɟ	voiced palato-alveolar affricate (Eng. <i>j</i> in <i>jam</i>) ('D-Yod ligature')
ð	voiced dental fricative (Eng. <i>th</i> in <i>other</i>) ('eth')
e	Cardinal Vowel no. 2 (approximately as in French <i>thé</i> ; also used for RP /e/ in <i>bed</i> , and for the first element of the diphthong /eɪ/
eModE	Early Modern English
ə	unrounded central vowel (Eng. initial and final vowels in <i>another</i>) ('schwa')
ɛ	Cardinal Vowel no. 3 (approximately as in French <i>père</i>) ('epsilon')
ɜ	unrounded central vowel (RP <i>ir</i> in <i>bird</i>) ('reversed epsilon')
ɝ	unrounded retroflexed central vowel (General American <i>ir</i> in <i>bird</i>) ('hooked reversed epsilon')

¹ For a full list of orthographic symbols, see Pullum and Ladusaw (1986), from which some of the names have been taken.

f	voiceless labiodental fricative (Eng. <i>f</i> in <i>four</i>)
ʃ	voiced palatal plosive (sometimes in French <i>guide</i>) ('barred J')
g	voiced velar plosive (Eng. <i>g</i> in <i>eager</i>)
ɡ	voiced velar implosive (see §4.3.10) ('hooked G')
ɠ	voiced uvular plosive (see §4.3.3) ('small cap G')
GA	General American
ɣ	voiced velar fricative (Spanish <i>g</i> in <i>luego</i>) ('gamma')
ɹ	Cardinal Vowel no. 15 (a realization of Eng. /ʊ/ in some varieties) ('baby gamma')
h	voiceless glottal fricative (Eng. <i>h</i> in <i>house</i>)
ɦ	voiced glottal fricative (sometimes Eng. <i>h</i> in <i>behind</i>) ('hooked H')
i	Cardinal Vowel no. 1 (approximately as in French <i>si</i>); also used for Eng. /i:/ in <i>see</i>
ɪ	unrounded close central vowel (a realization of English /i:/ in some varieties) ('barred I')
ɨ	centralized unrounded close-mid vowel (Eng. vowel in <i>sit</i>) ('small cap I')
j	voiced palatal approximant (Eng. <i>y</i> in <i>you</i>)
ɟ	voiced palatal fricative (sometimes <i>j</i> in Eng. <i>yeast</i>) ('curly tail J')
k	voiceless velar plosive (Eng. <i>c</i> in <i>car</i>)
l	voiced alveolar lateral approximant (Eng. <i>l</i> in <i>lazy</i>)
ɭ	voiced alveolar lateral approximant with velarization (RP <i>ll</i> in <i>ill</i>) ('barred L')
ɮ	voiceless alveolar lateral fricative (Welsh <i>ll</i>) ('belted L')
LF	lexical frequency
m	voiced bilabial nasal (Eng. <i>m</i> in <i>me</i>)
ɱ	voiced labiodental nasal (Eng. <i>m</i> in <i>comfort</i>) ('tailed M')
w	Cardinal Vowel no. 16 (like Eng. /u:/ with spread lips) ('turned M')
ME	Middle English
MRI	Magnetic Resonance Imaging
n	voiced alveolar nasal (Eng. <i>n</i> in <i>no</i>)
ɳ	voiced velar nasal (RP <i>ŋ</i> in <i>sing</i>) ('leftward right-tailed N')
ɲ	voiced palatal nasal (French <i>ɲ</i> in <i>vigne</i>) ('leftward left-tailed N')
NE	Northern (England) English
o	Cardinal Vowel no. 7 (approximately as in French <i>eau</i>)
ø	Cardinal Vowel no. 10 (approximately as in French <i>peu</i>) ('slashed O')
œ	Cardinal Vowel no. 11 (approximately as in French <i>peur</i>) ('O-E ligature')
OE	Old English
OF	Old French
ON	Old Norse
p	voiceless bilabial plosive (Eng. <i>p</i> in <i>pea</i>)
PresE	Present-day English
q	voiceless uvular plosive (see §4.3.3)
r	voiced alveolar trill (an emphatic pronunciation of <i>r</i> in Scottish English)
ɹ	voiced post-alveolar approximant (RP <i>r</i> in <i>red</i>) ('turned R')
ɽ	voiced retroflex approximant (sometimes for General American <i>r</i> in <i>red</i>) ('turned R with right tail')

R	voiced uvular trill (an emphatic pronunciation of French <i>r</i> in <i>rouge</i>) ('small cap R')
ʀ	voiced uvular fricative or approximant (French <i>r</i> in <i>peur</i>) ('turned small cap R')
ɾ	voiced alveolar tap (sometimes <i>r</i> in Eng. <i>very</i>) ('fish hook R')
RP	Received Pronunciation
s	voiceless alveolar fricative (Eng. <i>s</i> in <i>see</i>)
ʃ	voiceless palato-alveolar fricative (Eng. <i>sh</i> in <i>she</i>) ('esh')
SSE	Standard Scottish English
t	voiceless alveolar plosive (Eng. <i>t</i> in <i>tea</i>)
ʈ	voiceless palato-alveolar affricate (Eng. <i>ch</i> in <i>cheese</i>) ('T-Yod ligature')
ʈ	voiceless retroflex plosive (common pronunciation of English <i>t</i> in Indian English) ('tailed T')
θ	voiceless dental fricative (Eng. <i>th</i> in <i>thing</i>) ('theta')
TF	text frequency
u	Cardinal Vowel no. 8 (approximately as in French <i>doux</i>); also used for Eng. /u:/ in <i>do</i>
ʊ	rounded close central vowel (a realization for Eng. /u:/ in some dialects) ('barred U')
ʊ	centralized rounded close-mid vowel (RP. <i>u</i> in <i>put</i>) ('upsilon')
v	voiced labiodental fricative (Eng. <i>v</i> in <i>ever</i>)
ʌ	Cardinal Vowel no. 14; also used for Eng. /ʌ/ in <i>cup</i> ('turned V')
ʋ	voiced labiodental approximant (a speech defective pronunciation (but see §9.7.2) of Eng. <i>r</i> in <i>red</i>) ('script V')
w	voiced labial-velar approximant (Eng. <i>w</i> in <i>we</i>)
ʍ	voiceless labial-velar fricative (sometimes Eng. <i>wh</i> in <i>why</i>) ('turned W')
x	voiceless velar fricative (Scottish English <i>ch</i> in <i>loch</i>)
y	Cardinal Vowel no. 9 (approximately as in French <i>but</i>)
ʎ	voiced palatal lateral approximant (Italian <i>gl</i> in <i>egli</i>) ('turned Y')
z	voiced alveolar fricative (Eng. <i>z</i> in <i>lazy</i>)
ʒ	voiced palato-alveolar fricative (Eng. <i>s</i> in <i>measure</i>) ('yod')
ɿ	alveolar lateral click (the sound to make horses 'gee-up')
ɽ	dental click (as in the Eng. vocalization written 'tut-tut')
ʔ	glottal plosive (as in an emphatic pronunciation of Eng. <i>accident</i>)
·	indicates a syllable boundary
-	indicates a morpheme boundary
ː	indicates long vowel, e.g. [fi:d]
ˑ	indicates half long vowel, e.g. [fi:t]
ˑ	indicates short, non-prominent, vowel, e.g. [wɪndɪə]
ˑ	high falling nuclear tone (and used to indicate primary accent in citation forms), e.g. ˑyes
ˑ	low falling nuclear tone, e.g. ˑyes
ˑ	high rising nuclear tone, e.g. ˑyes
ˑ	low rising nuclear tone, e.g. ˑyes
ˑ	falling-rising nuclear tone, e.g. ˑyes
ˑ	rising-falling nuclear tone, e.g. ˑyes
ˑ	mid-level nuclear tone, e.g. ˑyes
ˑ	stylized tone (high level followed by mid level), e.g. ˑsorry

- syllable carrying (high) secondary accent, e.g. 'come .here
- ˙ syllable carrying (low) secondary accent, e.g. like ,that
- ˘ nasalization, e.g. [õ]
- centralization, e.g. [ə̞]
- ː more open quality, e.g. [ɔː]
- ː closer quality, e.g. [ɔ̟]
- ˑ devoiced lenis consonant, e.g. [z̥] (above in the case of [ʃ,ʒ,ʒ])
- ˑ syllabic consonant, e.g. [ŋ̥] (above in the case of [ŋ])
- ˑ dental articulation, e.g. [t̪]
- ˑ fronted articulation, e.g. [t̟]
- ˑ retracted articulation, e.g. [t̠]
- [] phonetic (allophonic) transcription
- // phonemic transcription
- is realized as
- < developed from/less than
- > developed to/greater than
- * standard in RP (Figs 12–30 and in Chapter 10)
- † substandard in RP
- < > orthographic form

PART I

Language and Speech

1.1 Language and Linguistics

1.1.1 Phonetics as Part of Linguistics

Phonetics is a branch of linguistics which is concerned with the physical production and transmission of speech sounds, and with the way in which these sounds are perceived by the human ear and interpreted by the human brain. It is the study of the physical and physiological aspects of speech sounds, and of the way in which these sounds are perceived and interpreted by the human ear and brain. It is the study of the physical and physiological aspects of speech sounds, and of the way in which these sounds are perceived and interpreted by the human ear and brain.

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1.1.2 Phonetics, Phonology and Phonemes

The study of phonetics is concerned with the physical production and transmission of speech sounds, and with the way in which these sounds are perceived by the human ear and interpreted by the human brain. It is the study of the physical and physiological aspects of speech sounds, and of the way in which these sounds are perceived and interpreted by the human ear and brain. It is the study of the physical and physiological aspects of speech sounds, and of the way in which these sounds are perceived and interpreted by the human ear and brain.

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 *cats*, the /z/ in *dogs*, the /ɪz/ in *losses* (see §10.10.3 (2)). Phonetics informs SYNTAX, e.g. it highlights word class differences, e.g. between the accent placement in the noun /tɔ:ment/ and the verb /tɔ:'ment/ (see §10.5). Phonetics informs PRAGMATICS, particularly in the way intonation is used, e.g. it shows the 'reservations' in a phrase such as *I like his ~wife* (see §11.6.2.3). Moreover, phonetics plays a leading part in analyses in SOCIOLINGUISTICS, including variations in dialect (see, for example, §7.6) and style (see, for example, §12.7).

1.1.2 Phonetics, Phonology and Phonemics

We have talked of '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, acoustics, 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 analyzes the stream of speech into a sequence of contrastive segments, 'contrastive' here meaning 'contrasting with other segments

which might change the meaning' (see further in §5.3). 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**). 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, 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 makes clear that the book makes much reference to spellings in the language. 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 the standard accent of English English known as RP. This standard has been evolving since the invention of printing in the fifteenth century (see §7.2). It started as the accent at the court 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 itself changed to one of dilution of RP. Greater generational, social and regional variation is now permitted within RP itself and other accents have become acceptable in broadcasting. And in the last half century with the advent of English as an international language, the need to set up RP as a monolithic standard has weakened and the need to describe variations within RP 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 sub-sections of Chapters 8 and 9 dealing with each consonant and vowel, while some space is devoted to the evolution of RP, more space is now given to variation within RP and how other standards and dialects differ.

1.3 Learning

1.3.1 Functional Load, Phonetic Cues and Redundancy

While we set up models of English as the models of English to acquire in productive competence, 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, i.e. some contrasts carry a higher **FUNCTIONAL LOAD** than others, e.g. the contrast between /i:/ and /i/ carries a higher functional load than that between /u:/ and /ʊ/. Moreover, while a contrast between two sounds or sets of sounds may be indicated in various 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 (breathing); (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 than are (i) and (iii) and of the two (ii) is more important in syllable-initial position and (iv) in syllable-final position. 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 [θ] 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 recognize that the final word is *below* rather than *billow* because of the accented 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 recognize *lions* even though the word might sound similar to *liars*.

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 Part IV).

1.3.2 Acquiring English as an L1

Children learning English as an L1 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 difficulty 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, 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 L2 or foreign 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. But various changes in the status of English around the world have led to more general changes. RP has become less homogeneous and much more variation within RP has been allowed and discussed. Other British accents have become less stigmatized and on the BBC, for instance, almost all regional British dialects 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 §7.6 for some of these). In many countries around the world English is used as the *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 first 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 sub-continental varieties (e.g. /t,d/ as retroflex [t,d] 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 to five vowels). Thus the book has changed and evolved from the exposition of RP as an almost invariant model for the foreign learner to one which describes RP only as one of a number of models for the learner of English as a second or foreign language.

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; the first stage may, therefore, 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 important stage for our purposes is articulatory or physiological. The movement of our organs of speech will create disturbances in the air; these varying air pressures may be investigated and they constitute the third stage in our chain, the physical or 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.

Our immediate concern is with the speaker's behaviour and more especially, on the concrete speech level, with the activity involved in the production of sounds. For this reason, we now examine the articulatory stage (the speech mechanism) to discover how the various organs behave in order to produce the sounds of speech.

2.2 The Speech Mechanism

Humans possess, in common with many other animals, the ability to produce sounds by using certain of their body's mechanisms. Humans differ from other animals in being able to organize 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 when he speaks makes use of organs whose primary physiological function is unconnected with vocal communication; in particular, those 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 what 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, largely 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 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, such as stomach air, has to 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 at one time 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 the surrounding muscles, although the technique of Magnetic Resonance Imaging (MRI) is now preferred on medical grounds.

2.2.2 The Larynx and the Vocal Folds

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

¹ But see, for example, Fouts and Mills (1999).

² Stetson (1951).

³ Ladefoged (1967).

the LARYNX, containing the vocal folds, often, less correctly, called the VOCAL CORDS, or even vocal chords (see Fig. 1).

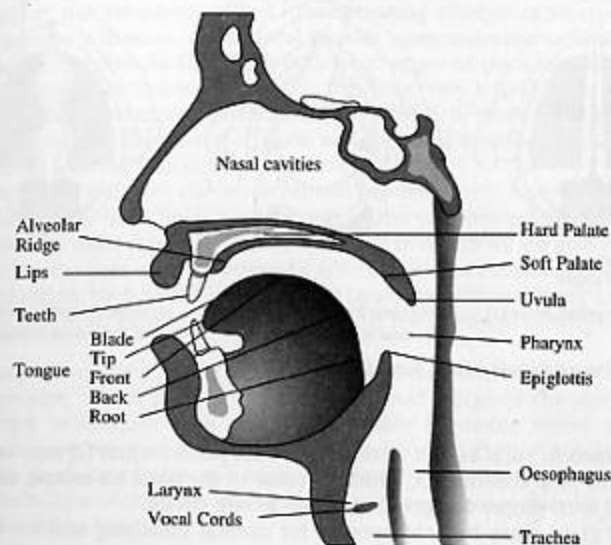


Figure 1. *Organs of speech.*

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 folds) through muscular action. The inner edge of these folds is typically about 17–22 mm long in males and about 11–16 mm in females.⁴ The opening between the folds is known as the GLOTTIS. Biologically, the vocal folds 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. This 'glottal stop' [ʔ] frequently occurs in English, e.g. when it precedes the energetic articulation of a vowel as in *apple* [ʔæpl] or when it reinforces /p,t,k/ as in *clock* [klɒʔk] or even replaces them, as in *cotton* [kɒʔn]. It may also be heard in

⁴ Clark and Yallop (1995: 181).

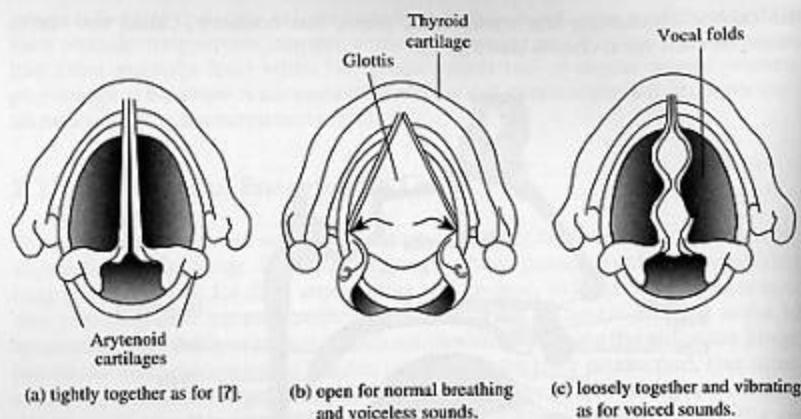


Figure 2 The vocal cords as seen from above.

defective speech, such as that arising from cleft palate, when [ʔ] may be substituted for the stop consonants, which, because of the nasal air escape, 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 folds in speech is as a vibrator set in motion by lung air, which produces voice, or phonation; this vocal fold vibration is a normal feature of all vowels or of a consonant such as [z] compared with voiceless [s]. In order to achieve the effect of voice, the vocal folds are brought sufficiently close together that they vibrate when subjected to air pressure from the lungs. This vibration, of a somewhat undulatory character, is caused by compressed air forcing the opening of the glottis and the resultant reduced air pressure permitting the elastic folds to come together once more; the vibratory effect may easily 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 folds in order to change the pitch of the voice; the more rapid the rate of vibration, the higher is the pitch (an extremely low rate of vibration being partly responsible for what is usually called creaky voice). Normally the vocal folds 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 folds; 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 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 cavities function as the principal resonators of the voice produced in the larynx.

2.2.3.1 The Pharynx The pharyngeal 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 the 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 [æ] 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.

The pharynx may be observed by means of a laryngoscope or fibre-optic nasendoscopy and its constrictive actions are revealed by lateral X-ray photography or nowadays preferably by MRI.

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 nasalized vowels in such a phrase as *un bon vin blanc* [ɑ̃ bɔ̃ 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).⁵

(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 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 normal English sounds, with the exception of the nasal consonants mentioned in (2), 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 nasalized 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 nasalized vowels turned into their oral equivalents and the English word *morning* would have its nasal consonants replaced by [b,d,g] becoming [bɔ:dɪg]. 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 nasalization of vowels and the failure to articulate such oral stop consonants as [b,d,g]. This excessive nasalization (or hypernasality) is typical of such a condition as cleft palate.

It is evident that the action of the soft palate is accessible to observation by direct means, as well as by lateral X-ray photography and Magnetic Resonance Imaging; 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; but there is in such an attitude a danger of oversimplification. Nevertheless, it is true that 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 this oral chamber which may be regarded as 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, too, 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. The space between the upper and lower teeth will often enter into our description of the articulation of sounds; in all such cases, it is clear that the movement of the lower jaw is ultimately responsible for the variation described. 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 our descriptive purposes to divide the roof of the mouth into three parts: moving backwards from the upper teeth, first, the teeth ridge (adjective: ALVEOLAR) 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). 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 directed 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 summarized 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* 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 the vowel of *do* or, more markedly, in the French vowel of *doix*. This is the CLOSE-ROUNDED position;

⁵ Laver (1980: 77ff).

(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) 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 *he*; or the back may be most prominent as in the case of the vowel in *who*; or the whole surface may be relatively low and flat as in the case of the vowel in *ah*. 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, or with the upper alveolar ridge as in the case of /t,d,s,z,n/ or the apical contact may be only partial as in the case of /l/ (where the tip makes firm contact while the rims make none) 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 USA.

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] sounds in English words such as *she* 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 back side being raised in the case of [k,g] and lowered for [ŋ] as in *sing*; 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 *red* and the /l/ in *table*, 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 midline 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. 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 means of still and moving X-ray photography and by Magnetic Resonance Imaging. It is not, however, to be expected that pictures of the articulation of, say, the vowel in *cat* will show an identical tongue position for the pronunciation of a number of individuals. 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 between two speakers; and, in any case, two sounds judged to be the same may be produced by the same individual with 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

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, such as 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 **LOUDNESS**—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 emitted by a speaker and, if the sound from the speaker and the response from the listener are made in terms of the same linguistic system, then the utterance will be meaningful for speaker and listener alike. It is reasonable to assume, therefore, that there is a constant relationship between the speaker's articulation and the listener's reception of sound variations. Thus the transmission phase links the listener's impressions of changes of quality, pitch, loudness and length with the articulatory activity on the part of the speaker. But it will be seen that an exact correlation between the production, transmission and reception phases of speech is not always easy to establish, the investigation of such relationships being one of the tasks of present-day phonetic studies.

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 folds which are energized by air pressure from the lungs.

Any such sound produced in the larynx is then modified by the resonating chambers of the pharynx, mouth and, in certain 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 folds; 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 fold 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 [a:] are not very different from those for [i:], 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 folds 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 etc. 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 recognize speakers. But we can all modify the glottal tone so as to produce vowels as different as [i:] and [a:], 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, mouth and nasal cavities. These chambers are capable of assuming an infinite 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 [a:], 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 recognize the quality intended. It is found that, for male speakers, the vowel [i:] 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 [a:] 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.

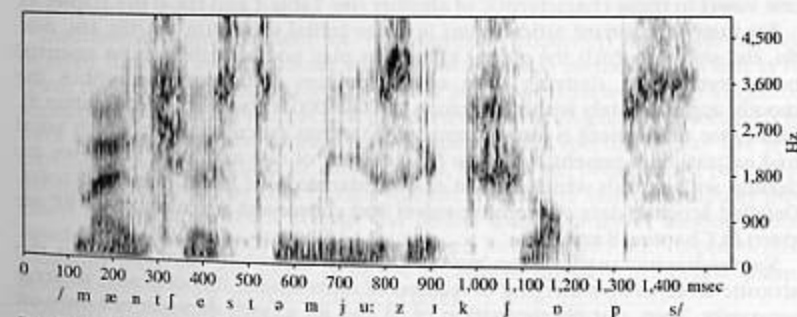


Figure 3 Spectrogram of the phrase *Manchester music shops* as said by a male speaker of RP.

Nevertheless, much of the information given is, in fact, irrelevant to our understanding of speech and the phonetician is obliged to establish by other methods the elements of the spectrum which 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 recognizing 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. [i:] and [u:] have high tongue positions and have first formants for both men and women around 280–330 Hz, whereas [a:] and [ɔ] 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 [i:], where the tongue is raised high in the front of the mouth, has a second formant around 2,200–2,700 Hz, whereas [u:], 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 RP 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 Fig. 32 in Chapter 9). This noise component is also present in analogous 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 RP are 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 not only 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 characterized acoustically by only a very brief burst of noise, the vowel TRANSITION between the noise and the steady state of the vowel appears to be of prime importance for our recognition of the consonant.

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 folds. 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 variations of intensity or by varying the shape of the resonating cavities.

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 as extensive as 80–350 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 20 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 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 the 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 folds either by glottal illumination or by

¹ Fant (1956).

² Hollen and Shipp (1972); Russell *et al.* (1995).

³ Denes and Pinson (1993: 101ff).

electroglottography. The best-known technique in the latter class involves using a LARYNGOGRAPH.⁴ 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 *bam* 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, in terms of our linguistic system, we need to perceive and interpret only gross differences of loudness, despite the fact that when we judge quality we are, in recognizing the formant structure of a sound, reacting to characteristic regions of strong 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 by means of such traces as are 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 such as whether the utterance is spoken quickly 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 msec may have a good chance of being recognized.

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.

⁴ Abberton and Fourcin (1984).

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 of discovering the significant acoustic cues is that of SPEECH SYNTHESIS, controlled by listeners' judgements. After all, the sounds [a:] and [s] are [a:] and [s] only if listeners recognize 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 20. 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.

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. It is now important to formulate a method of description and classification of the sound types which occur in speech and, more particularly, in English. We have seen that a speech sound has at least three stages available for investigations—the production, transmission and reception stages. A complete description of a sound would, therefore include information concerning all three stages. Describing the first sound in the word *ten* only in terms of the movements of the organs of speech is to ignore the acoustics of the sound which is produced and the features which are perceived by a listener. Nevertheless, providing all the information for all the phases would entail a lengthy description, much of which would be irrelevant to a particular purpose. For example, when a description of the sounds of a language is used in the teaching of a language to foreigners, the emphasis is principally focused on the articulatory event. Moreover, it is only comparatively recently that there has existed any considerable body of acoustic information concerning speech. The most convenient and brief descriptive technique continues to rely either on articulatory criteria or on auditory judgements, or on a combination of both. Thus, those sounds which are commonly known as 'consonants' are most easily described mainly in terms of their articulation, whereas the description of 'vowel' sounds requires a predominance of auditory impressions.

4.2 Vowel and Consonant

Two types of meaning are associated with the terms 'vowel' and 'consonant'. Traditionally, 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,ough> 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

We have seen, in the preceding chapters, that the production of a speech sound may involve the action of a source of energy, a vibrator, and a particular configuration of the supraglottal organs. In the case of 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 folds 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 nasalized)
- (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 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 become ejectives (see §4.3.9 below).

4.3.2 Voicing

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

4.3.3 Place of Articulation

The chief points of articulation are the following:

- BILABIAL**—The two lips are the primary articulators, e.g. [p,b,m].
- LABIODENTAL**—The lower lip articulates with the upper teeth, e.g. [f,v].
- DENTAL**—The tongue tip and rims articulate with the upper teeth, e.g. [θ,ð], as in *think* and *then*.
- ALVEOLAR**—The blade, or tip and blade, of the tongue articulates with the alveolar ridge, e.g. English [t,d,l,n,s,z].
- POST-ALVEOLAR**—The tip of the tongue articulates with the rear part of the alveolar ridge, e.g. [ʃ] as at the beginning of English *red*.
- 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**—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,tʃ,dʒ] as in English *ship, measure, beach, edge*.¹

PALATAL—The front of the tongue articulates with the hard palate, e.g. [j] or [ç] as in *queue* [kju:] or [kçu:] or a very advanced type of [k,ç] = [ç,j], as in French *quitter* or *guide*.

VELAR—The back of the tongue articulates with the soft palate, e.g. [k,g,ŋ], the last as in *sing*.

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 folds, e.g. English [h].

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' [ɪ], as at the end of *pull*, in addition to the partial alveolar contact, there is an essential raising of the back of the tongue towards the velum (velarization); or, again, some post-alveolar articulations of [ʒ] are accompanied by slight lip-rounding (labialization). 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. [tʃ,dʒ] 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 [r] where the uvula trills against the back of 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,ɫ], as pronounced in southern British *little* [lɪtɫ] or they may be accompanied by a little friction [l̪] as in *fling* or by considerable friction [ɫ] as in *please*.

(4) Narrowing

FRICATIVE—Two organs approximate to such an extent that the airstream passes between them with friction, e.g. [f,β,ʃ,v,ʁ,θ,ð,s,z,ʒ,ç,x,h]. In the bilabial region, a distinction is to be made between those purely bilabial such as [f,β] where the friction occurs between spread lips and a labial-velar sound like [ʁ] 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] occurs at the beginning of *huge*, [x] and [ʁ] 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 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 [ʃ] and labiodental [v], the former the usual pronunciation in RP at the beginning of *red*, the latter a regional or defective 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 [j] 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 airflow 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.

¹ These are called post-alveolar on the chart of the International Phonetic Alphabet (Table 1).

replaced or reinforced by a glottal stop; thus the final sound in the word *stop* may be replaced by a glottal stop or have a glottal closure accompanying the bilabial one, but there is no compression between the glottal and bilabial closures.

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 pulmonic airstream in combination with ingressive glottalic air. Such ingressive stops (generally voiced) are known as *IMPLOSIVES* and occur with bilabial [ɓ], dental or alveolar [ɗ], or velar [ɠ] mouth closures. Though such sounds occur in a number of languages, sometimes in the speech of the deaf and in types of stammering, they are not found in normal English. In some languages voiceless implosives may occur, which of course 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 nasalization. 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 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

This category of sounds is 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 nasalized 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. Again, 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 description of vowel sounds, especially by means of the written word, 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 /i:/ (*key*) and /ɑ:/ (*car*) (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 are 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. 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. Moreover, we would not find it easy to judge whether our tongue was at 4 or 5 mm from the palate. It is no more helpful to relate the vowel quality to a value used in 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 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.

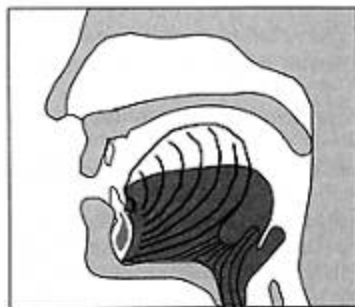


Figure 4 Tongue positions of [i:], [a:].

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 [a]. 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, ε, 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 [a] position and with the soft palate again raised; additionally the lips were changed progressively from a wide open shape for [a] 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 [ε]; 4 [a]; 5 [ɑ]; 6 [ɔ]; 7 [o]; 8 [u].

The front series [i, e, ε, 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. The 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 [ɑ] position. Such a secondary series is denoted by the following numbers and symbols: 9 [y]; 10 [ø]; 11 [œ]; 12 [œ̃]; 13 [ɒ]; 14 [ʌ]; 15 [ɤ]; 16 [ʊ].

This complete series of 16 Cardinal Vowel values may be divided into two lip-shape categories, with corresponding tongue positions:

unrounded—[i, e, ε, a, ɑ, ʌ, ɤ, ʊ]
rounded—[y, ø, œ, œ̃, 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.³ Thus a vowel quality can be described as being, for instance, similar to that of Cardinal 2 ([e]), or another as being a type half-way between Cardinal 6 ([ɔ]) and Cardinal 7 ([o]), but somewhat centralized. Diacritics are available in the IPA alphabet to show modifications of Cardinal values: a subscript under a symbol, e.g. [ɔ]₁, to mean more open, a subscript under a symbol, e.g. [ɔ]₂, meaning closer, and a pair of dots over a symbol, e.g. [ɔ̞], to mean centralized. The vowel quality mentioned above, that between C.[ɔ] and C.[o] and centralized, can in this way be symbolized as [ɔ̞] or [ɔ̞̞].

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 symbolized by [ɜ̞] or [ɔ̞̞] 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 conventionalized 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 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

³ Copies of the original recording of the Cardinal Vowels by Daniel Jones are available from the author at the Phonetics Laboratory, 41, Wellington Square, Oxford OX1 2JF.

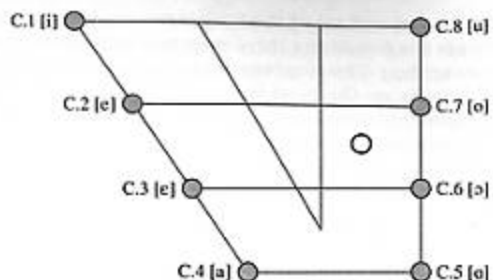


Figure 5 The primary Cardinal Vowels; the area symbolized by [ɜ] or [ɝ] shown as a circle.

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, a chart based on an acoustic analysis of Cardinal Vowel qualities corresponds 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 symbolization denote, a vowel description must also indicate whether the vowel is purely oral or whether it is nasalized. The 16 Cardinal Vowels mentioned may all be transformed into their nasalized counterparts if the soft palate is lowered. It is unusual, however, to find such an extensive series of nasalized vowels, since it is unusual (though not unknown) for languages to make such fine, significant distinctions of nasalized 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 will be marked on the diagram as a dot, showing the highest point of the tongue or, better, a ring, since it would be inadvisable to attempt to be over-precise in the matter of these auditory judgements; the

gliding (or diphthongal) vowel sound will be 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* and *line* will be marked.

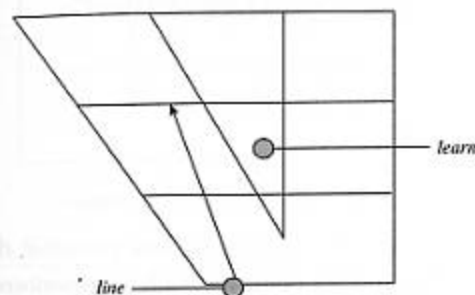


Figure 6 The vowels of *learn* and *line*.

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 symbolized above as [ɜ] or [ɝ] might be described in this way: 'A vowel quality between Cardinal Vowels 6 and 7, but somewhat centralized'. 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 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; this means that we cannot say that the first corresponds to the primary cardinal

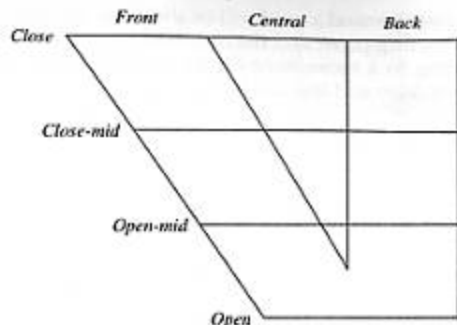


Figure 7 Articulatory labels combined with the Cardinal Vowel diagram.

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, [i,æ,i,ɔ,ɐ] being used for unrounded vowels and [ɨ,ʊ,ø] for rounded vowels.

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 may 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 moving fMRI (functional MRI, essentially a video produced from a series of MRI images), 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], [ɔ], [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' (not only because of the influence of the spelling), such a judgement on his part being a highly sophisticated one which results from his experience in hearing and speaking English. 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

¹ It is customary to distinguish sound segments from linguistic sound units (phonemes) by using [] to enclose the former and / / to enclose the latter.

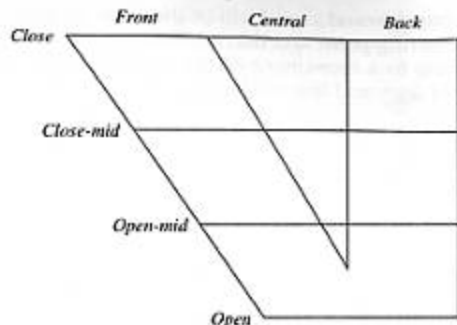


Figure 7 Articulatory labels combined with the Cardinal Vowel diagram.

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, æ, ɪ, ə, ɐ] being used for unrounded vowels and [ʊ, ɔ, ɒ] for rounded vowels.

5

Sounds in Language

5.1 Speech Sounds and Linguistic Units

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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 realizations 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. But 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 are smaller sound sequences which may be interchanged meaningfully, but which may or may not be capable of standing by themselves. These smaller units, known as MORPHEMES, may correspond with words, e.g. *boy*, in which case they may stand alone, or they may not normally occur other than in association with a word. There is, however, yet a lower level at which meaningful commutation is possible. The word *ran* is also a morpheme; but, if instead of saying [ræn] we say [rɑn], 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 12 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 symbolize them as /p,b,t,d,k,tʃ,dʒ,f,θ,s,ʃ,w/. But other sound sequences will show other consonantal oppositions, e.g.

- (1) *tame*, *dame*, *game*, *lame*, *main*, *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/ (this spelling <th> is transcribed /ð/);
- (4) *two*, *do*, *who*, *woo*, *zoo*, adding /z/.

Such comparative procedures reveal 22 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 /t/ 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*, *shimmer*, *singer* or *some*, *son*, *sung*.

Such an analysis of the consonantal phonemes of English give us a total of 24 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 emphasize 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. [tʃ,dʒ,ʒr,dʒ]) and diphthongs (e.g. [eɪ,əʊ,aɪ,əʊ]), 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^haan/ 'mine', 'quarry' /gaan/ 'song', /g^haan/ '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 features² 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 realizations 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 realizations of the phoneme sequence /k + æ + 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

² Chomsky and Halle (1968).

second is made further back on the soft palate. This difference of articulation is brought about by the nature of the following vowel, [i:] having a more advanced articulation than [ɑ:]; the allophonic variation is in this case conditioned by the context. In some varieties of English the two [l] sounds of *lull* [lʌl] 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' [ɫ] 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 /i:/ in *key* but retracted [k̠] before back vowels like /ɑ:/ 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 /ɔ:/ in morpheme-medial and morpheme-final positions (cf. *board* [bɔəd] vs *bored* [bɔəd])).

Complementary distribution does not take into account those variant realizations 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 realizations of the phonemes are said to be in FREE VARIATION. Again, the word *very* may be pronounced [veɪɹ] (where the middle consonant is an approximant) or [veɪt] (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 *lung* 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. The ordinary native speaker is, in fact, often unaware of the allophonic variations of his phonemes and will, for instance, say that the various allophones of /l/ we have discussed are the 'same' sound; [h] and [ŋ], however, he will always consider to be 'different' sounds. When he makes a statement of this kind, he is usually referring to the function of the sounds in the language system and can thereby offer helpful, intuitive information regarding the phonemic organization of his 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 Neutralization

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 neutralized 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 neutralization 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 [m] in rapid 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 [m] 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, because [l] and [ɫ] are not contrastive in English and belong to the same phoneme, that this is so in other languages—in Russian [l] and [ɫ] 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*, were it not for the fact that the /g/ in words such as *sing* was lost about 400 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 400 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*,

³ Wingate (1982).

half, *cart* contain the phonemes /æ/, /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 Southern British English, 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 a pair such as *witch/which*, which establishes a phonemic contrast between /w/ and /m/.

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 [set], i.e. with a vowel in the region of Cardinal 3, may be a realization of *sat* in one dialect and of *set* in another; the phonemic categories commonly represented as /e,æ/, may nevertheless be present in both dialects, all the short front vowels /i,e,æ/ being closer in the first dialect than that in the second. Or again, the diphthong [əu] is a realization of the phoneme of *boat* in educated southern England, but is frequently a realization 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 /æ/ 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 /æ/ in the second syllable, others /ɑ:/ and some will say /'ju:nɪzn/ for *unison*, others /'ju:nɪsn/.

Lastly, even individuals are inconsistent; in certain situations, they may change the number of their phonemes, e.g. the occasional use of /m/ 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 /v/ or /ɜ:/ 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 realizations 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 realization, 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 §7.4.)

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, 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) provides numerous diacritics for a purpose such as this

e.g. the word *titles* might be transcribed as [tʰä-ëtʰz]. Such a notation would show the affrication and aspiration of the initial [t], the fact that the first element of the diphthong is centralized from Cardinal 4 and is long compared with the second element, which is a centralized Cardinal 2, that the [t] 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 the various methods of physiological and acoustic investigation. This type of transcription 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 44 different symbols (24 consonants and 20 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 'r' but the phonemic transcription replaces /r/ by /r/ on the basis of (b). But in the transcription of vowels Romanization (i.e. the principle under (b)) is not completely carried through in this book, e.g. the transcription uses /ɒ/ and /ɔ:/ for the vowels in *cot* and *caught* where it would be possible to use /o/ and /o:/. 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 44 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 realized 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. /tartɪz/ while square brackets indicate an allophonic transcription, e.g. [tʰä-ëtʰz]. 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. [tʰäɪz]. Slant brackets may only be used if the whole sequence is represented phonemically.

5.5 Syllables

The concept of a unit 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, such as our own, which have as their basis the representation of phonemes by letters (however approximately), have reached this state by way of a form of writing which symbolized a group of sounds—a syllabary. Indeed, the basis of the writing of many languages, e.g. that

of the Semitic group, remains syllabic in this sense. The general notion that there exists a unit known as the syllable has led to many attempts in recent times to define the term. The best-known approach is that which used to be called a theory of prominence⁴ but is nowadays better known as the sonority hierarchy.

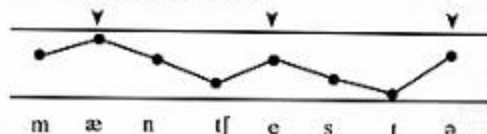
5.5.1 The Sonority Hierarchy

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. We have not previously used the terms 'glide' and 'liquid'. This is a subdivision 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 RP).

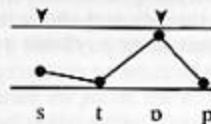
Using the sonority hierarchy we can then draw a contour representing the varying prominences of an utterance, e.g.



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

⁴ Jones (1918 [1960: 55]).

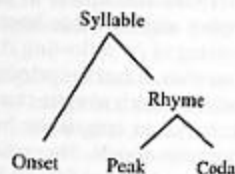
speakers' intuition. However, there are some cases where contours plotted with the sonority hierarchy do not produce results which accord with our intuition. Many such cases in English involve /s/ in clusters, as, for example, in *stop*:



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' to syllables which may consequently violate restrictions on their sonority (see §10.10.1 (11)).⁵

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*.

⁵ Giegerich (1992: 147-50).

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 /t/ 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 /t/). 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 up to the trough. But problems arise because the hierarchy does not tell us whether to place the 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* [ˈɛkstrə]. 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 §10.10.2.

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:/ or /dɪ/ 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* [mɪdʒ], and *button* [bʌtʃn], 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.

5.7 Prosodic Features⁶

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 discursive meaning (discourse 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; TEMPO (the average conversational tempo of speakers of southern British

⁶ For a detailed classification of prosodic and paralinguistic features, see Crystal and Quirk (1964).

English is around four syllables per second⁷); 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 sometimes 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 southern 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 VOCALIZATIONS: these include single sounds or sequences of sounds like [ʃ:] for 'be quiet', [pst] as an attention-getter, and [ll] (a reduplicated dental click), for 'irritation' or 'naughty' (often written *tut-tut*) and various conventionalized types of cough and whistle. Since the foreign learner is 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 him. With the acquisition of correct hesitations a foreign learner can, if he so wishes, dramatically increase his 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; 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 prosodically as 'bedroom voice', yet a particular speaker may have this as a constant characteristic of her 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 §11.8 below.

⁷ Byrd (1992a) found men speaking 6.2% faster than women.

⁸ Knowles (1978).

⁹ Laver (1974, 1980).

PART II

The Sounds of English

The Historical Background

6.1 Phonetic Studies in Britain

Although linguistic science has made rapid and spectacular progress in recent years, it is not only in modern times that speech and language have been the object of serious study. Extensive accounts of the pronunciation of Greek and Latin were written 2,000 years ago and, in India, at about the same time, there appeared detailed phonological analyses of Sanskrit, which reveal remarkable affinities with modern ways of thought. "These early phoneticians speak in fact to the twentieth century rather than to the Middle Ages or even to the mid-nineteenth century. . .".¹ In this country, too, printed works containing information of a phonetic kind extend back for at least 400 years. It is true that the very earliest writers in England rarely had as their main interest a purely phonetic investigation; and the descriptive accounts which they provided are less rigorous and satisfactory, by modern standards, than those of the Indian grammarians. But, by the seventeenth century, we find a considerable body of published work, which is already entirely phonetic in character and which contains observations and theories still adhered to today.

6.1.1 Palsgrave and Salesbury

Some of the first writers whose work we possess were concerned with the relation between the sounds of English and those of another language. Thus, John Palsgrave's French grammar *Lesclaircissement de la Langue Francoyse* (1530) includes a section which deals with the pronunciation of French, much as any modern grammar would. In order to explain the values of the French sounds, Palsgrave compares them with the English. This is done in no objective fashion and it is not easy for us now to know what precise sound is indicated in either language. But this difficulty of communicating sound values in print—especially those of vowels—was one which was shared by all writers until some system of

¹ Allen (1953: 7).

objective evaluation, such as that of the Cardinal Vowels, was devised and this of course depended on the development of recording techniques. John Palsgrave was sufficiently aware of divergent associations between letters and sound to provide some passages of French in a kind of phonetic transcription.

Another early writer concerned with pronunciation is William Salesbury, a Welshman, whose *Dictionary in Englyshe and Welshe* (1547) contained comments on the sounds of English. Sound values are indicated by means of a method of transliteration in Welsh or English. Indeed, though grammars of foreign languages published during the next three centuries increasingly attempted more exact description and comparison of sounds, for the great majority of them the section devoted to pronunciation continued to rely mainly on transliteration for indicating approximate values. Even today, grammars of foreign languages frequently make use of this approximate method of 'simulated' pronunciation.

6.1.2 Spelling Reformers—Smith, Hart and Gil

A more important type of phonetic inquiry stemmed from the activities of those who, particularly in the sixteenth and seventeenth centuries, were concerned at the increasing inconsistency of the relationship between (Roman) letters and the sounds which they represented, especially in English. There had been during the previous five or six centuries great changes of pronunciation, particularly as far as the vowel sounds were concerned, so that letters no longer had their original Latin values. The same sound could be written in a number of ways or the same spelling do service for several sounds; moreover, the same word might be spelt in different ways by different writers. Thus, 400 years before the activities of the Simplified Spelling Society, men were aware of the need to bring some order into English spelling. During the four centuries that have elapsed since these early efforts, our pronunciation has continued to evolve without any radical changes of spelling having been made, with the result that today discrepancies between sound and spelling are greater than they have ever been. It can, however, be said that for more than 200 years our spelling forms, inconsistent though they may be as far as sound symbolization is concerned, have been standardized.

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. A writer such as Thomas Smith, *De recta et emendata linguae anglicae scriptione* (1568), makes many pertinent phonetic comments on matters such as the aspiration of English plosives and the syllabic nature of /n/ and /l/, as well as providing correct descriptions of the articulation of consonants. Yet in the sixteenth century he is overshadowed as a phonetician by John Hart, whose most important work, the *Orthographie*, was published in 1569. Besides making out his case for spelling reform and proposing a revised system, Hart describes the organs of speech, defines vowels and consonants (distinguishing between front and back vowels and between voiced and voiceless consonants) and notes the aspiration of voiceless plosives. Of the numerous seventeenth-century orthoepists, only Alexander Gil, author of *Logonomia Anglica* (1619, 1621), can be compared with Hart on the phonetic level, though even his observations lack the objectivity of Hart's.

6.1.3 Phoneticians—Wallis, Wilkins and Cooper

If the writers mentioned above used phonetic methods of analysis and transcription as a means to their end of devising an improved spelling, there emerged in the seventeenth century a group of writers who were interested in speech and language for their own sake. Because of their preoccupation with detailed analysis of speech activity, the comparative study of the sounds of various languages, the classification of sound types and the establishment of systematic relationships between the English sounds, they can be said to be the true precursors of modern scientific phoneticians. Two of the most celebrated, John Wallis and Bishop Wilkins, were among the founders of the Royal Society; and Isaac Newton, the greatest of the early members of the Society, was interested in phonetic analysis and has left notes of his own linguistic observations. Language was considered a proper object of the attention of the writers of this new scientific age, their view of speech and pronunciation being set against a framework of the universal nature and characteristics of language.

The linguistic fame of John Wallis, primarily a mathematician, spread throughout Europe and lasted into the eighteenth century, his work being copied long after his death. His principal linguistic work, *Grammatica Linguae Anglicanae*, was first published in 1653 and the last authoritative edition appeared in 1699; but other, unauthorized, editions continued to appear in the eighteenth century, the last being dated 1765. Wallis intended his *Grammar* to help foreigners to learn English more easily and also to enable Englishmen to understand more thoroughly the true nature of their language. He admits in his preface that he is not the first to undertake such a task, but claims that he does not seek to fit English into a Latin mould, as most of his predecessors had done, but rather to examine the sounds of English as constituting a system in their own right. By his methods, he says, he has succeeded in teaching not only foreigners to pronounce English correctly but also the deaf to speak. The introductory part of the work (*Tractatus de Loquela*), besides giving a short history of English, describes in detail the organs of speech and attempts to establish a general system of sound classification which will cover all languages (illustrations of qualities are taken from French, Welsh, German, Greek and Hebrew as well as English). Vowels are classified into *Guttural*, *Palatal*, and *Labial* categories, subdivided into *Wide*, *Medium*, and *Narrow* classes. The degrees of aperture are similar to those which are used even today, but the divisions *Guttural*, *Palatal*, and *Labial*, which take into account both the area of raising of the tongue and also lip action, show a confusion of dimensions not to be found in more modern analyses.

Consonants, like vowels, are divided into three classes: *Guttural*, *Palatal*, and *Labial*, being different from vowels in that the airstream from the lungs is obstructed or constricted at some point. Wallis remarks that the airstream may pass entirely through the mouth, almost completely through the nose or almost equally divided between the mouth and the nose, the position of the uvula determining the difference of direction. Thus, nine basic consonantal articulations are postulated. In addition, the airstream may be completely shut off (*Closed* or *Primitive*) or merely constricted (*Open*, *Derivative* or *Aspirate*), the latter being articulated with a narrow aperture or with a wider, rounder opening. The 'closed' consonants (stops) consist of the *mutēs* [p,t,k], the *semimutēs* [b,d,g] and the

semi-vowels [m,n,r]. The corresponding 'open' or 'aspirated' consonants are mute [f,s,x] and semi-mutes [v,z,x] or [ʃ];² and those with a wider opening: mute [ʃ (again),θ,h] and semi-mutes [w,ð,j]; [l,r] are related to the [d] or [n] articulations; and [ʃ,z] are regarded as compound sounds. Wallis's detailed remarks on the pronunciation of English are made in terms of this general system stated in the *Loquela*. It will be seen that such a classification, despite errors and inadequacies which are apparent today, represents a serious attempt at the establishment of universal sound categories. Although the elements of Wallis's system have been quoted briefly here, it should be pointed out that his is merely the most celebrated of a number of similar analyses made at about the same time.

His fellow member of the Royal Society, Bishop John Wilkins, published in 1668 an *Essay towards a Real Character and a Philosophical Language*. Written in English, this work of 454 pages, with a dictionary appended, is of much wider scope than that of Wallis, since it aims at no less than the creation of a universal language, expressed by means of 'marks, which should signifie things, and not words'. Wilkins acknowledges his debt to his contemporary linguists, especially in respect of the account of pronunciation which forms a comparatively small part of the *Essay*. Wallis, he says, 'seems to me, with greatest accurateness and subtlety, to have considered the philosophy of articulate sounds'. Wilkins, too, describes the functions of the speech organs and gives a general classification of the sounds articulated by them; his treatment of consonants is, in fact, more satisfactory than that of Wallis. He claims that the 34 letters which he proposes for his alphabet are sufficient 'to express all those articulate sounds which are commonly known and used in these parts of the world'. In his account of the values of the letters, reference is made not only to European sound systems but also to such little-known languages as Arabic, Armenian, Chinese and Japanese.

Any account of seventeenth-century phoneticians should include the name of Christopher Cooper. Though he did not achieve the great European reputation of Wallis, he is considered by many to be the greatest English phonetician of the century. His work on English pronunciation was first published in 1685 (*Grammatica Linguae Anglicanae*), with an English edition appearing in 1687 (*The English Teacher, or The Discovery of the Art of Teaching and Learning the English Tongue*). A schoolmaster rather than a member of the Royal Society, Cooper was less concerned than many of his contemporaries with the establishment of universal systems. His aim was to describe and give rules for the pronunciation of English for 'Gentlemen, Ladies, Merchants, Tradesmen, Schools and Strangers', rather than to devise a logical system into which the sounds of English and other languages might be fitted. Moreover, he deals with the spelling of English as it exists and does not seek to reform it. The first section of his book is concerned with the description of speech sounds ('The Principles of Speech') and the second part gives rules for the relation of spelling and pronunciation in different contexts. Cooper describes the organs of speech and names those sections of the upper speech tract which are mainly responsible for the articulation of the

² Wallis's own symbols are here replaced by IPA equivalents, but it is not always clear from Wallis's description which sounds are intended: thus, his description of *ch* and *gh* would seem to indicate [x] for both, though in the system one would expect *gh* to mean [ʃ].

'breath': 'guttural, lingual, palatine, dental, labial, lingua-palatine, lingua-dental'. Those sounds in the production of which the airstream is 'strained or intercepted' are consonants (classified as semi-vowels, aspirated, semi-mutes, and mutes), while those in which the airstream is 'freely emitted through the nostrils or the lips' are vowels. He notes that voice, 'made by a tremulous concussion of the larynx', is a characteristic of vowels, semi-vowels, and semi-mutes. His classification of vowels is in terms of *lingual*, *labial*, and *guttural* categories, a somewhat confusing distinction being made between the English long and short vowels. Diphthongs are defined properly as 'a joyning of two vowels in the same syllable, wherein the power of both is kept'. His consonantal classification, with IPA equivalents here, shows: *labial* sounds, subdivided into semi-vowels [w,v,m], aspirated [m,f,ɸ], semi-mute [b] and mute [p]; *lingual* sounds, subdivided into semi-vowels [z,ʒ,ð,n,l,r,j], aspirated [ʃ,θ,ɳ,ʒ,ʒ,ç], semi-mute [d], and mute [t]; *guttural* sounds, subdivided into semi-vowels [ɣ,ŋ,h], aspirated [x,ʁ,h], semi-mute [g] and mute [k]. The second part of the work, dealing with the pronunciation of various English spelling forms, provides 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 300 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.

It will be seen from the mention of these few names, chosen from the many who were writing on matters of pronunciation in the seventeenth century and omitting those who were composing spelling books and grammars for foreigners, compiling lists of homophones and devising systems of shorthand, that there was at this time a surge of scientific and analytical interest in speech and pronunciation such as was not to be repeated until the nineteenth century. It is true that the judgements made were largely intuitive, but this was to remain the case in phonetic research until the second half of the nineteenth century. In their theoretical approach, however, many of these early writers show a preoccupation with classification, systematization and problems of distribution which is paralleled in the activities of modern linguists.

6.1.4 Eighteenth Century—Johnson, Sheridan, Walker and Steele

The spirit of general scientific inquiry into speech which characterized a large proportion of the phonetic work of the seventeenth century had, by the eighteenth century, lost much of its original enthusiasm. Prescriptive grammars containing rules for pronunciation continued to be produced in large numbers and provide us with information concerning the contemporary forms of pronunciation; shorthand systems, too, which show an undiminished popularity, necessitated the analysis of English into its constituent sounds. Yet the main achievement of the century lies in its successful attempt to fix the spelling and pronunciation of the language. Dictionaries had been published in the seventeenth century, but the works having the main stabilizing and standardizing influence on the language were to be the dictionaries of Samuel Johnson (1755),

Thomas Sheridan (1780) and John Walker (1791), the last two writers being particularly concerned with the standardization of pronunciation. John Walker, whose dictionary is called by the *Dictionary of National Biography* 'the statute book of English orthoepy', exerted a great influence on the teaching of English not only in this country but also in America. Moreover, he pays considerable attention in his work to the analysis of intonation, treated only perfunctorily by most earlier writers. About the same time Joshua Steele published his *Prosodia Rationalis* (1775-79), in which is presented a system of notation capable of expressing pitch changes, stress and rate of delivery. (Steele is celebrated for his detailed analysis of a soliloquy delivered by David Garrick.)

We have, in fact, been dealing up to now with two types of work on pronunciation, which, especially in the eighteenth century, came to be confused: on the one hand, and in the minority, the books which laid emphasis on description, analysis and classification; on the other, the books which were mainly normative and continue the tradition of 'rhetoric'. That part of rhetoric known as 'elocution' originally referred to the style and form of speech, 'the garnishing of speech', but in the eighteenth century the term was increasingly applied to the method of delivery. It was not until the nineteenth century that a clear distinction was made between the aesthetic judgements upon which elocution largely relies and the objective descriptive statements which form the basis of phonetic analysis. Until such a distinction was explicitly made, advances in phonetic techniques have to be disentangled from a mass of irrelevant opinion.

6.1.5 Nineteenth Century³—Pitman, Ellis, Bell and Sweet

In the nineteenth century the traditional English preoccupation with phonetic notation and the simplification of English spelling continued. Isaac Pitman (1813-97), whose system of shorthand is so widely used today, and Alexander J. Ellis (1814-90), concerned at the difficulties which our spelling presented to English children as well as to foreigners, devised an alphabet *Phonotype*, which conformed to a phonetic analysis of English and yet remained based upon the Latin characters. They were supported by the *Phonographic Society* and published a journal which eventually (1848) was named the *Phonetic Journal*. Ellis, however, developed other types of alphabet, notably *Glossic*, which is essentially an adaptation of traditional spelling, and *Palaeotype*, which used conventional letter shapes but in a great variety of type, so that fine shades of sound could be symbolized. This latter alphabet was put to good use by Ellis in his historical and dialectal studies; but not only is the precise value to be attached to a letter not always easily determined—because of the method of reference to sounds in languages—but also the complexity of the system renders it difficult for the reader to assimilate. Ellis's work on notation, however, largely inspired the 'Broad' and 'Narrow' Romic transcriptions of the great Henry Sweet (1845-1912). In 1867,

Alexander Melville Bell, father of Alexander Graham Bell (the inventor of the telephone), published his book *Visible Speech* while a lecturer on speech in the University of London. This remarkable work set out to classify all the sounds capable of being articulated by the human speech organs and to allot a systematic and related series of symbols to the sounds. The unfamiliarity of the invented symbol shapes was no doubt responsible for the fact that this means of notation has never been widely used in purely phonetic work, but its value was for many years demonstrated, especially in America, as a system applied to the teaching of the deaf.

Although, in referring to these writers, emphasis has been laid on their contribution to the development of phonetic transcription, their published work covers every aspect of speech activity. Bell's interests, in his 49 publications, lay mainly in the field of elocution and the description of articulatory processes. But Ellis and Sweet applied the techniques of phonetic analysis both to the description of contemporary pronunciation and also to the whole field of historical phonological investigation. Ellis, in fact, will be chiefly remembered for his massive work *On Early English Pronunciation*, published in five volumes between 1869 and 1889. In these volumes Ellis traces the history of English pronunciation and, at the same time, contributes descriptive phonetic studies of contemporary dialects. It is not surprising that a work of such enormous scope should since have been found to be inadequate in many respects, but it cannot be denied that Ellis was a great pioneer in the application of objective techniques to the description of past and present states of the language. Although his assessment of the value of many grammarians from the sixteenth century onwards was often faulty, he initiated a study of their work which has continued unabated to this day. Henry Sweet, a greater phonologist and scholar, applied stringent phonetic techniques to all his work, so that, whether it be a question of phonetic theory or the history of English or the description of a language such as Welsh or Danish, his basic approach and the majority of his conclusions remain valid today. He belongs as much to the twentieth century as to the nineteenth and his influence is clearly to be seen in the work of Daniel Jones, who dominated British phonetics in the first half of the last century. In the twentieth century, phonetics really came of age with the formation of Departments of Phonetics in London (University College and the School of Oriental and African Studies), Leeds, and Edinburgh, though these later amalgamated with departments of the newly established subject of linguistics; in the USA phoneticians were more usually in departments of speech science, though a few were in departments of linguistics (notably in UCLA, headed by Peter Ladefoged).

This brief and selective outline goes some way towards revealing a line of phonetic inquiry which has been continuous in England from the sixteenth century to the present day. The techniques for describing speech and language have become progressively more objective, modern instrumental methods for physiological and physical investigation (now supported by digital computers) providing the latest stage in the process. A problem confronting linguists of today concerns the correlation of concrete data, which is being accumulated in great detail in computer databases, with abstract linguistic realities, many of which have for centuries been implicit in the work of writers on language.

³ See MacMahon (1998) and Collins and Mees (1999).

6.2 Sound Change

The language spoken in England has undergone great changes during the last thousand years, changes which have affected every aspect of the language, its morphology, syntax, and vocabulary as well as its pronunciation. Old English⁴ is so different from present-day English from every point of view that it is unintelligible to the modern Englishman either in its written form or in a reconstructed spoken form; Chaucer's poetry presents difficulties in print and, when read in what is presumed to be the pronunciation of the fourteenth century, offers a sound pattern which it is not easy for the modern listener to understand; even Shakespeare, though phonetically not far removed from ourselves, raises problems of syntax and meaning.

The pronunciation of a language is subject to continuous change. It would indeed be surprising if speech, handed on orally from one generation to another, showed no variation over the centuries. It is not difficult to find examples of changes which are taking place in our own times, e.g. the final vowel in words like *city* is closer and tenser and the vowel in *sad* more open in the south of England today than they were 70 years ago. A change of a different kind—the use of different phoneme in a class of words—is illustrated by the case of words such as *poor* and *sure*; these tend to be said by the older generation with /u:/, whereas the younger generation much more commonly uses /ɜ:/. At any given time several pronunciations may be current, representing older and newer forms.

There are a number of reasons why we might expect changes to operate less rapidly at the present time. Universal education, greater ease of travel, increased numbers of newspapers, journals and books, ubiquitous radio and TV, are all influences which might apply a brake to changes in pronunciation. But all these factors have operated only in comparatively recent times. In earlier stages in the development of English, there was no mass, nation-wide influence likely to lead to stability and levelling. Printing, it is true, has been with us for 400 years, but the wide dissemination of books, as of education, is a modern development. Indeed, as we have seen, the spelling of English, even in printed books, was not finally standardized until the eighteenth century. With such freedom from restraint, especially before the eighteenth century, it is not surprising that there were considerable changes of pronunciation.

6.2.1 Types of Change

(1) The most important kind of change tends to affect a phoneme in all its occurrences. Such changes, not usually being set in motion by any immediate, outside influence, are in this sense independent they are called INTERNAL ISOLATIVE changes. Thus, the ME [u:] has become [aʊ] in PresE, as in the word *mouth*; similarly, ME [a:] has become [eɪ] in PresE, as in the word *name*. Changes of this type

apply particularly to the English vowel system, which underwent a remarkable evolution of values, known as the GREAT VOWEL SHIFT, during the centuries preceding the modern period.

(2) Another kind of change is that which is brought about by the occurrence of phonemes in particular contexts—a dependent change, called INTERNAL COMBINATIVE. Thus, the phoneme in *mice*, having now the sound [aɪ], results from ME [i:] by an internal isolative change, but this [i:] itself arose as a result of a combinative process of i-mutation (a type of VOWEL HARMONY), through the stages [mu:si] > [my:si] > [mi:s], where the change [u:] > [y:] can be explained by the fronting of [u:] under the influence of the [i:] of the following syllable. Compare *mice* with PresE [aʊ] in *mouse* which arises from the isolative change [u:] > [aʊ] without being subject to any earlier i-mutation. I-mutation belongs to OE, but a more recent change of this type is exemplified by words such as *swan*. This word was probably pronounced [swan] or [swæn] 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 [ɔ:], by reason of this combinative change affecting this particular sound sequence, e.g. *want*, *quality*, *war*, *water*. A similar combinative change is the use of PresE [ɑ:] instead of ME [æ] before voiceless fricatives, e.g. *after*, *path*, *pass* (this change has not taken place in the north of England or in most of America).

(3) 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. Thus, it was fashionable in Elizabethan times to pronounce words such as *servant* and *heard* with [æɪ] or [aɪ], perhaps originally a dialect form, rather than with [er], the regular form of development; these words, have reverted to the normal development of ME [er] > [ɜ:] rather than [ɑ:]. An exception here is *clerk* which is pronounced with [ɑ:] arising from ME [æɪ]. Similarly it was fashionable to pronounce the termination *-ing* as [ɪn] in the nineteenth century (as in *huntin'*, *shootin'*, and *fishin'*) though this is used today only as a special form of affectation or in some dialects. Such changes, involving a change of distribution of phonemes among words and morphemes, do not affect the phonemic system of the language.

(4) The introduction of foreign words may disturb the number of phonemes or increase their positional possibilities in words. Such changes are said to be EXTERNAL. Thus, if the French words *beige*, *prestige*, *camouflage* are used in English with the pronunciations /beɪʒ, pres'ti:ʒ, 'kæməflɑ:ʒ/, we have a case of a final /ʒ/ previously unknown in English words while the importation of originally Italian, later French, *gigolo* /'ʒɪgələʊ/ makes the /ʒ/ possible in initial position. However, such foreign borrowings are more frequently made to conform to the English system: so /dʒ/ is used in place of /ʒ/.

(5) In addition to changes of quality, some changes may be ACCENTUAL. Changes of accent are particularly striking in the case of words which have come into the language from French: in ME *village* and *necessary* retained their accent on the penultimate syllable—[vɪ'la:ʒə] and [nesə'sɛəriə]. Now, the accent has shifted to an earlier syllable, together with associated changes of quality—[vɪlɪdʒ], [nesəsɪ] (the latter may retain the ME accentual pattern in American English). Later borrowings, or those in less common use, often retain the French accentual pattern—thus, *hotel* or *machine*, with accent on the final syllable, whereas, if they

⁴ The following abbreviations will henceforward be used: OE—Old English (up to approximately AD 1100); ME—Middle English (approx. 1100–1450); eModE—early Modern English (approx. 1450–1600); PresE—Present-day English (RP); AN—AngloNorman; OF—Old French.

had conformed to the English system, we might have had such modern forms as /'həʊtl/ and /'mætʃn/ or /'meɪʃn/ in the same way that the thoroughly anglicized form of *garage* gives /'gærɪdʒ/ for some speakers. (See §7.4 on current changes.)

6.2.2 Consonant and Vowel Changes

The English consonants have been subject to fewer changes than have the vowels. This is not surprising, for a consonantal articulation usually involves a contact which can be felt; such an articulation tends to be more stable. There have only been a small number of changes involving modification of consonants in English. One example is the change of the OE palatal plosives [c,ɟ] to PresE [tʃ, dʒ] as in OE *cirice* > PresE *church* and OE *brycg* > PresE *bridge*, involving the combinative change of palatal plosive to palato-alveolar affricate before a front vowel. More common is the type of change involving the conferment of phonemic status on an existing sound, e.g. [v, ð, z], medial allophones of /f, θ, s/ in OE, later get contrastive, phonemic, significance when words like *effort*, *method* and *assist* were imported from French with medial /f, θ, s/; or the disappearance of an allophone, e.g. postvocalic [x] and [ç] (allophones of /h/ in ME) in such words as *brought* and *right* were largely lost in the south of England by the seventeenth century (with compensatory lengthening of the preceding vowel); or the insertion of an existing phoneme in a particular class of words, e.g. the initial /h/ in words such as *herb*, *homage*, in which the <h> was not pronounced in the original French. Whether it is a question of consonantal modification, addition or loss, it is usually possible to explain the change which has taken place and the approximate period during which it occurred.

A modification of vowel quality results from very slight changes of tongue or lip position and there may be a series of imperceptible gradations before an appreciable quality change is evident (or is capable of being expressed by means of the Latin vowel letters). It is particularly difficult to assess rate and phonetic route of change in the case of those internal independent vowel changes which affect a phoneme throughout the language. It is known, for instance, that the modern homophones *meet* and *meat* had in ME different vowel forms, approximately of the value [e:] and [ɛ:]. The [e:] vowel of *meet* became [i:] by about 1500 and it might be postulated that by a process of gradual change the [ɛ:] of *meat* first closed to [e:] and then, by the eighteenth century, coalesced with the [i:] in *meet*. The available evidence, however, suggests that the change [ɛ:] > [i:] may not have been either simple or gradual, but that two pronunciations existed side by side for a long period (the conservative [ɛ:] beside another form [i:] which had resulted from an early coalescence with the *meet* vowel). In other vowel changes, it may be agreed that the change was gradual, but it is difficult to date precisely the stages of development. Thus, the modern /aɪ/ of *time* results from a ME [i:] value; it is clear that the change has been one of progressive, widening, diphthongization, but there may have been a period of incipient diphthongization when there was hesitation between the pure vowel [i:] and some such diphthong as [iɪ] or [ɔi]. It is well to remember, therefore, that at any particular time in history there are likely to be a number of different, coexistent, realizations of vowel

phonemes, not only between regions but also between generations and social groups. An example of such variety in modern English is provided by the vowel at the end of *city*, which in the south of England has progressively become [i] through generations over approximately the last 60 years so that fewer and fewer speakers have the original [ɪ].

6.2.3 Sound Change and the Linguistic System

It is convenient to study sound change by looking at particular phonemes or sounds, but it is somewhat misleading to ignore the place of particular phonemes in the overall system within which they function and which may not be changing as a whole. In other words, although there may be considerable qualitative changes, the number and pattern of the terms within the system may show relative stability. The ME /i:/ phoneme, for instance, is now realized as [aɪ], but there is still a phonemic opposition which contrasts such words as *time*, *team*, *tame*, *term*, *tomb*. On the other hand, the system may change because a sound, without itself changing, may receive a new, phonemic value, e.g. the sound [ŋ] has always existed in English as a realization of /n/ followed by the velars /k/ or /g/, but when the final /g/ in a word like *sing* was no longer pronounced, /ŋ/ contrasted significantly with /n/ and /m/, e.g. *ram*, *ran* and *rang*.

The phonological system of our language consists of a framework of phonemic contrasts which lead to differences of meaning and therefore we might expect it to remain stable since the loss of a contrast might lead to loss of meaning. But the redundancy in the English language is such that the loss of a particular contrast is often easily tolerated, particularly if that contrast has a low functional load, i.e. contrasts only a small number of words. Thus, today, few speakers in the south of England distinguish pairs like *saw* and *sore* by means of the contrast /ɔ:/~ /ɔə/, yet the loss of the /ɔə/ diphthong leads to little loss of understanding.

Though the relationships within the system remains stable, a change of phonetic realization of any phoneme may have qualitative repercussions throughout the system. Such a disturbance may be observed in modern English. The phonetic relationship of the vowel phonemes in *set* and *sat*, in one type of pronunciation, is of a front vowel between close-mid and open-mid to a front vowel between open-mid and open. If, however, the vowel of *sat* has a closer articulation than that described, that of *set* must be raised, too. A limit of raising is imposed by the presence of *sit*, which itself cannot be raised without danger of confusion with *seat*, unless this vowel becomes some sort of diphthong (which long vowels often do). A series of related changes of this sort does in fact take place in much Australian and New Zealand speech (see §7.6.5). Alternatively, if the vowel phoneme of *sat* is realized as a front open vowel, as in many English regional dialects, the vocalic area in which the phoneme of *set* can be realized becomes more extensive; in fact, in those kinds of English where this occurs (in much of northern England—see §7.6.4), the vowel in *set* tends to be of open-mid quality. Such considerations of the phonetic relationship of phonemes have a relevance in the historical study of English. In ME there were, for instance, four long vowels in the front region—/i:, e:, ɛ:, a:/. By 1600, /i:/ had diphthongized and the remaining vowels closed up. Such a movement may have been caused by the

creation of an empty space brought about by the diphthongization of the pure vowel /i:/ (often called a pull-chain) or alternatively pressure upwards from /a:/ (often called a push-chain).

Although, therefore, it is often convenient in historical studies to investigate the development of individual phonemes in terms of the quality of their realization, it is clear that many sound changes can be explained only by reference to a readjustment of the phonetic relationships of the phonemes of the system as a whole. The primary significance of the sounds of modern English is how they fit into the present-day phonological system; in the same way, the English sounds of 1600 are to be viewed in terms not only of their past and future forms but also of the way in which they fitted into the phonological system of the time.

Some sound changes are, indeed, the result of an influence which applies to the system as a whole. Those drastic changes of vowel quality known as the Great Vowel Shift (exemplified in the changes to /i:,e:,e:,a:/ explained above) mainly affected vowels in accented syllables. But vowels in most unaccented syllables (especially those in word-final positions) have undergone, in the last thousand years, an equally striking, though different, type of change. OE is sometimes called the period of full endings, e.g. *stana* was realized as [ˈstɑ:nɑs]; ME, the period of levelled endings (when vowels in endings were all levelled to [ə]), when *stones* was pronounced [ˈstɔ:nəs]; and eModE onwards, the period of lost endings, when *stones* is [stɔ:nz] or later [stəʊnz]. The general tendency has been for all unaccented vowels to shorten (if long) and to gravitate towards the weak centralized vowels [ɪ] or [ə], or sometimes [ʊ], if not to disappear altogether. This fact accounts for the high frequency of occurrence of [ɪ] and [ə] in PresE and for the complete elision of many vowels in unaccented syllables in rapid colloquial speech, e.g. *suppose* [spəʊz], *probably* [prɒbblɪ].

6.2.4 Sources of Evidence for Reconstruction

Whether our aim is to reconstruct the phonological system of English at any particular moment in history or to trace the development of particular phonemes, it is necessary to establish the sound values which were used in the pronunciation of the language—relative values in the case of the system, absolute values as far as possible in the case of sound development. An investigation of the phonological structure of PresE depends on careful listening and recording; future generations will have the benefit of recordings of the speech of today. 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 (rarely is there a detailed and reliable direct description); yet such is the agreement generally among the various types of evidence that the broad lines of sound change can often be conjectured with reasonable certainty. Some of the indirect methods are:

(1) *Theoretical paths of development*—If, in dealing with the changing realization of a particular phoneme, we can be reasonably sure of its sound value at two points in history, we can, from our knowledge of phonetic possibilities and

probabilities, infer theoretically the intervening stages of development. We can, of course, be sure of the pronunciation of PresE. If, then, the evidence suggested unequivocally that, for instance, the vowel in *home* was pronounced as [ɑ:] in OE, the development to be described and accounted for would be [ɑ:] > [əʊ]. It is likely that the articulation has always involved the back, rather than the front, of the tongue; the change has clearly meant a closing of the tongue position, to which at some stage there has been added a gliding (diphthongal) movement. We might, therefore, postulate such developments as [ɑ:] > [ɑʊ] > [əʊ] or [ɑ:] > [ɔ:] > [o:] > [əʊ]. The available evidence will then confirm or refute the hypothesis—in this case the second solution being more in keeping with the information. Such recognition of phonetic probabilities will always be implicit in the tracing of change. It must be considered unlikely that [ɑ:] on its way to [əʊ] or [əʊ] would have passed through a stage of front articulation, without any combinative influence.

It would be dangerous to attempt to predict, merely according to phonetic probabilities, the way our present sound system will develop. The rounded close-mid back ME [ʊ] developed by the nineteenth century to an unrounded open-mid centralized back [ɤ]. In the London area (London pronunciations today are often the 'standard' pronunciations of tomorrow) this vowel has now become more open and more front [ɛ]. Yet, at the same time, there is a tendency to make the vowel in *sad* more open. There is here a potential conflict and the future development of these vowels is uncertain.

(2) *Old English*—It is most important in an investigation of the development of English sounds over the last thousand years that the pronunciation of OE should be established with some certainty. If this can be done, we shall have a 'starting-point' for the phonetic route of change to PresE. The term Old English, however, spans a period of some 400 years from about AD 700 to AD 1100. Moreover, the invasion of the Angles, Saxons, and Jutes in the fifth and sixth centuries introduced four separate varieties of English: the Angles, in the Midlands, North-East England, and the south of Scotland, using types of English known as MERCIAN and NORTHUMBRIAN (or, in general terms, ANGLIAN); the Saxons, in the south and south-west, using the WEST-SAXON dialect; and the Jutes, settling mainly in the region of Kent and using a dialect called KENTISH. Of the four dialects, West-Saxon, which was to become a kind of standard language in Old English, is the one about which most is known from the extant texts. In its later form—that in use between about AD 900 and AD 1100—it is referred to as Classical OE.

The broad lines of the pronunciation of this language can be conjectured from a comparison of the development of the other members of the West Germanic group of languages to which it is related. But by far the most explicit evidence concerning its sounds is to be inferred from the alphabet in which it is written. The earlier runic spelling was replaced by a form of the Latin alphabet. This alphabet was probably introduced into the country in the seventh century by Irish missionaries. It can be assumed, therefore, that the sounds of OE were represented as far as possible by the Latin letters with their Latin values, with some modifications of an Irish kind. A great deal is known about the pronunciation of Vulgar Latin, whose sound system had much in common with that of modern Italian. If an Italian, knowing no English, were today asked to write down with his own spelling the PresE pronunciation of the word *milk* [mɪlk], he

would have no difficulty in representing the first sound, which he could spell as <m>; the vowel [i] might, however, seem to him to resemble the sound he would write in Italian as <e> rather than as <i>; the 'dark' [ɨ] would appear to have a back vowel glide accompanying it, requiring a spelling such as ; and, since he has no <k> letter, he would spell the final [k] as <c>. His transcription of the word might, therefore, be *meolc*, which is, in fact, a West-Saxon spelling of the word now written *milk*. This is a fortuitous example and must not be taken to suggest that OE was pronounced in the same way as PresE. But it does demonstrate that OE spellings, which may appear to be very different, are often less surprising when we keep in mind the Latin values originally attached to the letters.

Sometimes the simple forms of the Latin alphabet were evidently inadequate for representing the English sound: thus, the ligature <æ> was used to symbolize a sound between C.[a] and C.[e]; the sounds [θ] and [ð] were written in the earlier manuscripts as <th> in initial position and <d> medially and finally in a word, and later as <ð> (called 'eth') or the rune <þ> (called 'thorn') regardless of the sound's position in the word or its voiced or voiceless quality; the rune <ƿ> (called 'wynn') frequently replaced the earlier <u> or <uu>. The vowel values of the OE system were particularly difficult to represent with the five Latin vowel letters. Unaccented vowels, already beginning to be 'levelled' (see §6.2.3 above), presented a particular problem to the 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. A diphthong such as the one written as *ea* in OE must probably be interpreted as a glide to a central [ə] quality.

Quantity was often shown in the case of vowels by doubling the letter or by the use of an accent mark and, in the case of consonants, by doubling the letter. The accent in a word is irregularly marked; but, in any case, it is agreed, from a comparison of the West Germanic languages, that the word accent in OE fell generally on the first syllable of words, with the exception of certain compounds.

The written form of OE provides us, therefore, with considerable information concerning the language's pronunciation; we have a working hypothesis from which to begin our investigations. The study of later forms of English will often, in fact, confirm that the OE pronunciation postulated from the spelling and the comparison of Germanic languages is the only one from which later forms can be expected to have developed.

(3) *Middle English*—Spelling forms can also help us to deduce the pronunciation of the ME period, roughly AD 1100–1450. Generally speaking, the letters still had their Latin values and those letters which were written were meant to be sounded. Thus, the initial <k> in a word such as *knocke* was still pronounced and the vowel in *time* would have an [i] quality. This persistence of Latin values in spelling was no doubt due to the influence of the Church, which was still the centre of teaching and writing, and the absence of a thoroughly standardized spelling accounts for its predominantly phonetic character. However, English spelling was modified by French influences. Notably, the French <ch> spelling was introduced to represent the [ʃ] sound in a word such as *chin* (formerly spelled *cinn*), where the new spelling form indicates no change of pronunciation; similarly following French, <ou,ow> now represent the sound [u], formerly written

<u>, e.g. OE *hus*, ME *hous*. The simple <u> spelling was retained to express both the French sound [y] in words like *duke* and *fortune* and the OE short [u] sound, though this latter sound is often written as <o>, especially when juxtaposed with the letters <w,m,n>, e.g. *wonne* rather than *wunne*, to avoid confusion between the letter shapes.

Rhymes, too, have their value, especially as, in this period, they are almost always satisfactory to the ear as well as to the eye: in the whole of Chaucer's work, for instance, there are very few eye-rhymes in the written text which turn out to involve the pairing of different vowel sounds. But evidence from rhymes is valueless unless we are certain, from other sources of evidence, of the pronunciation of one member of the pair. Thus, in the Chaucerian rhyme *par cas :: was*, we can be sure that the French word *cas* had a vowel of the [a] quality, thus confirming that the [w] of *was* had not yet retracted and rounded the vowel to [ɔ]. The final <s> in *cas* almost certainly represented [s] and thus the final sound of *was* had not yet been voiced.

Words imported from French can also give us information concerning the timing of sound changes. Thus, French words such as *age* and *couch*, which we know from French sources had [a:] and [u:] at the time of their introduction into English, fell in with the English vowel development [a:] > [e] and [u:] > [aʊ] in words like *name* and *house*; we can conclude, therefore, that at the time the French words came into the language, the [a:] and [u:] vowels had not begun their change.

Moreover, after the ME period, as we shall see, a great deal of direct evidence is available to us, so that our conjectures from about 1500 onwards can be made with considerable certainty. We may often be able to deduce from our knowledge of pronunciation in the sixteenth century the stage probably reached in the ME period in the development of a sound from OE. The OE [i:] sound in *time*, for example, was beginning to be diphthongized generally very early in the sixteenth century. It is reasonable to suppose (even if other evidence to support the theory did not exist) that *time* still had a relatively pure [i:] for much of the ME period.

Finally, the metre of verse reveals 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. *courage* [ku'rɑ:ʒə] and that the accent shift in these cases is a phenomenon of at least late ME.

(4) *Early Modern English*—The same sources of evidence which we have already considered remain available for the eModE period, roughly AD 1450–1600. The introduction of printing brought standardization of spelling and already the spoken and written forms of the language were beginning 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. If a modern child writes *He must have gone* as *He must of gone*, he is only representing the phonetic identity of the weak forms of *have* and *of* ([əv]), an identity which he will learn to ignore when he adopts the conventional spelling distinction. In the same way, if fifteenth- and sixteenth-century spellings show the word *sweet* occasionally written as *swit*, it may be assumed that this original ME [e:] 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 current throughout the eModE period in such words. Moreover, the conventional adoption of an unphonetic spelling can sometimes provide us with positive evidence as to its value: thus, when words like *delight* (formerly *delite*) began to be spelt with <gh>, this spelling form <gh> clearly no longer had the consonantal fricative value which it had formerly represented in *light*, since there never was a consonantal sound between the vowel and final [t] in *delight*. We may conclude, therefore, that <gh> no longer had its former phonetic significance in words such as *light*. Care must, of course, be taken to identify the increasing number of learned or technical spellings adopted by printers. The initial letter group <gh> in *ghost* (OE *gast*) indicates no change in pronunciation—*goose* was also sometimes spelt *ghoose* in this period. Again, spellings which aim at revealing the etymology (true or false) of a word must usually be discarded as phonetically valueless, e.g. *debt*, *island*.

Rhymes, too, continue to be useful as complementary evidence. A rhyme such as *night* :: *white* confirms the view that post-vocalic <gh> no longer had a consonantal value; or again, *can* :: *swan* suggests that the rounding of [a] after [w] had not yet taken place. Yet, just as in the case of ME, rhymes must be treated with caution, more particularly as eye-rhymes were doubtless beginning to become more prevalent. 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 capable of being pronounced [fu:tər]) and *known*, *none* (both [no:n]); such puns suggest that the pronunciation of the two words was commonly sufficiently close to make an immediate impression upon 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 and schoolmasters, some of whom have been mentioned in §6.1. 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 descriptive 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. 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, fashion and place in society, in the same way that a description of PresE (even that of a restricted area such as the south of England) would have to take into account a large number of variants.

The following systems represent conjectures about one possible set of phonemes current in the period in question.

6.2.5 Classical Old English Sound System

Vowels	i:, y; y	u:, u
	e:, e	o:, o
	æ:, æ	
	ɑ:, ɑ	[ʊ] before nasals
	[ə]	in some weakly accented syllables

Diphthongs	e:, eə; e:, eə
	p, b, t, d, k, g ([ʏ] between vowels), f, ç
Consonants	m, n ([ŋ] before velars)
	l, r
	f, θ, s ([v, ð, z] medially), f
	h ([x, ç] medially before consonants)
	j, w

Note (1) Consonants may be long or short.

Note (2) The spellings *hn*, *hl*, *hr*, *hw* may be interpreted as phoneme sequences /h/+ /n, l, r, w/; alternatively, if it is assumed that *h* is here an indication of voiceless [h, ç, w], these four sounds may be counted as contrastive, i.e. of phonemic status.

Text (St. John, Chapter 14, verses 22, 23)

- ju:das kwæθ to: him. næs na: se: skarɔt. driçtən, hwæt is jəwɔrdən θæt θu:wilt θe: sylf nɑ jəswuteljən us næs middanærdɑ.
- se: hæ:lænd ɔndswarɔdɑ ɔnd kwæθ him; jif hwa: me:lɔvɑθ he:hilt mi:nɑ spræ:ʃə ɔnd mi:n fædər lɔvɑθ hi:nɑ ɔnd we: kumɑθ to: him ɔnd we: wyrkiɑθ ɛardɔngsto:wɑ mid him.

Authorized Version

- Judas saith unto him, not Iscarioth, Lord, how is it that thou wilt manifest thyself unto us, and not unto the world?
- Jesus answered and said unto him, If a man love me, he will keep my words; and my Father will love him, and we will come to him, and make our abode with him.

6.2.6 Middle English Sound System

Vowels	i:, i	u:, u
	e:	o:
	e:, e	ɔ:, ɔ
	ɑ:, ɑ	ɑ:
Diphthongs	[ə] in unaccented syllables	
	ei, (æi), ɔi, iu, (eu), eu, ɔu, (au)	
Consonants	p, b, t, d, k, g, f, ç	
	m, n ([ŋ] before velars)	
	l, r	
	f, v, θ, ð, s, z, f, h ([x, ç])	
	j, w ([w] after /h/)	

Text (from the Prologue to *The Canterbury Tales*)⁵

⁵ The type of transcription given here is slightly archaic for Chaucer's pronunciation, e.g. long consonants were probably lost in later ME and such words as *and*, *that*, would have had a weak vowel.

hwan 0at a:pril, wi0 his fu:ras so:t0
 00 dru:xt 0f ma:rtf ha0 pers0d to: d0 ro:t0,
 and ba:00d e:vri v0in in swif liku:r
 0f h0wif vertiu end0end0rd is 00 flu:r,
 hwan zefirus e:k wi0 his swet0 bre:0
 inspi:r0d ha0 in evri h0lt and he:0
 00 tend0r kr0pp0s, and d0 ju:gg0 s0nn0
 ha0 in d0 ram his halv0 kurs ironn0,
 and sm0:l0 fu:l0s ma:k0n mel0di:0
 0at sle:p0n a:l d0 ni:xt wi0 0:p0n i:0—
 s0: pri:k00 hem nattiu:r in hir k0ra:0g0s—
 0an l0:gg0n f0lk to: g0:n 0n pilgrima:0g0s.

6.2.7 Early Modern English Sound System

Vowels	i:,ɪ	u:,ʊ
	e:	o:,ɔ
	ɛ:,ɛ	
	æ ([a])	ɔ:([ɑ:]),ɒ
	/e:/ was probably /i:/ or /ɛ:/ in certain types of pronunciation	
	[ə] occurs in unaccented syllables	
Diphthongs	əɪ,əʊ,ɪu (or ju),eʊ,ou,ɔi,uɪ,ɛi	
Consonants	p,b,t,d,k,g,ʃ,ʒ	
	m,n,ŋ	
	l,r	
	f,v,θ,ð,s,z,ʒ,(ʒ),h	
	j,w ([w] after /h/)	

Text (*Macbeth*, Act II, Scene 1)

n0u 0:0r d0 w0:n ha:f w0:rd
 n0:t0r si:mz ded, 0nd w0:kɪd dre:mz 0bju:z
 d0 k0:rt0ind sl0p: w0:fkraft sel0bre:ts
 p0:l hek0ts 0f0:ri:z: 0nd w0:00rd m0:rd0r,
 0l0r0md b0i hiz sent0n0l, d0 w0:lf,
 hu:z h0ulz hiz w0:lf, 0vz wi0 hiz stel0t p0:s,
 wi0 tarkw0nz r0:v0i:ŋ str0idz, tu:0:rdz hiz d0z0in
 mu:vz l0ik 0 g0:st. d0u sju:r⁶ 0nd ferm-set 0r0
 he:r n0t m0i st0ps, hwi:f wei d0i w0:k, f0r fe:r
 d0i ven st0:nz pre:t 0v m0i hwe:r0b0ut,
 0nd te:k d0 prez0nt h0r0r fr0m d0 t0im,
 hwi:f n0u sju:ts⁶ w0d it.

⁶ Alternatively, [j] or [ʃ] for [s].

6.2.8 Present English Sound System

Vowels	i:,ɪ	u:,ʊ
	e	ɜ:
	æ	ʌ
	ɔ:	ɑ:,ɒ
	[ə] occurs in unaccented syllables	
Diphthongs	eɪ,əʊ,ai,au,ɔi,ɪə,ea,ʊə	
Consonants	p,b,t,d,k,g,ʃ,ʒ	
	m,n,ŋ	
	l,r	
	f,v,θ,ð,s,z,ʒ,ʒ,h	
	j,w	

6.2.9 Summary of Historical Changes in the English Sound System

6.2.9.1 Vowels The similarities of the systems given above may obscure the fact that the same sound, especially as far as the vowels are concerned, may occur in different categories of words according to the period. Thus [u:], now in *food*, occurred in OE in words such as *town*; [i:], now in *team*, occurred in OE in *time*. The following summary shows some of the most striking changes affecting the vowel quality used in particular types of word:

	OE	ME	cModE	PresE
<i>time</i>	i:	i:	əi	aɪ
<i>sweet</i>	e:	e:	i:	i:
<i>clean</i>	æ:	ɛ:	e:	i:
<i>stone</i>	ɑ:	ɔ:	o:	əʊ
<i>name</i>	a	a:	ɛ:	eɪ
<i>moon</i>	o:	o:	u:	u:
<i>house</i>	u:	u:	əʊ	aʊ
<i>love</i>	ʊ	ʊ	ɜ	ʌ

Several trends are apparent from the development from OE to PresE:

- OE long vowels have closed or diphthongized.
- Some long vowels and diphthongs have coalesced. OE /e:/ and /æ:/ > PresE /i:/; OE /i:/ and /y:/ > ME /i:/; The diphthong of *know* has coalesced with the originally pure vowel of *stone*; the diphthongs of *day* and *way* have coalesced with the former pure vowel of *name*.
- 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. In this category note also the coalescence of OE /ɪ/ and /y/ > PresE /i/ and OE /a,æ/ (and the short diphthong /eə/) > PresE /æ/.
- The OE rounded front vowels /y:,y/ have been lost (following even earlier /ø:,œ/)

(e) The loss of post-vocalic [r] in the eighteenth century gave rise to the Prest centring diphthongs /iə, eə, uə/, the pure vowel /ɜ:/ and introduced /a:, ɔ:/ into new categories of words (*cart, port*).

(f) Vowels under weak accent have increasingly been obscured to [ə] or [ɪ], or have been elided.

(g) Changes of quantity have affected certain phonemes in particular contexts or sets of words, e.g. OE /ɑ, æ, eə/ were lengthened in open syllables, ME /a/ was lengthened before /f, θ, s/; ME /o:/ was shortened in words like *good, book, blood*, and ME /e:/ was shortened in words such as *breath, death, head*.

6.2.9.2 Consonants Changes in the consonantal system are less striking, but the following may be noted:

(a) Double (or long) consonants within words were lost by late ME; certain other consonant clusters ceased to be tolerated, e.g. /hl, hr, hn/ by ME and /kn, gn, wr/ in the eModE period; ME /r/ post-vocally has been lost in England apart from (mainly rural) areas of the south-west and north-west.

(b) Allophones of certain phonemes have been lost, e.g. the [y] allophone of /g/ in late OE and the [x, ç] allophones of /h/ in eModE.

(c) New phonemes have emerged, e.g. /ʃ, ʒ/ in OE, /v, ð, z/ in ME, and /ŋ, ʒ/ in eModE; in addition, /h/ is used initially in words of French origin where, originally, no [h] sound was pronounced (*habit, herb, humble, etc.*).

7

Standard and Regional Accents

7.1 Standards of Pronunciation

No one pronunciation of an individual word is inherently more beautiful or 'better' than another. Some people may think that a Cockney's pronunciation of *paint* as [paɪnt] is ugly but they themselves may pronounce *pint* in a similar way. Such judgements about a speaker's accent are social judgements (which listeners often think are aesthetic), i.e. certain types of pronunciation are thought to show the speaker as uneducated or uncultured. The British have over the centuries been particularly sensitive in this way; more so, for example, than (North) Americans. Over the past half century there has to some extent been a weakening of such judgements; the BBC, for example, allows far more regional variation in its newsreaders and presenters than it did 50 years ago. Nevertheless, lack of any broad regional accent is still evident in many professions; for example, in briefings by senior officers of the Army or Navy heard on radio or TV.

Criticisms are often also made of the speech of many people (particularly teenagers) that their speech is slovenly, that it is poorly articulated or that it is mumbled. This seems to refer particularly to what is considered an unacceptable amount of centralization of vowels towards [ə], the dropping of word-final consonants, and the constant glottalization of [t]. Complaints of this sort were familiar as early as the seventeenth and eighteenth centuries; Alexander Gil, for example, complained of 'improper diphthongs'.¹

Orthoepists (of whom Gil was one) and elocutionists (e.g. John Walker, 1787, 1791) of the seventeenth to the nineteenth centuries were busy attempting to set up a standard model of English. We will now consider how this notion of a standard evolved from the sixteenth century onwards. This will go some way towards explaining the attitudes which the unofficial standard and differences from it have aroused.

7.2 The Emergence of a Standard

It is clear that the controversy does not centre around the written language: the spelling of English was largely fixed in the eighteenth century; all but a few of the

¹ Gil (1619 [1972]: 101).

conventions of grammar as well as most of our vocabulary have for a long time been accepted by the majority of educated English speakers. Indeed, the standardization of the written form of English began in the ninth and tenth centuries. But much diversity has always existed in the spoken language, in terms of the sounds used by different sections of the community and in different parts of the country. On the one hand, since the sounds of the language are always changing, there have always been disparities between the speech sounds of the younger and older generations; as noted in the previous section, the speech of the young is commonly characterized by older people as slovenly and debased. On the other hand, particularly in times when communications between regions were poor, the speech of all communities did not develop either in the same direction or at the same rate; moreover, different parts of the country were often exposed to different external influences (e.g. foreign invasion) which influenced the sounds of the language in particular geographical areas. English has, therefore, always had its regional pronunciations. Yet, at the same time, especially for the last four centuries, there has existed in this country the notion that one kind of pronunciation of English was preferable socially to others. In the sixteenth century one regional accent began to acquire social prestige.² For reasons of politics, commerce, and the presence of the Court, it was the pronunciation of the south-east of England, and more particularly to that of the London region, that this prestige was first attached. The early phonetician John Hart notes (1570) that it is 'in the Court and London speeches, where the general flower of all English country speeches are chosen and read. And though some would say it were not so, reason would we should graunt no lesse: for that unto these two places, do dayly resort from all towns and countries, of the best of all professions, as well of the own landmen, as of aliens and strangers ...'.³ Puttenham's celebrated advice in the *Arte of English Poesie* (1589) recommends '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 Nevertheless, many courtiers continued to use the pronunciation of their own region; tradition has it, for example, that Sir Walter Raleigh kept his Devon accent. The speech of the Court, however, phonetically largely that of the London area, increasingly acquired a prestige value and, in time, lost some of the local characteristics of London speech. It was finally fixed, as the speech of the then ruling class, through the conformist influence of the public schools of the nineteenth century. Moreover, its dissemination as a class pronunciation throughout the country caused it to be recognized as characteristic not so much of a region as of a social stratum. With the spread of education, the situation arose in which an educated man might not belong to the upper classes and might retain his regional characteristics; on the other hand, those eager for social advancement still felt obliged to modify their accent at least in the direction of the social standard. Pronunciation became, therefore, a marker of position in society.

² See in particular Mugglestone (1995).

³ See reprint of Hart (1570) in Danielsson (1955: 234).

⁴ See edition of Puttenham (1589) by Willcock and Walker (1936: 145).

7.3 The Present-day Situation: RP

(1) Some prestige is still attached to this implicitly accepted social standard of pronunciation. It is often called RECEIVED PRONUNCIATION (RP),⁵ the term suggesting that it is the result of a social judgement rather than of an official decision as to what is 'correct' or 'wrong' (the word 'received' here means 'acceptable'). It became more widely known and accepted through the advent of radio and television. The BBC used to recommend this form of pronunciation for its announcers mainly because it was the type which was most widely understood and which excited least prejudice of a regional kind. Indeed, early attempts to use announcers who had a mild regional accent used to provoke protests even from the region whose accent was used. Thus, RP often became identified in the public mind with 'BBC English'. But, over the last 30 years, both the BBC and other national radio and TV channels have been increasingly tolerant of the accent of broadcasters. Nevertheless, in their choice of newsreaders, the national TV and radio channels still use predominantly RP speakers, even though they may be speakers of a type of 'Regional RP' as discussed in (4) below.

(2) Certain types of regional pronunciation are, however, firmly established as alternative standards. Some, especially Standard Scottish English (SSE), have been accepted for at least the last 30 years; others, particularly the popular forms of pronunciation used in large towns, are still often characterized 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 which, though they have lost some of their force, have by no means completely disappeared. On the other hand, RP itself (particularly an RP with no regional traces at all) can be a handicap nowadays, since it may be taken as a mark of affectation or a desire to emphasize social superiority.⁶ Most speakers of RP 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 familiar in Britain; this was not the case in the 1930s when the first sound films were shown, an American pronunciation then being considered strange and even difficult to understand. This 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.

(3) Within RP, those habits of pronunciation that are mostly firmly established tend to be regarded as 'correct' while innovation tends to be stigmatized. Thus conservative forms tend to be most generally accepted, sometimes even by those who themselves use other pronunciations. Where the accentual patterns or the phonemic structure of words is concerned, this attitude may result in a speaker's use of the conservative variant in a formal situation and the use by the

⁵ The earliest recorded use of the term 'Received Pronunciation' is in Ellis (1869: 23). See discussion in Gimson (1984), MacMahon (1998) and Kerswill (2006).

⁶ For a summary of experiments on the social evaluation of RP using the matched-guise technique, see Giles *et al.* (1990).

same speaker of a less well-established variant in more casual speech, e.g. the avoidance of /verɪfəəbl/ (*verifiable*) and /'kri:tʃə/ (*creature*) in more formal speech and their replacement with the more conservative /'verɪfəəbl/ and /'kri:tʃə/. As long ago as 1910 Robert Bridges noted the pronunciation /kri:tʃə/ with coalescent assimilation (/tj/ → /tʃ/).⁷ Nevertheless, if asked, many speakers will still say they prefer /tj/ and even deny that they ever say /tʃ/ (see section (5) below).

Where variation within phonemes is concerned, most speakers are unaware of their own changing speech patterns. Objections to the use of the glottal stop are often made, its use being popularly associated with Cockney speech, and yet its occurrence as a realization of pre-consonantal /t/ is increasingly frequent within the speech of the middle and younger generations of RP speakers (see section (5) below and §9.2.8).

(4) Even within RP there are some areas and many individual words where alternative pronunciations are possible. It is convenient to distinguish three main types of RP: General RP, Refined RP and Regional RP.⁸ The last two types require some explanation. Refined RP is that type which is commonly considered to be upper-class, and it does indeed seem to be mainly associated in some way with upper-class families and with professions which have traditionally recruited from such families, e.g. officers in the Navy and in some regiments. Where formerly it was very common, the number of speakers using Refined RP is increasingly declining. This may be because for many other speakers (both of other types of RP and of regional dialects) a speaker of Refined RP has become a figure of fun and the type of speech itself is often regarded as affected. (The adjective 'Refined' has been deliberately chosen as having positive overtones for some people and negative overtones for others.) Particularly characteristic of Refined RP are the realization of /əʊ/ as [əʊ], and a very open word-final /ə/ (and where [ə] forms part of /tə, eə, uə/) and /ɪ/. The vowel /ɜ:/ is also pronounced very open, this time in all positions. The vowel /æ/ is often diphthongized as [æɪ].

While Refined RP reflects a class distinction and describes a type of pronunciation which is relatively homogeneous, Regional RP reflects regional rather than class variation and will vary according to which region is involved in 'regional'. (Hence, strictly speaking, we should talk of Regional RPs in the plural.) Some phoneticians, on the basis that part of the definition of RP is that it should not tell you where someone comes from, would regard the term 'Regional RP' as a contradiction in terms. Yet it is useful to have such a term as 'Regional RP' to describe the type of speech which is basically RP except for the presence of a few regional characteristics which go unnoticed even by other speakers of RP. For example, vocalization of dark [ɪ] to [ʊ] in words like *held* [held] and *ball* [bɔː], characteristic of Cockney (and some other regional accents), now passes virtually unnoticed in an otherwise fully RP accent. Or, again, the use of /æ/ 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. But some other features of regional accents may still be too stigmatized to be acceptable as RP, e.g. realization of /t/ by glottal stop word-medially between vowels, as in *water* (Cockney) or the lack of a distinction between /ɒ/ and /ʊ/ (Northern English).

⁷ Bridges (1910: 50).

⁸ Cf. Wells (1982: 280-3 and 297-301).

The concept of Regional RP reflects the fact that there is nowadays a far greater tolerance of dialectal variation in all walks of life, although, where RP is the norm, only certain types of regional dilution of RP are acceptable. Moreover it remains true, that most manuals and dictionaries of the pronunciation of British English, like this book, are based almost entirely on RP.

General RP, Refined RP, and Regional RP 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 RP or between RP and regional pronunciations; a speaker may, for example, generally be an RP speaker but have one noticeable feature of Refined RP.

(5) Special mention must be made of London Regional RP, because, under the name of 'Estuary English', it has provoked much discussion in the press. As mentioned under (4), London Regional RP is a modification of RP towards Cockney. The vocalization of dark [ɪ] to [ʊ] has already been noted as one of the features of this form of Regional RP. 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 is spreading 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 confirmed, Estuary English⁹ would be competing with the Regional RPs of these cities. Estuary English is said to be being adopted by those wishing to avoid the stigma of RP as 'posh' and by upwardly mobile speakers of local dialects. It is often characterized among younger speakers as having 'street credibility' or 'streetcred', i.e. as being fashionable. The phonetic features of Estuary English are discussed further in the section on London English below (§7.6.3).

(6) RP has traditionally been the type of pronunciation taught to learners of English as an L2 and that most commonly described in books on the phonetics of British English. But it has to be recognized that the role of RP in the English-speaking world has changed very considerably in the last century. Over 320 million people now speak English as a first language;¹⁰ of this number, native speakers of English form only a small proportion (and the majority of these speak some form of American English). At least another 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, RP 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 RP and General American (GA) or some amalgam or 'cut-down' version of either or both (see §13.2.3). Some sort of model based primarily on RP 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

⁹ See bibliography and collection of documents including press articles on the website of the Department of Phonetics and Linguistics, University College, London: <http://www.phon.ucl.ac.uk/home/estuary>

¹⁰ Figures from Crystal (1997: 54).

about the way in which the pronunciation of RP may be adapted to suit local and international needs.

7.4 Current Changes within RP

In this section, we survey changes in General RP which have begun approximately in the last 70 years but which a number of speakers, either small or large, have not yet embraced.

7.4.1 Changes Almost Complete

This involves pronunciations which are now typical of the large majority of speakers of General RP:

- (1) The distinction between /ɔ:/ and /ɔə/ is lost, e.g. *paw* and *pour* (or *pore*) are both /ɔ:/.
- (2) /j/ is lost following /l, s, z/, e.g. *luminous*, *suit* and *exhume* are /ˈlu:mɪnəs/, /su:t/ and /ɪgˈzu:m/.¹¹
- (3) The diphthong /eə/ is realized monophthongally as [ɛ:], e.g. *fare* and *tear* as [fɛ:] and [tɛ:].
- (4) /r/ is realized 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* as [veɪrɪ] and [ɛrə] rather than [verɪ] and [erə].
- (5) /əʊ/ is now regularly realized as [əʊ] rather than the older realization as [oʊ], e.g. *over*, *boat* and *comb* as [əʊvə], [bəʊt], [kəʊm] rather than [oʊvə], [boʊt], [koʊm].
- (6) /tj, dj/ in unaccented positions are regularly changed to /tʃ, dʒ/, e.g. *culture* [kʌltʃə], *soldier* [səʊldʒə].

7.4.2 Changes Well-established

This section describes pronunciations which are now typical of a majority of speakers of General RP:

- (1) /ɪ/ in many unaccented syllables replaced by /ə/. For this change there is, besides age variation, affixal and lexical variation, e.g. the suffix *-ity* as in *quality* now usually has /ə/, the word *palace* is variable between /pæləs/ and /pælis/, while the word *pocket* is usually pronounced /pɒkɪt/. See more detail in §8.9.2 below.
- (2) /ɔ:/ used in place of /ʊə/ in some, particularly monosyllabic, words, e.g. in *sure*, *poor*, *cure*, *moor*, *tour*. This change, like the last, is also lexically conditioned: some words, like monosyllabic *pure* as well as non-monosyllabic *curious*, *puerile*, *endure* and *secure*, are less likely to have /ɔ:/ while in others it is impossible, e.g. in *dour*, *gourd*, *lure*, *Ruhr* and *Ure*. It is also impossible in words derived from /u:/ plus a suffixal /ə/ like *doer*, *fewer*, *newer*, *two-viewer*, *sewer* (but strictly speaking this last is not analysable into root morpheme plus suffix).

- (3) Final /ɪ/ replaced by /i:/ in words like *city*, *pretty*, *happy*, *nappy*, *witty*, *smutty*, *potty*, *putty*, *hearty*, *booty*, *dirty*. Recent editions of pronouncing dictionaries transcribe this with /i:/¹² without the length marks, presumably to indicate that this final unaccented /ɪ/ is often shorter than /i:/ elsewhere (and not subject to diphthongization), cf. the final vowels in *city* [ˈsɪti] and *settee* [seˈti:], and also that it may still often have the variant /ɪ/. In a phonemic analysis this final vowel could be ascribed either to /i:/ or to /ɪ/ or regarded as a neutralized form, though we prefer to ascribe it to /i:/.
- (4) The quality of the vowel /æ/ becoming more open, 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 §7.6.4. below) although it retains greater length than the northern vowel.¹²
- (5) Preconsonantal /t/ becoming [ʔ], e.g. *not very* [nɒʔ veɪ], although such glottalization is not acceptable before /l/, e.g. *little* [lɪʔ] is considered substandard.¹³
- (6) Loss of /j/ following /n/, *news* [nu:z], *neuter* [nu:tə]. This may be under the influence of American where it is already standard.
- (7) Fronting of /ʊ, u:/ to [ʊ, u:], e.g. *soon* [su:n].¹⁴
- (8) Accented /tj, dj/ become /tʃ, dʒ/, e.g. *tune* /tju:n/, *endure* [ɪnˈdʒʊə].
- (9) The increased use of /ʒ/ in imports where formerly they were anglicized to /dʒ/, e.g. *beige*, *Khmer rouge*, *adagio*, *Zhivago*, *gigolo*, *genre*, *Beijing*.

7.4.3 Recent Innovations

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

- (1) /ɪə/ /ʊə/ realized as [ɪ:] and [ʊ:], e.g. *beer* [bɪ:], *sure* [ʃʊ:]. The latter change intersects with the replacement of /ʊə/ by /ɔ:/ (see §7.4.2 (2) above).
- (2) Unrounding of both /ʊ/ and /u:/ to [ɪ] and [i:], e.g. *good* [gɪd], *soon* [si:n]. Fronting of /ʊ, u:/ has been common in RP rather longer (as in 7.4.2 (2) above).
- (3) The overfrequent use of a 'checking' high rise on declarative sentences in conversational narratives, where some form of fall would previously have been expected, e.g. (the mark ˀ indicates the high rise) 'I was at Heath ˀrow yesterday. They've got a new duty-free shop.' This was a new trend in Australia and New Zealand some 20 years earlier, and perhaps even before that in parts of the USA. How it has spread to Britain 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.
- (4) The realization of /r/ with no upwards curl of the tongue tip, i.e. = [ʊ] or [ʌ], *red* as [ved] or [tved]. This has been described as one of the features of

¹¹ See, for example, the three major pronouncing dictionaries of British English: Wells (2000), Upton et al. (2003) and Jones et al. (2007). See also Fabricius (2002a).

¹² Hawkins and Midgley (2005) show evidence that this change was most rapid in the middle of the twentieth century but that it is still ongoing.

¹³ See Fabricius (2002b).

¹⁴ Hawkins and Midgley (2005) suggest this may have been widespread by the 1970s.

Estuary English, but it seems more likely that it is general tendency within RP and not something particularly typical of the London area.

- (5) /e/ following the lowering of /æ/ (see §7.4.2 (4) above), i.e. it is being 'pulled' downwards'.¹⁵

7.4.4 Innovations on the Verge of RP

These are mainly pronunciations which are standard in London Regional RP ('Estuary English'—see below §7.6.3) but which must be considered as on the verge of being acceptable as part of General RP:

- (1) Vocalization of dark [ɪ] as [ʊ] in a wide range of preconsonantal positions and finally, e.g. *held* [heʊd], *fill* [fiʊ], *middle* [midʊ].
- (2) Use of [ʔ] for /t/ before an accented vowel or before pause, e.g. *not even* [nɒtʔi:vən], *need it* [ni:dʔɪ], although before unaccented /i,ə/ use of [ʔ] is still stigmatized as non-RP (and typical of broad London) and is considered substandard, both intra-word and inter-word, e.g. *water* [wɔ:tʔə], *got a* [gɒtʔə], *fit it* [fi:tʔɪ].¹⁶
- (3) The use of [ə] plus non-syllabic consonant where previously a syllabic consonant has been the norm (and where the use of the [ə] was considered babylike), e.g. *garden* [gɑ:dən], *bitten* [bitən], *middle* [midəl], *bottle* [bɒtəl].¹⁷
- (4) The fronting of the second element of /əʊ/ to give [əʊ] (parallel to the fronting of /ʊ, u:/). It is not clear whether the genesis of this change is in London.

7.5 Comparing Systems of Pronunciation

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

- (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 RP contrast between /æ/ and /ɑ:/ may not be present in Ulster or Scotland, e.g. *Sam* and *psalm* are pronounced the same. The contrast between RP /ʌ/ and /ɒ/ may not be present in the English of the north of England, e.g. *put* and *pot* 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*, *ring* are pronounced as /sɪŋk/ and /sɪŋg/ and there is no minimal contrast between /g/ and /n/ as between RP *sin* and *ring* (see §7.6.4).
- (2) *distributional differences* (or different phonotactic possibilities)—The system may be the same, but the phonetic context in which a phoneme occurs

¹⁵ Hawkins & Midgley (2005) suggest this began to fall before the 1980s.

¹⁶ See Fabricius (2002b). Windsor Lewis (2007) suggests that the glottal is allowable in the latter word cases provided the vowel itself begins with a glottal, e.g. [gɒtʔə].

¹⁷ See Windsor Lewis (2007).

may be limited, e.g. in RP /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 preconsonantly and pre-pausally as well as pre-vocally, thus *part* and *car* will be pronounced /pɑ:rt/ and /kɑ:r/ (cf. RP /pɑ:t/ and /kɑ:/). The distribution of /r/ in this sort of accent more closely reflects the spelling (see §7.6.2 and §12.4.7).

- (3) *lexical differences* (i.e. different occurrences or 'incidence' in words)—The system may be the same, but the occurrence of phonemes in words is different and this difference is not simply a consequence of syllable-position as in (2) above. The English of the north of England has the opposition /u:/-/ʊ/ like RP, but nevertheless uses /u:/ in, for example, *book* and *took* (see §8.9.9). Other accents have /ʊ/ and /ʌ/ like RP but /ʊ/ is used instead of /ʌ/ in, for example, *one* and *among* (see §8.9.5). Sometimes the choice of phoneme is associated with the habits of different generations (as opposed to being purely dialectal), e.g. /ɔ:/ for /ɒ/ in *off*, *cloth* and *cross* in RP (see §8.9.7) or /eɪ/ for /i/ in *Monday* and *holiday*.
- (4) *realizational differences*—The system of contrasts is the same in two dialects but the phonetic realization of some phonemes is different. The RP opposition between the vowels of *bet* and *bat* is maintained in the English of the north of England, but the realization of both vowels is more open than it is in RP (see §7.6.4). Accents of English in Ireland, Scotland and Wales all have a phoneme /l/ phoneme occurring in the same words 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 and dark [ɫ] in all other positions.

7.6 Systems and Standards Other than RP (and their Influence on Regional RPs)

The following chapters of this book are a description of English set within the basic framework of RP, with some reference to variation in other dialects in the discussion of each of the RP phonemes. But, in order to show overall differences from RP, we will in this section briefly survey six other systems: General American, Standard Scottish English, Northern (England) English, (Broad) London English, Australian English and Caribbean English. We survey an American pronunciation because, as noted in §7.3, this is more frequently the standard model for learners of English as a second language in much of Asia and Latin America. We look at Scottish English because this is the type of pronunciation of English within the British Isles which is most frequently accepted as an alternative standard to RP. We survey Northern (England) English and (broad) London English because these are the areas (apart from Scottish) whose characteristic pronunciations are heard most widely within Britain and which often underlie regional forms of RP. We look at Australian English because this is typical of an English pronunciation of the southern hemisphere and may increasingly become the standard for an area wider than just Australia. We survey

Caribbean English because it is the first language of many islands of the Caribbean and adjoining mainland as well as having many speakers in England. Of course we could easily have made a case for the inclusion of other systems of pronunciation here (e.g. South African English and Indian English); but since this is not primarily a book about varieties of English, a limit had to be put somewhere. Moreover there are now books which survey dialectal variation in English pronunciation in detail.¹⁸ Where reference is made in this book to non-standard varieties of English, the type of pronunciation being referred to is the broad or BASILECTAL variety of the area concerned, i.e. that used by lower socio-economic classes (and often by middle socio-economic classes in informal situations).

7.6.1 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 RP) and is sometimes referred to as 'Network English' (just as RP, 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 America (e.g. Mexico).

There are two major areas of systemic difference between RP and GA. First, GA lacks the RP diphthongs /ɪə, eə, uə/ which correspond in GA to sequences of short vowel plus /r/, e.g. *beard*, *fare*, *dour*, /bɪrd/, /fɛr/, /dʊr/. This reflects the allied distributional difference between RP and GA, namely that, unlike in RP, where /r/ occurs only before vowels, GA /r/ can occur before consonants and before pause (GA is rhotic and RP non-rhotic—see §7.5 (2) above). Second, GA has no /ɒ/. Most commonly those vowels which have /ɒ/ in RP are pronounced with /ɑ:/ in GA, e.g. *cod*, *spot*, *pocket*, *bottle*. But a limited subset has /ɔ:/, 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 RP /ɒ/ and /ɑ:/ fall together but /ɔ:/ 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 RP have /ɔd/ while in GA they have /æ/. Like the change from /ɒ/ to /ɔ:/, this change commonly involves the context before a voiceless fricative or, alternatively, before a nasal followed by another consonant thus RP /pɑ:st/-GA/pæst/, RP /aɪftə/-GA /æftər/, RP /plɑ:nt/-GA /plænt/ (this difference from RP is the same as in the north of England). Allied to the pronunciation of /r/ in preconsonantal positions mentioned in the previous paragraph, there is considerable re-alignment of vowels before /r/, so that *merry* and *marry* may be pronounced the same while

short and *sport* may have different vowels (/ɔ:/ in the former and [o:] corresponding to RP /ɔ:/ in the latter).

Differences of realization are always numerous between any two systems of English pronunciation and only the most salient will be mentioned. Among the vowels this includes the realization of the diphthongs /eɪ/ and /əʊ/ as monophthongs [e:] and [o:], hence *late* [le:t] and *load* [lo:d]. Among the consonants, /t/ is either phonetically [t̪], i.e. the tip of the tongue is curled further backwards than in RP, or else a similar auditory effect is achieved by bunching the body of the tongue upwards and backwards; /t/ intervocally following an accent is usually a voiced tap in GA, e.g. *better* [bɛtə] and may sometimes become [d] producing a neutralization between /t/ and /d/; and /l/ is generally a dark [ɫ] in all positions in GA, unlike RP where it is a clear [l] before vowels and a dark [ɫ] in other positions (see §9.7.1).

A wholesale change in the realization of the short vowels in GA is increasingly reported, sometimes called the 'Northern Cities Shift',¹⁹ although it now seems more widely spread than this. The vowel principally affected by this shift is /æ/ which becomes closer to [e] or [eə], or even [e] or [eə]. This affects both those words like *sad* which have /æ/ in RP and those words like *after* where the GA /æ/ corresponds to /a:/ in RP.

7.6.2 Standard Scottish English (SSE)

There are nowadays taken to be three languages in Scotland: Gaelic, Scots and (Scottish) English. 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 RP distinctions between /ɑ:/ and /æ/, between /u:/ and /ʊ/, and between /ɔ:/ 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 RP /e:/ while most such words have a vowel of an [e] quality, a small group of words have a vowel of an [ɛ] quality, e.g. *heaven*, *eleven*, *next*.

SSE also has no /ɪə, eə, uə/ because, like General American, it is rhotic, and *beard*, *fare* and *dour* are pronounced as /bɪ:rd/ /fɛr/ (= [fɛ:r]) and /dʊ:r/ (= [dʊ:r]). Some speakers will also have different sequences of vowel plus /r/ corresponding to RP /ɜ:/ in *bird*, *serve* and *turn*; others have the same r-coloured schwa [ə] in such words. Rhoticity in SSE is declining with many speakers now only semi-rhotic (e.g. pre-pausal and preconsonantal /r/ may be treated differently). Moreover the lexical incidence of vowels before /r/ may not correspond to RP: *short* and *sport* may have different vowels as in GA, *short* rhyming with *caught* but *sport* with *boat*.

¹⁸ In particular, Wells (1982), Foulkes & Docherty (1999), Trudgill (1999).

¹⁹ See Labov (1991).

The vowel in *fare* which we transcribed /feɪ/ above with the RP diphthong /eɪ/ is typically monophthongal [e:] (and of course would be transcribed as such if we were devising a phonemic transcription independently for SSE). The vowel /əʊ/ is also monophthongal [o:] (and again would be transcribed as such in an independent transcription) as in *coat* [ko:t]; so the vowels in *fare* and *coat* are similar to those in General American. Moreover, the vowel common to *soot* and *suit* is not like either of the RP vowels in these words, but is considerably fronted to something like [y], hence [syt]. More generally there is no systemic durational difference between long and short vowels, as there is in RP.

The chief differences from RP in the realization of the consonants lies in the use of a tap [ɾ], e.g. *red* [red] and *trip* [trɪp], though there is variation between this and [ɹ] (the usual type in RP), the use of [ɹ] being more common in post-vocalic positions and generally more prestigious. The phoneme /l/ is most commonly a dark [ɫ] in all positions, *little* [tɪtl], and *plough* [plɔ:ɫ]. Finally, intervocalic /t/ is often realized as a glottal stop, e.g. *butter* [bʌʔə].

7.6.3 London English

The basilectal speech of London is called Cockney. Unlike 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 the working class of London than is its vocabulary; this type of pronunciation we henceforth refer to as popular London or broad London.

Unlike the previous two types of pronunciation there are no differences in the inventory of vowel phonemes between RP 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 realization. The short front vowels tend to be uniformly closer than in RP, 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 diphthongization of /i:/ (= [əi]), /u:/ (= [əu]), and /ɔ:/ which varies between [əu] morpheme-medially and [əwə] morpheme-finally, thus *bead* [bɛəd], *boot* [bɔ:ət], *sword* [sɔ:əd], *saw* [sɔ:wə]. Broad London speech also uses distinctive pronunciations of a number of diphthongs /eɪ/ = [əi], /aɪ/ = [əi], /əʊ/ = [əu], and /aʊ/ = [a:]; e.g. *late* [laɪt], *light* [laɪt], *load* [ləud], *loud* [ləud]. The last two vowels are close enough to cause considerable confusion among non-London listeners, although the distinction is not usually neutralized. In two cases special allophones are used before dark [ɫ] (which itself = [ʊ]—see below): /əʊ/ = [əu] and /u:/ = [u:] (is monophthongal compared with the usual [əu]), e.g. *bowl* [bɔ:u], *fool* [fɔ:u]. Before the vocalized form of /l/ there is much neutralization, e.g. *field* and *filled* as [fɪud], *col* and *coal* as [kɔ:u], and *pull* and *pool* as [pu:u].

Among the consonants most notable are the omission of /h/ and the replacement of /θ, ð/ by /f, v/, e.g. *hammer* [fæmə], *think* [fɪŋk], *father* [fɑ:və]. Dark [ɫ], i.e. /l/ in positions not immediately before vowels, becomes vocalic [ʊ], e.g. *milk* [mɪʊk], *middle* [mɪdʊ]; /t/ is realized as a glottal stop following vowels, laterals and nasals

e.g. *butter* [bʌʔə], *eat* [i:ʔ], *not that* [nɔ:ʔ ðæt], *benefit* [benɪfɪʔ], *belt up* [beʊʔ ʔp]; there may be similar replacement of /p, k/ before a following consonant, e.g. *soapbox* [səʊʔbɒks], *technical* [tɛʔnɪʔʊ] (in this last word [ʊ] as the realization of /l/ still counts as a consonant); and there is coalescence of /t, d/ + /j/ to /tʃ, dʒ/, e.g. *student* [stju:dnɪʔ], *during* [dʒuərɪŋ], but elision of /j/ following /n/, e.g. *news* [nu:z].

Popular London speech has historically been the major influence on the phonetic development of RP and, as has been outlined in 7.3 (5) above, London Regional RP, i.e. a hybrid between General RP and broad London, popularly called Estuary English,²⁰ 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 [ɫ] by [ʊ], e.g. *field* [fɪud]; the glottalization of /t/ pre-consonantly, e.g. *not that* [nɔ:ʔ ðæt] and increasingly word-finally before pause and before a following vowel, e.g. *not that* [nɔ:ʔ ðætʔ], *eat ice* [i:ʔ ʔaɪs]; the use of London-type realizations of the diphthongs /eɪ, aɪ/ and London-type allophones before /l/, e.g. *cold* [kɔ:ʊd], *cool* [ku:ʊ]; and the coalescent forms of /tj, dj/ together with the elision of /j/ following /n/, e.g. *tune* [tʃu:n], *June* [dʒu:n], *new* [nu:].

Other broad London sounds are less likely in Estuary English, e.g. /h/-dropping, monophthongization of /əʊ/, the wide diphthong in /əʊ/, fronting of /ʌ/, the use of glottal stop for /t/ intervocalically as in [wɔ:ʔə] 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 General RP: the realization of /r/ without a tongue-tip contact, i.e. [ʊ] or [ʊr]. and the replacement of /s/ by /ʃ/ where it is initial in consonant clusters, e.g. *stop*, *stare*, *industry*, *strain*, *obstruct* as [stɒp], [stɛə], [ɪndʌʃtri:], [ʃtreɪn], [əbʃtrakt].

One intonational characteristic of Cockney 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*). A similar spreading usage is that 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'.

7.6.4 Northern English (NE)

While there is relative homogeneity in a broad Cockney accent but much less so in General American and Standard Scottish English, the label Northern English is even less homogeneous (strictly speaking, the label should be Northern England English). We use it here simply to identify those things which the disparate pronunciations 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

²⁰ See Przedlaska (2002a) for evidence that Estuary English does not present a coherent new accent replacing RP.

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 like /i:/ in *night*, and /æ/ in *long*.

The major identifying feature of this area is the loss of the distinction between RP /o/ and /ɒ/, the single phoneme varying in quality from [o] to [ɔ]. So Northern English has no distinction between *put* and *putt*, *could* and *cut* and, for many speakers, between *buck* and *book* (although others may use /u:/ in the latter word). Hypercorrections are often made by those attempting Regional RP producing, for example, *sugar* [ˈʃʌgə], *pussy* [ˈpʌsi], *put* [pʌt]. Almost as identifying a characteristic is the change-over in lexical incidence from /ɑ:/ to /æ/ in words with a following voiceless fricative (or a nasal followed by a further consonant), as in General American, e.g. *past* /pæst/, *laugh* /læf/, *aunt* /ænt/. Another type of lexical incidence concerns the occurrence of a full vowel in prefixes where RP has /ə/, e.g. *advance* /ædˈvæns/, *consume* /kənˈsjʊ:m/, *observe* /ɒbˈzɜ:v/. The short vowels are generally realized with more open qualities than RP, e.g. *mad* [mad] and the diphthongs /eɪ/ and /əʊ/ are commonly monophthongal [e:] and [o:] 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 /u:/ and /ɑ:/ (the distinction between /æ/ and /ɑ:/ being carried by length alone). Vowel incidence in the final syllable of *city*, *pretty*, *usually* etc. varies between /i:/ in, for example, Liverpool, Hull and Newcastle and /ɪ/ in Manchester and Leeds.

Other vowel changes (compared with RP) characteristic of particular areas include the loss of the /eə/-/ɜ:/ distinction in Liverpool (the local accent is called Scouse) and its common realization as [œ:], e.g. both *fare* and *fur* are pronounced [fœ:]; a similar neutralization and realization of /eə/ and /ɜ:/ in Hull where another notable feature is the monophthongization of /əʊ/ to [ɜ:]; the realization of /au/ as [u:] in broad Newcastle (where the local accent is called Geordie) while /u:/ itself becomes [ɪə], e.g. *about* [əˈbu:t], *boot* [biət]; and the use of a particularly close /ɪ/ 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 Northern English is the realization of /t/ as [t̪] in a number of conurbations including Leeds, Liverpool and Newcastle and the lack of the RP allophonic difference between clear [l] and dark [ɫ], clear [l] being used in all positions in many areas, e.g. Newcastle, and dark [ɫ] in others, e.g. Manchester. In a quite extensive area from Birmingham to Manchester and Liverpool the RP 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) are realized as ejectives.

7.6.5 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 Regional RP. The broad accent described here shares many features with basilectal 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 RP and not an extensive number of words involved in differences of incidence. It is the

realization of long /ɑ:/ as [a:] which more than any other identifies ANE, e.g. *father* [ˈfɑ:ðə], *part* [pɑ:t] (thus, for example, making it distinctively different from South African English). Words which in RP have /ɑ:/ before clusters of nasal plus another consonant, e.g. *dance*, *advantage*, *chance*, vary between /æ/ and /ɑ:/ (= [a:]) in ANE; pronunciations with [a:] are by some considered prestigious, by others affected. Like Cockney, /i:/ and /u:/ are realized as [əi] and [əu]; and the short front vowels are all closer than RP, the distance between /æ,e,i/ being thus reduced (compare this with New Zealand where /æ,e/ are equally raised and /ɪ/ becomes [i], almost indistinguishable from /ə/).

In its diphthongs ANE is again like Cockney in having /eɪ/ = [aɪ] and /aɪ/ = [oɪ], and in having a convergence of quality of /əʊ/ and /aʊ/; however, diphthongs in /əʊ/ are monophthongized, so /əʊ/ = [ɜ:], *clear* [kli:ɜ:] (leading to an accumulation of three vowels, /i:/ /ɪ/ and [ɪ:] in the close-front area), /eə/ = [e:] *fare* [fe:] while /uə/ is either replaced by /ɜ:/ as in *sure* or becomes dissyllabic as in *sewer* [ˈsɜ:ə].

Although ANE, in its broader form, does drop /h/, it does not use glottal stop nor does it vocalize /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,²¹ 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 §7.4.3 and §11.6.3 below).

7.6.6 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 basilectal variety generally referred to as a creole (a creole being a first language which has been derived from a pigeon) to an acrolectal variety which approaches RP and can be regarded as a type of Regional RP. What is described here is the basilectal creole variety. There are few descriptions of the English accent of most of the islands;²² only Jamaica has been the topic of a number of articles and books.²³

The most obvious characteristic of the vowel system is that it is like that of RP rather than that of General American. The second most obvious characteristic is the absence of /ə/, this vowel usually being replaced by /æ/ (although sometimes by other full vowels), e.g. *father* [ˈfɑ:væ], *woman* [ˈwɒmæn]. Replacement of [ə] by [æ] also occurs in the second part of the diphthongs ending in [ə], although the three diphthongs ending in [ə] of present-day RP are regularly reduced to two: corresponding to RP /ɪə/ and /eə/ is a diphthong approximating to [eæ], e.g. *beer* [beæ] and *pear* [peæ] and corresponding to /uə/ (and some words which in RP have /ɜ:/ where older forms of RP had /ɔə/) is [ɜæ], e.g. *sure* [ʃɜæ]. /eɪ/ and /əʊ/ are generally realized as monophthongs [e:] and [o:], the latter often very close to

²¹ Guy et al. (1986), Britain (1992).

²² The only overall attempt at a description is in Wells (1982).

²³ E.g. Le Page and DeCamp (1960) and Cassidy (1961); see also Wells (1973).

/aʊ/ pronounced [oʊ], so *load* [lo:d] and *loud* [bʊd]. /ʌ/ remains unfronted as [ɔ] as it was in older RP.

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 /tʃ,dʒ/, e.g. *cheese* and *trees* both as [tʃi:z] and *draw* and *jaw* both as [dʒɔ:]. /h,ʒ,v/ are also absent: /h/ is dropped as in many British accents, /ʒ/ is replaced by /dʒ/ or less commonly by /f/ and /v/ may be replaced by /b/ (or occasionally /w/), e.g. *river* [ɪbæ]. 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 RP—see §12.4.6 (2)). The pronunciation of /r/ post-vocalically is variable in the Caribbean though a majority of speakers probably follow RP in being non-rhotic; some, particularly Jamaicans, may be semi-rhotic (e.g. /r/ is present word-finally in *hear* but not preconsonantly in *weird*). Additionally there are some allophonic preferences, notably /l/ being always a clear [l] and the palatalization of /k,g/ before front vowels, e.g. *king* [kɪŋ] and *begin* [beɪn].

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 first language accents of English. The contrasts are established by the commutations possible in series such as those shown in Table 2.

/i:/	heed	feel	bead	pea	
/ɪ/	hid	fill	bid		except
/e/	head	fell	bed		
/æ/	had		bad		
/ɑ:/	hard		bard	par	
/ɒ/	hod		bod		
/ɔ:/	hoard	fall	board	paw	
/ʊ/	hood	full			
/u:/	who'd	fool	booed	pooh	
/ʌ/			bud		
/ɜ:/	heard	fur	bird	purr	
/ə/					accept
/eɪ/		fail	bayed	pay	
/aɪ/	hide	file	bide	pie	
/ɔɪ/		foil	buoyed		
/əʊ/	hoed	foal	bode	po	
/aʊ/	how'd	foul	bowed	pow	
/ɔɪ/			beard	peer	
/eə/	haired		bared	pair	
/ʊə/				poor	

Table 2 Contrasts in vowels established by commutation

A general phonetic assessment of the qualities of these vowels in RP, in terms of the Cardinal Vowels (see §4.4.2), is made below, with examples in word-final and word non-final positions:

Final	Non-final	Quality	Notation
I Short			
city ¹	bid	centralized, raised [e]	i
—	bed	between [e] and [ɛ]	e
—	bad	just above [a]	æ
—	bod	C.[ɒ]	ɒ
—	hood	centralized, raised [o]	ʊ
—	bud	central, open-mid	ʌ
sitter	accept	central, mid	ə
II Long (relatively pure)			
pea	bead	lowered [i] or [ii] or [ij]	i:
pooh	bood	centralized [u] or [uu] or [uw]	u:
par	bard	centralized [ɑ]	ɑ:
paw	board	raised [ɔ]	ɔ:
purr	bird	central, mid	ɜ:
III Long (diphthongal glides, with prominent first element)			
(a) glide to [i]			
pay	fail	lowered [e] → [i] above	eɪ
pie	file	between [a] and [ɑ] → [i]	aɪ
coy	foil	[ɔ] → [i]	ɔɪ
(b) glide to [u]			
bow (archery)	bowed	[ə] above → [u] above	əʊ
bough	bowed	between [a] and [ɑ] → [u]	aʊ
(c) glide to open-mid [ə]			
peer	beard	[i] above → [ə] above	iə
pair	bared	[e] → [ə]	eə
poor	moored	[u] → [ə]	ʊə

Notes

(1) The length of the vowel /æ/ varies considerably and is often almost as long as that of the long vowels. Length is dependent on individual speaker's usage, on the context, and on the characteristic pronunciation of particular words (see §8.9.4). Because of this variation and because the distribution of [æ] is like that of the other short vowels, the vowel is included in the table of short vowels.

(2) Of the short vowels, it is to be noted that [ə] occurs only in unaccented syllables.

(3) The so-called pure vowels of *bee* and *do* frequently contain a glide between two distinct elements, especially in final position. Nevertheless, because the glide is relatively short and because a non-gliding vowel is not uncommon or thought to be un-English, these two vowels may on phonetic grounds be included in the 'long, pure' list.

¹ Final /t/ has now been replaced in all but the oldest RP speakers by [l] which is to be analysed as an allophone of /l:/—see §8.9.2 (2).

(4) Some (usually older) speakers of RP 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/.

(5) The diphthong /eə/ is increasingly monophthongized to [e:]; see §8.12.2 (3).

(6) A vowel glide [ui] exemplified by such words as *ruin*, *fluid*, *suet*, is of extremely rare occurrence within one syllable, though it may occur as a reduced form of [u:] + the suffix *-ing*, i.e. in the case of the juxtaposition of two syllables, e.g. in *doing*. The sequence [u] + [i] may also occur across word boundaries as a result of smoothing e.g. *two in* [tuɪn]. Since this diphthong carries such a low distinctive weight, and since it may be analysed as dissyllabic, it may be regarded phonemically as a sequence of /ʊ/ plus /i/.

(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*.

8.2 Vowel Glides with a Non-prominent First Element

We find that the sounds (semi-vowels) [j] and [w] regularly occur in positions preceding most of the above basic vocalic elements:

[j + i]	Yiddish	[w + ɪ]	wit
[j + e]	yet	[w + e]	wet
[j + æ]	yap	[w + æ]	wax
[j + ɒ]	yacht	[w + ɒ]	watch
[j + ʊ]	you (weak form)	[w + ʊ]	wood
[j + ʌ]	young	[w + ʌ]	won
[j + ə]	failure	[w + ə]	were (weak form)
[j + i:]	yeast	[w + i:]	week
[j + u:]	youth	[w + u:]	woo
[j + ɑ:]	yard	[w + ɑ:]	waft (one pronunciation)
[j + ɔ:]	yawn	[w + ɔ:]	wall
[j + ɜ:]	yearn	[w + ɜ:]	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 <i>wind</i>)
[j + ɪə]	year	[w + ɪə]	weir
[j + eə]	yeah	[w + eə]	wear
[j + ʊə]	lure	[w + ʊə]	wooper

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 short vowel or long, relatively pure, 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 vocalic glide, 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 cases such as the [j] in *tune* or the [w] in *queen* tend to be voiceless and to have the friction which is phonetically characteristic of a consonant. 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.

Notes

It is possible, in the same way, to express the brief [i] and [u] elements occurring post-centrally in the diphthongal glides as consonantal /j,w/ following a simple syllabic element. Thus, if [i:] and [u:] are interpreted as glides and [ui] similarly included, the following statement may be made: [i:] = /ij/, [ei] = /ej/, [a:] = /aj/, [ɔ:] = /ɔj/, [ɔi] = /ɔj/, [əu] = /əw/, [aʊ] = /aw/, [u:] = /uw/, with, in addition, the following possibilities of /j/ or /w/ preceding and following the central syllabic element: /ji/, wij, jej, wej, waj, jɔj, wɔj, jəw, wəw, waw, juw, wuw/. In the present treatment of RP vowels, however, such post-central [i,u] 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 pre-central /j,w/;
- (2) they are in RP very weakly articulated (compared with pre-central /j,w/) and may correspond to monophthongal pronunciations in many other accents, e.g. /e/ may be [e:] or [e:];
- (3) they have none of the fricative (phonetically consonantal) allophones characteristic of pre-central /j,w/ following /p,t,k/.

8.3 Glides to [ə]

Similarly, glides to [ə] are treated here as composite vocalic units, since in general RP [ə] combines with a syllabic vowel element only after [i,e,u] and may with some RP speakers be realized merely as a lengthening of the preceding syllabic vowel element.

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:

<i>bid</i> and <i>bead</i>	/i-i:/
<i>good</i> and <i>food</i>	/u-u:/
<i>cad</i> and <i>card</i>	/æ-ɑ:/

<i>cod</i> and <i>cord</i>	/ɒ-ɔ:/
(<i>for</i>) <i>ward</i> and <i>word</i>	/ɔ-ɜ:/

Notes

(1) Only in the case of /ə/-/ɜ:/ can there be said to exist an opposition solely of length and even in this case it has to be stated that /ə/ occurs only in unaccented syllables, whereas /ɜ:/ 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 carries the greater contrastive weight. Indeed, in the particular case of the *cad/card* opposition, both vowels may be equally long.

(3) In a transcription which sets out to show explicitly certain phonetic characteristics, it is definitely necessary to indicate the qualitative difference, at the same time noting quantity by means of the length mark.

(4) 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:

- /i:/ in *beat* is only about half as long as the /i:/ of *bee* or *bead* and may, in fact, be of approximately the same length (duration) as the /i/ vowel of *bid*;
- /u:/ in *boot* is only about half as long as the /u:/ of *do* or *food* and has about the same duration as the /u/ vowel in *good*;
- /ɔ:/ in *caught* is only about half as long as the /ɔ:/ in *cord* or *saw* and has about the same duration as the /o/ in *cod*.

The length of /ɜ:/ and /ɑ:/ varies in the same way before voiceless and voiced, although the length relationships to /ə/ and /æ/ are more complex because /ə/ only occurs in unaccented syllables and because of the varying length of /æ/ mentioned in §8.1 Note (1).

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

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

(6) 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 voiced consonants and before voiceless consonants.

(7) One study² showed the duration of English vowels in different phonetic contexts as follows (measured in 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

² Wiik (1965). Gonet and Stadnicka (2006) give comparable figures for citation forms but show the differences much less in connected speech.

(8) /æ/ is not here included in the category of short vowels, because of the special length often associated with it (see §8.1 Note (1) and §8.9.4), but is classified separately as 'neutral'. The following are the measurements for /æ/: +voiced fricative, 25.2 csecs; +voiced plosive, 21.6 csecs; +nasal, 19.6 csecs; +voiceless fricative, 16.5 csecs; +voiceless plosive, 15.0 csecs.

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

/i:/ + voiced fricative, 36.0 csecs; /i:/ + voiced plosive, 28.5 csecs; /i:/ final (not including words like *city*, which vacillate in RP between final /ɪ/ and /i:/), 28.0 csecs; /i:/ + nasal, 19.5 csecs; /ɪ/ + voiced plosive, 14.7 csecs; /ɪ/ + voiceless fricative, 13.0 csecs; /ɪ:/ + 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 /i:/ is typically shorter in a word such as *seat* (12.3 csecs.) than /ɪ/ in a word such as *hid* (14.7 csecs.).

(10) 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 [i:] and short [ɪ]. However, historically the long vowels underwent the Great Vowel Shift (see §6.2.1), 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-microscopic* 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) /i:/-/e/ *hero-heroine, serene-serenity, athlete-athletic, sheep-shepherd, intervene-intervention, extreme-extremity, obscene-obscenity, supreme-supremacy, compete-competitive, sincere-sincerity, discrete-discretion, cease-cessation*
 (3) /eɪ/-/æ/ *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-phonetic, 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 generalized 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 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 Romanization, i.e. the degree to which symbols giving phonetic detail about the most frequent allophone are replaced by their nearest Roman symbols, e.g. /ɪ/ instead of /ɪ/ in *red*. The transcription of vowels in this present book does not carry the Romanization principle very far, i.e. it continues to show the phonetic quality of vowels in its choice of symbols; thus for example, using the Romanization 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 RP /ɒ/ is a rounded open 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 RP vowels has ranged from the comparative phonemic of the present book to a simple phonemic transcription where the Romanization principle is fully implemented. Such a simple phonemic system has been popular at various times and uses /l:,l,e,a,ɑ:,o,ɔ:,u,ʊ:,ɹ,ə,ɜ:,eɪ,ai,oi,ou,au,iə,eə,uə/ for the 20 vowels listed in §8.1. A variation on these symbols uses double letters instead of the length mark to indicate long vowels, e.g. /aa/ instead of /a:/ in *card*. Almost all other transcriptions of RP vowels represent some degree of Romanization lying between this fully Romanized 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 /ou/ (or, more commonly, /ou/) which again is a deliberate attempt to represent a different pronunciation (see under §8.10.4).

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 RP and GA are represented (GA has no /ɒ, ɪə, eə, uə/ (see §7.6.1)), and, second, in the representation of monophthongal realizations of the vowels in *in play* and *gout* as /e/ and /o/ (which enforces the representation of the equivalent of RP /e/ in *set* as /e/). 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 /i:/, and the second element in closing diphthongs is shown as /j/ or /w/, e.g. /aj/ for /ai/ and /əw/ for /əu/ (this usage was discussed in §8.2).

In conclusion, the transcription of the vowels of RP 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, æ, ɒ, ʊ, ə/ are given different symbols from the long vowels /i:, ɑ:, ɔ:, u:, ɜ:/ 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.

8.6 Acoustics of RP Vowels

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

³ Values for Tables 3 and 4 are taken from Deterding (1990, 1997). Those in Table 5 were computed in the Phonetics Laboratory, Department of Linguistics, University of Manchester; details can be obtained from the author, The Phonetics Laboratory, 41 Wellington Square, Oxford OX1 2JF.

connected speech shows that the values for connected speech represent vowels considerably less peripheral (more centralized) 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.

Pure vowels				
	F1		F2	
	Male	Female	Male	Female
/i:/	275	319	2,221	2,723
/ɪ/	382	432	1,958	2,296
/e/	560	645	1,797	2,287
/æ/	732	1,011	1,527	1,759
/ʌ/	695	813	1,224	1,422
/ɑ:/	687	779	1,077	1,181
/ɒ/	593	602	866	994
/ɔ:/	453	431	642	799
/ʊ/	414	414	1,051	1,203
/u:/	302	339	1,131	1,396
/ɜ:/	513	650	1,377	1,593

Table 3 Formant frequencies for RP (relatively) pure vowels (in citation form)

Diphthongs								
	First component				Second component			
	F1		F2		F1		F2	
	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
/eə/	538	691	1,864	2,210	655	751	1,594	1,883
/ʊə/	426	420	1,028	1,157	587	485	1,250	1,258

Table 4 Formant frequencies for RP diphthongs (in citation form)

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

Table 5 Formant frequencies for RP (relatively) pure vowels in connected speech

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;5) 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] (= /æ/) are likely to occur next, e.g. /i:/ and /u:/. 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 /æ/ vs /ʌ/, /i:/ vs /ɪ/, /u:/ vs /ʊ/, /ɔ:/ 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 largest category of vowel system in the world's languages

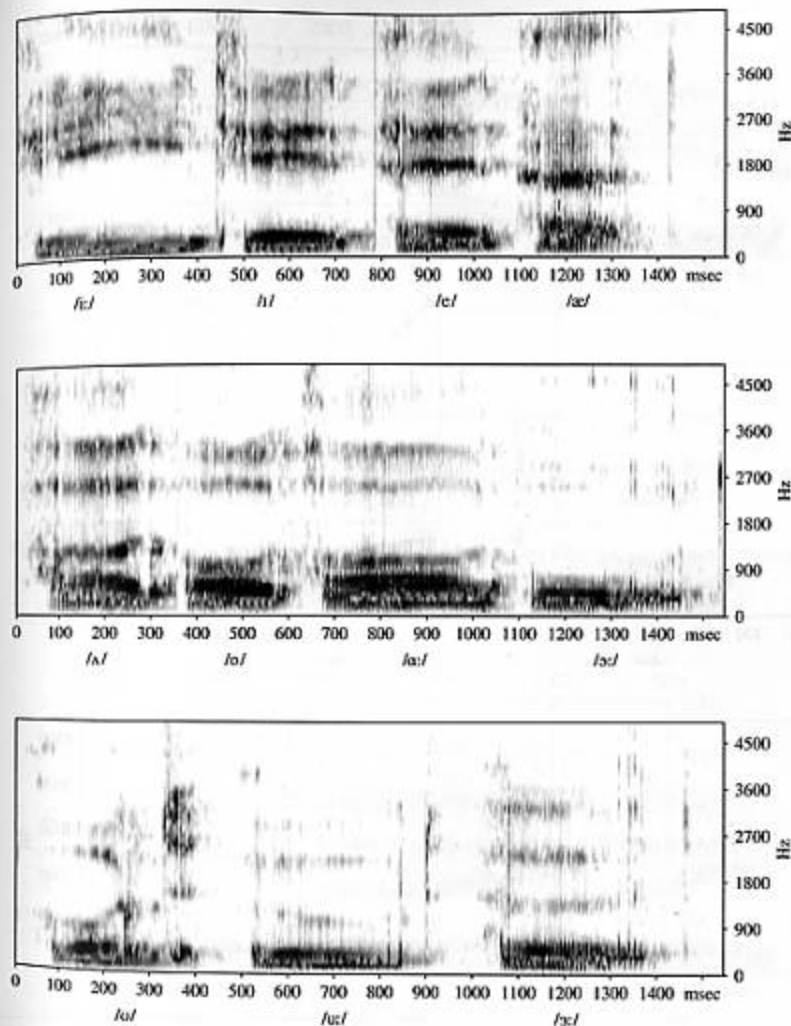


Figure 8 Spectrograms of the RP relatively pure vowels in the frame *lh—dl* as spoken by a male speaker of RP.

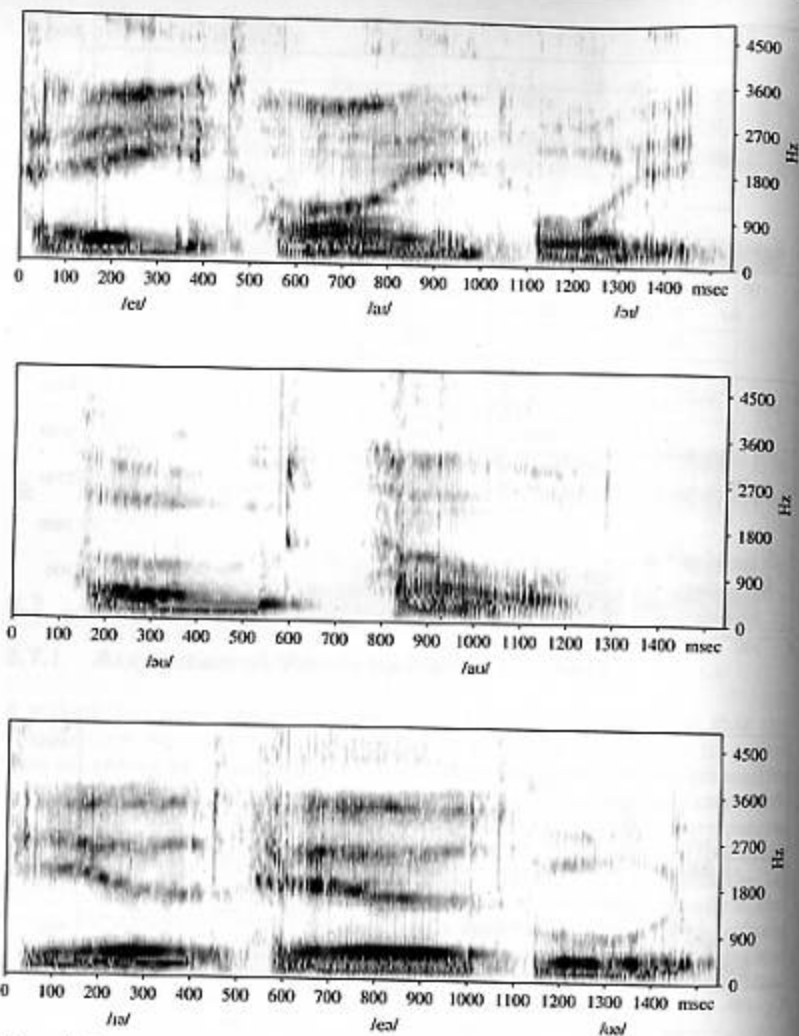


Figure 9 Spectrograms of the RP diphthongs in the frame *th—d* as spoken by a male speaker of RP.

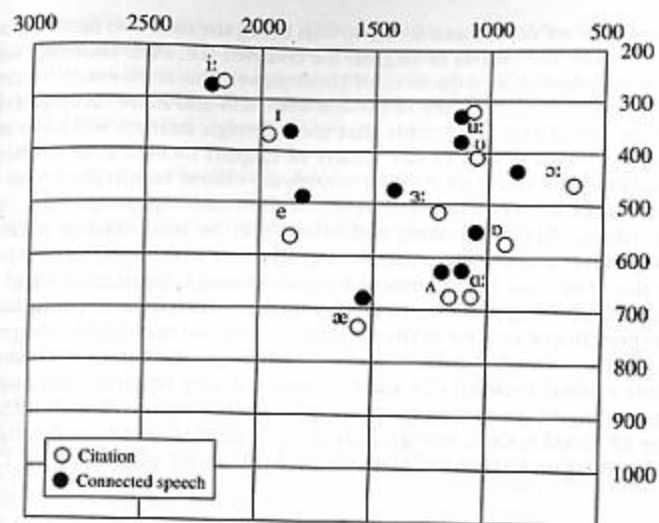


Figure 10 Formant frequencies for RP pure vowels said in citation form and in connected speech (male speakers).

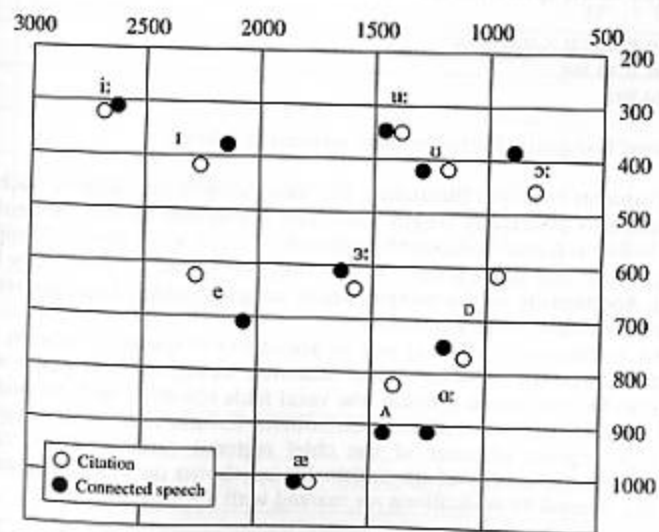


Figure 11 Formant frequencies for RP pure vowels said in citation form and in connected speech (female speakers).

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 RP. 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: /i:/, /e/, /æ/, /a:/, /ɒ/, /ɑ:/, /ɔ:/, /u:/, /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 leads to confusion with /ɔ:/. The presence of an <r> in the spelling of /ɪə, eə, 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 /æ/ and /a/. Because of such difficulties with the RP 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 RP vowel phonemes will be treated in a sequence based upon their quality relationships, i.e.

/i:/, /e/, /æ/, /a:/, /ɒ/, /ɑ:/, /ɔ:/, /u:/, /ʊ/, /ɜ:/, /ə/
 /eɪ/, /aɪ/, /əʊ/, /aʊ/
 /ɪə, eə, ʊə/

Each vowel is organized 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 [ɫ]. 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 Cardinal Vowels. (In all cases, unless otherwise stated, the soft palate will be assumed to be in its raised position, the vocal folds vibrating, and the tongue tip behind the lower teeth.) Remarks on distributional features in the word and syllable.

(3) A description of some of the chief regional variants. These variants together with the main variants within RP are shown on vowel diagrams, on which the General RP realizations are marked with a *.

⁴ Maddieson (1984: 126) estimates 21.5% as having five vowels, 13.6% six vowels, 10.7% seven vowels, with only 4.1% having over 17.

(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 RP; 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 spellings associated with the vowel (in which TF = Text Frequency and LF = Lexical Frequency);
 (b) the main historical origins of the vowel.

8.9 (Relatively) Pure Vowels⁵

8.9.1 /i:/

(1) Examples

Long [i:]—see, seed, seen; fee, feed, fees

Reduced [ɪ]—seat, feet, piece, lease, beef, reach

Compare [i:], [ɪ]—bead, beat; seize, cease; leave, leaf; liege, leash; Eden, eaten

Before [t]—feel, meal, field, eels

Variation between [i:]-/ɪ/finally—city, lady, sloppy, happy, charity, memory

Spellings of /i:/			
	Examples	TF	LF
ee	tree, cheese, canteen, see, seed, fee, feed, beef, feet, feel, eel		
e	complete, be, these, Eden		
	e, ee	64%	64%
ea	leaf, reason, sea, reach, seat, bead, beat, cease, leave, leash, eaten, leave, meal	25%	20%
i	machine, police, prestige, suite		
ie	piece, field, siege, liege		
	i, ie	7%	1%
ei, ey	seize, receive, key		
Note (1): quay, people			
Note (2): y (finally /i:/ or /ɪ/), e.g. city, lady, sloppy, happy, charity, memory			

⁵ In the vowel diagrams * indicates principal RP realizations. For meanings of abbreviations in the sections on Sources, see footnote 4 to §6.2.

(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. The quality is nearer to C.[i] (with the glide mentioned below) than to C.[e]. /i:/ does not normally occur in a syllable closed by /ŋ/. The vowel is often noticeably diphthongized, especially in final positions. A slight glide from a position near to [i] is common among RP 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.

The use of a pure vowel in final position is typical of Refined RP. Among many speakers of RP, /i:/ is increasingly used finally in words like *city*, *lady*, *sloppy*, *happy*, etc. (Fig. 12). See further under /i/ below.

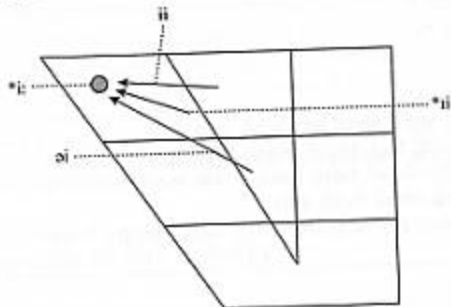


Figure 12 Variants of /i:/.

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

Sources of /i:/

OE [e:]	ME [i:]	
		cheese, sleeve
OE [eə]		deep, thief
OE [e:]		deed, needle
OE [o:]		geese, green
OE [i] in open sylls		week
OE [e] before [tð]		field
OF [ie], AN [e:]		siege, niece, grief

Note: Later adoptions include *esteem*, *canteen*, *machine*, *routine*

(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 diphthongization which is typical of RP, 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 [i].

8.9.2 /i/

(1) Examples

Compare [i:], /i/—feel, fill; seen, sin; bead, bid

[i], /i/—least, list; reach, rich; sheep, ship; week, wick; feet, fit

[i:], [i], /i/—seed, seat, sit; league, leak, lick; seized, ceased, cyst

Before [t]—will, hill, milk, built, film, kiln

Variation between /i:/-/i/finally—city, lady, sloppy, happy, charity, memory

Spellings of /i/

	Examples	TF	LF
i	fifth, rich, sit, with, fill, will, milk, built, film, kiln, sin, list, rich, ship, wick, fit, sit, lick	61%	61%
e	pretty, needed, wicket, wicked, except, careless, houses, England	16%	16%
y (inc. final y)	rhythm, symbol, cyst, city, lady, sloppy, happy, charity, memory	20%	21%
a	village, private	2%	1%
ie	ladies, cities		

Note: build, Sunday etc., business, women, minute (time)

(2) *Description*—The short RP vowel /i/ 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 /i:/), with the side rims making a light contact with the upper molars. The quality is that of a centralized C.[e]=[ē]. /i/ may occur in all positions in the word.

The degree of closeness and centralization varies according to the accentual force falling upon the vowel and its position in the word (cf. the realizations of /ɪ/ in the word *visibility*, those of syllables 2 and 4 being somewhat more centralized and that of the final syllable showing considerable variation from lower than close-mid (and even open-mid for refined RP, i.e. [ɛ̃]) at one extreme to something well above close-mid at the other). Indeed, in such final unaccented positions, e.g. in *city*, *lady*, *memory*, *coffee*, /ɪ/ is increasingly replaced by a short variety of /i:/ by many speakers. (The contrast between /ɪ/ and /i:/ is in any case neutralized in word-final positions, so no ambiguity arises from such pronunciations.) The latest editions of standard pronouncing dictionaries transcribe such words with [i], and thus avoid equating it either with /ɪ/ or /i:/.⁶ Some Refined RP speakers will diphthongize /ɪ/ towards [ə] particularly in accented monosyllables, i.e. in *big*, *did*, *thin*, *wish*, etc.

A trend towards /ə/ in non-final unaccented syllables, traditionally having /ɪ/, is becoming increasingly noticeable among RP speakers of the middle and younger generations.

- (a) In some terminations, /ə/ is now more common than /ɪ/, e.g.
- ity: /-əti/ rather than /-iti/ as in *sincerity*, *quality*, etc.
 - itive: /-ətiv/ rather than /-itiv/ as in *positive*, *fugitive*, etc.
 - ily: /-əli/ rather than /-ili/ (especially after /t/) as in *merrily*, *primarily* and also *easily*, *happily*, etc.
 - ate: Often /-ət/ rather than /-it/ as in *fortunate*, *chocolate*, etc. (Words such as *magistrate*, *candidate* sometimes also have /-ət/ as a third possibility.)
 - ible: /-əbl/ (as for *-able*) rather than /-ibl/ as in *possible*, *visible*, etc.
 - em: /-əm/ rather than /-im/ or /-em/ as in *problem*, *system*, *item*, etc.
- (b) In the case of other weak syllables, both /ɪ/ and /ə/ are heard from RP speakers, e.g.
- ess: /-ɪs/ or /-əs/ as in *useless*, *goodness* (/ə/ being preferred by the younger generation); in cases where *-ess* is strongly felt as a feminine suffix, e.g. *goddess* /es/, may be used.
 - ace: /-ɪs/ or /-əs/ as in *necklace*, *palace*, *preface*, with an increasing tendency to /-əs/.
- (c) In other cases, /ɪ/ remains dominant, e.g. *-age*: predominantly /-ɪdʒ/ in *manage*, *village*, etc. (Recent French borrowings such as *barrage*, *camouflage*, etc., tend to have /-ɑ:(d)ʒ/.)
- et: predominantly /-it/ especially following /k, g, tʃ, dʒ/ as in *pocket*, *target*, *hatchet*, *budget*, etc. However, the endings *-let*, *-ret* often have /-ət/, as in *bracelet*, *scarlet*, *claret*, *garret*, etc.
 - be-: /ɪ/ is more common than /ə/, as in *begin*, *between*, *become* (though in *believe*, *belong*, *behave*, etc., /ə/ is often heard).
- (Note: Although *se-*, as in *sedition*, *select*, may sometimes have /sə-/ rather than the more usual /si-/; *de-*, as in *deposit*, *deny*, *desire*, etc., is almost invariably with /di-/.)

In the preceding cases, no significant oppositions between /ɪ/ and /ə/ were involved. Where an opposition exists, it might be expected that there would be

some pressure to retain the /ɪ/-ə/ distinction, as in the inflected forms *offices* /-ɪz/ vs *officers* /-əz/ or *chatted* /-ɪd/ vs *chattered* /-əd/. The neutralization of this opposition is typical of several non-RP forms of English, but the opposition is still generally maintained by RP speakers. On the other hand, potential oppositions between /ɪ/ and /ə/ in such pairs as *effect*, *affect* and *except*, *accept* are commonly lost in favour of /ə/ and /ɪ/ respectively (Fig. 13).

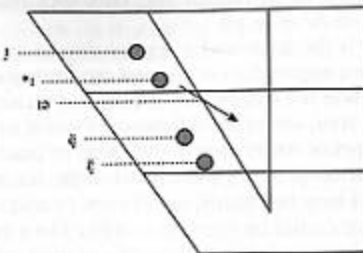


Figure 13 Variants of /ɪ/.

(3) *Regional variants*—Regionally the use of a very close /ɪ/ (= [i]), 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 shortened form of /i:/ (= [i]) in RP; 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/.

(4) *Advice to foreign learners*—It is very important that a proper qualitative relationship should be maintained between /i:/ and /ɪ/. Many languages have a short

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

⁶ Wells (2000), Jones et al. (2006). Fabricius (2002a) finds the final vowel quality to be often halfway between /i:/ and /ɪ/.

variety of [i], e.g. French, Italian, but one which is likely to be too tense and close for the English /i/; others, e.g. Polish, Russian, have a centralized type of [i] which has too much of an [ə] quality for English; others, e.g. German, have a type of [i] near to the English variety but yet 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 /i/) 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 /i/ as in *bit*.

Of equal importance is the quantitative relationship of /i:/ and /i/. Once the correct quality of /i/ has been acquired, most learners can distinguish *bead* [bi:d] from *bid* [bid], where the distinction is a complex of quality and quantity. But an opposition of the sort *beat* [bit] - *bit* /bit/, where the difference of vowel length is insignificant, is more difficult. Three types of vowel should, therefore, be practised: close, tense, long [i:] (*bead*); close, tense, short [i] (*beat*); and the half-close, lax, short [ɪ] (*bit*, *bid*).

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

The fact that /i/ occurs very frequently in unaccented syllables should also be noted, since an unreduced vowel in the weak syllables of such words as *village*, *waited*, *fountain*, *describe* may seriously deform the accentual pattern. The learner may use either [i] (i.e. a shortened form of /i:/) or /ɪ/ for the ending <y> in *pity*, *ability*, *memory*, etc.

8.9.3 /e/

(1) Examples

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

Spellings of /e/			
	Examples	TF	LF
e	bed, set, went, ten, well, desk, net, wretch, red, fell, sell, else, health, elm, held	84%	96%
ea	breath, dead, head	6%	3%
a	many, Thames		
Note: says, said, bury, Geoffrey, Leicester, friend, ate, again			

(2) *Description*—For the short RP /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 /i/; the tongue may have more tension than in the case of

/i/, the side rims making a light contact with the upper molars. The quality lies between that of C.[e] and that of C.[e]=[ɛ] or [ɛ]. The General RP variety of /e/ tends to be closer to C.[e] than to C.[ɛ].⁷

A diphthong from a closer position [e] in the direction of [ə] is typical of Refined RP, e.g. *men*, *said*, *get* pronounced as [me^ən, se^əd, ge^ət]. Such diphthongization is often characterized as 'affected'. /e/ does not occur in final open syllables, although in word-final position in Refined RP and in some dialects the quality of /i/ may encroach on that of /e/ (Fig. 14).

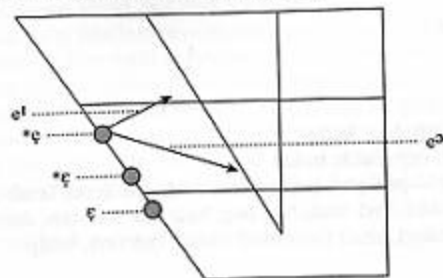


Figure 14 Variants of /e/.

(3) *Regional variants*—A closer variety of /e/ is heard in Australia, 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* [be^d, le^g]. A more open type of /e/ at or slightly below C.[e] is used in the north of England.

Sources of /e/

OE [e]	ME [e]	bed, neck, edge, best
OE [e:]		fed, met
OE [e:ə]		theft, friend
OE [æ:]		let, ever, flesh
OE [y](Kentish [ɛ])		bury, merry
OF [ɛ]		debt, press, accept, second, member
	ME [ɛ:]	bread, death, deaf
	eModE [ɛ]	Leicester, said, says

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

⁷ Hawkins and Midgley (2005) suggest it became more open during the latter half of the twentieth century.

(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. A foreign learner may in such cases equate English /e/ with one or other of his own vowels; this risks confusion with /ɪ/ if a C.[e] quality is used, e.g. by Arabic speakers, or with /æ/ if a C.[ɛ] quality is used, e.g. by Cantonese, German and Hindi speakers. He should therefore aim to produce a vowel intermediate between the two qualities.

8.9.4 /æ/

(1) Examples

Long [æ:] bad, cab, bag, badge

Reduced [æ] bat, cap, back, batch

Compare /e/, /æ/—pet, pat; peck, pack; said, sad; lend, land; merry, marry

/ɪ/, /e/, /æ/—bid, bed, bad; big, beg, bag; tin, ten, tan; miss, mess, mass

Before [ʃ]—alphabet, shall (accented form), balcony, scalp

Spellings of /æ/			
	Examples	TF	LF
a	hand, lamp, macho, marry, rash, sat, pat, pack, sad, tan, land, merry, marry, bad, bag, tan, mass, cap, cab, bat, back, badge, batch, alphabet, balcony, scalp	99%	99%
Note: 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 midway just above open, with the side rims making a very slight contact with the back upper molars; the lips are neutrally open. This vowel has become more open recently, previously being nearer to C.[ɛ] where now it is now close to C.[a].⁸ Only tradition justifies the continuing use of the symbol 'æ' for this phoneme. 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 neutralization of /æ/ and /ʌ/. More often, however, the lowering of /æ/ has resulted in a retreat of /ʌ/ towards the central region. This lowering also brings RP /æ/ nearer to its equivalent in Northern (England) English, although it remains

⁸ 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 even confirmed by Harrington *et al.*'s (2000) study of the Queen's Christmas broadcasts from the 1950s to the 1980s.

considerably longer. Even more recently there are reports that RP /æ/ is backing as well as being more open (and hence may be driving /ʌ/ further back and perhaps raised as well).⁹

This traditionally short vowel is now generally longer in RP 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*; /æ/ in these contexts is almost equivalent to the long vowels, so *badge* /bædʒ/ and *barge* /bɑ:ʒ/ have vowels of similar length. Moreover some RP speakers in the south of England appear to have a contrast between short /æ/ and long /æ:/ which shows up in a limited number of minimal pairs like *jam* (to eat) (and probably also *jamb*) as [dʒæm] and *jam* (of traffic) [dʒæ:m]. Potential minimal pairs involve *land* (n) and *land* (vb), *banus* and *bans* and *champ* (=champion) and *champ* (at a bit).

Speakers of Refined RP and older speakers of General RP generally have a closer variety of /æ/ almost at the level of C.[ɛ] which may also be diphthongized to [e*], hence *bad, bag* as [be'd, be'g] or [be*d, be*g] (cf. similar diphthongization of /ɪ/ and /e/): such speakers may also produce /æ/ with considerable constriction in the pharynx, the tongue itself having more tension than is the case for /e/ (Fig. 15). But see §§13.4.2 and 13.5.2 if the target is not RP.

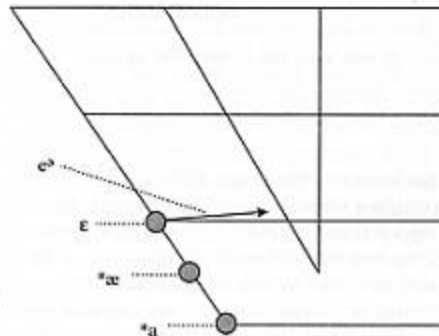


Figure 15 Variants of /æ/.

(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 diphthongization to [e*] (like Refined RP; indeed a closer realization of the three front vowels is typical of Australian, London and Refined RP). The north of England generally has a fully open pronunciation [a] like RP, but is noticeably different from RP in not having the length associated with this vowel in RP; in this area /æ/ is no longer than the other short vowels. Also in the north of England words which have /a:/ plus a voiceless fricative or nasal plus another consonant in RP are pronounced with /æ/, hence *past, after*,

⁹ Fabricius (2006), Kamata (2006).

bath, *dance* /pæst, ˈæftə, bæθ, dæns, dɪˈmænd/; this variation also applies to General American, where such words are also prone to raising to [e], 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 /æ/ and /ɑ:/; thus the words *can* and *calm* will have the same vowel (of intermediate length) between C.[a] and C.[ɑ].

Sources of /æ/

OE [æ,ɑ]	ME [a]	
		sad, back, apple; man, cat
OE [e:ə]		shadow, shank
OE [æ:ɑ:]		ladder, mad; hallow
ON [ɑ]		flat, anger
OF [a]		lamp, manner, passage
OF [au]		salmon, savage
Note: OE [w] + [æ] > /æ/ in <i>wag</i> , <i>wax</i> , <i>twang</i> , but > /ɔ/ in <i>watch</i> , <i>quality</i> , <i>water</i>		

(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/–/æ/–/ʌ/. The opposition /e/–/æ/ may be emphasized by making use of the length component of RP /æ:/ 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 /æ/ like the typical <a> vowel in those languages which only have one (central) vowel in the open region (e.g. in those languages, like many in the Bantu group, which only have a five- or seven-vowel system). /æ/ must be kept fully front and, if necessary, above C.[a] if confusion with /ʌ/ and even /ɑ:/ is to be avoided (e.g. by Arabic speakers).

8.9.5 /ʌ/

(1) Examples

Compare /æ/, /ʌ/—*cat*, *cut*; *lamp*, *lump*; *match*, *much*
 /ɑ:/, /ʌ/—*cart*, *cut*; *barn*, *bun*; *march*, *much*
 /ɒ/, /ʌ/—*cot*, *cut*; *fond*, *fund*; *wander*, *wonder*
 /ɜ:/, /ʌ/—*curt*, *cut*; *fern*, *fun*; *turf*, *tough*
 Before [ʃ]—*dull*, *result*, *pulse*, *bulge*, *bulb*

Spellings of /ʌ/

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

(2) *Description*—The short RP /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. The quality is that of a centralized and slightly raised C.[a]=[ɚ] (the IPA symbol for a vowel in this region is [ɚ]; /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 /æ/.¹⁰ /ʌ/ does not occur in final, open, syllables. Alternation between the vowels /ʌ/ and /ɒ/ may be heard within RP in words where the letter <o> is followed by a nasal consonant, e.g. *accomplish*, *combat*, *comrade*, *conduit*, *constable*, *Montgomery*. Refined RP has a variety of /ʌ/ which is more of a back vowel (= [ɚ]) although this variety is increasingly heard in General RP, again reflecting the avoidance of a clash with the opening of /æ/ (Fig. 16).

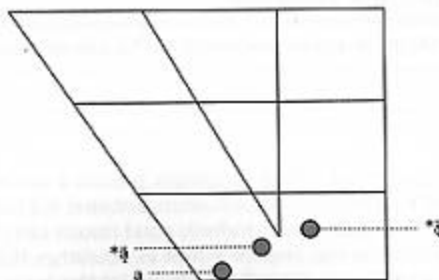


Figure 16 Variants of /ʌ/.

¹⁰ Fabricius (2006) presented evidence that /ʌ/ is now backing and rising among middle-class speakers.

(3) *Regional variants*—Popular London has a vowel further forward and more open, approaching C.[a]. In the north of England 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 RP. /ʊ/ and thus it can be said that NE has no /ʌ/. Some Regional RP speakers from the north of England (see §7.6.4) may, in adopting /ʌ/, use the vowel in words which even in RP have /ʊ/, e.g. *butcher* /ˈbʌʃə/, *cushion* /ˈkʌʃn/, *sugar* /ˈʃʌɡə/. 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 /u:/ in the north of England, e.g. *look*, *cook*, *book* /lu:k, ku:k, bu:k/. 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]	sun, love, nut, ugly
OE [u:]		us, husband, utter, enough, scum
OE [y]		blush, much, such
OF [u]		cousin, touch, dozen, colour, cover
OF [o] before nasals		front, uncle, comfort, money
OF [y]		just, judge, public, study
	ME [o:]>[u:]>[ʊ]	flood, blood, done, month, glove, mother

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

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

(4) *Advice to foreign learners*—Most languages possess a vowel of the [a] or [ʌ] type; this sound will be spelt <a> if the Roman alphabet is used. The English /ʌ/ should be related to this quality and, indeed, good results can often be obtained in teaching by transcribing the English vowel as /a/ rather than with the traditional /ʌ/ symbol. In this way prejudice induced by the frequent orthographic spelling with <u> or <o> is avoided; if the quality thus obtained is too fronted, it may be modified in the direction of /a:/. A proper qualitative distinction should be maintained between the vowels in words such as *match*, *much*, *march*, *ban*, *bun*, *ban*; *hat*, *hut*, *heart*. There should be no lip-rounding such as might

produce a type of front open-rounded [æ] or confusion with lip-rounded /ʊ/ (this common among Arabic speakers).

8.9.6 /ɑ:/

(1) Examples

Long—bar, far, farm, large, hard

Reduced—dart, last, raft, lark, arch

Compare [ɑ:], [a]—card, cart; parse, pass; carve, calf; large, larch

/ɑ:/, /ʌ/—cart, cut; harm, hum; march, much; lark, luck; dance, dunc

Before [t]—snarl, gnarled, Charles

Spellings of /ɑ:/

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

Note: reservoir, repertoire, memoir

(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. The quality is nearer to C.[a] 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 [ɪ] of *beat* may be of similar length to the /i/ of *bit*, the

reduced [a] of *cart* is somewhat longer than the short /ʌ/ of *cut*. /ɑ:/ does not normally occur before /ŋ/. A variety of /ɑ:/ retracted near to the quality of C.[ɑ] is typical of Refined RP and in some words a pronunciation with /ɑ:/ rather than /æ/ is typical of Refined RP, e.g. in *gymnastic* and *Atlantic*. It should also be noted that smoothing of the sequences [aɪə] and [aʊə] (*fire, tower*) may produce a new long vowel [ɑ:] or this may fall together with /ɑ:/—see §8.11 (Fig. 17).

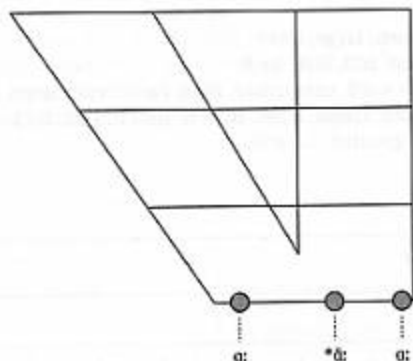


Figure 17 *Variants of /ɑ:/*.

(3) *Regional variants*—A quality near to C.[ɑ] 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 /ɑ:/ may thus lead to neutralization between /ɑ:/ and /æ/.

Where an /ɑ:/ is followed in RP by a voiceless fricative or by a nasal plus a second consonant, General American and the north of England have /æ/, e.g. in *laugh, pass, branch, advance*. (Australian has the variation but limited to the nasal plus consonant words.) Such a pronunciation may be allowable as part of a Regional RP, particularly if the /æ/ is given the extra length usual in RP but not usual in northern England. In many dialects including General American and that of south-west England RP /ɑ:/ corresponds in a number of words to /ɑ:/ + /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 §7.5). This also applies to Standard Scottish English but here in addition the remaining instances of RP /ɑ:/ fall together with /æ/ and there is thus no contrast between these words, *cam* and *calm*, *Pam* and *palm* being pronounced equivalently.

Although RP /ɑ:/ followed by a voiceless fricative or a nasal plus second consonant generally corresponds to /æ/ in northern English, the reverse is not true, that is, there are examples where RP itself has /æ/ in these contexts, e.g. *passage, finance, gas, romance*. In such words hypercorrections may sometimes be heard from speakers of Regional RP, e.g. /'pɑ:sɪdʒ, fɪ'nɑ:ns, gɑ:s, rəʊ'mɑ:ns/. In a number of other words RP is undecided; thus *lather, transfer, elastic, plastic*, are words in which either /æ/ or /ɑ:/ may be heard.

Sources of /ɑ:/

OE [æ]	ME [a]+[r]	charm, march
OE [e]	ME [e]+[r]	far, star, heart
OF [e]		farm, clerk, sergeant
	ME [a] before [f,θ,s]	staff, after; path, bath; pass, ask, cast; father, rather
OF [ā]	ME [ou]>[ɔ:]	aunt, branch, command, chant
	ME [a]+[t]	half, calf, palm, balm
Note (1): Recent imports from Fr. and It.: <i>charade, moustache, memoir, sonata, tomato, drama, saga</i>		
Note (2): Recent optional monophthonging of [aɪə, aʊə] > [ɑ:], e.g. <i>fire, tower</i> (see §8.11)		

(4) *Advice to foreign learners*—Many languages do not have a qualitative opposition, in the relatively open region, of the English /æ/-/ɑ:/ type. The retracted nature of RP /ɑ:/ should be insisted upon to distinguish it from /æ/ 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 /ɑ:/ is shown in the spelling by vowel letter <r>, and if the target is RP, 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 nasalization in words of French origin which suggest modern French forms, e.g. *branch, plant*, etc.

8.9.7 /ɒ/

(1) Examples

Compare /ɒ/, /ɑ:/—lodge, large; cot, cart; cough, calf; impossible, impassable
/ɒ/, /ɔ:/—cod, cord; don, dawn; stock, stalk
Before [t̪]—doll, involve, revolver, solve

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

(2) *Description*—This short vowel is articulated with wide open jaws and slight open lip-rounding; the back of the tongue is in the fully open position, no contact being made between the tongue and the upper molars. The quality is that of an open lip-rounded C.[ɒ], i.e. secondary C.[ɒ]. /ɒ/ does not occur in a final, open syllable. The realization of /ɒ/ varies very little within RP. A small number of words prefer /ɔ:/ in Refined RP, e.g. *off, cloth, across, gone* (Fig. 18).

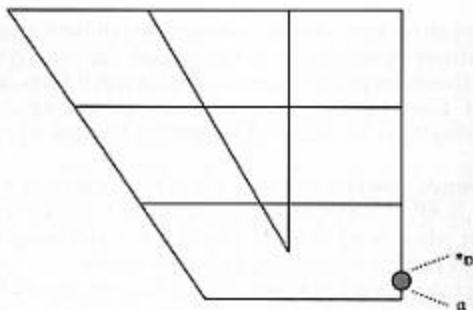


Figure 18 Variants of /ɒ/.

(3) *Regional variants*—Like Refined RP, basilectal London speech uses /ɔ:/ in *off, cloth, across, gone*. Otherwise there is also little variation within Britain, such variation as there is generally involving unrounding to [ɑ] as in south-west England; in such cases /ɒ/ and /ɑ:/ may be kept apart only by length (although, as noted under /ɑ:/ above, /ɑ:/ often = [ɑ:]). In General American the contrast between /ɒ/ and /ɑ:/ is lost, both *bomb* and *balm* being pronounced with a vowel similar to RP /ɑ:/. However, a smaller group of words with /ɒ/ in RP may have /ɔ:/ 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 RP /ɒ/ fall together with /ɔ:/, the quality being nearer to the latter

RP vowel; thus *cot* and *caught*; *not* and *nought*; *nod* and *gnawed* will all be pronounced with /ɔ:/ (though the vowel will be shorter than that in RP). In other cases RP /ɒ/ corresponds to Scottish /ɔ:/ while RP /ɔ:/ corresponds to /ɔ:/ plus /r/ (Scottish English generally being rhotic), hence *cod* /kɔ:d/ but *cord* /kɔ:rd/.

Sources of /ɒ/

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

Note (1): ME [ɔ] before [f, θ, s] and nasals was lengthened in the eighteenth century but has reverted to the shorter vowel; archaic pronunciations remain for *across, broth, gone, lost, off* (see under (3) above)

Note (2): /ɒ/ is used in some recent French borrowings, e.g. *restaurant, fiancé* /'restrɒnt, fi'ɒnsɛ/

(4) *Advice to foreign learners*—Short back open vowels occurring in other languages often differ from the English /ɒ/ in that either they are somewhat closer or more centralized, or are pronounced with stronger lip-rounding. The extremely open nature of the English vowel can be emphasized by relating it to /ɑ:/ in words such as *part, large, calf* and adding shortening and lip-rounding (although the lip-rounding must only be slight). The shortness of /ɒ/ also keeps it distinct from /ɔ:/. Confusions between the three vowels /ɒ, ɑ:, ɔ:/ are common, e.g. by Cantonese, Hindi and Spanish speakers.

8.9.8 /ɔ:/

(1) Examples

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

Spellings of /ɔ:/

	Examples	TF	LF
ar, or, ore	war, quart; cord, horse, born; before, more	25%	35%
our	court, four	8%	4%
oar, oor	oar, board, door, floor		
	Total preceding /t/	39%	43%
au(gh)	fault, cause, daughter	11%	27%
a(l)	talk, all, salt, water	34%	15%
aw	saw, lawn, jaw, yawn, awesome	9%	12%
ou	bought, ought		
oa	broad		
	Total not preceding /t/	61%	57%
ure	sure, pure, cure (alternative to /uə/)		
Note (1): <i>sword</i>			
Note (2): Spelling <or> usually corresponds to /ɔ:/ but /ɔ:/ in <i>worse, worst, word, work, worm</i>			

(2) *Description*—This relatively long RP 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. The quality lies between C.[ɔ] and C.[o], i.e. [ɔ] or [o]. /ɔ:/ does not normally occur before /ŋ/.

Until relatively recently there was a contrast between /ɔ:/ and /ɔə/ in RP, so that *saw* and *sore* were pronounced differently. Nowadays this contrast is generally not made, except by some older speakers. A number of words which formerly had only /uə/ in RP have now acquired an alternative pronunciation with /ɔ:/, e.g. *sure, poor, your* (Fig. 19).

(3) *Regional variants*—Words which formerly had /ɔə/ are often words derived from [ɔ] or [ɔ:] plus /t/, as reflected in the spelling; rhotic dialects like General American and Scottish English will therefore have a shorter vowel plus /t/ in words like *horse, cord, war*. In non-rhotic dialects other than RP, /ɔə/ may nevertheless be kept distinct from /ɔ:/, e.g. in some parts of the north of England. In Standard Scottish English /ɔ:/ covers both RP /ɔ:/ and RP /ɔ/, no contrast being made between these two vowels; thus *cot* and *caught* are pronounced the same.

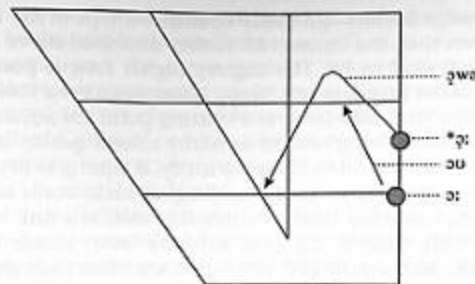


Figure 19 Variants of /ɔ:/.

However, a number of pairs of words are still kept apart by the presence of /t/, e.g. *cod* /kɔ:d/ *cord* /kɔ:rd/. There is also no distinction between /ɔ:/ and /ɒ/ in General American. Words which have /ɒ/ in RP usually have /ɑ:/ in GA but a minority have /ɔ:/, e.g. *across, trough, coffee*. The quality of the vowel in General American is generally more open (= [ɔ:]) than in RP. In general, dialectal variation in /ɔ:/ is small; most notable is the diphthong or triphthong of popular London speech, where /ɔ:/ = [ɔʊ] in morpheme-non-final positions, but [ɔwə] in morpheme-final positions, cf. *board* [bɔəd] and *bored* [bɔwəd].

Sources of /ɔ:/

OE [a] + [w]	ME [aʊ]	thaw
OE [a] + [y]		law
OE [æ:] + [x]		taught
OE [a] + [v]		hawk
OE [a ^h] before [t]		all, fall, call, talk, walk
OF [ā] or [a] + [o, u]		cause, autumn, sauce, haunt, lawn
OF [a] + [v]		saunter, laundry
OE [ɑ:, ɔ:, o:] + [x]	ME [ɔʊ]	ought; bought, wrought; thought, brought, daughter
	ME [a, a:] following [w]	water, quart, warn, warm
	ME [ɔ:, ɔ:, o:, u:] + [r]	short, horse; force, board; sword, floor; fourth, mourn, pour

Note: Loss of [t] in *talk, walk* occurred later (possibly seventeenth century)

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

The spelling forms of /ɔ:/ often cause difficulty. If aiming at RP, no <r> should be pronounced where it occurs in the spelling of such words as *part, 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* /pɔ:r `aut/. Words having /ɔ:/ 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 /ɔ:/ should be insisted upon, especial care being taken to keep a proper distinction between /ɔ:/ and /ɔu/ in such pairs as *caught, coat; saw, sew*.

8.9.9 /ʊ/

(1) Example

Compare /ʊ/, /u:/—full, fool; wood, wooed
 /ʊ/, /ɔ:/—could, cord; wood, ward
 Before [t]—full, pull, wool, wolf

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

Note: worsted, Worcester

(2) *Description*—The short RP 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 /i/; the tongue is laxly held (compared with the tenser /u:/), no firm contact being made between the tongue and the upper molars. This vowel has moved forward recently¹¹ and there is an increasing tendency for this vowel to be unrounded; if the lips are rounded at all, a close but loose rounding is involved. The quality is that of a centralized C.[o]=[ö] or [y] or (with unrounding) centralized C.[ɜ]=[ɝ] or [i]. The unrounding is particularly noticeable in the common word *good* [gʊd] or [gɪd], and also in *should, could* and, to a lesser extent, *would*. (But the unaccented forms of these last three words very often have /ɔ/ 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, would*. /ʊ/ does not occur in word-initial positions nor before final /ŋ/ and finally only in a (nowadays relatively rare) unaccented form of *to* /tʊ/ and *you* /ju/. In some words there is a variation between /ʊ/ and /u:/, e.g. *room, groom, broom, tooth*, the commoner phoneme being /u:/ (Fig. 20).

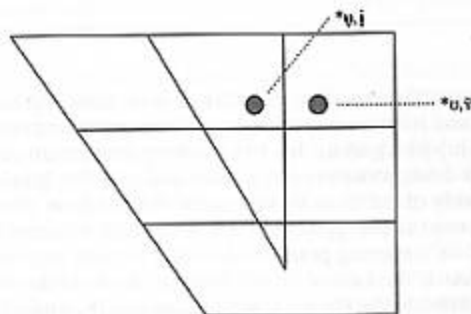


Figure 20 Variants of /ʊ/.

(3) *Regional variants*—Throughout the north of England no contrast is made between /ʊ/ and /ʌ/, a vowel in the region of /ʊ/ occurring for both the RP vowels (see §§7.6.4 and 8.9.5). A form of [ɜ] represents /ʊ/ and /ʌ/ in some northern regional speech, e.g. *butcher* ['bʃtʃɜ]; and again, in some northern speech, many words spelt with *oo* have /u:/, e.g. *cookery book*. In Standard Scottish English the opposition /ʊ/-/u:/ is neutralized, a fronted [uː] being used for both, so that *pull* and *pool* have a similar vowel quality.

¹¹ Hawkins and Midgley (2005) present acoustic evidence to show that the fronting of /ʊ,u:/ may have been general by the 1970s.

Sources of /ʊ/

OE [u]	ME [u]	bosom, bull, could, full, pull, put, should, wolf, woman, wood, wool, would
OF [u]		bullion, butcher, courier, cushion, pullet, pulley, push, sugar
OE [o:]	ME [o:]	book, cook, foot, good, hood, hook, look, nook (only ME), rook, shook (eighteenth century), stood, wood, wool

Note (1): ME [u] regularly developed to /ʊ/ but remained [u] in some words with a labial or a velar, e.g. *bull, put, wolf*

Note (2): ME [o:] regularly developed to /u:/ but shortened to /ʊ/ in some words. These still have /u:/ in 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 /i:/ and /ɪ/ presented three oppositions involving complexes of quality and quantity, [i:]–[i]–[ɪ], so /ʊ/ has to be distinguished from /u:/ sometimes by quality alone (*foot–boot*), sometimes by quality and quantity (*good–food*). If the target is RP, the quality of /ʊ/ must be kept quite distinct from that of the reduced form of /u:/; 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 centralization 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 /u:/ is less difficult once the distinction /ʊ/–reduced /u:/ is established (see following section for comparative exercises).

8.9.10 /u:/**(1) Examples**

Long [u:]—two, blue, food, move

Reduced [u]—boot, fruit, hoof, group, douche, hoop

Compare [u:], [u]—shoe, shoot; rude, root; lose, loose; use (v.), use (n.);
nude, newt; Jews, juice

[u:], /ʊ/—food, good; pool, pull

[u], /ʊ/—boot, foot; loop, look

Before [t]—cool, rule, schools, fooled

Spellings of /u:/

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

Note: In the spellings u, eu, ew, ue, ui /u:/ is preceded by /j/, e.g. *argue, neuter, new, hue, nuisance*; in some cases both /u:/ and /ju:/ are heard, e.g. *suit, enthusiasm*

(2) *Description*—RP long /u:/ is a close back vowel with varying degrees of centralization, lowering and unrounding. Two types occur within General RP: (i) a more centralized monophthongal vowel [ü:] or [u:] or, with unrounding, [u:] or [i:]; and (ii) a short diphthong [uɪ] or [iʊ] (this being particularly common in final position, e.g. *do, shoe, who*). A fully back and round C.[u:] is typical of Refined RP, but may sound rather comic. The centralization of /u:/ is greatest following /j/ in all types of RP, e.g. in *youth, beauty, cute*, as is a more monophthongal and back [u:] before [l], e.g. in *tool, school, rule* (Fig. 21).

The relationship of /u:/ to /ʊ/ is similar to that between /i:/ and /ɪ/, the articulation of /u:/ being tense compared with that of /ʊ/, though no firm contact is made between the tongue and the upper molars. /u:/ does not normally occur before /rj/.

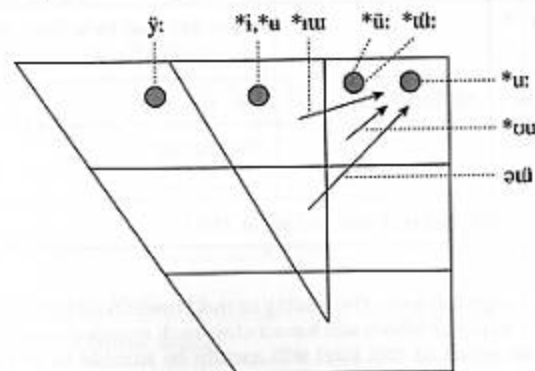


Figure 21 Variants of /u:/.

(3) *Regional variants*—Increased diphthongization and unrounding are characteristic of a number of other dialects. Popular London has diphthongs of the type [əu] and [yü] with little, if any, lip-rounding. Diphthongization of the former variety is also typical of Australian English. As mentioned under the section on /u:/, SSE loses the contrast between /u:/ and /ʊ/, the common vowel being in the region of [ü] or [y]; in some cases the lip-rounding may be only slight, so that the distinction between /u:/ and /ʊ/ 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 /u:/ and /ju:/		
/u:/		
OE [o:]	ME [o:]	doom, soon, to, tool, goose
ON [o:]		root, boon
OE [w] + [ɑ:]		womb, whom, two
OF [o:]		fool, prove, proof
Note (1): [o:] > [u:] by around 1550		
Note (2): Fr. imports with [u:] later than ca. 1400 kept [u:], e.g. <i>route, routine, group, soup</i>		
Note (3): Fr. imports with final <i>-on</i> [-ō] finally have [u:], e.g. <i>platoon, balloon, saloon, typhoon</i>		
/ju:/		
OE [i,e,æ] + [w]	ME [iu,eu,y:] > [ju:]	Tuesday, hue; you, knew
OF [iu,eu,y,ui]		adieu, lieu; due, view; duke, accuse, deluge; suit, pew, nuisance
OE [e,æ,æ:] + [w]	ME [eu] > [eu] > [ju:]	few, dew, hew
Late OF (post 1400) [eu]		feud, neuter
Note: All these sounds had coalesced on [ju:] 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 RP centralization or diphthongization should be imitated only with caution, since any

exaggeration of the movement will produce an effect which may be judged dialectal. The centralization of /u:/ following /j/ need not 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 centralization of this vowel in RP; 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 realization of English /u:/ and Japanese learners of English should introduce some lip-rounding.

More difficult is the relationship of fully long [u:], reduced [u] and short [ʊ] as in *food, boot*, and *foot*. It should be noted, for instance, that *use* (v.) [jü:z] 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.

8.9.11 /ɜ:/

(1) Examples

Long [ɜ:]—*fur, burn, bird, urge*

Reduced [ɜ]—*first, earth, worse, church*

Compare—[ɜ:], [ɜ]—*cur, curt; heard, hurt; surge, search; purrs, purse;*

Thursday, thirsty; serve, surf

Before [t]—*earl, curl, world, girl*

Spellings of /ɜ:/

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

(2) *Description*—RP /ɜ:/ is articulated with the centre of the tongue raised between close-mid to a mid position, no firm contact being made between the tongue and upper molars; the lips are neutrally spread. The quality is, therefore, remote from all peripheral Cardinal Vowel values. /ɜ:/ being the only accented vowel in the central area, there is considerable individual variation in its realization, with variations from close-mid to open-mid.

The quality of /ɜ:/ often coincides with that of /ə/, the difference between the two being only one of length. Since /ɜ:/ 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 /ɜ:/ occurs in unaccented syllables and is not reducible to /ə/, e.g. in *commerce* /'kɒmə:z/, cf. *commas* /'kɒməz/, and indeed most speakers have a minimal pair between *foreword* /'fɔ:wɜ:d/ and *forward* /'fɔ:wəd/. Moreover most words which have /ɜ:/ in their citation form do not reduce this vowel to /ə/ when they occur unaccented in connected speech, e.g. *Now it's my turn, he said* (but note that *were, her* and *sir* can be reduced to /ə/).

A pronunciation somewhat below open-mid is characteristic of Refined RP. Such a pronunciation comes close to the usual RP position for /ɑ:/; however, speakers of Refined RP generally use a retracted variety of /ɑ:/ to ensure the vowels keep their distance (Fig. 22).

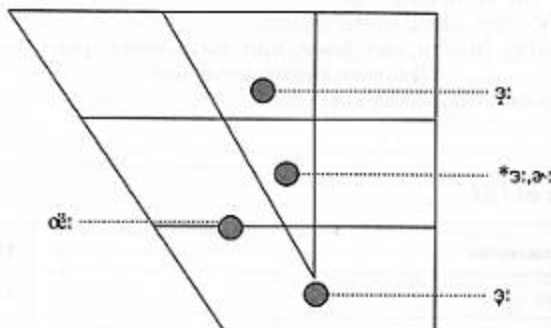


Figure 22 *Variants of /ɜ:/.*

(3) *Regional variants*—In most cases /ɜ:/ 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 symbolized as [ɜ̄]. 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 [i, e, a, o]) plus /r/ is retained; hence this dialect has no /ɜ:/ in its phonemic inventory. In broad varieties of Tyneside /ɜ:/ falls together with /ɔ:/ so that *burn* and *born* may be pronounced the same. There is considerable variation in the quality of /ɜ:/ in other dialects, notable being a close variety (= [ɜ]) in Australian

English and in Birmingham, and a rounded variety (= [œ]) in Liverpool, where the contrast between /ɜ:/ and /eə/ is lost, *fur* and *fare* being pronounced the same.

Sources of /ɜ:/

	ME [e] + [r]	virtue (=ME vertue), earth, heard, fern
	ME [i] + [r]	shirt, birth, myrrh
	ME [u] + [r]	word, journey, spur
Note (1): These sequences became [ə] in the seventeenth century and [ɜ:] (= /ɜ:/) in the eighteenth century		
Note (2): The Fr. final sequence [œs] sometimes > /ɜ:/, e.g. <i>connoisseur</i> /kɒnɔː'sɜ:/; <i>liqueur</i> /liː'kɜ:/		

(4) *Advice to foreign learners*—It is comparatively rare to find a long central vowel such as /ɜ:/ in other languages. Some languages, however, possess somewhat centralized front rounded vowels of the [ø] and [œ] types, e.g. Dutch, French, German and the Scandinavian languages. These are unacceptable for RP because of the lip-rounding. An articulation with spread lips should, therefore, be encouraged, keeping the same position with spread lips for words such 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 /ɜ:/ occur in words having an <r> in the spelling, if the target is non-rhotic RP, care must also be taken to avoid post-vocalic /r/ (except as a liaison form as in *stir up* /stɜ:r'ʌp/) or any retroflexion of the tongue such as would produce r-colouring.

8.9.12 /ə/

(1) Examples

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

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

Spellings of /ə/ (excluding function words)

	Examples	TF	LF
a	woman, about, affect	35%	30%
o	oblige	19%	24%
e	gentlemen	13%	13%
er,re	mother, waiter, grocer, batter, mitre	15%	12%
l	possible		
u	suppose		
ar,or,our,ure	particular, doctor, razor, colour, figure		
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 'alone, fatigue, decorative, afterwards', etc. 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 more raised and retracted, e.g. in 'long ago' [lɒŋ əˈgəʊ]. In final positions, e.g. in 'mother, doctor, over, picture, China', the vowel may be articulated in the open-mid central position (= [ə]). The acoustic formants of /ə/ are, therefore, likely to be similar to those for /ɜ:/ or /ɪ/ according to the situation. In Refined RP, final /ə/ will be below open-mid (= [e]) and may even approach /ɑ:/, so that the two vowels in *father* become similar in quality (Fig. 23).

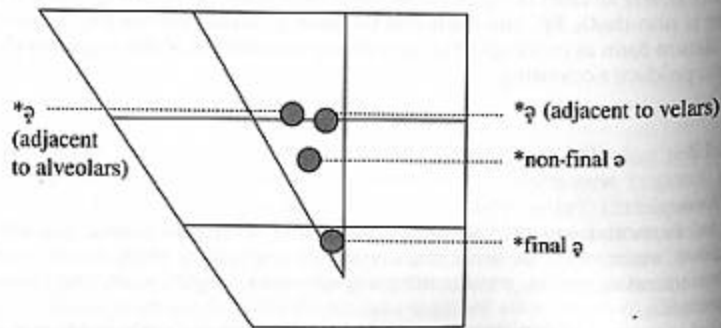


Figure 23 Variants of /ə/.

(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 (= [ə]) 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 which have /ə/ in RP have a full vowel, e.g. *con-, ad-, sub-* as in *conclude* /kɒŋˈkluːd/, *advance* /ədˈvɑːns/, *substantial* /sʌbˈstæɪnʃəl/.

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 fifteenth or sixteenth centuries in which spellings such as *disabey, Bishap, teme a clocke, saposé*, 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 [ədvrˈsəri] or [ədvrˈsəri] in ME, whereas today the previously accented syllable has been reduced, giving /ədˈvɜːsəri/. In words like *follow, pillow, widow, window*, which in ME had a final [ə], present-day RP has restored the full vowel /əʊ/. In northern England some prefixes retain a full vowel, e.g. *advance* /ədˈvɑːns/, *conflict* /kɒnˈflikt/, *observe* /ɒbˈzɜːv/.

(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 the foreign learner, provided that he remembers 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 ˈfɑːðər/.

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 obscuration of the unaccented syllables of a word is as much a part of the word's accentual pattern as the full vowels of the accented syllables. In this connection, the learner may gain greater familiarity with the occurrence of /ə/ by reading English texts transcribed phonetically and by himself making a phonetic transcription 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 RP diphthongs have as their first element sounds in the general region of [i, e, a, ə, u] and for their second element [ɪ, u, ə] (but see §8.2). The following generalizations refer to all the RP 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, 8.12.3 for the exceptional cases of /ɪə, uə/); 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* [pleɪz], *place* [pleɪs]. The reduced forms show a considerable shortening of the first element.
- (3) They are particularly susceptible to variation regionally and socially. Even within RP, 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 RP diphthongs principally derive from earlier pure vowels.

8.10.1 /eɪ/

(1) Examples

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

(2) *Description*—The glide begins from slightly below the close-mid front position and moves in the direction of RP /ɪ/, there being a slight closing movement of the lower jaw; the lips are spread. The starting-point is, therefore, [e] (somewhat closer than RP /e/ of *bet*). Although this quality mentioned is the most common in RP, nevertheless there is considerable variation in the starting-point. Older speakers may have a starting-point nearer to C.[e], while in Refined RP a more open starting-point nearer to C.[e] is common, as is a monophthongal [e:]. Before [t], the [t] element is often absorbed into the [ə] or [ʊ] glide on to [t], e.g. *sail* [se^ət] (Fig. 24).

(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* [faɪt]. 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

Spellings of /eɪ/

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

Note (1): *gauge, gaol, fete, suede*

Note (2): from French: *café, foyer, dossier, sauté, ballet, sachet, purée, matinée*

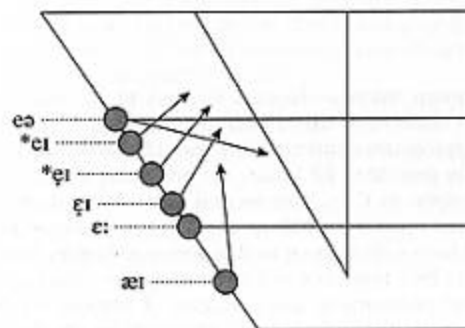


Figure 24 Variants of /eɪ/.

of London, Birmingham and the south and midlands of England, whereby /i:/ = [əɪ], /eɪ/ = [aɪ], /aɪ/ = [aɪ] or [ɔɪ], and /ɔɪ/ = [oɪ] (the accent of Birmingham is more usually similar to the north of England).

Many other regional realizations of /eɪ/ have a monophthongal [e:], e.g. Standard Scottish English and General American. Northern English may have [e:] or [e:] and some areas may have a split between [e:] in *late* and *main* and [ɛ:] 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,a] in open syllable	ME [a:]	name, ape, raven, ale
ON [a] in open syllable		take
OF [a:]		male, nature, cave, state
OF [au]		chamber, change, strange, safe
OE [æ,æ:,ε] + [j]	ME [æi,εi]	day, again; grey, clay; way, play
OF [a:,ei]		pay, chain; faith, obey
ON [ei]		they, swain
Note (1): ME [æi,εi] > [εi] fifteenth century, > [ε:] sixteenth and seventeenth centuries, > [ei] eighteenth century, > [ei] nineteenth century		
Note (2): ME [ε:] (normally > ModE /ɪ:/) > /eɪ/ in <i>great, steak, break</i>		
Note (3): Recent French borrowings: <i>fiancé, soirée, ballet, bouquet, beige, crêpe</i>		

(4) *Advice to foreign learners*—Foreign learners of RP 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 RP limits, i.e. preferably slightly more open than C.[e] and not as open as C.[ε]. 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 [e:]. This is a realization 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 /i/ or /e/.

8.10.2 /aɪ/

(1) Examples

Long [a:]—fly, die, mine, hide, eyes

Reduced [aɪ]—fight, like, ice, ripe

Compare [a:], [aɪ]—tie, tight; tidal, title; eyes, ice; riding, writing

Before [ʃ]—mile, aisle, piles, mild

Spellings of /aɪ/

	Examples	TF	LF
i (inc i..e)	time, write, bite, climb, design, mine, hide, like, ice, ripe, tide, title, ride, mile, pile, mild		
ie, y, ye (finally)	die, lie, pie, tried, cry, dry, by, dye, fly, die, tie		
	i, ie (non-finally) y, ye (finally)	80%	82%
y (non-finally)	type, tyrant, cycle, asylum, anodyne	2%	9%
igh	high, light, fight, might, right, bright, sight, tight	13%	4%
Note: <i>eye, height, either, neither, elder, aisle, buy, maestro</i>			

(2) *Description*—The most frequent glide of General RP /aɪ/ begins at a point slightly behind the front open position, i.e. [ä], and moves in the direction of the position associated with RP /ɪ/, although the tongue is not usually raised to a level closer than [ē]; the glide is much more extensive than that of /eɪ/, the closing movement of the lower jaw being obvious. The starting-point may be similar to the articulation used in RP /ʌ/ (see §8.9.5). The lips change from a neutral to a loosely spread position. Before [ʃ] the [j] element is often absorbed into the [ə] or [ʊ] glide on to the [ʃ], e.g. *pile* [pa:ʃ] (Fig. 25).

Since RP /eɪ/ is realised between the limits [eɪ] and [ei], /aɪ/ cannot, while remaining contrastive, have a first element closer than C.[e]. Those RP speakers who use the closest form of /eɪ/ will probably have a type of [æi] glide for /aɪ/, while those whose /eɪ/ is nearer to [ei] may realize /aɪ/ with the more retracted type of [a] mentioned above. In Refined RP 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 /a:/ realized as C.[a].

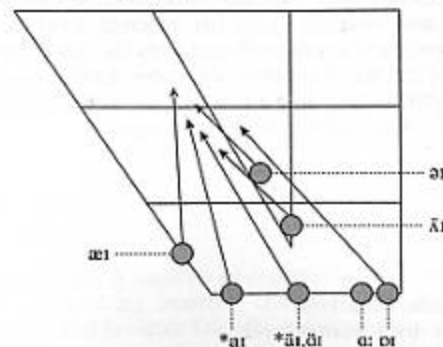


Figure 25 Variants of /aɪ/.

(3) *Regional variants*—In broad London also /aɪ/ has a back starting-point to give [äɪ], as indeed has Australian English, although in this case there may be rounding to [ɔɪ] (see this realization 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 a closer starting-point may be heard (= [ɔɪ]). In Scottish English many speakers have a distinction between a morpheme-non-final realization [äɪ] and a morpheme-final [äɪ], thus *tied* [taɪd] but *tide* [äɪ]. 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 [i:]	ME [iɪ]	ice, like, time, life
OE [ɪ]		child, find, wild
OE, ON [y]		hide, mice, kind, sky
OE [e:] or [e:] + [j]		fly, lie, dye, eye
OE [e:] + [ç]		light, night
OF [i:]		fine, arrive, licence, price
Note: [i:] > [iɪ] fifteenth century > [ɔɪ] sixteenth century > [äɪ] seventeenth century > [aɪ] eighteenth century		

(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 RP 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 [ɔɪ]—boy, noise, void, coin
Reduced [ɔɪ]—voice, joist, joint, choice
Compare [ɔɪ], [ɔɪ]—noise, voice; joys, joist
Before [h]—soil, coiled, boils

Spellings of /ɔɪ/

	Examples	TF	LF
oi	boil, noise, point, voice, void, joist, joint, choice, soil, coil	62%	71%
oy	boy, oyster, toy, voyage, joy	38%	29%
Note: <i>buoy</i>			

(2) *Description*—For RP /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 [ɛ̃]. The tongue movement extends from back to centralized 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 [t] the [ɪ] element is often absorbed into the [ə] or [ʊ] glide on to the [t], e.g. *oil* [ɔɪ*ʔ].

Refined RP unrounds, raises and centralizes the starting-point, so that we have [əɪ]. This produces a cluster of unrounded back open vowels or diphthongs: /ɑ:/=[ɑ:], /ɜ:/=[ɜ:], /aɪ/=[äɪ], /ɔɪ/=[əɪ] and /aʊ/=[ɑ:ʊ], 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 [ɔɪ], as in *ruin* (see §8.1 Note (4)) is discounted). To this extent, /ɔɪ/ may be considered asymmetrical in the RP diphthongal system (Fig. 26).

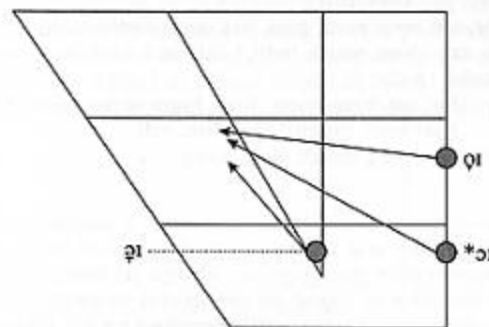


Figure 26 /ɔɪ/ and variants.

(3) *Regional variants*—A number of dialects have a starting-point closer than that of RP, 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]	choices, noise
OF [uɪ]	ME [uɪ]	boil, point, coin, join

Note: In the eighteenth century the ME [uɪ] 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 RP /ɔ:/ and /ɒ/ and that the glide does not extend beyond the close-mid front level, i.e. [e̞].

8.10.4 *ɪəʊ*(1) *Examples*

Long [ɔ:ɔɪ]—go, toe, home, road, pose

Reduced [əʊ]—goat, rope, oak, post, both

Compare [ə:ɔɪ], [əʊ]—robe, rope; toes, toast; grows, gross; road, wrote; cold, colt

/əʊ/, /ɜ:/—foe, fur; own, earn; goal, girl; oath, earth; coat, curt; foam, firm

/əʊ/, /ɔ:/—so, saw; pose, pause; bold, bald; load, lord; boat, bought; choke, chalk

/əʊ/, /ɜ:/, /ɔ:/—foe, fur, four; bone, burn, born; woke, work, walk; coat, curt, caught; coal, curl, call

Before [t̪]—hole, roll, old, moult, bolt, poles

(2) *Description*—The glide of RP /əʊ/ begins at a central position, between close-mid and open-mid, and moves in the direction of RP /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 /ɜ:/. Older speakers of RP commonly use a rounded first element, i.e. [ɔ̞]. A very recent development in General RP is the fronting of the second element to [u] giving [əu], similar to the fronting of /ʊ, u:/.

Refined RP uses a type of diphthong where an unrounded first element is produced further forward, i.e. between close-mid and open-mid and centralized from front, giving [ɛ̞ʊ]. Alternatively an unrounded central first element may be lengthened and the second element weakened, i.e. [ə:] so that there may arise for

Spellings of /əʊ/

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

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

a listener a confusion between /əʊ/ and /ɜ:/ (especially where [t̪] follows, e.g. *goal* and *girl*, where a weak [ʊ] element may be taken as the glide onto dark [t̪]).

/əʊ/ is regularly kept in RP in unaccented syllables where other dialects reduce to /ə/, e.g. in *window* /ˈwɪndə/, *fellow* /ˈfelə/; such pronunciations are generally considered substandard by RP speakers. 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 /ə/ may produce in colloquial speech homophones which are distinct in a more formal style, e.g. *ferment* (v.) *foment*—both /fəˈment/, *hypertension*, *hypotension*—both /haɪpəˈtenʃn/ (Fig. 27).

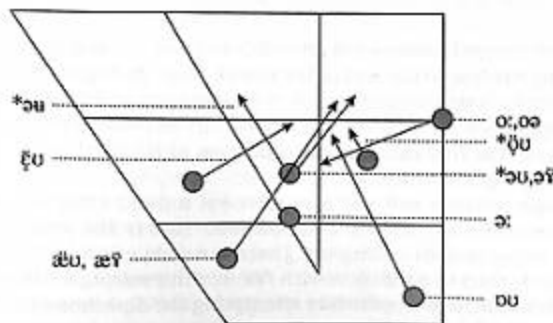


Figure 27 Variants of /əʊ/.

(3) *Regional variants*—Dialectally there is considerable variation in this vowel. Broad London has [æʊ] or even [æʊ̯], with unrounding spreading to the second element; this realization is near to Refined RP [ɛ̃ʊ] although London often has more pharyngealization than RP. The lower and more front pronunciation of /aʊ/ in broad London keeps it apart from the realization of /u:/ as [əu], see above §8.9.10. Regional RP of the London region may have the unrounding but not the fronting of London, i.e. [əʊ̯]. London also has a considerably different allophone of /əʊ/ before [t], that is [pʊ], and this allophone is also typical of London Regional RP.

Australian English has a very similar spread of allophones for this phoneme to 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-west England (particularly Tyneside) may have a reversed diphthong [oə].

Sources of /əʊ/

OE [ɑ:]	ME [ɔ:] via [o:] ca.1600	no, go, home, loaf, ghost
OE [æ,ɛə] before [ld]		old, told, cold
OE [ɔ] in open sylls		over, open, nose, hope
OF [ɔ] accented		robe, rose, coat, toast, gross
OE [ɑ:,ɔ] + [w,ɣ]	ME [ɔu] via [o:] ca.1600	know, blow, soul, snow, own, dough
OE [o:] + [w]		glow, flow, row
Note: Later borrowings from French words with [ɔ,o]: <i>beau, bureau, hotel</i>		

(4) *Advice to foreign learners*—It is advisable to learn /ɔ:/ first and to modify /ɔ:/ by adding lip-rounding to the end of the vowel. Thus, *fur* may be modified to *foe*, *girl* to *goal*, *burn* to *bone*, etc. In this way, the diphthong will be kept distinct from /ɔ:/ (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 realization of this phoneme in many accents of English. There is no objection in principle to this but the danger is then of confusion with /ɔ:/. For this reason, for those aiming at an RP pronunciation, it is worthwhile attempting the diphthong in the way outlined above.

8.10.5 /aʊ/

(1) Examples

Long [a:ʊ]—how, loud, town, cows

Reduced [aʊ]—shout, about, mouse, mouth

Compare [a:ʊ], [aʊ]—allows, a louse; found, fount; mouth (v.), mouth (n.); loud, lout

Before [t]—cowl, foul, owls

Spellings of /aʊ/

	Examples	TF	LF
ou	house, sound, out, council, ground, blouse, doubt, loud, shout, about, mouse, mouth, found, fount, lout, foul		
ow	allow, cow, town, crowd, owl, browser, growl, powder, how		
	ou,ow	99%	96%
Note: the present spellings <ou,ow> come from French where it represented [u:]			

(2) *Description*—The glide of RP /aʊ/ begins at a point between the back and front open positions, more fronted than the position for RP /aɪ/, and moves in the direction of RP /aʊ/, though the tongue may not be raised higher than the close-mid level, i.e. [ø]. 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.

The RP 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*. RP 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 Refined RP 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 (Fig. 28).

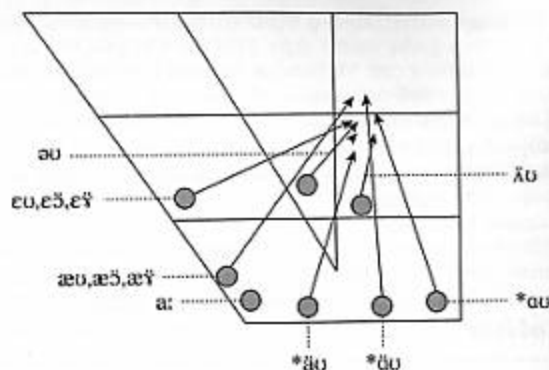


Figure 28 Variants of /aʊ/.

(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 realization of /aʊ/ as [æʊ] or [äʊ], 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* [nəʊ], *now* [nəʊ]. Even if the two starting-points are on the same level, however, the diphthongs are kept phonetically separate by the greater centralization 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/: [äʊ] or [äʊ] for /əʊ/ as against [æɤ] or [æɥ] for /aʊ/. Alternatively, /aʊ/ may be realized as a long, relatively pure vowel of the [a:] type, e.g. *town* [ta:n]. The realizations 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 /aʊ/ is realized as [o:], the starting-point of /aʊ/ may be raised to give [əʊ] or [ɤʊ]. Also some speakers of these dialects may have [u:] as a realization of /aʊ/. Generally, but not always, the contrast between /aʊ/ and /u:/ is not lost, since /u:/ is realized as [y:] in Scottish English, and [ɪə] in those parts of the north of England (mainly the north-east) which use the traditional dialect [u:] realization of /aʊ/. In Scottish English realization with [u:] in words like *town*, *mouse*, *about*, *house*, etc. is typical only of broad accents and is regarded as a feature of Scots rather than Scottish English.¹²

(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.[a] is also to be avoided, being part of the nowadays very marked Refined RP (see §7.3 (4)). 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. [o:].

¹² Jones (1997).

Sources of /aʊ/

OE [u:]	ME [u:]	cow, house, mouth
OE [o]		ground, found
OE [ɑ:] + [w] or [ɣ]		fowl, bow, bough
OF or AN [u:]		allow, powder, couch, count, mountain
Note (1): [u:] > [ʊ] fifteenth century > [əʊ] sixteenth century > [aʊ] eighteenth century		
Note (2): in some northern and Scottish accents the change in note (1) did not occur, e.g. present Scottish /hu:s/ = [hys]		
Note (3): [u:] sometimes remains or was shortened near bilabial consonants, e.g. <i>wound</i> , <i>droop</i> , <i>stoop</i> ; <i>plum</i> , <i>crumb</i> , <i>thumb</i>		

8.11 Diphthongs + [ə]

All the preceding diphthongal glides /eɪ, aɪ, ɔɪ, əʊ, aʊ/ are FALLING (i.e. have decreasing prominence, indicated by a longer first element and not to be confused with the falling pitch of intonation) and CLOSING (i.e. gliding from a more open to a closer position); three of them, /aɪ, ɔɪ, aʊ/, require an extensive movement of the tongue. All may be followed by [ə] within the word, either as an inseparable part of the word, e.g. *Noah*, *fire*, *choir*, *iron*, *hire*, *society*, *our*, *sour*, *tower* /nəʊə, faɪə, kwaɪə, aɪə, haɪə, sə'saɪətɪ, əʊə, saʊə, taʊə/ or as a suffix (morpheme) appended to the root, e.g. *greyer*, *player*, *slower*, *mower*, *higher*, *drier*, *employer* /ɡreɪə, pleɪə, sləʊə, məʊə, haɪə, draɪə, ɪm'plɔɪə/ or, sometimes, as a separable element internal in a composite form, e.g. *nowadays* /'naʊədəɪz/. In such cases, a third vocalic element [ə] may, in slow speech, be added to the two elements of the diphthongal glide; but there is a tendency in General RP spoken rapidly and particularly in Refined RP (even spoken slowly) to omit the second ([ɪ] or [ʊ]) element, especially when [ə] is not felt as a separable morpheme. This process is sometimes known as SMOOTHING.

(1) [aɪə] → [a:ə] in General RP, e.g. in *fire*, *tyre*, *choir*, *society*, *hire*, *shire*, *byre*, *lyre*, *liable* and also in cases where [ə] may be considered as a separable suffix, e.g. *higher*, *shyer*, *buyer*, *liar*.

(2) [aʊə] → [a:ə] in General RP, e.g. in *our*, *shower*, *flower*, *coward*, *nowadays*.

It will be seen that the reduction of the phonetic sequences [aɪə, əʊə] to [a:ə, a:ə] results in a phonemic opposition relying on a distinction between [a:] and [ə:]. It is natural that such a tenuous qualitative difference should be levelled out, with the result that both original [aɪə] and [əʊə] are frequently reduced to a diphthongal glide whose first element is a central open vowel. Several new homophones are produced in this way, e.g. *tyre*, *tower*; *shire*, *shower*; *sire*, *sour* (Fig. 29).

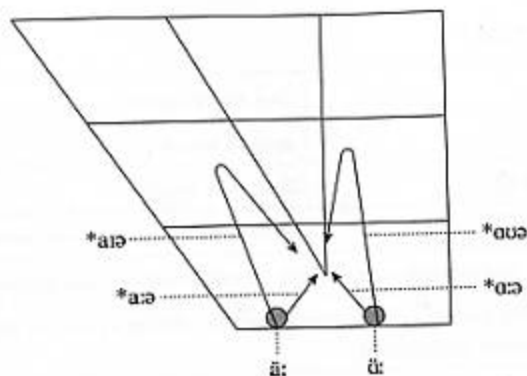


Figure 29 Variants of /aɪə, aʊə/.

In addition, in Refined RP the diphthongal pronunciations thus produced are sometimes further reduced to a long monophthong, i.e. [a:ə]→[a:] and [a:ɔ]→[a:]. If [a:] and [a:] are kept distinct, there is nevertheless confusion between [a:] < [aʊə] and /a:/, resulting in such homophones as *shower, Shah; tower, tar*. A more extensive levelling (criticized as an affectation in RP, but also as a Cockney vulgarism and also present in other accents, e.g. Liverpool) reduces both [a:ə] and [a:ɔ] to [a:], so that homophones of the type *shire, shower, Shah; tyre, tower, tar; byre (or buyer), bower, bar*, are produced, all with /a:/. The most likely situation in RP at the moment seems to be a levelling of the two triphthongs to a single diphthong, usually [a:ə], but not the further reduction to a monophthong and no loss of the contrast with /a:/.

(3) [eɪə]→[e:] in General RP, e.g., in *player, greyer, conveyor, layer*. In these examples, in which it is a question of /eɪ/ + a /ə/ suffix, the resultant diphthong is frequently levelled with the /eə/ of *there, rare*, etc. Thus, such homophones as *prayer, pray-er; lair, layer*, are produced (see §8.12.2 for reduction /eə/ to [e:]).

(4) [aʊə]→[ɔ:] = /ɜ:/ in General RP, levelling frequently occurring between *mower, slower* and *myrrh, slur* (with /ɜ:/).

(5) [ɔɪə]→[ɔ:] in General RP, as in *employer, enjoyable, buoyant, joyous*. In these cases the [ɔ:] element of the diphthong is qualitatively distinct from the value associated with /ɔ:/, since it has a tongue position not higher than open-mid. Thus, *drawer* ('one who draws') with /ɔ:/ + /ə/ may have a closer initial vowel element than the starting-point of the glide in the reduced form of *coir*, with [ɔ:ə].

(6) Some speakers distinguish between sequences of diphthong + /ə/, usually in the case of terminations spelt *-el, -al*, e.g. *trial, towel, royal*, and sequences of diphthong + /ɪ/, e.g. *tile, owl, toil*. However, the first sequence, containing three vocalic elements, may be reduced to a centring diphthong; and, in the case of the second type of sequence, an [ə] (or [ʊ]) glide is present before [ɪ], so that a similar triphthongal glide reducible to a centring diphthong is produced. Thus, /eɪ, aɪ, aʊ, ɔɪ/ followed by either /ɪ/ or /ə/ tend to be realized as [e:ə, a:ə, a:ə or a:ə, ɔ:ə], the examples given above being perfect rhymes. In the case of /aʊə/

(= [aʊ]) + [ɪ], the [ə] element of the diphthong may be retained, both because it is reinforced by the glide on to [ɪ] and also in order to maintain the distinction /əʊ/-/ɜ:/ as in *pole, pearl*. In London Regional RP (= Estuary English) it is also likely that /əʊ/ before /ɪ/ as in *pole* will be produced with the contextual allophone [ʊʊ] and the quality of the beginning of the diphthong will thus keep such words distinct.

(7) 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 *flower* and *higher*. However, it is certain that smoothing is possible across morpheme boundaries and indeed it may occur across word boundaries where a word-final diphthong is followed by word-initial /ə/, e.g. *they are* [ðe:ə] or [ðe:ə], rhyming with *there; go away* [gə:ə`weɪ] = /gɜ:ə`weɪ/; *buy a house* [ba:ə`haʊs]; *now and then* [nə:ən`ðen]; *boy and girl* [bɔ:əŋ`gɜ:l].

(8) 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 /i:/ 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*, though some glide in the direction of [ɪ] is likely to be made when the following vowel has a quality near to that of the first element of the diphthong (especially of the wide diphthongs /aɪ, ɔɪ/, e.g. in *may end, my uncle, the boy often*, etc. In the case of /əʊ, aʊ/, absorption of the [ʊ] element before /u/ or /ʊ:/ rarely arises, since a following /u/ or /ʊ:/ 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*, though when /ɜ:/ follows some movement towards [ʊ] and lip-rounding normally takes place, e.g. in *so early*. Loss of the [ʊ] element of /əʊ/ does not, in pre-vocalic positions, lead to confusion with /ɜ:/, since /ɜ:/ in such a position will normally be realized with a linking /r/, cf. *slow it* /ˈsləʊ it/ or /ˈslɜ: it/ and *slur it* /ˈslɜ: it/. 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] and lip-rounding normally takes place, e.g. in *how are they, plough up, how odd*. This tendency to absorb the second element of diphthongs before other vowels is a feature which is more marked in Refined RP than in General RP. A more careful pronunciation of sequences of diphthong following vowel may involve the presence of a linking [ɪ, w], e.g. *way in* [weɪˈɪn], *plough up* [pləʊˈɪp], but this linking [ɪ, w] is never as prominent as phonemic /j, w/, cf. *three ears vs three years, and two-eyed vs too wide* (see further under §12.4.7).

(9) A similar weakening of the monophthongs /u:/ and /ɪ:/ sometimes occurs across syllable boundaries. /u:/ may be replaced by /ʊ/ and /ɪ:/ by /i/ before vowels in such phrases as *two in the morning* /tu in ðə ˈmɔ:ɪnɪŋ/ and *three o'clock* /θri ə ˈklɒk/. It is possible in a word such as *ruin* to regard the pronunciation /rʊn/ as a version of /ru:ɪn/ exhibiting smoothing. (Alternatives in careful speech may again involve the use of linking [ɪ, w], e.g. [tu:ˈɪn ðə ˈmɔ:ɪnɪŋ].)

(10) 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.

(11) *Advice to foreign learners*—Foreign learners should be aware of this tendency to reduce vowel sequences, in order that they may understand colloquial English. They will observe that such reduced forms are normal among many educated speakers. Nevertheless, like most changes of pronunciation, these reductions are often condemned as vulgarisms—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. [a:] and [ɑ:] for [aɪə] and [ɑʊə], and [ɜ:] for [əʊə]. But the levelling to [a:ə], [ɑ:ə], [e:ə], and [ɔ:ə], described above, may be taken to be current and permissible. Certainly such pronunciations are preferable to sequences containing an exaggerated [i] or [u] element, i.e. [ij] or [uw], giving [ajə], [awə], [əwə], [ejə], [ajə], etc.

8.12 Centring Diphthongs

8.12.1 /ɪə/

(1) Examples

Long [i:]—*dear, here, cheer, beard*

Reduced [ɪə]—*pierce, fierce*

Compare [i:ə], [ɪə]—*fears, fierce*

Before [t]—*real*

Spellings of /ɪə/

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

Note: *weird*

(2) *Description*—The glide of RP /ɪə/ begins with a tongue position approximately that used for /ɪ/, i.e. close-mid and centralized 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. The lips are neutral throughout, with a slight movement from spread to open.

In unaccented syllables the sequence [i] + [ə]¹³ may not always constitute the falling diphthong described, i.e. prominence may not always be on the first element. Thus, the [i] element may be the weaker of the two, giving a rising diphthong and being almost equivalent to [ij], cf. the two [i] + [ə] sequences in both syllables of *period, serious* ['piəriəd] or ['piəriəd] and ['siəriəs] or ['siəriəs]. Thus, a falling diphthong is usual in *reindeer* and a rising diphthong in *windier*.¹⁴ The glide of the rising type [iə] often occurs when the [ə] represents a suffix with morphemic status, e.g. *easier, carrier*, in which case [i] and [ə] are conveniently treated as a hiatus of vowels in two syllables with a variant monosyllabic pronunciation [jə]. Increasingly, a closer vowel is to be heard in such words, i.e. ['i:ziə], ['kæriə], which may be interpreted as /'i:zi:ə/, /'kæri:ə/, an interpretation which supports the view that there is vowel 'hiatus' between two syllables. Such a solution may also be applied to cases of a rising diphthong where there is no morpheme boundary as commonly heard in *billiards* and *hideous*, e.g. ['bɪliədz], ['hɪdiəs], to be interpreted as /'bɪli:ədz/ and /'hɪdi:əs/ (alongside their monophthongal variants /'bɪljədz/ and /'hɪdjəs/).

Increasingly, pronunciations with a monophthong [ɪ:] can be heard within General RP. (This type of pronunciation has been common in Australian English for some time.) In some kinds of Refined RP, and especially when /ɪə/ is accented and final, a different type of rising diphthong may be heard, the quality often being near to the phonetic quality of /ɜ:/ or even /ɑ:/. Thus, *here, dear*, may become /hɜ:/, /dɜ:/ or /hɜ:ə/ (= [çɑ:]) /dɜ:ə/. The form with /ɑ:/ is usually characterized as an affectation (Fig. 30).

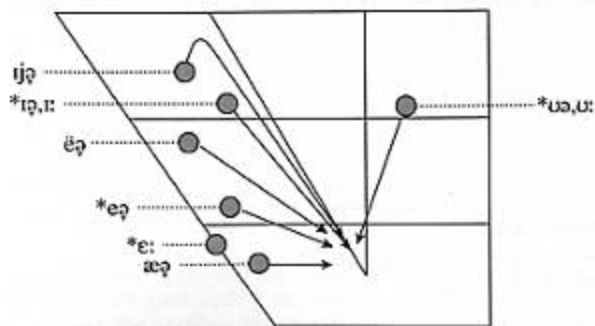


Figure 30 Variants of final /ɪə, eə, uə/.

¹³ Jones (1954).

¹⁴ Andréssen (1957).

(3) *Regional variants*—Rhotic dialects like General American and Standard Scottish English have no /ɪə/, having /ɪ/ or /i:/ + /r/ 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. [ɪjə]. See under /eə/ for loss of contrast between /ɪə/ and /eə/ in a number of regional dialects (§8.12.2 (3)).

Sources of /ɪə/

	ME [e:] + [r]	here, hear, dear, weary, appear, clear
	ME [ɛ:] + [r]	ear, shear, fear, beard
Note (1): ME [e:,ɛ:] + [r] > [i:] by seventeenth century > [i:ə] eighteenth century		
Note (2): /ɪə/ also arises from juxtaposition of two vowels with weakening of the second, e.g. <i>idea, idiom, museum</i>		

(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 /i:/. 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. Although the <r> should not be pronounced finally or before a consonant, it should be remembered that an /r/ link is regularly made before a following vowel, initial either in a bound or a compounded morpheme, e.g. *hearing* /'hɪərɪŋ/ (cf. /hɪə/), *car auction* /'kɑ: r ɔ:kʃn/, or initial in the next word of the group, e.g. *hear and there* /hɪər ən ðeə/, *area of it* /'eəriə əv ɪt/.

8.12.2 /eə/

(1) Examples

Long [e:ə]—pair, there, chairs, cared
Reduced [eə]—scarce
Compare [e:ə], [eə]—scares, scarce
 (No cases of /eə/ + [ɪ])

(2) *Description*—The glide of RP /eə/ begins in the open-mid front position, i.e. approximately C.[e], and moves in the direction of the more open variety of /ə/, especially when the diphthong is final; where /eə/ occurs in word-medial position, the [ə] element tends to be of a mid [ə] type. The lips are neutrally open throughout. (See §8.11 for the reduction of /eɪ/+ə/ to /eə/.)

Spellings of /eə/

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

Note: *heir, their, there, mayor, prayer, compère, première, sombrero*

Nowadays a long monophthong [e:] is a completely acceptable alternative in General RP. Refined RP keeps the diphthong but has a more open starting-point, giving [æə].

(3) *Regional variants*—Rhotic dialects like General American and Standard Scottish English have no /eə/, this diphthong usually corresponding to /eɪ/ or /e/ plus /r/. Most dialects of the north of England prefer a monophthongal pronunciation. In Liverpool the contrast between /eə/ and /ɜ:/ is lost, with the resulting single phoneme being realized as a vowel centralized from C.[e] and rounded, i.e. [œ:]. In Cockney the starting-point of this diphthong is closer, giving [eɔ]. The opposition between /eə/ and /ɪə/ occurs irregularly in East Anglia, in the Atlantic states of the USA, in the Caribbean and in New Zealand.¹⁵

Sources of /eə/

	ME [a:] + [r]	care, hare, mare
	ME [ɛɪ] or [æɪ] + [r]	their, air, hair, fair
	ME [e:] + [r]	bear, there, where, swear
Note: ME [a:][æɪ][ɛɪ] > [e:] sixteenth century [e:] + [r] > [e:ɪ] or [eɪ] seventeenth century > [eə] eighteenth century		

(4) *Advice to foreign learners*—See the comments in section (5) of the previous section about the effect produced by pronouncing an /r/ in this diphthong. The post-vocalic <r> of the spelling forms can be pronounced as a linking form when a following word begins with a vowel, e.g. *pair of shoes* /peər əv 'ʃu:z/, or

¹⁵ Trudgill (1974), Kurath and McDavid (1961), Cassidy and Le Page (1980) and Trudgill (1974, 2004).

when a vowel occurs in the following syllable of the same word, e.g. *care* /keə/, but *caring* /'keərɪŋ/. Since a monophthongal pronunciation of /eə/ is now common, a suitable realization of this phoneme can be achieved starting from /e/ and adding length and opening the mouth somewhat.

8.12.3 /ʊə/

(1) Examples

Long [ʊə]—tour, pure, demure, secure, plural
 ([ʊə] does not occur before voiceless consonants and hence does not occur in a reduced form)
 Before [ɪ]—jewel

Spellings of /ʊə/			
	Examples	TF	LF
oor	poor, moor, boor	No figures available	
our	tour, dour, gourd, amour, tournament, bourgeois		
ure	pure, endure, cure, sure, abjure, secure		
ur	curious, spurious, during, security, insurance, furious		
ue,ua	cruel, fluent, puerile, actual, mutual, usual, gradual		
Note: jewel, incongruous, pleurisy, arduous			

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

In the same way that the sequence [ɪ]+[ə] may constitute a rising diphthong, the sequence [ʊ]+[ə] may also, in unaccented syllables, have the prominence on the second element, e.g. in *influence*, *valuable*, *vacuum*, *jaguar*, etc., the first element often weakening to [w]. In many cases of such sequences, [ʊə] represents a realization of a final unaccented /u:/ + morpheme /ə/, e.g. *rescuer*,

[ˈreskjʊə] → [ˈreskjʊə].¹⁶ An alternative development of /ʊə/ in RP is a monophthongization of /ʊə/ to [ʊ:], which is kept distinct from /ɔ:/.
 /ɔ:/ having coalesced with /ɔ:/ for most RP speakers, the pattern of centring diphthongs is rendered asymmetrical, there being only one back glide of this type opposed to the two front glides. As a result, the first element of /ʊə/ can be lowered considerably without risk of confusion. Thus several words with /ʊə/, which have a pronunciation [ʊə] for some RP speakers, are given by others a glide [ə], e.g. in *poor*, *sure*. This glide [ə] may in turn be levelled with the realization of /ɔ:/. So *Shaw*, *sure*, *shore*, still pronounced by some /ʃɔ:ʃʊə,ʃɔ:ʃə/, are levelled by many others to /ʃɔ:/ for all three words; or again, *you're* (most frequently with /ʊə/) may be realized as /jɔ:/, i.e. identical with *your*. It is to be noted, however, that such lowering or monophthongization of /ʊə/ is rarer in the case of less commonly used monosyllabic words such as *dour*, *gourd*. The [ʊə] or [ʊə] derived from /u:/ plus /ə/, as in *rescuer*, *sewer*, is not subject to alternation with /ɔ:/. Words with a preceding /j/, e.g. *cure*, *curious*, *puerile*, *secure*, *endure*, *bureau*, are also generally not involved in such alternation, although in Refined RP the /ʊə/ in such words may be subject to monophthongization with both lowering and unrounding, giving [ɔ:].

(3) *Regional variants*—The development /ʊə/ → [ʊ:], mentioned above as a recent development in RP, occurred somewhat earlier in Northern English, in London and in Australian English, although in all these accents the merger with /ɔ:/ often occurs with a quality nearer to [ɔ:]. 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 RP usually corresponds to an /u:/ or /ʊ/ plus /r/ where there is an <r> in the spelling.

Sources of /ʊə/

	ME [ɔ:,o:] + [r]	moor, poor, boor
	ME [u:] + [r]	mourn (also /ɔ:/)
	ME [iu,eu] + [r]	sure, pure
	ME [ə] + [r]	fewer
Note (1): ME [ɔ:,o:,u:] + [r] often > lowered vowel /ɔ:/, e.g. <i>fourth</i> , <i>floor</i> , <i>court</i> (see §8.9.4 (2))		
Note (2): /ʊə/ may arise from /u,u:/ + a vowel reduction, e.g. <i>influence</i> , <i>truant</i> , <i>virtuous</i> , <i>jewel</i>		

(4) *Advice to foreign learners*—Care should be taken to use a first element of a close-mid kind rather than a quality resembling that of /u:/. Alternatively, /ʊə/ may be pronounced as a monophthong, achieved by lengthening /ʊ/. Additionally, if aiming at RP, the spelling <r> should not be pronounced, except when an /r/ link

¹⁶ As with /ɔ:/ (see §8.12.1 (2)) this sequence may be realized as a closer short vowel, thus [ˈreskjʊə].

is made before a following vowel, either occurring initially in the next word, e.g. *poor old man* /puər əld 'mæn/, or before a prefix or the second element of a compound, e.g. *tour* /tuə/ but *touring* /'tuəriŋ/, *cure* /kjʊə/ but *cure-all* /'kjʊərə:l/. See section §11.12.1 (4) above for comments about the effect of producing the post-vocalic /r/ in all positions.

8.13 Vowels in Syllables Without Primary Accent

With the principal exception of /ə/, which occurs only 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 6 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.

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* /'refə'ri/, *canteen* /'kæn'ti:n/. 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/, /ə/ or /u/) 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. /ɪ/, /ə/ or /ʊ/. These are the three short vowels with a central or centralized quality 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 1,000 years. As a general rule, weak accent in OE led to the obscuration of short vowels and the shortening of long vowels. By ME, however, new long vowels or diphthongs under relatively weak accent emerged as a result of vocalization of earlier consonantal articulations, e.g. [i:] < OE [i] + [g] or [j] (*holy*), [ɔ:] deriving from an intrusive [o] or [ɔ] before [ɣ] or [w] (*follow*). Moreover, 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 or, in the case of polysyllables such as *justify*, *temporary*, retained a full vowel on a syllable following the primary accent. In words of the *temporary*, *secretary* type, American

	<i>Remote preceding</i>	<i>Adjacent preceding</i>	<i>Adjacent following</i>	<i>Remote following</i>
<i>Unaccented</i>				
/ɪ/	ina'bility	e'ffect	'sorry	'apathy
/ʊ/	superi'ority	silhou'ette	'ambulance	'neighbourhood
/ə/	conside'ration	a'llow	'mother	'character
<i>Accented short</i>				
/eɪ/	refe'ree	Sep'tember	'prefect	'architect
/æ/	maga'zine	can'teen	'syntax	'caravan
/ɪ/	subjec'tivity	sul'phuric	'product	'aqueduct
/ɒ/	poli'tician	Oc'tober	'diphthong	'catalogue
<i>Accented long</i>				
/i:/	precon'ceive	aes'thetic	'phoneme	'obsolete
/ɑ:/	arti'san	sar'castic	'placard	'reservoir
/ɔ:/	audi'bility	au'gust (adj.)	'record	'corridor
/u:/	super'sede	Ju'ly	'nephew	'residue
/ɜ:/	perpen'dicular	ur'bane	'expert	'universe
<i>Accented diphthongs</i>				
/eɪ/	phrase'ology	a'orta	'detail	'magistrate
/aɪ/	bio'logical	mi'nute (adj.)	'missile	'civilize
/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
/eə/	varia'bility	where'by	'fanfare	'underwear
/ʊə/	neuro'logical	cu'rator	'contour	'manicure

Table 6 Vowels in syllables without primary accent

English, for instance, keeps a full [e] vowel, as was the case in English up to the eighteenth century, whereas in present RP the former [e] or [e:] is reduced to [ə] or elided. As a result of influences of this kind, full vowels were found in eModE in a number of situations where today qualitative weakening is once again the rule,¹⁷ e.g. *certain*, *bargain*, with [eɪ] in the final syllable; *history*, *majesty*, *tragedy* and *merrily*, with [əɪ] finally; and *emperor*, *saviour*, with [əʊr] finally.

¹⁷ For an account of vowels in unaccented syllables in eModE, see Dobson (1957).

8.14 The Frequency of Occurrence of RP Vowels

In colloquial RP, /ə/ (10.74 %) and /ɪ/ (8.33 %) 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/ has a high frequency of occurrence in both accented and unaccented syllables. The frequency of occurrence of each RP vowel as given in Fry (1947) is shown in Table 7. Frequency of occurrence measured by other authors in both RP and in American English¹⁸ (in so far as similar measurements can be made, given that /ɒ, ɪə, eə, uə/ do not occur in General American and /ʌ/ is not always given phonemic status) produces the same top five /ə, ɪ, e, aɪ, i:/, a second group of three /eɪ, əʊ, æ/ and a bottom six of /u:, ʊ, ɑ:, əʊ, ɔ:/ with /ɔ:/ always last.

	%		%
/ə/	10.74	/ɔ:/	1.24
/ɪ/	8.33	/u:/	1.13
/e/	2.97	/ʊ/	0.86
/aɪ/	1.83	/ɑ:/	0.79
/ʌ/	1.75	/aʊ/	0.61
/eɪ/	1.71	/ɜ:/	0.52
/i:/	1.65	/eə/	0.34
/əʊ/	1.51	/ɪə/	0.21
/æ/	1.45	/ɔɪ/	0.14
/ɒ/	1.37	/ʊə/	0.06
Total all vowels: 39.21%			

Table 7 Text frequencies of vowels in RP

9

The English Consonants

9.1 The Distinctive Consonants

We find by commutation (see §5.3) that there are 24 distinctive units which are consonantal both in terms of their position in syllables (see §5.6) and also, in the majority of cases, in terms of their phonetic nature (i.e. they have, at least in some of their realizations, articulations involving the obstructions or narrowings which produce, acoustically, a noise component—see §4.2).

These 24 consonantal phonemes are classified in Table 8 into two general categories:

- Those articulations in which there is a total closure or a stricture 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.
- 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.

	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		tʃ, dʒ	ʃ, ʒ		
Palatal					j
Velar	k, g			ŋ	w
Glottal			h		

Table 8 The distinctive consonants of English

¹⁸ See French *et al.* (1930), Carterette and Jones (1974), Mines *et al.* (1978), Knowles (1987).

Notes

(1) In some types of RP it may be necessary to include the labial-velar voiceless fricative [ɱ] as a phoneme, e.g. in words like *which*, *what*, *whether*, but for most RP speakers these words are pronounced with a /w/.

(2) In practical teaching, it may sometimes be convenient to treat /tʀ/ and /dʀ/ as distinctive affricates as well as /tʃ/ and /dʒ/ (see §9.3).

(3) The glottal stop [ʔ] has been excluded, since it is not phonemically distinctive in RP; its use as a reinforcement for vowels and its allophonic association with /p,t,k/ is dealt with in §9.2.8.

It will be seen from Table 8 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 realizations 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 the allophones of /k/ may be palatal, without constituting 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** 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 folds;
- (3) the **RELEASE** stage, during which the organs forming the obstruction part rapidly, allowing the compressed air to escape abruptly (i.e. with an explosion, hence 'plosive'); if stage (2) is voiced, the vocal fold vibration will continue in stage (3) if a vowel follows; if stage (2) is voiceless, stage (3) may also be voiceless (aspiration) 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 RP plosive phonemes comprise three pairs: /p,b/; /t,d/; /k,g/. Table 9 illustrates oppositions in word-initial, medial and final positions.

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

Table 9 Minimal oppositions among English plosives

These oppositions may be realized 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
- (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* [p^hɪn, t^hɪn, k^hɪn]. 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*, etc. In other positions, i.e. preceding a vowel in an unaccented

¹ Lower intraoral pressure for /b,d,g/ was reported by Subtelny *et al.* (1966) and Malécot (1968).

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 neutralized (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*, *skin* 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 have full voice 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 realized as [b̥d̥g̥], 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 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 10. Note that an initial fully devoiced [d] 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 ms whereas VOT for voiced plosives varies from a 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.⁵

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% of word-initial voiced plosives following vowels and in 46% of word-final voiced plosives preceding vowels.

⁴ Catford (1977: 112).

⁵ See Docherty (1992), Volatis and Miller (1992).

		<u>i:</u>	<u>d</u>					
<u>i:</u>		<u>i:</u>	<u>d</u>					
				<u>ə</u>				
	<u>s</u>		<u>t</u>		<u>ə</u>	<u>n</u>		
			<u>t</u>		<u>ə</u>	<u>n</u>		
					<u>ə</u>	<u>n</u>		

Final devoiced [d̥]
 Medial fully voiced [d]
 Partially voiced [d̥] (negative VOT)
 Unaspirated [t] (zero VOT)
 Aspirated [tʰ] (positive VOT)

Table 10 VOT differences in English (underlining indicates voicing) in lead, leader, done, stun, ton

(5) *Length of preceding sounds*—When the RP 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.⁶ 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*, *Elbe*, /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 complex of quantitative and qualitative contrasts extending over the whole of the coda of syllables. The same effect of reduction also operates when /p,t,k/ occur medially in a word, cf. the length of /a/ 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 RP 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 *bow*. 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

⁶ Peterson and Lehiste (1960) found vowels up to one and a half times as long preceding voiced consonants as preceding voiceless consonants.

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 a 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 'intersyllabic' consonant).

(7) *Advice to foreign learners*—If aiming at RP, 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 [pin], instead of [p^hin], there is the danger that the English listener may understand *bin*, since he interprets 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 /p^h,t^h,k^h/, they tend to identify English /p,t,k/ with their unaspirated series.

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 other languages, e.g. Cantonese, German and Russian, neutralize 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 /i:/ 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 'hold'. This part of the consonant is generally characterized 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.⁷ 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/.⁸ 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) characterizing /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/.⁹ Although there is a tendency for the longer 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.¹⁰

(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.¹¹ Before [a]¹² 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 4000 Hz) and intermediate for velars (maximum around 2000 Hz). See Fig. 31 for a diagram of formants and bursts before [a] and Fig. 32 for spectrograms of /b,d,g/ before /a/.

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 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 /i,e/, /k,g/ may be considerably fronted and on the verge of being palatal [c,j], 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 msec), then glides of the type [j,w] may be perceived.

⁷ Ohde (1984).

⁸ Liberman, Delattre and Cooper (1958) and Stevens and Klatt (1974).

⁹ Lisker (1957a) showed that an intervocalic /b/ has an average duration of 75 msec while an intervocalic /p/ has an average of 120 msec. See also Malécot (1968) and Subtelný et al. (1966).

¹⁰ See Laeuffer (1996).

¹¹ Cooper et al. (1952), Stevens and Blumstein (1978) and Liberman and Blumstein (1988).

¹² As [a] is described as part of a seven-vowel systems in much American work, its quality is best assumed to be intermediate between RP /æ/ and /ɑ:/.

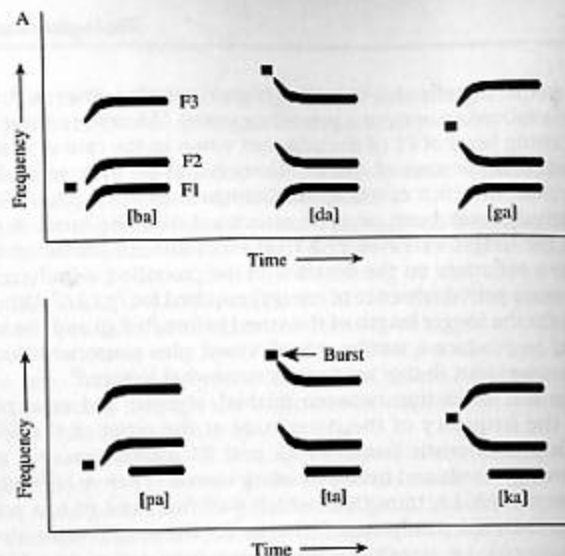


Figure 31 Formant transitions and bursts for the syllables [ba, da, ga, pa, ta, ka]. [From Liberman and Blumstein 1988.]

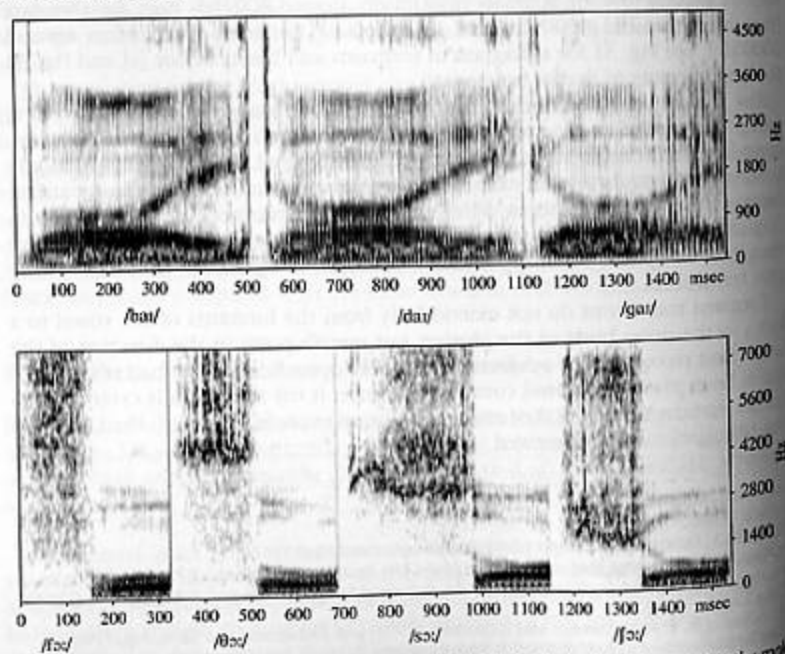


Figure 32 Spectrograms of /baɪ/, /daɪ/, /gaɪ/, and of /tɔɪ/, /θɔɪ/, /sɔɪ/, /ʃɔɪ/ as spoken by male speaker of RP (the full length of /sɔɪ/ is not displayed).

Duration of VOT is usually in the order labials < alveolars < velars¹³ 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 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 stage¹⁵ 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, mac, 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

¹³ Docherty (1992) finds word-initial /p/ having a VOT of around 40 ms and /t,k/ a VOT of around 60 ms. See also Gonet and Rózańska (2003).

¹⁴ Macken and Barton (1980).

¹⁵ Some writers, e.g. Arnold (1966), argue that this stage should be separated into a 'release' (an articulatory feature which is the converse of the 'closure') and a 'plosion' (an auditory feature).

is proved by the high percentage of correct discrimination between such pairs as *mat*, *mac*, 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 General RP. 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 formal circumstances. Velar stops are more prone to non-release than bilabial and alveolar stops.¹⁶ (See further under §12.7 on stylistic variation.)

(2) *No audible release in stop clusters*—It is also a feature of most kinds of English that in a cluster of two stops (plosives 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/+/dʒ/), *great joke* (/t/+/dʒ/), *big chin* (/g/+/tʃ/). In those languages where plosives in such situations are released audibly, the result is an intervening [h] in the case of voiceless plosives and an obscure vowel of the [ʔ] type in the case of voiced plosives. In English the closure for the second stop is made before the release of the first,¹⁷ 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 (onglide, 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 the oral closure 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

¹⁶ Byrd (1992b).

¹⁷ For articulatory overlap in plosive clusters, see Byrd (1994).

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 glottalized 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 RP. 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, opened by the lowering of the soft palate for the nasal consonant, e.g. /p/+/m/ *topmost*, /p/+/m/ sometimes in *happen* [ˈhæpm], /b/+/m/ *submerge*, /b/+/m/ sometimes in *ribbon* [ˈrɪbm], /t/+/n/ *chutney*, /t/+/n/ *cotton*, /d/+/n/ *madness*, /d/+/n/ *sudden*; and, more rarely, /k/+/ŋ/ *thicken* [ˈθɪkɪŋ], /g/+/ŋ/ *organ* [ˈɔ:gɪŋ], *token* [ˈtəʊkɪŋ], *pagan* [ˈpeɪɡɪŋ]. 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 generalization 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, ˈsɑdən]) but as yet this is limited to a small minority.

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 the frontier.

(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 are normally released laterally, 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* [kæt], *medal* [med] 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 English usage, there being no intervening removal of the tongue-tip contact on the alveolar ridge, such as would result in aspiration or an obscure vowel. Pronunciations of this type, e.g. [ˈlɪtʰɪ], [ˈmɪdʰɪ] for *little*, *middle*, were until recently limited to children, but can now be heard increasingly from adults.

(6) *Affrication and weakening of plosives*—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. Common realizations of the English plosives /p,b,t,d,k,g/ might, therefore, be followed by brief fricatives of the types [ɸ,β,s,z,x,ɣ]. In some varieties of English the alveolars /t,d/ may frequently be heard in affricated form [tʰ,dʰ]: 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 [tʰ] and [dʰ] differ from the realization of the plural terminations /t/+s/ and /d/+z/ mainly in the brevity of the friction associated with the affricated plosives.) Affrication is also occasionally heard with the velar plosives, i.e. [kʰ] and [gʰ], 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, familiar 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. The following examples have been noted among educated speakers; *imported* [ɪmˈpɔːtsɪd], *invaded* [ɪnˈveɪzɪd], *baker* [ˈbeɪkə], *dagger* [ˈdæɪə] (this latter, 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 RP speakers. A foreign speaker of English may be generally intelligible without adopting any of these features, such is the redundancy of information carried in the English utterance. But the foreign learner who aims at a near approximation to RP should adopt the following features at least:

- Inaudible release of plosives preceding other plosives or affricates.
- Nasal release of plosives followed by a homorganic nasal, especially /t,d/+n/, with avoidance of any intervening [h] or [ʰ].
- Lateral release of /t,d/+l/, also with avoidance of intervening [h] or [ʰ].
- 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*—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)

weakly accented, slightly aspirated—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, with no audible release—captain, topcoat, wiped, hop picker, top boy, top girl, top dog, ripe cheese
nasal release, followed by nasal consonant—topmost, happen, cheap meat
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, with no audible release—obtain, rubbed, subconscious, sob bitterly, sub-prefect, rib cage, object
nasal release, followed by nasal consonant—submerge, robe mistress, 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	pencil, praise, cup, ramp, piper, surprise		95%
pp (excl. before -ed, -ing)	apply, opposite, pepper, apple, opportunity		5%
Note (1): hiccough			
Note (2): Silent <p> in <i>pneumonia, psychology, psalm, ptarmigan, receipt, cupboard, raspberry</i>			
/b/	Examples	TF	LF
b	bike, brain, fibre, hubris, tube, jibe	98%	96%
bb (excl. before -ed, -ing)	rabbit, ribbon	1%	3%
Note: Silent in <i>limb, lamb, bomb, thumb, comb, debt, subtle, doubt</i>			

(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. Lung air is compressed behind this closure, during which stage the vocal folds 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 (Fig. 33). 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 *cup-full*, *obvious*, the stop is often made by a labiodental rather than a bilabial closure, in anticipation of the following fricative articulation, thus [kʌpʃʊl], [ʊbʏvɪʃ]. Tongue movements involved in vowels or consonants adjacent to the bilabial stop are made independently of the lip closure, e.g. the /ɔ:/ tongue position is maintained through the /b/ closure in *four balls* and the /l/ alveolar contact through the /p/ closure in *helpless*.

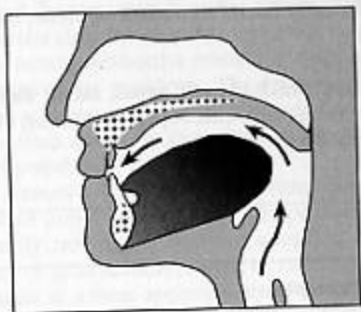


Figure 33 Section of /p, b/.

No important variants of /b/ occur within RP, 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) *Regional variants*—The only regional variation associated with /p, b/ concerns the amount of aspiration. Some dialects have very little aspiration (e.g. some parts of Lancashire) while others have more aspiration than RP (e.g. southern Irish, Highland Scottish). 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 RP; hence Indian speakers of English tend to import their unaspirated series into English.

(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 may substitute [β] for /b/.

Sources of /p, b/

OE [pp, bb]		pin, apple, stop, blow, ebb
OF [p, b]		peel, appear, pump, abbey, robe
Note (1): In some cases /b/ derives from earlier /p/, e.g. <i>lobster</i> , <i>pebble</i> , or /p/ from earlier /b/, e.g. <i>pudding</i> , <i>purse</i> , <i>gossip</i>		
Note (2): [b] was lost after [m] in ME, e.g. <i>climb</i> , <i>lamb</i> , or inserted, e.g. <i>thimble</i> , <i>bramble</i> , <i>shamber</i>		

9.2.6 Alveolar Plosives /t, d/

(1) Examples

/t/—*syllable-initial, accented, aspirated*—take, tall, tone, attend, obtain; try, between, tune
syllable-initial, accented, after /s/, unaspirated—steak, stall, stone (but see §5.3.4)
syllable-initial, unaccented, slightly aspirated—butter, letter, after, taxation, phonetic; entry, antler, outward
syllable-final (often with no audible release)—beat, boat, late, past, sent, halt, tuft
followed by another plosive, 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 man¹⁸
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

¹⁸ If the alveolar plosive is articulated as such. See §§9.2.8, 12.4.5.

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	tall, tap, bait, cot, fighter, beauty		96%
tt (except -ed, -ing)	attack, attitude, battle, cassette, attract, matt		3%
th	posthumous, Thames, Thomas, Esther, Anthony		
-ed	jumped, looked, laughed		
tz= /ts/	blitz, pizza, intermezzo, quartz, scherzo, schizophrenia		

Note: Silent <t> in *castle, hasten, soften, Christmas, mortgage*

/d/

d	die, dawn, side, load, lido, body, wooden		98%
dd (except -ed and -ing)	add, sudden, puddle, middle		2%
-ed	banged, bombed, logged		

Note (1): *Buddha, dhow*

Note (2): silent <d> in *handkerchief, handsome, sandwich, landscape, grandfather*

(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).¹⁹ Lung air is compressed behind this closure, during which

stage the vocal folds 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 (Fig. 34). 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/.

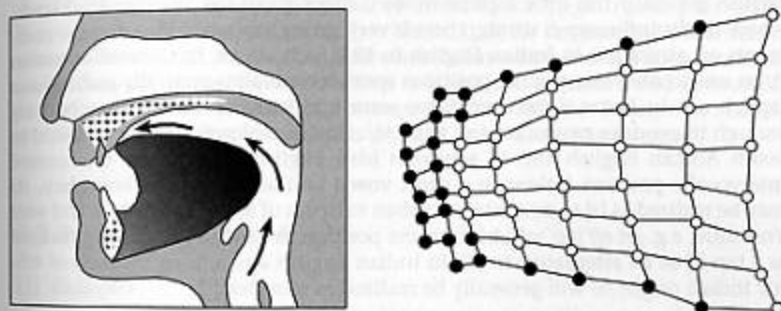


Figure 34 Section and palatogram of /t,d/.

The alveolar stop contact is particularly sensitive to the influence of the place of articulation of a following consonant. Thus, followed by /t/ as in *try, dry*, the contact may be post-alveolar [t̠,d̠] (although, alternatively, the /t/ 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* [tʰaɪm], *important* [ɪmˈpɔːtənt] or even [ɪmpɔːsənt].

Increasingly, /t/ in syllable-final positions is reinforced or replaced by a glottal closure unless a vowel or syllabic [ŋ] or [l] follows, e.g. *late, want, cricket, outright, chutney*. Even before a following vowel the use of [ʔ] for word-final /t/ is now acceptable as a form of London Regional RP (Estuary English), e.g. in *get off, got it, right order*. An alternative pronunciation before a vowel, voicing of /t/ to [d], is

¹⁹ Bladon and Nolan (1977).

increasingly reported for a minority of RP speakers, e.g. in *British*, *hot enough*, *not unusual*, *fat or thin*. Some RP speakers will also use [ʔ] to realize /t/ when syllabic [ŋ] follows, e.g. *cotton*, *certain*. It is a feature of Refined RP that /t/ is neither reinforced nor replaced by glottal closure.

(3) *Regional variants*—The use of [ʔ] for /t/ preceding syllabic [l], and, more particularly in unaccented intervocalic word-medial positions, is typical of regional varieties of English (e.g. those of Cockney and Glasgow), as in *kettle*, *butter*, *later*; in Cockney these become [keʔʊ, bʌʔə, leiʔə] (see §8.9.9 for /l/→[ʊ]). Such pronunciations are not acceptable as part of London Regional RP. (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 English, having more aspiration than RP, 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 (3) above. In General American /t/ in unaccented intervocalic positions (post-accentual) is generally realized as a tap [ɾ], e.g. in *butter*, *latter*, *put it*; for some speakers the closure may be long enough to produce neutralization with /d/. Similar realizations 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 realized as [ɹ] in a number of urban varieties of south Lancashire and west Yorkshire, e.g. *get off* [gɛˈɹɒf]; in the same position in Cockney /t/ may be realized as a tap [ɾ] as an alternative to [ʔ]. In Indian English and among speakers of ethnic Indian origin /t/ will generally be realized as retroflex [ɻ].

Sources of /t,d/

OE [t,t,d,dd]	ME [t,d]	turn, butter, boat, dew, adder, road
OF [t,d]		try, attend, button, doubt, adamant, bend
ON [t,d]		take, down
Note (1): Some words with present /θ/ had [t] until eModE, e.g. <i>throne</i> , <i>orthography</i> , <i>diphthong</i> , <i>authority</i>		
Note (2): [t] was elided in many (usually homorganic) clusters in eModE, e.g. <i>castle</i> , <i>hasten</i> , <i>Christmas</i> , <i>often</i> , <i>fasten</i> , <i>Wednesday</i> , <i>handsome</i>		
Note (3): [t,d] have been added in some (mainly French) words after voiceless fricatives and [n], e.g. <i>against</i> , <i>amongst</i> , <i>graft</i> , <i>peasant</i> , <i>parchment</i> , <i>sound</i> , <i>astound</i>		
Note (4): The earlier suffix [ɔd] > [t] after voiceless sounds, e.g. <i>wrapped</i> , <i>missed</i> , <i>pierced</i> , <i>blessed</i>		

(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 emphasized 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. [tʰ] [dʰ] in words such as *time*, *day*. If the closure point remains dental, the affrication produced will be clearly of the [tʰ], [dʰ] 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 [t,d] 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 ˈtru:/, /wɒs ˈðæt/, /ðæs ˈnɔ:məl/.

9.2.7 Velar Plosives /k,g/

(1) Examples

/k/—*accented, aspirated*—come, car, kin, incur, according; cry, clean, quick, queue

accented after /s/, *unaspirated*—scum, scar, skin (but see §5.3.4)

weakly accented, slightly aspirated—income, baker, talking, biscuit, anchor; secret, duckling, equal, dockyard

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 /'θɪkɪŋ/), black magic

lateral release, followed by lateral consonant—buckle, clean, close, blackleg

/g/—*word-initial, partially devoiced*—go, geese, guess, girl; glass, grass

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, naggle;
pick, pig; back, bag; duck, dug; crate, great

Spellings of /k,g/

/k/	Examples	TF	LF
k	king, kept, kettle, revoke, break, walk, bank, sky, monk, turkey	21%	10%
c	carpet, cord, caught, crew, clique, disc, maniac, alcohol, circus	59%	69%
cc	accused, occur, accommodation, account, occupy, occasion	1%	1%
q	cheque, conquer, unique, bouquet, liquor, mosquito, racquet		
ch	stomach, chemist, choir, chorus, chaos, echo, orchid, character	2%	3%
ck	chicken, neck, buttocks, hemlock, mackerel, creaky, tacky	6%	5%
qu=/kw/	quiet, quilt, queer, quest, acquire	4%	4%
x=/ks/	xray, six, larynx, climax		
Note: Silent <c,k> in <i>muscle, knew, knit, knob, knowledge, knight, knave</i>			
/g/		86%	92%
g	go, gourd, good, geese, grow, glum, agree, congratulate, bugle		
gg	egg, waggon (also wagon), aggravate, aggressive	6%	2%
gh	ghost, dinghy, ghastly, spaghetti	1%	1%
gu, gue	guide, guerdon	4%	3%
x (=gz/)	exhaust, exempt, exist	4%	4%
Note (1): <u> is a later, analogical, insertion in <i>guest, guilt</i>			
Note (2): Silent <g> in <i>gnaw, gnash, gnu, diaphragm, sign, reign</i>			

(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 folds 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. 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. /i:/ 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; when a back vowel follows, e.g. /o/ 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 /ɜ:/ as in *come, gun, girl* (see Figs 35, 36). Since the initial clusters /k/, /g/, as in *clean, glean*, are not in opposition with /t/, /d/ which do not occur initially, a substitution of /t/, /d/ for /k/, /g/ in such positions may occasionally be heard both in RP 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 RP is heard in areas where there has been Gaelic influence: in the Scottish Highlands, in Wales and in southern Ireland. Lesser aspiration than in RP 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 palatalize /k, g/.

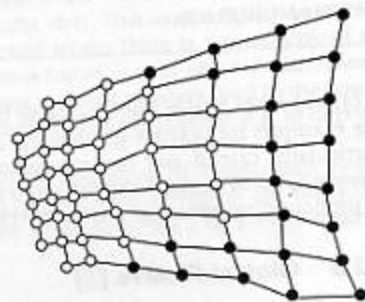
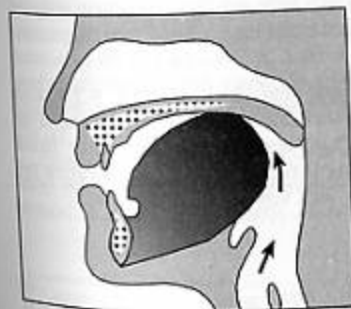


Figure 35 Section and palatogram of /k, g/ + /i:/.

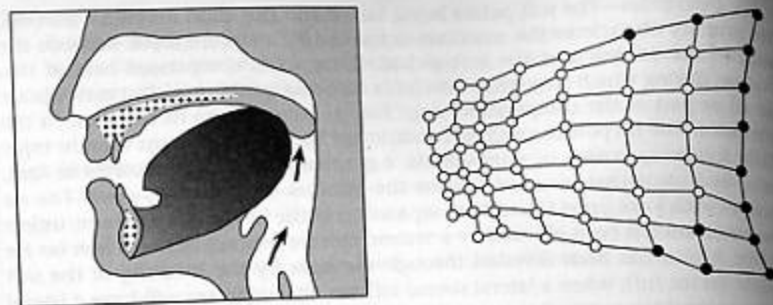


Figure 36 Section and palatogram of /k, g/ + /a:/.

Sources of /k, g/

OE [k, g]	ME [k, g]	
		king, keen, sick, back; go, grunt, again
		cause, cave, catarrh, case; agree, gutter, grain, rogue, vague
		sky, skip, skirt, skill, skate (fish), bag, rag
		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 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, nung* in the seventeenth century, though it is kept medially in RP *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-palatalize /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 folds, 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 folds. 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 glottalization or laryngealization which involves tension in the laryngeal region and either an excessively slow rate of vibration of the vocal folds ('creaky voice') or a vibration of the false vocal folds situated just above the true vocal folds ('ventricular voice' or 'harsh voice').²⁰ 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 the fall-rise tone) or on almost any pitch level in certain affected voice qualities, there is no total closure of the vocal folds. 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 RP speakers, is not a significant sound in the RP system. A distinction must be made between (a) the regular occurrence of glottal reinforcement in RP; (b) extended use of reinforcement in RP; (c) use of glottal replacement in RP; and (d) more extensive use of glottal replacement in other dialects.

(a) *Regular glottal reinforcement in RP*²¹—[ʔ] serves regularly for many RP 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* [kəʊ'ɒpəreɪt, dʒi:'ɒmətri, ri:'tækʃən], and even when the second vowel is weakly accented, e.g. *day after day* [deɪ ʔɑ:ftə 'deɪ]. This usage of [ʔ] is extended among overly careful speakers to those cases where there is a possibility of an intrusive /r/ (see §12.4.7) 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 the teaching of singing) in cases where a regular linking /r/ is permissible, 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

²⁰ Catford (1964, 1977), Laver (1980).

²¹ Christophersen (1952), O'Connor (1952), Andréson (1958, 1968), Higginbottom (1965), Roach (1973).

again, any vowel, initial in an accented morpheme, may receive this glottal reinforcement, e.g. *It's un* [ʔeatable, such dis [ʔ]order.

(b) *Extended glottal reinforcement in RP*—As was pointed out in §9.2.4, in RP (although not in Refined RP) /p,t,k/ and also /f/ 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 plosive 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 /tʃ/, 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, bauk, chocolate, back down*; for /f/, *rich, bench, searched, teaching, wretched, search me, reach it*.

(c) *Glottal replacement in RP*—Some RP speakers replace syllable-final /p,t,k/ by [ʔ] when a consonant follows, no oral closure being made.²² Such a glottal closure most commonly replaces /t/ when the following consonant is homorganic, i.e. /t,d,tʃ,ʒ,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, boathouse*. Some RP speakers may also replace the first (plosive) element of the affricate /tʃ/, e.g. in *coach, much, catch, couch*. Use of [ʔ] to replace /t/ in other positions, i.e. before syllabic [ŋ] and [l], e.g. in *cotton, little, eat an apple, bat and ball* and before words beginning with vowels, e.g. *not on* [nɒʔ ʔn], *it opens* [ɪʔ ʔɒpmz] was until recently stigmatized as non-RP but all except [ʔ] are now acceptable in London Regional RP.²² Use of [ʔ] for /t/ word-medially intervocally, as in *water*, still remains stigmatized as non-RP.

The replacement of final /p,k/ by [ʔ] is much less frequent among RP 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 RP although more frequently, but also occurs in a wider number of contexts. Word-medially and intervocally a /t/ following an accented vowel may be replaced by [ʔ], e.g. in *daughter, butter, Saturday, Waterloo, writing, potato* [pə ʔæɪʔə], *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 ʔɪ], *lucky, joker, I don't like it* [aɪdɒʔ ʔlaɪʔɪ], 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, /-m,-n,-ŋ/ are realized as [i,ɛ,ɛ̃], the following stop can only be glottal. [ʔ] may also occasionally replace the fricative /f/ in Cockney, especially in the phrase *half a*, e.g. *half a minute* [a:ʔ ə ʔmɪnɪʔ]. 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* [aɪ ʔæɪ ʔɪm], *we haven't* [wi ʔævnʔ].

Glottal replacement and glottal reinforcement are used in similar ways in East Anglia, Bristol, Glaswegian and Tyneside,²³ intervocalic (post-accentual) replacement being generally marked as characteristic of broad varieties of accents (sometimes referred to as 'basilectal'). Tyneside is unique in realizing glottal reinforcement in intervocalic positions by post-glottalization, e.g. *water* [watʔə], *keeper* [ki:pʔə], *speaker* [spi:kʔə].

(3) *History*—Since it would appear that [ʔ] has never been a significant sound 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 century²⁴ 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 200 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 Regional RP (Estuary English) than of General RP.

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 'affricative'. In English, apart from the exceptional affrication mentioned in §9.2.4 (6), only /t,d/ may have this type of release, namely in /tʃ,dʒ,ʧ,ʤ,ʤr,ʤr,ʤs,ʤz,tθ,dθ/.

²³ Wells (1982).

²⁴ Abercrombie (1948).

(2) *Phonemic status*—From a functional or distributional 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* realizations and *disjunct* realizations (i.e. with the elements in separate syllables or morphemes) may be treated as a complex phonemic entity.

Table 11 shows that /tʃ,dʒ/ best fulfil these conditions, occurring in all positions with a medial distinction between close-knit /tʃ/ 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. [tθ,dð] have an occurrence restricted to the final position in very few words.

	Word-initial	Word-final	Word-medial close-knit	Word-medial disjunct
[tʃ]	chap	patch	butcher	lightship
[dʒ]	jam	badge	aged	
[tr]	tram		mattress	footrest
[dr]	dram		tawdry	handrail
[ts]		cats	curtsey (?)	outset
[dz]		roads	Pudsey (?)	
[tθ]		eighth		
[dð]		(width)		

Table 11 Distribution of homorganic sequences of plosive plus fricative

Close-knit and disjunct sequences of /t,d/ plus /ʃ,z/ or /r/ involve different phonetic characteristics. In the case of /t/ plus /ʃ/ and /d/ plus /z/, 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,z/) in close-knit sequences but approximant in disjunct sequences: additionally the /r/ is devoiced following /t/.²⁵ Thus the /r/ in *mattress* is fricative and voiceless while

²⁵ 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* [kæt] and the longer friction of the plural form *cats* [kæts] or between *ratchet* [ˈrætʃɪt] and *rat shit* [rætʃɪt]. 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.

the /r/ in *footrest* is approximant and voiced. Medial close-knit sequences can be regarded as involving the two sounds within one syllable²⁶ while the disjunct sequence involves a syllable boundary between the two sounds.

(b) *Possibilities of commutation of the elements.*

(i) The elements of /tʃ/ may be commuted within the same syllable as follows: word-initially, the stop, commutes only with zero, cf. *chip, ship* while the fricative commutes with /r,j,w/ and zero, cf. *chip, trip, twin, tune, tin*; word-finally the stop commutes with /l/ or zero, cf. *watch, Welsh, wash* while the fricative commutes with /s/ or zero, cf. *catch, cats, cat*; and word-medially the stop commutes with zero, cf. *matches, mashes* while the fricative commutes with /t/ 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 /dʒ/ have a more restricted possibility of commutation owing to the rarity of syllable-initial /z/. Word-initially only the fricative commutes, with /r,j,w/ and zero, cf. *jest, dressed, dune, dwell, dam*; word-finally again only the fricative commutes, with /z/ or zero, cf. *hedge, heads, head*; word-medially the stop commutes with zero, cf. *ledger, leisure* and the fricative commutes with /r/ and zero, cf. *orgy, Audrey, larger, larder*.

Thus the possibilities of commutation are restricted in the case of the elements of /tʃ/ 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 /dʒ/ 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, /tʃ/ is in opposition to /dʒ/ 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, therefore, /tr,dr/ are more reasonably to be considered as consisting of separable elements than /tʃ,dʒ/.

(c) *Glottalization*—/tʃ/ is liable to glottal reinforcement before vowels as in [tʃːʃɪn] where /p,t,k/ are, within RP, generally subject to reinforcement only when a consonant follows; and to glottal replacement of the [t] element alone as in [kəʊʔ]. Both facts suggest that the [ʃ] element of /tʃ/ is in some sense the 'following consonant' which allows glottalization of the preceding [t]. Contrary to sections (a) and (b) above, section (c) argues for an analysis of [tʃ] as always a sequence of [t] + [ʃ].

(d) *Native speakers' reaction*—It seems that the native speaker does not regard /tʃ,dʒ/ 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 PresE /tʃ,dʒ/ derive in many cases from earlier (OE or OF)

²⁶ In words like *mattress* /tr/ may be analysed as one complex unit having ambisyllabic status (see §5.5.2).

plosives [c] or [j] (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 realization, 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 də ˈgleɪm/, *came to a stop* → /skem tu ə ˈstɒp/. (Sometimes an error will involve a transposition, sometimes just an addition.) In this respect, /tr,dr/ behave like clusters, e.g. *caught the tram* → /krɔ:t də ˈtæm/ whereas /tʃ,dʒ/ are never involved in such errors; we do not, for example, get errors like *ring the changes* → /rɪŋ də ˈʃeɪndʒɪz/ whereas we do get /tʃɪŋ də ˈreɪndʒɪz/.²⁷

(f) *Conclusion*—The criteria above on balance clearly suggest taking /tʃ,dʒ/ as phonemic affricates (despite the contrary evidence from glottalization). 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 /tʃ,dʒ/. Accordingly only /tʃ,dʒ/ 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 /tʃ,dʒ/, the transition will not necessarily be that which is typical of the alveolar plosives, since the stops of /tʃ,dʒ/ will be of a palatalized type; and there may be brief intervening friction of the alveolar /s,z/ type before the [ʃ,ʒ] elements proper.²⁸

9.3.1 Palato-alveolar²⁹ Affricates /tʃ,dʒ/

(1) Examples

/tʃ/—*word-initial*—cheese, chain, charge, charm, choke, cheer
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

/dʒ/—*word-initial*—gin, jest, jar, jaunty, Jew, jerk, joke, joist, jeer
word-medial, intervocalic—midget, ledger, margin, fragile, urgent, orgy, adjacent, agenda, major

²⁷ Fromkin (1971).

²⁸ Stevens (1960).

²⁹ 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 [tʃ,dʒ], are labelled 'post-alveolar'. In this book the former label 'palato-alveolar' is retained as more closely indicating the palatalized alveolar articulation of these sounds. The term 'post-alveolar' is kept for RP /r/ (= [ɹ]) which is simply labelled 'alveolar' on the new chart (see further under §9.7.2).

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

/tʃ/, /dʒ/—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; beseech, besiege
 /tʃ/, /tr/—cheese, trees; chip, trip; chap, trap; chew, true; chain, drain
 /dʒ/, /dr/—jest, dressed; jaw, draw; Jew, drew; jam, dram

Spellings of /tʃ,dʒ/

/tʃ/	Examples	TF	LF
ch	chain, choose, chunk, leech, pinch, achieve, rich, attach, much	65%	62%
tch	watch, fetch, wretched, sitch (the letter 'h'), bitch, butcher	10%	12%
ti	question, suggestion, navigation, etc.		
tu	nature, statue, furniture, virtuous, century, actual		

Note: *righteous, cello, concerto*

/dʒ/

j	jam, jaw, job, juice, major, pyjamas, enjoy, eject, jostle	29%	22%
g	gem, magic, pigeon, fragile, cage, imagine, village	61%	70%
dg	midget, lodge, judge, edge, fridge, badge, budge	5%	5%
dj	adjacent, adjective, adjunct, adjacent	1%	2%

Note: *soldier, suggest, exaggerate, grandeur, arduous*

(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. During both stop and fricative stages, the vocal folds are wide apart for /tʃ/, but may be vibrating for all or part of /dʒ/ according to the situation in the utterance. (/dʒ/ shares the features of devoicing in initial and final positions exhibited by plosives, see §9.2.1 (4), and fricatives, see §9.4 (3).) /tʃ,dʒ/ 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 /tʃ/ in *choose* in relation to that of *cheese*), though with some speakers a certain amount of lip protrusion is always present.

In addition, it should be noted that the voiceless /tʃ/, 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 /dʒ/. This effect must be taken as the primary perceptual cue to the /tʃ/-/dʒ/ opposition in syllable-final positions (Figs 37 and 38).

A minority of speakers makes /tʃ,dʒ/ 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 /tʃ,dʒ/ within RP, except in the matter of the degree of lip-rounding used. Some very careful speakers, however, use /t/ and /d/+/j/ in words which otherwise frequently have /tʃ/ or /dʒ/ at the onset of an unaccented syllable, e.g. *gesture, culture, virtue, statue, righteous, fortune, literature, question, posture, Christian, soldier, grandeur*. Potential oppositions between medial /tʃ,dʒ/ and /tj,dj/ are rare, but compare *verger* with /dʒ/ and *verdure* with /dj/. In the case of /t,d/+<u>, both the palato-alveolar affricates and /t/ or /d/+/j/ may be heard (again in unaccented positions), e.g. in *actual, punctual, mutual, obituary, individual, gradual, educate*. In accented positions /tʃ,dʒ/ are less common than /tj,dj/, e.g. in *tune, Tuesday, Turing, during, dune, dew*. Some speakers omit the stop element in the clusters /ntʃ,nɔʃ/ in word-final positions as in *pinch, French, lunch, branch, paunch, hinge, revenge, challenge, strange, scrounge*; and also medially as in words like *pinching, luncheon, avenger, danger*. In accented-syllable-final position /dʒ/ is increasingly simplified to /z/, e.g. in *liege, adagio, subterfuge*, while in unaccented positions it is sometimes reduced to /d/, e.g. *dangerous* [ˈdeɪndərəs].

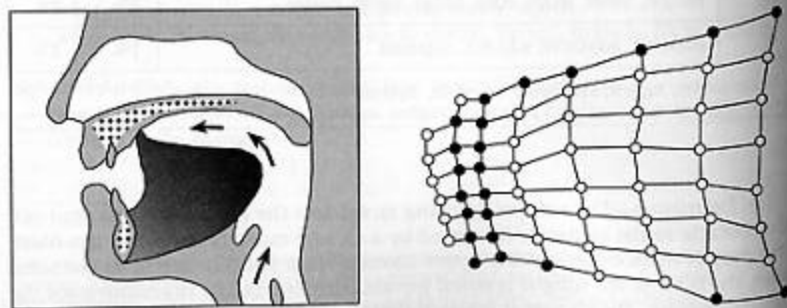


Figure 37 Section and palatogram of stop phase of /tʃ,dʒ/.

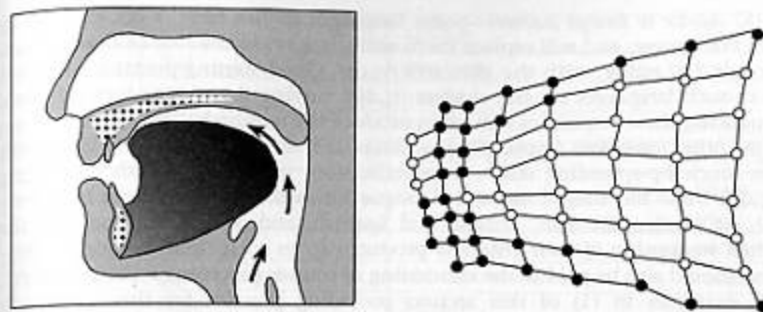


Figure 38 Section and palatogram of stop phase of /tʃ,dʒ/.

(3) *Regional variants*—There is no substantial dialectal variation in /tʃ,dʒ/. But in those dialects 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 /tʃ,dʒ/.

Sources of /tʃ,dʒ/		
Late OE [tʃ,dʒ] < earlier [c,ɟ]	ME [tʃ,dʒ]	child, chin, kitchen, teach, church, edge, bridge
OF [tʃ,dʒ]		chief, chair, chamber, choice, merchant, branch, judge, major, age, village, change
	ME [tj,t,dj,dj] > [tʃ,dʒ] eighteenth century	nature, virtue, question, creature, grandeur, soldier (cf. piteous, bestial, tedious, odious, which have reverted to [tj,dj] or [tj,dij])

(4) *Acquisition by native learners*—The affricates /tʃ,dʒ/ are, along with the fricatives and /t/, 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 /dʒ/, 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 /ʃ,ʒ/, 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 /tʃ,dʒ/. Good starting-points for learners from such languages are the clusters /tʃ,dʒ/; 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 /ʃ,ʒ/ with too much lip-spreading and overpalatalization, producing sounds resembling [tʃ,dʒ]; these too should move the tongue forward. Some languages have only /ʃ/, e.g. Arabic, German, Russian and Spanish, and replace the one with the other; weakening /ʃ/ will generally produce /ʒ/ in such cases. Particular attention should also be paid to the shortening of sounds preceding syllable final /ʃ/, 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 ˈtʃeə/, /dʌʃ ˈtʃiːz/, /lɑːʒ ˈdʒɑː/; however it is not acceptable to omit the fricative element.

Although only /ʃ,ʒ/ are here considered as unit phonemes, special attention should nevertheless be given to the sequences /tr,dr/ (see Fig. 37) because of the nature of the often retracted [t,d] 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 /ʃ/ and /tr/ and /ʒ/ and /dr/ as in the minimal pairs in (1) above.

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, characterized 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 RP 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 [ç,β,s,z,x,ɣ] occurring as the fricative element of affricated plosives, see §9.2.4 (6), and for the fricative allophones of /r,l,j,w/, see §9.7.

Table 12 illustrates oppositions, especially between members of the fricative pairs, in word-initial, -medial, and -final positions:

These oppositions may be realized 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 must be considered to be relatively complex. 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 articulations in the alveolar region (e.g. /s/); whereas the

	Initial	Medial	Final
/f/	feel	proofing	leaf
/v/	veal	proving	leave
/θ/	thigh	earthy, ether	wreath
/ð/	thou, thy	worthy, either	wreath
/s/	seal	racer	peace
/z/	zeal	razor	peas
/ʃ/	sheet	fission, Confucian	niche
/ʒ/	gigolo, genre	vision, confusion	rouge
/h/	heat	behave	

Table 12 Fricatives in different word positions

absence in French and many other languages of dental fricative phonemes allows a dentalized quality in the alveolar articulations, which if introduced into English, is liable to cause confusion with /θ,ð/ or to produce a 'lisp' fricative which is considered socially undesirable. This reflects the fact that [s,z], whether alveolar or dental, 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/.³⁰ 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/;³¹ the former are FORTIS, the latter LENIS. /h/ is normally fortis in character, but may have a lenis allophone (see §9.4.6).

(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,³² 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—[v,ð,z,ʒ]. 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

³⁰ Stone (1990), Stone et al. (1992).

³¹ Subtelny et al. (1966), Malécot (1968).

³² Haggard (1978), Docherty (1992).

precede them.³³ /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, cf. *five, 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.³⁴

Summary—The RP 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 languages³⁵ and learners aiming at RP 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 [ʃ], 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,³⁶ 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. 32):

(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

³³ Denes (1955), Wiik (1965).

³⁴ Subtelny *et al.* (1966), Malécot (1968).

³⁵ Maddieson (1984: 43) found only 3.5% of the 317 languages in his survey had 11 or more fricatives.

³⁶ Hughes and Halle (1956), Stevens (1960), Jongman (1989), Amerman and Parnell (1992), Scully *et al.* (1992), Stevens *et al.* (1992).

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.³⁷ Voicing may also manifest itself in more extensive transitions of the first formant adjacent to voiced fricatives.³⁸

(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.³⁹

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 [ʃ]. 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

³⁷ Stevens *et al.* (1992) found that an interval of at least 60 ms was necessary for an intervocalic fricative to be perceived as voiceless.

³⁸ Stevens *et al.* (1992).

³⁹ Jongman *et al.* (2000).

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—/fθ(s)/ fifth(s),⁴⁰ /ft(s)/ raft(s), /mf(s)/ triumph(s)⁴¹
 /lf(s)/ wolf(s), /lft/ engulfed, /lfθ(s)/ twelfth(s), /fn(z,d)/ soften (s,ed),
 /fl(z,d)/ baffle(s,ed), /fs/ coughs

/v/—*word-initial*—veal, vex, vat, vast, vain, vice, voice
word-medial—ever, nephew, over, silver, cover, event, canvas
word-final—leave, give, have, of, move, dove, grove
in word-initial clusters—/vj/ view
in word-final clusters—/vz/ loaves, /vd/ loved, /vn(z)/ oven(s), /lv(z,d)/
 solve(s,d), /l(z,d)/ grovel(s,ed), etc.

Compare

/f/, /v/—fine, vine; fat, vat; few, view; offer, hover; surface, service; laughter, larva; camphor, canvas; leaf, leave; proof, prove; safes, saves

Spellings of /f, v/			
/f/	Examples	TF	LF
f	fork, friend, selfish, comfort, leaf, roof, strife	84%	77%
ff	offend, coffee, effort, stuff	4%	14%
ph	physics, phonetics, photograph, epitaph, sapphire	11%	8%
gh	enough, rough, cough, draught, laugh	2%	1%
/v/			
v	vine, vote, view, savage, seven, deliver, novel, active, love, save	99%	99%

Note (1): *nephew, of*

⁴⁰ Clusters with a /θ/ are often simplified by its omission.

⁴¹ An epenthetic /p/ may be inserted, thus /traɪlʌmpfsl/. Cf. §§9.4.5 (2) and 10.8 (3).

(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 (Fig. 39). The actual point of contact will vary somewhat according to the adjacent sound, e.g. in the case of a back strongly 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*). For /f/, the friction is voiceless, whereas there may be some vocal fold vibration accompanying /v/, according to its situation (see §9.4 (3) above). 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.

No important articulatory variants for /f, v/ occur among RP 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 sequences such as *love to, have some* (see §12.4.3) or may, in familiar 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 ˈmʌni, aɪ kəd ə ˈbɔ:t tɪ/, where /ə/ is phonetically equivalent to the unaccented forms of *a* and *are* (see §12.2).⁴²

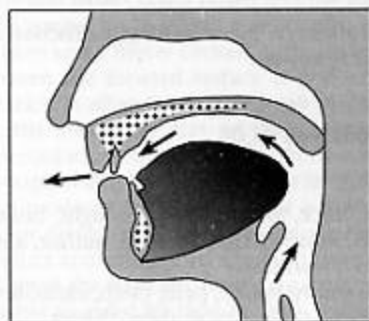


Figure 39 Section of /f, v/.

(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*).

(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

⁴² Note the accepted forms of *man-of-war, tug-of-war, o'clock, will-o'-the-wisp*, with /ə/ rather than /əv/ for *of*.

Sources of /f, v/**/f/**

OF [f]	ME [f]	fine, fruit, profit, chief
--------	--------	----------------------------

OE (rounded vowel)+[x]		dwarf, laugh, rough, cough
------------------------	--	----------------------------

Note (1): *plough, dough, bough* as /plau, dəu, bau/ had lost [x] in the inflected form

Note (2): *lieutenant* RP /lef'tenənt/ (cf. GA /lu:'tenənt/)

/v/

OE [f] between voiced sounds	ME [v]	love, devil, wolves, wives, driven
------------------------------	--------	------------------------------------

OF [v]		vain, very, cover, serve
--------	--	--------------------------

SW dialect [v] (cf. OE [f] and PresE <i>fox, fan</i>)		vat, vixen, vane
--	--	------------------

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, thwart
in word-final clusters—/θt/ earthed, /θs/ mouth's, /pθ(s)/ depth(s),⁴³ /tθ(s)/ eighth(s), /fθ(s)/ fifth(s), /ksθ(s)/ sixth(s), /mθ/ warmth,⁴⁴ /nθ(s)/ month(s), /lθ(s)/ twelfth(s), /ŋkθ(s)/ length(s), /lθ(s)/ health('s), /θl(z)/ Ethel('s), /θn/ earthen

/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*⁴⁵—/ðm(z)/ rhythm(s), /ðn(z)/ southern('s), /ðl(z)/ betrothal(s), /ðz/ clothes, /ðd/ writhed, /dð/ width (alternatively /witθ/)

⁴³ Clusters with a /θ/ are often simplified by its omission.

⁴⁴ An epenthetic /p/ may be inserted, thus /wɔ:mpθ/. Cf. §§9.4.5 (2) and 10.8 (3).

⁴⁵ /ð/ does not occur in word-initial clusters.

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 and 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/) (Fig. 40). With some speakers, the tongue tip may protrude between the teeth; this is a common type of articulation in American English. 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*, etc., and somewhat rounded for *thought, truth, soothe*, etc.

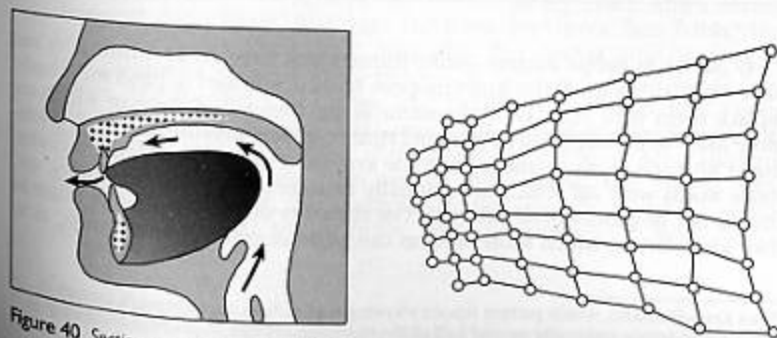


Figure 40 Section and palatogram of /θ, ð/

(3) *Regional variants*—No important RP 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—/ɪz zər eni, wɒts zə ˈtaɪm/. In popular London speech and in the southern USA, the dental articulation may be replaced by labiodental, e.g. *throw it*, *Smith* /ˈfrəʊ ɪt, smɪθ/, *mother*, *breathe in* /ˈmʌθə, brɪ:v ˈɪn/. Many reports suggest such pronunciations have become widespread in Britain in basilectal speech, particularly in urban centres.⁴⁶ Other alveolar articulations may also be heard for the weak /ð/, e.g. *all the way* /ɔ:l də ˈweɪ/, *in the morning* /ɪn nə ˈmɔ:ɪnɪŋ/. In Southern Irish speech /θ, ð/ are often realized as dental plosives [t, d] but this does not generally lead to neutralization with /t, d/, e.g. /t/ is aspirated.

Sources of /θ, ð/		
/θ/		
OE initial and final [θ]	ME [θ]	think, throat, bath, tooth, earthly, worthless
OF [ð]		faith
Gk [θ]		theory, thesis
OE [t]	ME [t]	catholic, authority, theatre
/ð/		
OE [θ] between voiced sounds	ME [ð]	other, feather, breathes
Note: Many function words have initial [ð] rather than the expected (from OE) [θ], e.g. <i>the, this, then, that, than, they</i>		

(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/, two exceptions being French and German which are more likely to replace them by /s, z/ and Hindi speakers who use their [ʃ, ʒ]. If aiming at RP, 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*, etc. /s, z/ preceding /θ, ð/ in sequences like *what's that, is this, nice thing* should not be assimilated to /θ, ð/ to give /wɒððɪs/ etc.

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—/sp/ spare, /st/ stain, /sk/ scarce, /sm/ smoke, /sn/ snake, /sl/ slow, /sf/ sphere, /sw/ swear, /spl/ splice, /spr/ spray, /spj/ spume, /str/ stray, /stj/ stew, /skr/ scream, /skj/ skewer, /skw/ square
in word-final clusters—/sp(s,t)/, gasp(s,ed), /st(s)/ rest(s), /sk(s,t)/ ask(s,ed), /sm/ lissom, /sn(z)/ listen(s), /sns/ licence, /sl(z)/ muscle(s), /ns(t)/ mince(d), /nsl(z)/ pencil(s), /lst/ whilst, /snt/ decent, /ps(t)/ lapse(d), /mps(t)/ glimpse(d), /lps/ helps, /ts/ cats, /kts/ acts, /pts/ opts, /lts/ faults, /nts/ tents, /ls/ pulse, /fts/ drafts, /ks(t)/ tax(ed), /ŋks/ thanks, /lks/ milks, /mfs/ nymphs, /fs/ laughs, /θs/ fourths, /fθs/ fifths, /tθs/ twelfths, /nθs/ months, /ksθ(s)/ sixth(s), /tθs/ eighths, /dst/ midst, /mpts/ prompts, /stl(z)/ pistol(s), /tns/ pittance, /dns/ riddance, /vns/ grievance, /fns/ patience

/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*⁴⁷—/bz/ ribs, /dz/ heads, /gz/ legs, /mz/ limbs, /nz(d)/ cleanse(d), /ndz/ hands, /ŋz/ rings, /lz/ holes, /vz/ caves, /ldz/ holds, /lvz/ valves, /lbz/ bulbs, /lmz/ films, /lnz/ kilns /ðz/ clothes, /zm(z)/ prism(s), /zn(z,d)/ imprison(s,ed), /zl(z,d)/ puzzle(s,d), /zd/ raised, /zml/ dismal, /plz/ apples, /blz/ bubbles, /tlz/ battles, /dlz/ saddles, /klz/ buckles, /glz/ eagles, /rlz/ Rachel's, /dglz/ cudgels, /mlz/ camels, /nlz/ channels, /θlz/ Ethel's, /slz/ thistles, /vlz/ evils, /flz/ ruffles, /ʃlz/ officials, /tnz/ kittens, /dnz/ saddens, /fnz/ orphans, /vnz/ ovens, /snz/ hastens, /fnz/ oceans, /ʒnz/ visions, /ðnz/ heathens, /znt/ present, /mplz/ samples, /mblz/ symbols, /zndz/ thousands, /ndlz/ sandals, /ntlz/ lentils, /ŋklz/ uncles, /ŋglz/ angles, /stlz/ pastels, /mzlz/ damsels

⁴⁶ 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.

⁴⁷ /z/ does not occur in an initial cluster apart from /zj/ in *zeugma* and *Zeus* (in which /ˈzju:gmə/ and /zju:s/ alternate with /ˈzju:gmə/ and /zju:s/).

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 and se	so, single, sun, saw, bus, gas, stay, skin, snow, tense, lapse, goose		
ss	pass, kiss, class, cross, discuss, assist, cassette, embarrass, essential, waitress		
	s,se,ss	79%	78%
c and ce	receive, decide, exercise, council, niece, science, licence, advice, sauce	15%	15%
sc	science, descend, acquiesce, scent, obscene		
x (= /ks/)	axe, climax, six, axle, reflex		
/z/			
s and se	bars, dogs, plays, news, rose, please, cruise, choose, praise, bosom, prison		
ss	scissors, possess, dessert, dissolve		
	s,se,ss	93%	69%
z	zoo, zeal, zero, zip, quiz, wizard	5%	27%
x	xerox, xylophone, xenophobia		
x (= /gz/)	exact, anxiety, exaggerate, exempt, exhaust, exist, auxiliary		

(2) *Description*⁴⁸—The soft palate being raised and the nasal resonator shut off, the blade (or the tip and blade)⁴⁹ 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. The airstream escapes by means of a narrow groove (cf. the

⁴⁸ See Stone (1990) for the grooving of /s,z/.

⁴⁹ Bladon and Nolan (1977) found a majority of speakers using a blade articulation.

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 situation (see §9.4(3) above). The lip position will depend upon the adjacent vowel, e.g. spread for *see, zeal, piece, bees*, etc. and somewhat rounded for *soon, zoo, loose, lose*, etc. A lisp, i.e. a substitution of /θ,ð/ for /s,z/ or a strongly dentalized version of /s,z/, is a common speech defect.

Before /t/, 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 /t/ 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,i/ (see §12.4.5).

Few RP speakers regularly maintain the distinction between /ns/ and /nts/ which is widespread in regional speech, 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* /sæmsən/ → /sæmpəsən/, *Kingston* /ˈkɪŋstən/ → /ˈkɪŋktən/, such variation being reflected in the variable spellings of proper names such as *Sam(p)son* and *Sim(p)son*.⁵⁰ /nz/ and /ndz/ are more frequently kept distinct by most RP speakers, e.g. in *wins—winds, tens—tends, fines—finds*, except in the most rapid speech when the /d/ may be elided (Fig. 41).

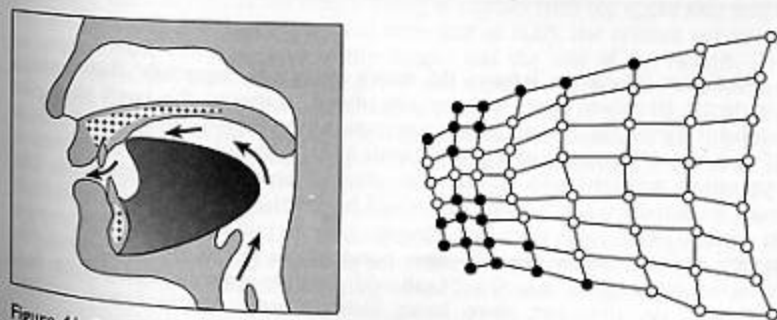


Figure 41 Section and palatogram of /s,z/.

⁵⁰ 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* /kəmp'fju:ʒn/, *convert* /kəmb'vɜ:t/ (= [kəmp'vɜ:t]), *anthem* /ˈæntθəm/ (= [ˈæntθəm]), *mansion* /ˈmæntʃən/.

(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]	soon, sun, kiss, mice, wasp
OF [s]		sudden, strange, lesson, beast, pace, false

/z/

OE /s/ = [z] between voiced sounds	ME [z]	rise, wise, thousand, wisdom
OF [z]		zeal, easy, dozen, cause

Note (1): Where ME [as] lost [ə], the [s]>[z] following a voiced sound, e.g. *loves, dogs, lands, stones*; where [əs] remained (following /s,z,f,ʒ,ʧ,ʤ/) it became /z/ or /z/, e.g. *passes, roses, rushes, touches, pages*. Similarly [s]>[z] in *as, was, has, his*.

Note (2): [s]>[z] between voiced sounds, e.g. *resemble, possess, observe, disease, exact*, but with many exceptions (often where the initial syllable is felt to be a prefix), e.g. *assist, excite, dishonest, research*. Sometimes /s/ and /z/ are alternatives, *absorb, disdalm, 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 dentalized articulation is to be avoided when aiming at RP 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 more retracted articulation for /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/ and /z,ʒ/: *sin, shin; sort, short; lasses, lashes; Caesar, seizure; 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,ʒ,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*⁵¹—/ʃr/ shrink
in word-final clusters—/ʃ(t)/ *welsh(ed), /ʃn(z,d)/ fashion(s,ed), /ʃnt(s)/ patient(s), /nʃn(z,d)/⁵² mention(s,ed), /ʃt/ pushed, /ʃ(z,d)/ marshal(s,ed); where /n/ precedes final /ʃ/, e.g. in *bench, lunch*, some speakers use a final cluster /nʃ/, without the [t] stop*

/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—/ʒn(z)/ *vision(s), /ʒd/ camouflaged, /nʒ(d)/ arrange(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 (when pronounced /əˈluːʃn/), allusion; Confucian (when pronounced /kənˈfjuːʃn/, confusion)

(2) *Description*⁵³—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. 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/.⁵⁴ The palatalization effect (i.e. the [j]-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/ in *shoe* tends to be lip rounded whereas /ʃ/ of *she* has neutral or spread lips.

⁵¹ /ʃ,ʤ/, having been treated as single complex phonemic entities, are not considered here as initial or final clusters.

⁵² An epenthetic /t/ may be inserted, thus /ˈmentʃn(z,d)/. See §§9.4.5(2) and 10.8(3).

⁵³ See Stone (1990) for the grooving of /ʃ,ʒ/.

⁵⁴ See §9.4(1) above.

Spellings of /ʃ,ʒ/

/ʃ/	Examples	TF	LF
sh	shoe, shed, shape, sham, sheep, wish, finish, brush, washer, ashes, publisher	37%	28%
ch,chs	machine, chief, fuchsia, brochure, parachute, sachet, chateau, chalet	1%	2%
s,ss+u,	sure, sugar, censure, assure		
ti-,si-,sci,ci-,ce-	patience, mansion, mission, conscience, fascist, conscientious, special, appreciate, ocean	55%	64%

Note: *schedule, luxury*

/ʒ/			
g	gigolo, genre		
ge,gi	beige, fuselage, garage, massage, sabotage, regime, bourgeois, blancmange		
	g,ge,gi	4%	23%
si-	division, allusion, conclusion, occasion, division		
s,z,ss+u	measure, casual, usually, closure, leisure, measure, pleasure, seizure, azure		
	si,s,ss,z + u	91%	74%

Apart from the degree of palatalization or lip rounding used, no important articulatory variants occur (Fig. 42). Medially in certain words, however, /ʃ,ʒ/ are not used by all speakers: (a) especially before /u:/ or /ʊ/, there is often variation between /ʃ,ʒ/ and /s,z/ + /j/, e.g. in *issue, sexual, tissue, inertia, seizure, casual, usual, azure* (cf. *assume* commonly with /s/ and *assure* with /ʃ/); (b) a similar variation between /ʃ/ or /s/ + /j/ (or /j/) + vowel, e.g. *ratio, appreciate, negotiate*; (c) the sequence /s,z/ + /j/ (or /j/) + vowel is more commonly kept in such words as *hosier, axiom, gymnasium, Parisian* (note American English /pɑːˈrɪzɪn/) and especially before the /ə/ comparative adjectival inflexion, e.g. *easier, lazier*; (d) 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 always possible and is felt to be the fully anglicized form. It will be seen that /ʒ/, rare initially in a word, replaceable by /dʒ/ finally and sometimes varying with /ʃ/ medially, has a particularly weak 'functional load' in English.

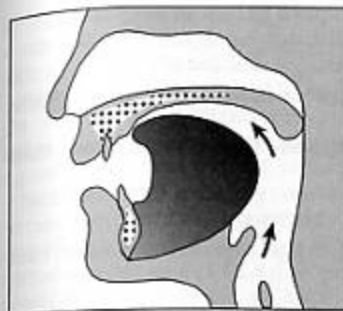


Figure 42 Section and palatogram of /ʃ,ʒ/.

(3) *Regional variants*—there are no significant variations dialectally apart from the variations within RP mentioned above.

Source of /ʃ,ʒ/

/ʃ/			
OE [ʃ] < [s,k] + [c]	ME [ʃ]	ship, shadow, bishop, fish, English	
OF palatalized [s]		cushion, cash, radish, finish	
	ME [s] + [j], 17c.	sure, sugar, ambition, ocean, special, patient	
OF [ʒ]	MF [ʒ]	chemise, chic, machine, charlatan, moustache	
/ʒ/			
	ME [z] + [j], 17c.	occasion, measure, treasure, usual	
OF [dʒ]	MF [dʒ]	prestige, rouge, beige, bijou	

(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 /dʒ/. Good results can generally be achieved by starting from /s,z/ 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 palatalized 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, spearhead, anyhow, manhood, abhor, adhere

Compare

/h/+ vowel, initial vowel—heat, eat; hill, ill; hedge, edge; harbour, arbor; haul, all; hate, eight; hold, old; hear, ear

Spellings of /h/

	Examples	TF	LF
h	heat, hen, ham, hot, horse, ahead, behave, perhaps, behind, anyhow, abhor, adhere	99%	99%
wh	who, whom, whose, where, whole		

Note: Silent <h> in *hour, honest, honour, heir, heiress, exhaust, exhilarate, exhibit, vehicle, vehement, shepherd*

(2) *Description*—Since English /h/ occurs only in syllable-initial, pre-vocalic positions, it may be regarded as a strong, voiceless onset to the vowel in question. 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 /hi:/, /ha:/, /hu:/. 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 characterizes the other English fricatives.

Although /h/ functions in English essentially as a voiceless syllable-initial phoneme (in the same way that /ŋ/ occurs only in syllable-final positions), 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 fold vibration, the result being a kind of breathy vowel or voiced glottal fricative [ɦ].

(3) *Regional variants*—In basilectal forms of most accents in England and Wales,⁵⁵ and in Australia, /h/ is lost, so that no distinction is made between such

RP 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* /ə'n ɪl/, *the house* /ðɪ:'aʊs/; alternatively an initial [ʔ] may replace the /h/, e.g. *a hill* [ə'ɪl], *the hospital* [ðə'ɪspɪtəl]. 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'eg] or [ə'heg], *the end* [ðə'end] or [ðə'bend].

Such loss of /h/ is usually considered characteristic of uneducated speech, but certain function words (especially *have, has, had*, pronouns and pronominal adjectives) frequently lose /h/ in RP in unaccented, non-initial, situations in connected speech (see §11.3), e.g. *he pushed him on his back* /hi: pʊʃt ɪm ɔn ɪz 'bæk/, *I could have hit her* /aɪ kəd əv 'hɪt ə/.

Some older RP speakers treat an unaccented syllable beginning with an <h>, as in *historical, hotel, hysterical*, as if it belonged to the special group *hour, honest*, etc., i.e. without an initial /h/, e.g. *an historical novel*. Pronunciations with initial /h/ are, however, commoner, e.g. *a historical novel*. (For /h/+ /j,w/, see §9.7.3.)

Sources of /h/

OE /h/ (= [h,x,ç])	ME /h/	home, high, help, horse
OF /h/ (<Germanic>)		hardy, haste, herald
OF /h/ (<Latin>)		herb, horror, habit, harass, heretic, 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 PresE pronunciation of *hour, heir, heiress, honour, honest* 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 initial vowel, e.g. *hill, ill*, etc. Those aiming at RP 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 in the utterance.

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 RP 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/ behave similarly to each other and differently from their

⁵⁵ See Trudgill (1999).

counterparts in the class /b,d,g,v,ð,z,ʒ/. This difference has generally been labelled as one of voicing; however, it will also have been seen that the realization of the distinction between the two classes varies according to position. To summarize, (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 the following consonants occur, their most common realizations are voiced and non-fricative.

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*⁵⁶—Voiced nasal consonants have no noise component such as results from the burst of plosives or the friction of fricatives or 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 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 1265–2310 Hz for the alveolars.⁵⁷ Spectrograms of /m,n,ŋ/ in *ram*, *ran*, *rang* are shown in Fig. 43.

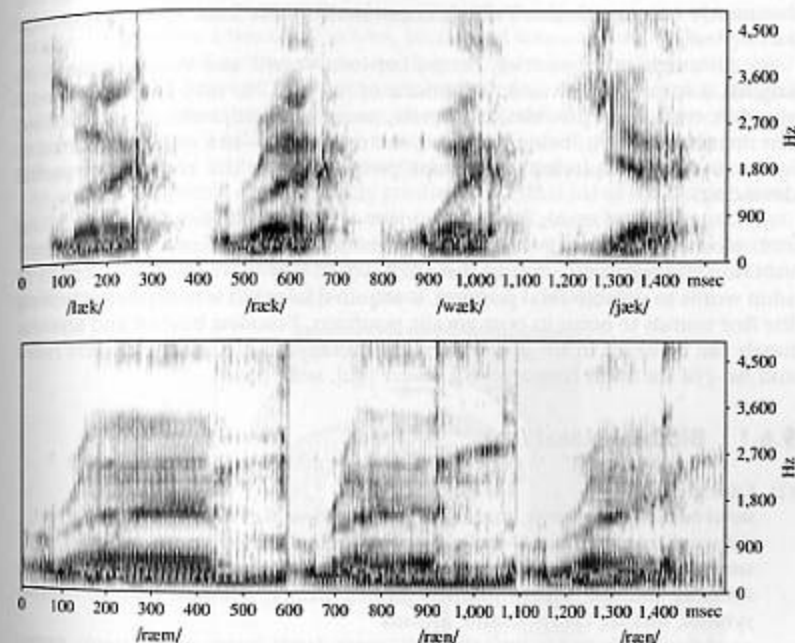


Figure 43 Spectrograms of /læk/, /ræk/, /wæk/, /jæk/ and of /ræm/, /ræn/, /ræŋ/ as said by a male speaker of RP.

(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 realized as /b,d,g/, e.g. *morning* /'bɔ:dnɪŋ/, *some nice lemons* /səb daɪs 'lebdɔ:z/. 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

⁵⁶ Liberman et al. (1954), and Malécot (1956).

⁵⁷ Kurowski and Blumstein (1984, 1987), Harrington (1994), Repp (1986), Ohde (1994).

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* ['mʌtɹ̩n]; less commonly /m/ e.g. *rhythm* ['rɪðm̩]; occasionally, with some speakers, /ŋ/, e.g. *bacon* ['beɪkɪŋ].

(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* [tʃiː], *smile* [mɪl].

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	morning, moon, gum, simple, number, amber, famine, damage, woman	96%	
mm	summer, dimmer, dimming, committee, immense, immoral, programme, ammonite	3%	
mb	comb, bomb, lamb, climb, crumb, womb, plumber, numb		
mn	autumn, column, solemn, hymn		

(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/. 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 realized as [m̥] and /b/ as [m̥].) When followed by a labiodental sound /f,v/, the front closure may be labiodental [m̥] 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 [m̥] 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 ˈmaɪl/, *more and more* /mɔː əm ˈmɔː/, *ten pairs* /tɛn ˈpeəz/, *gone back* /gɒn ˈbæk/; sometimes /m/ is a realization of word-final /ən/ or /n/ following /p/ or /b/, e.g. *happen* /ˈhæpən/, *ribbon* /ˈrɪbən/, or, in context, *cap and gown* /kæp ənd ˈgaʊn/ (see §12.4.5) (Fig. 44).

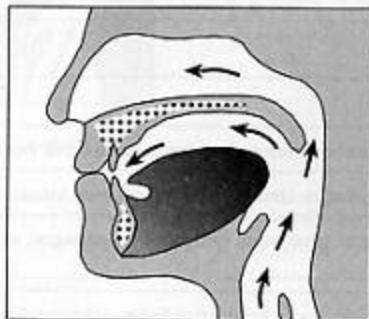


Figure 44 Section of /m/.

(3) *Regional variants*—There are no important regional variants of /m/ articulations.

Sources of /m/

OE [m,mm]	ME [m]	man, hammer, swim, home
OE [mb] finally		climb, lamb
OF [m]		master, family, solemn, sum

Note: in ME [m] was inserted before [b] when [l,r] followed, e.g. *thimble*, *bramble*, *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 /n/ or /n/), southerner (or with /ən/)

Spellings of /n/			
	Examples	TF	LF
n	now, noon, number, nonce, new, keen, barn, bend, bent	97%	
nn	funny, sinning, sinner, connect, annoy, innocent, innate, inn	1%	
gn	gnaw, gnash, gnu, gnat, sign, campaign, champagne, reign, alignment		
kn	know, knee, knife, knob, knot, knowledge, acknowledge, knuckle, knickers	1%	
pn	pneumonia, pneumatic		

(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*. 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 realized as [ŋ] 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 realized as [ŋ]—and thus strictly speaking to be regarded as an

allophone of the /m/ phoneme (see §9.6.1); /n/ before dental sounds /θ,ð/ is realized with a lingua-dental closure [ɲ], 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 realized 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) (Fig. 45).

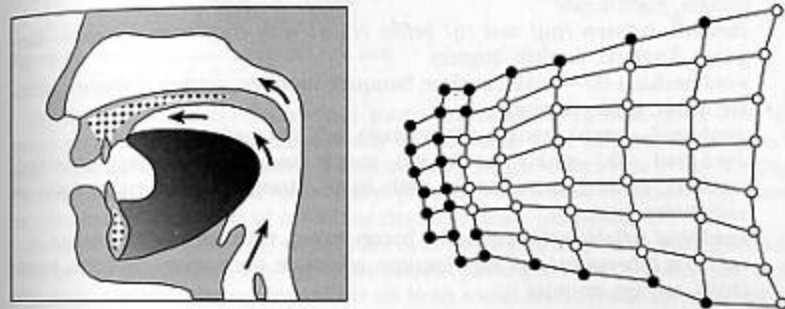


Figure 45 Section and palatogram of /n/.

(3) *Regional variants*—There are no important regional variants of /n/.

Sources of /n/

OE [n,nn]	ME [n]	
OE [hn,xn,ŋ]		name, many, man, spin
OF [n]		nut
OF [p]		noble, dinner, plain
OF [p]		sign, reign, line, mountain, onion
OE [kn, gn]	ME [kn,gn] > [n] seventeenth century	know, knit, gnaw, gnat

Note (1): An excrement [t,d] has been added to *tyrant, sound, ancient* (pre-ME) and *pleasant, ancient, pound* (post-ME)

Note (2): An [n] has sometimes affixed to a noun from the indefinite article 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 RP, 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 /t,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 /kɔŋk/), chunk(s), monk(s), distinct, amongst (or with /ŋst/), strength (with /ŋkθ/, /ŋθ/), or sometimes /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	sing, singer, singing, longing, tongue	75%	60%
n(+/k,g/)	sink, anxious, uncle, ankle, bangle, income	60%	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, being somewhat spread in *sing* and relatively open in *song*. /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 realized as /ŋ/ and /g/ as /ŋ/.) Word final /ŋ/ may result in context from citation forms of /n/, e.g. *ten cups* (see §12.4.5). Except in such assimilations /ŋ/ occurs usually after the short vowels /i,æ,ɒ,ʌ/; rarely after /e/ (Fig. 46).

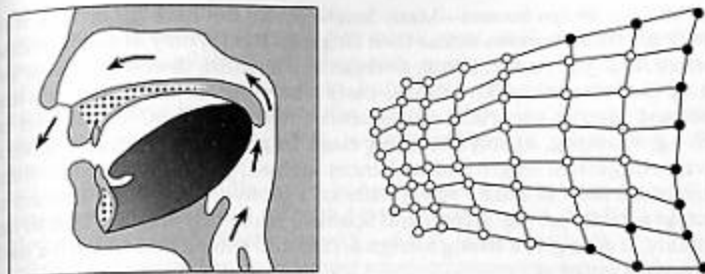


Figure 46 Section and palatogram of /ŋ/ in sang.

(3) *Regional variants*—Earlier /ŋg/ forms are retained, instead of RP /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* [sɪŋŋɪŋ] for RP [sɪŋɪŋ]. 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 used consistently 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 formal speech (e.g. when reading aloud).⁵⁸ 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/.

Sources of /ŋ/

OE /ŋ/ before [k,g]	ME /ŋ/ before [k,g]	Examples
		sing, hunger, thank, tongue
OF /ŋ/ before [k,g]		frank, rank, conquer, language
Note (1): /g/ was lost after /ŋ/ around 1700, first before consonants and later before vowels or pause. Loss of /g/ gave /ŋ/ phonemic status with minimal pairs such as <i>sin</i> vs <i>sing</i>		
Note (2): /k/ has not been lost following /ŋ/		
Note (3): Substitution of /ɪn/ for /ɪŋ/ in the suffix <i>-ing</i> was fashionable in the eighteenth and nineteenth centuries and remains as an archaic form of RP (e.g. <i>huntin'</i> , <i>shootin'</i> , and <i>fishin'</i>)		

⁵⁸ See e.g. Trudgill (1974, 1999).

(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 possible avoid using /g/ (or more rarely [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 /ŋi:ŋa:/ repeated in order to obtain a succession of nasal+vowel without a plosive. Some other learners may substitute palatal /p/, 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, ʃ/ 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. /p, t, k/ produce 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 [ə])

word-final, before following vowel or /j/—feel it, fall out, all over, will you

(b) *devoiced clear* [l̥]:

fully devoiced clear [l̥] (following voiceless plosives in accented syllables)

—play, please, plant, apply, aplomb, clean, close, climb, click, acclimatize

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* [ɫ] (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 [ɫ]—table, middle, eagle, cudgel, camel, final, quarrel (or with [ə]), oval, easel, usual, spaniel (or with [-jə]), equal, tumble, fondle, angle, doubled, tables, measles, finally (or with [-əl-]; cf. 'finely' with [l])

syllabic [ɫ], *partially devoiced following voiceless consonant*—apple, little, buckle, satchel, awful, parcel, special, simple, mantle, uncle, sinful, pistol (cf. gambling [l] or [ɫ] vs gambolling [ɫ])

variations in inflected forms of verbs having [ɫ] in the uninflected form—[ɫ], or [ə] (more rarely [l])—pommelling, tunnelling, cudgeling; [l] (more rarely [ɫ] or [ə])—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 [ɫ] or even non-syllabic dark [ɫ]; *gambling* [ˈgæmbɫɪŋ] vs *gambolling* [ˈgæmbɫɪŋ] or [ˈgæmbɫɪŋ]; *codling* [ˈkɒdɫɪŋ] vs *coddling* [ˈkɒdɫɪŋ] or [ˈkɒdɫɪŋ]

possible syllabic [ɫ] occurring in pre-accentual positions or rarely in accented syllables—fallacious, believe, select, bullish

Spellings of /l/

	Examples	TF	LF
l (inc. le)	leave, droplet, deal, fault, symbol, italic, polish, balance, salad, talent, middle	83%	90%
ll	allow, collide, illegal, million, balloon, intelligent, parallel	18%	10%

Note (1): British/American spellings in *distil(l)*, *fulfil(l)*, *instal(l)*, *enrol(l)*, *travel(l)ing*, *signal(l)ing*, *dial(l)ing*

Note (2) Silent <l> in *talk, would, could, should, half, calm, salmon, folk*

(2) *Description*⁵⁹—(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

⁵⁹ See Stone (1990), Stone et al. (1992) for the articulation of /l/.

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 [e] type, but may be closer or more open according to the following vowel, cf. *lick, lack*. For dark [ɫ], 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 velarized) resonance. Variations in the quality of the back vowel resonance associated with [ɫ] are found among RP speakers, with a range extending from [ɔ], [u], or [ɜ] to [ɔ] or [ʌ].

Many RP speakers and especially those of London Regional RP (=Estuary English) will use [ɔ] alone for [ɫ] in words such as *beautiful, careful, people, table*, etc., i.e. especially when a consonant involving a labial articulation precedes; they will, moreover, not recognize such a vocalic allophone as unusual when they hear it. The use of a vocalic allophone seems somewhat less usual in RP when other consonants precede, e.g. in *uncle, Ethel, parcel, special, spaniel* and is particularly avoided, as a childish pronunciation, after alveolar plosives, e.g. *little, middle*, where the consonants are regularly released laterally. On the other hand, in an artificial or somewhat precious style of speaking, [l] may be used for [ɫ].

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 [ɫ], and especially [ɫ], there is, with some speakers, always a tendency to lip-rounding. Both [l] and [ɫ] are voiced except when the preceding consonant is voiceless.

The RP distribution of [l] and [ɫ] is: [l] when a vowel or /f/ follows and [ɫ] in all other positions. In word-final positions following a consonant (*fiddle, final, parcel*), syllabic dark [ɫ] 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* [ri:t ʔeɪt], cf. *real estate* [ri:t ɛsteɪt]. The actual point of contact of the tongue for [ɫ] is conditioned by the place of articulation of the following consonant; thus, in *health, will they*, the [ɫ] has a dental contact (to a lesser extent, a preceding /θ, ð/ may cause a dental articulation [ɫ], e.g. in *a month late, with love*); or, in *already, ultra, all dry*, the contact for [ɫ] is likely to be post-alveolar. [ɫ] may also be strongly nasalized by a following nasal consonant, e.g. *elm, kiln*.

The velarization of [ɫ] 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 /i:/ + [ɫ], a central glide between the vowel and [ɫ] is often noticeable, and the [i] element of /eɪ, aɪ, ɔɪ/ tends to be obscured, e.g. in *pail, pile, oil*. /u:/ before [ɫ] tends to be more nonphthongal and nearer to C.[u] (Figs 47 and 48).

(b) *Acoustic features*⁶⁰—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 [ɫ]. Transitions

to and from vowels are generally slower than those for nasals although faster than those for glides. A duration for [ɫ] of greater than 50 to 60 msec produces an effect of syllabicity. A spectrogram of clear [l] is shown in Fig. 43.

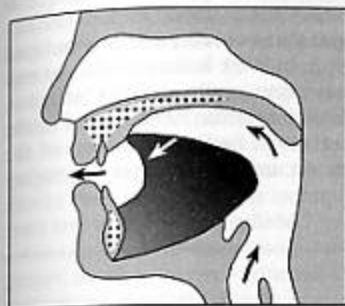


Figure 47 Section and palatogram of clear [l].

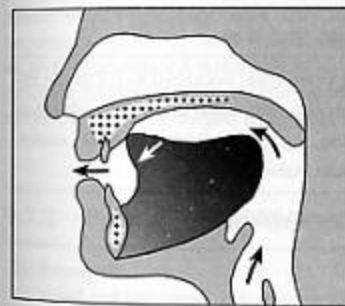


Figure 48 Section and palatogram of dark [ɫ].

(3) *Regional variants*—In the speech of London and the surrounding areas,⁶¹ the tongue-tip contact for [ɫ] is omitted, this allophone of /l/ being realized as a vowel (vocaloid) in the region of [ɔ] with weak lip-rounding or as [ɜ] with neutral or weakly spread lips, thus *sell* [seɔ] or [seɜ], *fall* [fɔ] or [fɜ], *table* [tæɪbɔ] or [tæɪbɜ]. In such speech, the lowering of /i:/ and /u:/ before [ɔ] 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. [mɪrɔ] vs [mɪɔ], [puɔ] vs [puɔ]; other confusions are likely, e.g. *rail* (RP [reɪt], London [ræɔ]) and *row* (RP [rɔ], London [ræɔ]), *dole* (RP [dəʊt], London [dɔ]) and *doll* (RP [dɔt], London [dɔ]). Such pronunciations have become part of London Regional RP as noted under (2) above.

⁶⁰ O'Connor et al. (1957), Lisker (1957b), Dalston (1975).

⁶¹ See Sivertsen (1960), Wells (1982), Trudgill (1999).

In other dialects of English, the RP distribution of [l] and [ɫ] 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 [ɫ] may occur in all positions. Reports suggest other types of /l/ in the USA, in particular a velar or uvular [ɮ], where the airstream escapes laterally around a velar or uvular closure; they also suggest that a vocalized /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 [ɫ] in words such as *fertile, futile, missile, reptile*, etc., where RP retains a prominent preceding vowel [-aɪɫ]; a reduction of the vowel, similar to the present American form, occurred in seventeenth-century British English.

Sources of /l/		
OE [l, ll]	ME [l]	land, climb, all, tell, apple
OE [hl], [xl] or [ll]		loaf, ladder
OF [l]		lamp, close, colour, veal, able
Note (1): Preconsonantal [ɫ] before back or open vowels was vocalized to [ʊ] in the fifteenth century, e.g. <i>walk, talk, half, folk</i> , but not in <i>halt, salt, malt</i> . In other words it has been reintroduced in spelling and pronunciation, e.g. <i>fault, falcon, emerald, soldier, realm</i> , and sometimes only in the spelling, e.g. <i>calm, palm, balm</i>		
Note (2): The loss of /l/ in <i>could, would, should</i> 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 [ɫ] 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* [ɬi:], *fling* [ɬɪŋ].

(5) *Advice to foreign learners*—Few foreign learners will possess in their own language [l] and [ɫ] sounds with the RP 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 [ɫ] in English, learners will be perfectly intelligible if they use only [l]. But those whose English otherwise conforms to an RP pattern should learn to make the dark [ɫ]. In the articulation of [ɫ] 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 [ɫ] may be said to be the accompanying weakly rounded [o] or [ɔ] quality; learners should, therefore, begin by pronouncing a vowel of the [o] or [ɔ] type for the syllabic [ɫ] in words such as *bubble, people, awful*, i.e. where a labial consonant precedes [ɫ], thus [ˈbʌbʊ], [ˈpiːpɔ], [ˈɔːfɔ]. 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 velarized quality. The relationship of [ɫ] and [o] can further be established by practising the alternation of [o]-[ɫ]-[o]-[ɫ], only the tongue tip moving and the [o] resonance continuing. The [ɫ] thus achieved should then be used in the examples of [ɫ] 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-velarized lateral in pre-vocalic positions. This should be particularly avoided, as such over-velarization is not even typical of those varieties of English which have a dark [ɫ] in all positions.

Care should also be taken to use a sufficiently devoiced [ɫ] 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 /p, k/ 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 [ɫ], 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 [ɹ] 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 /'hɪstri/

following voiced consonant in the same syllable (fricative [ɹ] after /d/)—brief, bright, dress, dry, dream, boundary, address, tawdry, grey, grow; umbrella, address, agree, hungry; comrade, sovereign, general, miserable

words containing more than one /r/—brewery, library (/laɪbrəri/ or /laɪbrɪ/), 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/, /ʃj/—trees, cheese; trip, chip; trap, chap; true, chew; train, chain
 /dr/, /dʒ/—drill, gill; dressed, jest; draw, jaw; drew, Jew; dram, jam; drear, jeer; Drury, jury

Spellings of /r/

	Examples	TF	LF
r	reed, rag, red, round, price, proud, brewery, tree, try, cream, crow, fry, throw, shrink, street, strain, scream, diary, dowry, dairy, eery, fury, history, library, apron, attract, mattress, buckram, afraid	94%	95%
rr	carry, arrive, arrogant, correct, arrest, narrative, barrister, mirror, arrow, sorry, hurry	4%	4%
wr	write, wrote, wrinkle, wriggle, wrist, wreath, wrong	2%	1%
rh	rhythm, rhyme, rhinoceros, rheumatism, rhetoric, rhododendron		

Note: Linking /r/ in *far away*, *poor old*, *for all*, *here at last*, *there are*

(2) Description

(a) *Articulatory and distributional features*—The most common allophone of RP /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. 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 RP phoneme is, therefore, phonetically vowel-like, but, having a non-central situation in the syllable, it functions as a consonant.

RP /r/ occurs only before a vowel, the above description being applicable to the realizations: 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 slow enough to produce friction, e.g. in *drive*, *tawdry* and, in rapid speech, at syllable or word boundaries, e.g. *headrest*, *bedroom*, *wide road*.

A completely devoiced fricative [ɹ̥] 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*; in the syllable-initial sequences /spr-,str-,skr-/, e.g. *spring*, *string*, *scream*; and after other voiceless consonants in accented syllables, e.g. *fly*, *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* /'nesəsəri/, *surf riding*, *birthright*, *horse race*, *cockroach*, *mushroom*.

In Refined RP, the approximant variety [ɹ] may 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 [ɹ], 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 [ɹ] differs from that of /d/ in that the contact for [ɹ] is of shorter duration and less complete than that of /d/, the central hollowing of the tongue typical of [ɹ] being retained; *carry* with [ɹ] and *caddie* with /d/ are, therefore, phonetically distinct. In the case of [ɹ] 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 RP speakers, but usually only in highly stylized speech, e.g. in declamatory verse-speaking.

In RP, too, the degree of labialization varies considerably. Although for perhaps the majority of RP speakers the lip position of /r/ is determined by that of the following vowel, some speakers labialize /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 realization 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 popular London moving into the south-east and then further afield (e.g. Derby, Milton Keynes, Middlesbrough).⁶² 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.

⁶² Foulkes and Docherty (2000).

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 /r/. Both are possible in *conference, misery, camera, reverie, malingering, 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 RP; the elision of /r/ in *parrot, barrel* may leave syllabic or non-syllabic /r/ (see further under §10.8) (Fig. 49).

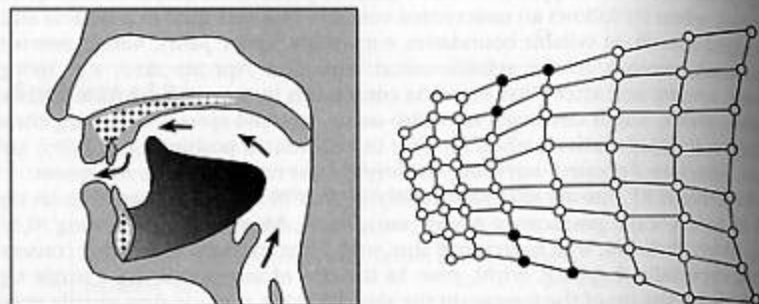


Figure 49 Section and palatogram of /r/ = [ɹ].

(b) *Acoustic features*⁶³—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 Fig. 43.

(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 realization 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 RP—[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.⁶⁴ In this type of articulation, the tip of the tongue is not retroflexed but approaches the base of the teeth.

/r/ differs in various types of English not only in its phonetic realization 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 RP homophones as *pair, paw; court, caught*. 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*, etc. For the use of word-final, post-vocalic /r/ as a linking form in RP, see §12.4.7.

Sources of /r/

OE [r]	ME [r]	rise, rope, green, nearer
OE [hr], [xr] or [ʀ]		ring, roof
OF [r,rr]		rule, remain, fruit, very, carry
OE [wr]	ME [wr]>[r] seventeenth century	wrap, write, wrest, wretch

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 the eighteenth century, leaving a [ə] which attached to a preceding vowel to form a diphthong

(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*—RP /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 RP, although it is not a question of loss of intelligibility through phonemic confusion. A weak tongue-tip tap is the least objectionable substitution for RP [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,

⁶³ O'Connor et al. (1957).

⁶⁴ See Hagiwara (1995).

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 RP [ɹ] as if it were a vowel. Any central vowel, either English /ə/ or RP /ɜ:/ 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. [ɹ:ed].

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 /tʃ, dʒ/, 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 [ɹ] 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 preconsonantal and pre-pausal positions. In words such as *car, arm, horse, hurt*, etc., the <r> may be taken as a sign indicating length of the preceding vowel, and in *fear, there, tour*, etc., 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 [ɹ], 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 /i:/ (with spread or neutral lips) and /u:/ (with rounded lips) respectively, e.g. in *year, west, inward, spaniel* [ˈspæniəl]. 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 /i:/ in *yeast* has a closer beginning than that of /j/ to /ɒ/ in *yacht* and the starting-point of /w/ before /u:/ in *woo* is closer than that before /ɒ/ in *what*. When /j/ is followed by a back close vowel as in *you*, or /w/ by a front close vowel as in *we*, the starting-points need not be as close as in *yeast* and *woo*, since, in the first cases, the glide is essentially of a front to back (or vice versa) direction, rather than a movement of close to more open, as in the latter cases. In English, however, it is never necessary for the starting-point of /j/+/i:/ or /w/+/u:/ to be so close that it falls within the fricative region beyond the vowel area, since English /i:/ and /u:/ 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, mainly 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 [j] and [w] 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 emphasized by the fact that the articles have their preconsonantal 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* [kɥu:], [kwɪk], i.e. they fall within a phonetic definition of a consonant.

(2) *Acoustic features*⁶⁵—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 /i:/ or /u:/. 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 msec. F1 starting-point of the glide is that of /i:/ or /u:/, 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 msec for both /j/ and /w/, with that of F1 of the same or shorter duration. Spectrograms of /j, w/ are shown in Fig. 43.

9.7.4 Unrounded Palatal Approximant /j/

(1) *Examples*
word-initial—yield, yes, yard, yacht, yawn, union, young, yearn, yokel, year, Europe

⁶⁵ O'Connor et al. (1957).

following accented /p,t,k,h/ (only before /u:,uə/) = [ç]—pew, tune, queue, cure, pure, huge; accuse, secure, peculiar, attuned
 following /sp,st,sk/, voiceless fricatives, or unaccented /p,t,k/ = slightly devoiced [j̥]—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	yes, yacht, young, yours, yeast, year, yak, yearn, beyond, lawyer	19%	4%
i	spaniel, brilliant, senior, onion, familiar, behaviour, view, saviour, opinion		
u (as part of /ju:/)	use, muse, tune, cure, pure, huge, duty, music, opulent, presume, congratulate, nebulous, accuse, secure, peculiar, attuned, spurious, enthusiasm, refuse, opulent, spatula, oculist, abuse, endure, manure, failure		
ue (as part of /ju:/)	avenue, revue, revenue, argue, subdue, barbecue, pursue, queue, value, residue		
ew, eu (as part of /ju:/)	new, mildew, nephew, spew, pew, stew, askew, feud, adieu, eulogy		

Note: *beauty*

(2) *Description*—The vocalic allophones of RP /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, yawn*, etc. 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 /u:/, /uə/ or sometimes /ɔ:/ may follow /j/ (*pew, cure*); in unaccented clusters, /j/ may be followed by /u:,u,uə/ or /ə/ (*argue, opulent, tenure, senior*). The sequence /h/+/j/ as in *hue*

/hju:/ [hçu:] may reduce to [ç] giving [çu:]. Such a realization 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 realization of /h/+/j/.

In many cases of RP /j/+/u:/, an alternative pronunciation without /j/ exists. Earlier /ju:/ or /ju/ sequences (see §8.9.10) have regularly been reduced to /u:/ in PresE after /ʃ,ʒ,t/; /ju:/ is retained after plosives, nasals, /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 /u:/ and /ju:/ being heard, e.g. in *absolute(ly), lute, salute, revolution, enthusiasm, pursuit, assume, suit, suet, suitable, superstition, supermarket, consume, presume*, etc., though /u:/ grows increasingly common in such words, being the more common after /l/ and /s/ in an accented syllable while /ju:/ remains predominant after /θ,z/. Increasingly pronunciations without /j/ are also heard following /n/ in accented syllables, e.g. *neutral, news*.

Unaccented sequences of /tj,dj,sj,zj/ coalesced in an earlier state of the language into /tʃ,dʒ,f,ʒ/ (see §§9.3.1, 9.4.6). In some cases, e.g. *statue, residue, issue, seizure, Christian, immediate, educate, gratitude, usual, visual, Jesuit*, both forms may now be heard, the pronunciation with /tj,dj,sj,zj/ being characteristic of careful speech. Coalesced forms in the onset of accented syllables, e.g. /f,ʒ/ in *assume, presume* are increasingly heard in RP, forms with /sʃ,zj/ becoming confined to Refined RP. Such coalescences also occur in rapid, familiar, speech, at word boundaries, e.g. in *not yet* /nɒtʃet/, *would you* /wʊdʒu:/, *this year* /ðɪʃjə/, *see you* /si:ʒu:/ (see §12.4.5).

In unaccented syllables, there is often variation between /jə/ and /ɪə/, e.g. in *immediate, India, audience, tedious, idiot, hideous*. In the cases involving a preceding alveolar plosive where the /jə/ form may be regarded as the primary one, this form may occasionally be further reduced to /tʃ,dʒ/ in rapid speech, e.g. /i'mi:diət, i'mi:diət, i'mi:diət/. 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] plus [ə] which are better regarded as bisyllabic).

A junctural [ʲ] glide may sometimes be heard between /i:,i,eɪ,aɪ,u/ and a following vowel, e.g. *seeing* [ˈsi:ʲiŋ], *saying* [ˈseɪʲiŋ], *sighing* [ˈsaɪʲiŋ], *enjoy it* [enˈdʒɔɪʲt], *see ants* [si: ˈɔ:nts], *say all* [seɪ ˈɔ:l], *my aunt* [maɪ ˈɑ:nt], *toy arm* [tɔɪ ˈɑ:m], resulting from the relatively close quality given to /i:/ and [j] 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 ˈɪə/ (= [maɪ ˈjə]) and *my year* /maɪ ˈjɪə/ (= [maɪ ˈjɪə]) and *we earn* /wi ˈɜ:n/ (= [wi ˈɜ:n]) and *we yearn* /wi ˈjɜ:n/ (= [wi ˈjɜ:n]). A junctural [ʲ] always has the alternative of a glottal stop, e.g. [maɪ ˈŋə] and [wi ˈʔɜ:n] (see §9.2.8) (Fig. 50).

(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 RP), e.g. in *tune, tunic, dune, duty, enthusiasm, news*. In East Anglia /j/ may

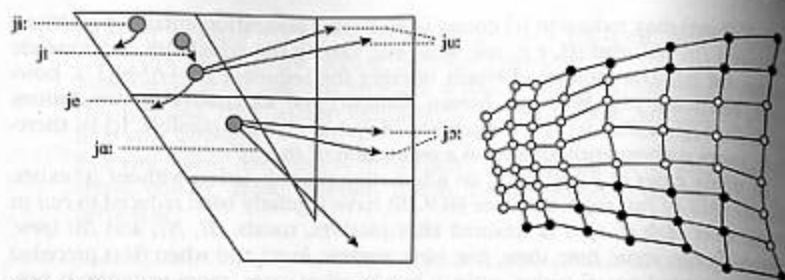


Figure 50 Vowel diagram and palatogram for /j/.

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 much of Wales.

Sources of /j/		
OE /j/	ME /j/	yard, year, yield, yoke, young
	ME [i, e, ε] + [u] > [j] + [u:]	hue, new, few (see §8.9.10)
OF /pɑ́/	ME [j] + V	opinion, familiar, onion, William, pavilion

(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*—RP /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 [i:] instead of the [j] at the beginning of the word, e.g. [i:ɪst], [i:i:ld], [i:i:dl], [i:ɪə] and then gradually shorten the initial [i:]. Spanish learners should avoid using a palatal plosive [j] in accented syllables, e.g. in *yes, young* [jes, ʝʌŋ]. 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*.

9.7.5 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/ = [ɰ]—twig, twelve, twin, twice, queen, quell, quick, quite, quaint, quaint

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/, /ɰ/—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	west, weather, wink, wit, wet, wagon, walk, wood, weed, wag, wasp, wood, womb, word, wave, wire, weird, wear, twig, twelve, twin, twice, dwindle, sweep, swoon, swim, swear, thwart, upward, outward	64%	59%
wh	whether, wheel, whisper, whistle, white, whisky, whist	5%	5%
qu (= /kw/)	quell, quick, quite, quick, quiet, queen, colloquial, conquer, square, squash, squirrel, acquaint, equal, adequate	27%	31%
u (after <g, s>)	language, penguin, linguist, sanguine, anguish, persuade, suede, suite	4%	4%

Note: *one, once, choir*

(2) *Description*—The vocalic allophones of RP /w/ are 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; the lips are rounded (more closely when followed by /u:, ʊ/ or /ɔ:/ than when preceding a more open or front vowel—cf. *woo, wood, war*, with *what, west, we*; in those cases where /w/ precedes /u:/, the lip-rounding for /w/ is closer and more energetic than that associated with /u:/, permitting a distinction between such a pair as *ooze, woos*). This is an example of double articulation, the approximation 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 folds vibrate; but when /w/ follows a voiceless consonant, devoicing takes place: when /w/ follows accented /t, k/, the devoicing is complete = [ɰ], 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 RP and in other types of British English, concerns the pronunciation of the spelling <wh>. Among careful RP speakers words such as *when* are pronounced with the voiceless labial-velar fricative [ɱ]. In such speech, which contains oppositions of the kind *wine*, *whine*, shown in (1) above, /ɱ/ has phonemic status. Among RP speakers the use of /ɱ/ as a phoneme has declined rapidly (though it is often taught as the correct form in verse-speaking). Even if /ɱ/ 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)). The fact that the stock of words in which /ɱ/ may occur (e.g. *whale*, *what*, *wheel*, *when*, *where*, *whet*, *which*, *whig*, *whin*, *whine*, *whirr*, *whist*, *whit*, *why*) is greater than those in which [ç] may occur, does not of itself provide sufficient argument for a monophonemic rather than a biphonemic solution.

A junctural [ʷ] glide may sometimes be heard between /u:/, ʊ, ʊ, ʌ, ɔ:/ and a following vowel, e.g. *doing* [ˈdu:ʷɪŋ], *following* [ˈfɒləʊʷɪŋ], *allow it* [əˈləʊʷɪt], *who asked* [hu:ʷɑ:st], *follow on* [fɒləʊʷɒn], resulting from the relatively close quality given to /u:/ 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 junctural [ʷ] can be seen in the opposition between *two-eyed* [tu:ʷaɪd] and *too wide* [tu:waɪd] and between *no air* [nəʊʷeə] and *no wear* [nəʊweə]. A junctural [ʷ] always has the alternative of a glottal stop, e.g. [tu:ʔaɪd] and [nəʊʔeə] (see §9.2.8) (Fig. 51).

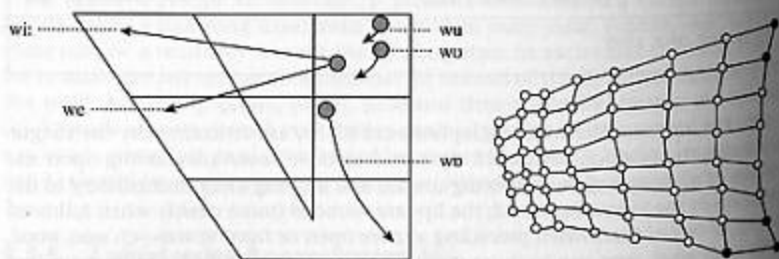


Figure 51 Vowel diagram and palatogram for /w/.

(3) *Regional variants*—The only regional variation concerns the more regular use of [ɱ] 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 USA, although the change from [ɱ] to /w/ seems to be more common than is thought.⁶⁶

Sources of /w/

OE [w]	ME [w]	way, wolf, wash, widow, twin, dwarf
AN [w]		wage, ward, warrant, war
OF (k,g)+[u]+V		squire, squirrel, squadron
OE [hw,xw,ɱ]	ME [hw]>[w] eighteenth century	whale, wheel, where, when, which, whistle
Note (1): Earlier [w] was lost in <i>so</i> , <i>such</i> , <i>thong</i> , <i>two</i> , <i>sword</i> , <i>answer</i> in late ME and in the cluster [wr] in <i>write</i> , <i>wreck</i> , <i>wrist</i> in the seventeenth century		
Note (2): In the case of <i>who</i> , <i>whom</i> , <i>whose</i> it was the [w] that was lost (by eModE), the [w] merging with the following [u:]		
Note (3): Initial [w] was added to <i>one</i> , <i>once</i> , in the seventeenth century		

(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 RP 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 /w/. 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 [u:] vowel should be used, e.g. *wine* being pronounced as [u:am], 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 [ɱ], as in *quite*, *twin*, etc. As in the case of the voiceless allophones of /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]–[tɱ, kɱ], but cf. *dwelt*, *twelve*; *distinguish*, *relinquish*; *dwindle*, *twin*; *Gwen*, *quench*.

⁶⁶ Wells (1982: 229).

9.8 The Frequency of Occurrence of RP Consonants

As a class, the alveolar phonemes emerge as those which occur most frequently in English, this being a generalization which appears to be applicable to many languages. The text frequencies of English consonants as given in Fry (1947) are shown in Table 13.

	%		%
/n/	7.58	/b/	1.97
/t/	6.42	/f/	1.79
/d/	5.14	/p/	1.78
/s/	4.81	/h/	1.46
/l/	3.66	/ŋ/	1.15
/ð/	3.56	/g/	1.05
/r/	3.51	/ʃ/	0.96
/m/	3.22	/j/	0.88
/k/	3.09	/tʃ/	0.60
/w/	2.81	/ʒ/	0.41
/z/	2.46	/θ/	0.37
/v/	2.00	/ʒ/	0.10
Total all consonants: 60.78%			

Table 13 Text frequencies of consonants in RP
(From Fry, 1947. Revised percentages, supplied by G. Perren, for /l/, /d/, and /r/ are included).

The frequencies of consonants shown in Table 13 and in other studies of text frequencies⁶⁷ show their rank order of occurrence falling into five groups: (i) /n,t,d,s,l,r/ (with /r/ much more frequent in General American because of its occurrence in pre-consonantal and pre-pausal positions); (ii) /ð,k,m,w,z/; (iii) /p,b/ (iv) /f,v,h,i,g,ŋ/; (v) /θ,ʃ,ʒ,tʃ,ʒ/. As is to be expected from its historical origins and its restricted contextual distribution, /ʒ/ regularly 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 general frequency of occurrence is, however, less important, as far as oppositional significance is concerned, than 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 (*thigh vs thy, ether vs either, teeth vs teethe, Aleutian vs allusion, illusion vs illuyshin, leash vs liege, Confucian vs confusion*).

⁶⁷ In addition to Fry (1947), see also Carterette and Jones (1974), Mines *et al.* (1978), Knowles (1967).

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, pitch 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 imperfectly) 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).

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/. In polysyllabic words, 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* /rɪˈtɜ:n/ 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 main accent always falls on a particular syllable of any given word,¹ but free, in the sense that the main 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 main 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*, *palatalization*, etc.

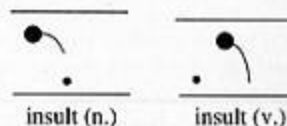
The accentual shape of a word, in terms of the degree of prominence associated with its parts, is a reality for both the speaker and the listener; but the speaker's impression of the factors which produce such a pattern of varying prominences may differ from the actual auditory cues by which the listener 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.

¹ With certain exceptions, determined by the larger rhythmic pattern of the total context (see §10.4).

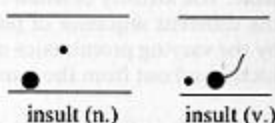
10.2 Accent and Prominence

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.

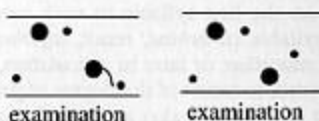
(1) *Pitch change*—The principal cue to accent is pitch prominence, which depends as much upon pitch change as pitch height. The different accentual patterns of *insult* (noun) and *insult* (verb) are easily distinguished by their pitch patterns. If a falling intonation is used, the fall occurs on the first syllable of the noun and on the second syllable of the verb.



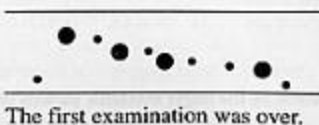
Similarly, if a rising intonation is used, the rise begins on the first syllable and the second syllable respectively (in these so-called interlinear diagrams, syllables are indicated by dots and accented syllables by large dots):



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 folds, 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 result from the relatively greater breath effort and muscular energy expended on the articulation of a sound by the speaker. This effort and energy are 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.), *'bellow*, 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 /i,u,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 only in unaccented syllables. 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* /'ælə/, *frontier* /'frʌntɪə/, *placard* /'plækɑ:d/, *record* /'rekɔ:d/, *expert* /'ekspɜ:t/. In similar cases where the unaccented syllable precedes the accent there is often alternation between a full and reduced vowel, e.g. *July* /dʒu:'laɪ/ /dʒə'laɪ/, *November* /nəʊ'vembə/ /nə'vembə/, *proceed* /prəʊ'si:d/ /prə'si:d/, *September* /sep'tembə/ /səp'tembə/. Some dialects, e.g. that of northern England, are more likely to retain the full vowel in these positions, particularly in monosyllabic prefixes, e.g. *obtain* /ɒ'teɪn/ /əb'teɪn/, *contain* /kən'teɪn/ /kən'teɪn/, *continue* /kən'tɪnju:/ /kən'tɪnju:/, *expect* /ek'spekt/ /ɪk'spekt/ or /ək'spekt/. In some dissyllables (both in RP 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* /'ædʌlt/ vs /ə'dʌlt/, *contact* (v.) /'kɒntækt/ vs /kən'tækt/.

(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,ʊ,ə/.

10.3 Word Accentual Patterns²

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. It is principally the status of the final syllable as strong or weak (together with grammatical class) which governs primary accent placement in English. Syllables are here counted as STRONG when they contain a long vowel or diphthong or a short vowel plus two consonants; otherwise they are WEAK.

English words may be divided into ROOTS and AFFIXES including both SUFFIXES and PREFIXES. Roots include not only single free morphemes like *fool*, *begin* and *understand* but also that part of a word remaining after an affix has been removed, even though such a part cannot occur on its own, e.g. *ephemeral*, *tremendous*, *hospitable*. In the next section tendencies in root stressing are, however, generally exemplified in free morphemes.

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. /rɪˈleɪt/, /tʃæsˈtaɪz/, /əˈraɪv/, /meɪnˈteɪn/, /əˈkɜː/, /pəˈsiːv/, /wɪðˈhəʊld/, /wɪðˈstænd/, /pəˈsweɪd/, /entəˈteɪn/, /rɪˈfjuːz/, /əˈɡriː/, /kənˈvɜːt/, /kənˈvɪkt/, /kənˈtɛm/, /ɪŋˈkluːd/, /əʊvəˈteɪk/, /rɪˈdʒekt/, /ʌndəˈstænd/, /dɪsˈlaɪk/, /əˈdɜːn/, /brɪˈliːv/, /prɪːsəˈpəʊz/, /ɪmˈvɒlv/, /reˈkəˈmend/, /rɪˈmaɪnd/, /ɪnˈtend/, /wɪspə/, /pɒlɪʃ/, /pʌnɪʃ/, /dɪˈveləp/, /wɜːʃɪp/, /vɪzɪt/, /gæləp/, /trævəl/, /əˈstɒnɪʃ/, /ɪkˈzæmɪn/, /lɪsən/, /ɪˈmædʒɪn/, /rɪˈzembəl/

Some exceptions:

unaccented strong final syllables: /ˈrekəɡnaɪz/, /ˈrɪəlaɪz/
 accented weak final syllables: /ɪmˈpres/, /pəˈses/, /brɪˈɡɪn/, /fəˈget/, /fəˈbɪd/, /pəˈmɪt/

(2) Adjectives

- (a) If the final syllable is strong, it is accented, e.g. /mɑːˈtʃuəl/, /sɪˈkjuəl/, /əˈfreɪd/, /əˈsliːp/, /kəmˈpliːt/, /ɪkˈstriːm/, /əˈbrʌpt/, /səˈblʌm/, /əˈləʊn/
 (b) Otherwise accent falls on the penultimate syllable, or (with reduced vowel on the penultimate) on the antepenultimate, e.g.

penultimate: /ɪkˈsesɪv/, /ˈnjuːtrəl/, /ˈsɒlɪd/, /ˈklevə/, /ˈfeɪməs/, /ˈrɪdʒɪd/, /ɪkˈsplɪtɪ/, /kɒnfiˈdenʃəl/
 antepenultimate: /ˈnesəsɪ/, /ˈdeɪndʒərəs/, /ˈdɪfɪkəlt/, /ˈdefɪnɪt/, /ˈɪntrɪstɪŋ/, /ˈpɒsɪbəl/, /ˈmɑːvələs/, /ɪntɪmət/

Some exceptions:

strong final syllables, unaccented: /ˈmɒrɪbænd/, /ˈtæntəmənt/, /ɪmˈpɔːtənt/, /kəʊˈhɪərənt/, /ˈæɹəɡənt/

(3) Nouns

- (a) If the final syllable is strong, it is optionally accented, e.g. /aɪˈdɪə/, /mɑːˈfɪːn/, /dɪsˈpjuːt/, /kæˈʃɪəl/, /ɑːftəˈnuːn/, /kəˈtɑː/, /bəˈluːn/, /ʃæmˈpeɪn/, /kəˈʃɪəl/, /pəˈlɪs/, /kæŋɡəˈruː/

- (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: /ˈprəʊfəl/, /təˈmɑːtəʊ/, /təˈbækəʊ/, /pəˈteɪtəʊ/, /ˈwɪndəʊ/, /ˈpɪləʊ/, /ˈæɹəʊ/, /ˈfeləʊ/, /ˈwɪləʊ/, /ˈwɪdəʊ/, /səˈprɔːnəʊ/, /ˈmɔːmənt/, /ˈsɒfɪks/, /ˈbærəks/, /ˈɪnɪŋz/

strong final, antepenultimate accent: /ˈænəkɒdʊt/, /ˈfærənhaɪt/, /ˈpedɪɡrɪː/, /ˈæpətəɪt/, /ˈkætərəkt/, /əˈsetlɪːn/, /ˈtelɪfəʊn/, /ˈæntɪləʊp/

weak final, penultimate accent: /ɪŋˈkɑːntə/, /ˈlæŋɡwɪdʒ/, /ˈrætən/, /kəmˈplekʃən/, /ˈpeɪpəl/, /ˈfeɪvɪt/, /ˈʃɒklɪt/, /ˈvɜːmɪn/

weak final, antepenultimate accent: /ˈkwɒntɪtɪ/, /ˈdɪsɪplɪn/, /ˈkæməɹə/, /ˈhɪstəri/, /əˈnælɪsɪs/, /ˈevɪdəns/, /raɪˈnɒsərəs/, /ˈɪnəsəns/

weak final, ante-antepenultimate accent: /ˈhelɪkɒptə/, /ˈtelɪvɪzən/

Some exceptions:

final accent on weak syllable: /həʊˈtel/, /pɜːsəˈnel/ (*persannel*), /sɪɡəˈret/ (but /ˈsɪɡəret/ in GA)

/ɪ/ sometimes functions as a reduced vowel, as in /ˈpedɪɡrɪː/ and sometimes as a full vowel, as in /vəˈnɪlə/ and sometimes has both functions in one word, as in /ˈwɪkɪd/.

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 (2) (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 root plus affix, e.g. in the case of /sɪɡəˈret/, the analysis root *cigar* plus suffix *-ette* would produce the correct accentual pattern for RP in the same way that *disk* becomes *disˈkette* (a similar problem arises in the treatment of compounds—see §10.3.5 below).

² See particularly Chomsky and Halle (1968), Fudge (1984). For an alternative formulation involving heavy syllable as VC and extrametrical final consonants, see Giegerich (1992).

10.3.2 Suffixes

Suffixes may be added to a root, e.g. *nation*, *national*, or they may be added to an already combined root plus suffix, e.g. *national*, *nationalist*, *nationalistic*. Those parts of words to which a suffix is added are called **STEMS**. Some suffixes have no effect on the accentual pattern of stems and hence are called **ACCENT-NEUTRAL**: in the complex word the primary accent remains where it is in the stem, e.g. *'bitter*, *'bitterness*. Other suffixes regularly take the accent themselves (are **ACCENT-ATTRACTING**), e.g. *'disc*, *dis'kette*. Yet others have the effect of fixing the accent on a particular syllable of the stem (are **ACCENT-FIXING**): on the final syllable of the stem, e.g. *'definite*, *defini'tion*, or on the penultimate syllable of the stem, e.g. *'infant*, *in'fanticide* (where the stem is *infanti-*), or varying between final and penultimate according to the same principle as that for roots, i.e. whether the final syllable of the stem contains, on the one hand, a short vowel in an open position or followed by only one consonant, or on the other hand, a long vowel or short vowel plus two consonants, e.g. *'medicine*, *me'dicinal*, but *in'testine*, *intes'tinal*. Unfortunately, many suffixes are not entirely regular in the accentual patterns they induce, belonging in one group of words to one category and in another group of words to another category. In many cases, variation occurs which is dependent on the type of stem, i.e. whether it consists of a **FREE** or **BOUND** morpheme; thus *disa'gree*, *disa'greement* but *seg'ment*, *tor'ment*. Where more than one suffix is applied to a stem, the last suffix determines the word's accentual pattern, e.g. *'rational*, *'rationalize*, *rationali'zation*; *fa'miliar*, *familiari'zation*.

There are some endings derived principally from Greek which are like suffixes in that they occur attached to a number of stems, but which have other Greek elements preceding them which themselves are like prefixes and neither element has a greater claim to be considered as a root, e.g. *phonograph*, *logogen*, *microscope*. These are not treated in this section, but dealt with under §10.3.5 as compounds, since their accentual patterning is similar to that of compounds.

(1) *Accent-neutral suffixes*—Included in this category are all inflexional and many common derivational suffixes. Some inflexions are non-syllabic such as plural, possessive and third person singular *-s* (but these are syllabic following /s,z,f,ʒ,ʒ,ʒ/—see §10.10.3) and past tense *-t* (this is syllabic following /t,d/—see again §10.10.3); 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*, 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 female *-ess*, e.g. *'fool*, *'foolish*, *'alcohol*, *'alcoholism*; *'separate*, *'separatist*; *'circular*, *'circularise*; *disa'gree*, *disa'greement*; *lead*, *leader*, and *'lion*, *'lioness*. All the examples given here concern stems which are free forms; in the case of stems which are not free forms, some of these suffixes fall into other categories, e.g. *-ary* as a suffix on such stems falls under (3b) below, and *-ment* will fall into (2) on verbs but into (3b) on nouns. (Note also irregular *advertising*.)

(2) *Accent-attracting suffixes*—Some common derivational suffixes in this category are *-ade*, *-cer*, *-esque*, *-ette* and *-ation* (which could be analysed into a double

suffix *-ate* plus *-ion* (= /-etʃn/), e.g. *es'cape*, *esca'pade*; *'mountain*, *mountain'eer*; *'picture*, *pictur'esque*; *'usher*, *ushe'rette*; *'private*, *privati'zation*. Verbal *-ate* belongs here in dissyllables, e.g. *mi'grate*.

(3) Accent-fixing suffixes

(a) On final syllable of stem—Here belong *-ic*, *-ion*, and *-ity*, e.g. *'chaos*, *cha'o'tic*; *de'vote*, *de'votion*; *'curious*, *curi'osity*. In the case of *-ion* most words are formed from free-form dissyllabic verbal stems accented on the second syllable and *-ion* could therefore equally well be regarded as accent-neutral; however, since the final syllable of the stem is almost unexceptionally accented in bound stems as well, e.g. *com'plexion*, *o'ccasion*, it is better regarded as accent-fixing.

(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*.

(c) On final or penultimate syllable of root according to the weight of the final syllable. Here belongs *-ative*, which is added to a similar set of bound forms as is *-ate* in (b) above, cf. *'operative*, *'qualitative* vs *repr'e'sentative*, *argu'mentative*. Here are also *-ency* and adjectival *-al*, e.g. *'presidency* but *e'mergency*, *'pharynx*, *pha'ryngeal* but *'medicine*, *me'dicinal*.

Besides those suffixes above which have been noted as preferring one pattern when suffixed to a free form and another pattern when suffixed to a bound form, there are others which vacillate freely between two patterns. A common suffix of this sort is *-able* which is in most cases accent-neutral e.g. *a'dore*, *a'dorable*; *com'panion*, *com'panionable*; *question*, *'questionable*; *realize*, *'realizable*; *reconcile*, *'reconcilable*. However, in a number of dissyllabic 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* may lead 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 in the opposite direction, e.g. *'demonstrate*, *de'monstrable*; *'extricate*, *(in-)ex'tricable*; *'realize*, *rea'lizable*; *'reconcile*, *recon'cilable* (all of which have an alternative form with initial accent). In most cases the form with the shifted accent (either right to left or left to right) is still the more acceptable pronunciation in RP.

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'genious*, *inco'rect*, *i'literate*, *inma'ture*, *irreverent*, *mal'function*, *mis'report*, *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 Accent³

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 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*, *'repr'e 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, *'magazine* in General American (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'thus'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.⁴ In most cases, the two roots are free morphemes themselves: 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 the 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 specialized 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*, 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

³ See Fudge (1984: 31).

⁴ For a recent survey of the various factors which can be involved in the definition of English compounds, see Plag (2006).

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. *'daybreak*, *'glasshouse* and in some cases this type of accentuation will distinguish the compound from a more productive phrasal pattern, e.g. *glass 'house* (but note that a contrastive accent within the phrase will produce the same pattern as the compound, e.g. *This is a 'brick house, not a 'glass house*). There are, however, many compounds (judged as such on grammatical and semantic criteria) which have the same pattern as phrases, e.g. *clear-'cut*. There are also often differences between the accentuation of compounds in RP and in General American, e.g. RP *shop 'steward*, *'horse 'chestnut*, *'stage 'manager*, *'season ticket*, compared with GA *'shop steward*, *'horse chestnut*, *'stage manager*, *'season ticket*. 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% of compounds). Three subtypes (a), (b), (c) can be distinguished:

(a) *N(oun) + N(oun)* (around 75% of compound nouns)—*adrenaline tourism*, *'alcohol abuse*, *'bank account*, *'bar code*, *'birthplace*, *'blood-money*, *'bomb factory*, *'bottle bank*, *'breadcrumbs*, *car 'boot sale*, *'child abuse*, *com'munity charge*, *com'pasion fatigue*, *com'puter virus*, *con'trol freak*, *'crime rate*, *'deckchair*, *de'signer steroid*, *'drug addict*, *'enterprise culture*, *'fun run*, *'ghetto blaster*, *'grief inflation* (three-minute rather than one-minute silences), *'guidebook*, *'keyboard*, *'lager lout*, *'laptop*, *'lifestyle*, *'matchbox*, *'mountain bike*, *'muesli belt*, *'ozone layer*, *'peace dividend*, *'phonecard*, *po'lice force*, *'pressure group*, *'racehorse*, *'seaside*, *'shopping centre*, *'shummy mummy* (slatternly mother), *'stock exchange*, *su'doku widow*, *'tape measure*, *'theme park*, *'toilet roll*, *'torture victim*, *'wheel clamp*, *'wheelie bin*, *'yield management*. Included here are examples involving nouns in final position formed from *V(erb)+er* e.g. *'bodyscanner*, *'bricklayer*, *'cash dispenser*, *'screensaver*, *'screwdriver*.

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* (but cf. *'footpath*), *elderberry 'wine*, *feather 'pillow*, *fruit 'salad*, *ice 'cream*, *paper 'bag* (but cf. *'paper clip*), *rice 'pudding*.

(ii) where *N1* is a name: *Bermuda 'triangle*, *Christmas 'pudding* (but cf. *'Christmas cake*, because *cake* generally produces a pattern of *'N+N*, e.g. *'apple cake*, *'cheesecake*, *'chocolate cake*, *'Eccles cake*), *Euston 'station*, *Fosbury 'flop*, *Highland 'fing*, *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, Molotov `cocktail, 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 `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, day re`lease, keyhole `surgery, kitchen `sink, morning `paper, office `party, star `turn, trade `union, week `end.

(b) `A(djective)+N, `Ns+N, `N+V, `V+N, `N+Ving, `Ving+N—batting average, `boardsailing, `bridging loan, `building society, `bull's eye, `chasecapping, `crow's nest, `ear-splitting, `eating apple, `faintheart, `fly tipping, `hack saw, `hand bagging, `job sharing, `joy riding, `landfill, `mind boggling, `pay cut, `pickpocket, `poll capping, `searchparty, `shop lifting, `skateboarding, `statesperson, `windsurfing. (There are many exceptions, particularly in the case of Ving+N, e.g. alternating `current, black `economy, compact `disc, flying `saucer, insider `dealing, living `memory.) 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, `melt-down, `rave-in, `ring-around, `set-up, `showdown. 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), `use-by (date), `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, ham-fisted, 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, `ring fence, `sidestep, `sidetrack, `wheelclamp (but man-handle). 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 root or root plus suffix, e.g. `microwave, `telegram, `thermostat, an `tithesis, `circumflex, `fungicide, ka`leidoscope, `monochrome, `prototype. Since they have no clear root, 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 (but `cyberchondriac)). The accentual pattern of pseudo-compounds generally conforms to the root pattern in 10.3.1 (3b) above, with the accent on the penultimate or antepenultimate syllable even though there is commonly a strong final syllable. The accentual patterns of pseudo-compounds are affected by suffixes as if they were simple roots, 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 specialized), 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 specialized meaning.

10.4 Word Accentual Instability

The accentual patterns of words are liable to change. Considerable changes of this kind have taken place within the last 300 years, in addition to the large-scale accentual shifts affecting French importations into Middle English. Thus, in the seventeenth century, and still in American English, a secondary accent with a strong vowel fell on the penultimate syllables of such words as *necessary*, *adversary*, *momentary*; the earlier distinction between the noun *abuse* (with primary accent on the first syllable) and the verb *abuse* (with primary accent on the second syllable) has been lost in this pair of words, a distinction being maintained by the occurrence of /s/ or /z/ finally; we no longer place the primary accent on the second syllable of *revenue*, *illustrate*, *confiscate*, *character*, etc., or on the first syllable of *humidity*, *convenient*, *prosperity*, etc.

Hesitancy and variation of accentual pattern occurring at the present time are the result of rhythmic and analogical pressures, both of which entail in addition considerable changes of sound pattern in words.⁵

(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

⁵ These remarks apply mainly to RP 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* /'ɛŋkwɪrɪ/, *realize* /'noʊləʒ/, *advertisement* /'ædvər'taɪzmənt/. For informant tests concerning the preferred variants, see Wells (2000). Where there is a preferred 'correct' pattern in RP, it is marked here with * in the transcription.

between [-] and [-] patterns, e.g. *exquisite* /'ɛkskwɪzɪt/ or /ɪks'kwɪzɪt/, *deficit* /'defɪsɪt/ or /dɪ'fɪsɪt/, *integral* /'ɪntɪgrəl/ or /ɪn'tegrəl/, *mischievous* /mɪʃ'ʃɪvəs/ or /mɪf'ʃɪ:vəs/ (or even /mɪf'ʃɪ:vɪəs/), *inculcate* /ɪn'kʌlkət/ or /ɪn'kalkət/, *acumen* /'ækjʊmən/ or /ə'kjʊ:mən/, *kilometre* /'kɪləmɪtə/ or /kɪ'lɒmɪtə/, *acumen* /'sɒnərəs/ or /sə'nɔ:rəs/, *precedence* /'presɪdəns/ or /prɪ'sɪdəns/, *sonorous* /ɪm'pɔ:tʃu:n/ or /ɪmpɔ:tʃu:n/, *premature* /'preməʃə/ or /premə'tʃʊə/, *inventory* /ɪn'ventəri/ or /ɪn'ventəri/.

Similarly, in words of four syllables, there is variation between first and second syllable accenting, e.g. *controversy* /'kɒntrəvɜ:sɪ/ or /kən'trɒvəsi/, *hospitable* /'hɒspɪtəbl/ or /hɒ'spɪtəbl/, *despicable* /dɪ'spɪkəbl/ or /dɛspɪkəbl/, *formidable* /fɔ'mɪdəbl/ or /fɔ:mɪdəbl/, *capitalist* /'kæpɪtəlɪst/ or /kə'pɪtəlɪst/, *aristocrat* /'æɪstəkɹæt/ or /ə'ɪstəkɹæt/; variation in second and third syllable accenting in such words as *centrifugal* /sɛn'trɪfju:gl/ or /sɛntrɪ'fju:gl/, *metallurgy* /mæ'tælədʒɪ/ or /mɛtəl:ʒɪ/. *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:tɪkju:ləri/ or /ɑ:tɪkju'leɪəri/, *Caribbean* /kə'ɪbɪən/ or /kæri'bi:ən/, *necessarily* /nɛsə'serɪl/ or /nɛsə'serɪl/, *inexplicable* /ɪn'ɪksplɪkəbl/ or /ɪn'eksplɪkəbl/.

Primary accent is also unstable in some compounds, e.g. *camp-fire*, *lacklustre*, *life-size*, *manhandle*, *overcast*. However, the number of truly unstable compounds is relatively small, although many may be 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 RP and General American, e.g. *Adam's apple* (RP) vs *Adam's apple* (GA), *peanut butter* (RP) vs *peanut butter* (GA), *shop steward* (RP) vs *shop steward* (GA), *stage manager* (RP) vs *stage manager* (GA), *vocal cords* (RP) vs *vocal cords* (GA), *season ticket* (RP) vs *season ticket* (GA). As can be seen, most of these involve a shift from final accent in RP 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'plai/, *prefer* /prɪ'fɜ:z/, *compare* /kəm'peə/, is responsible for the realization of *applicable*, *preferable*, *comparable*, as /ə'plɪkəbl/, /prɪ'fɜ:rəbl/, /kəm'peərəbl/ instead of /'æplɪkəbl/, /'pref(ə)rəbl/, /'kɒmp(ə)rəbl/. Again, the existence of *contribution*, *distribution* /kɒntri'bju:ʃn/, /dɪstri'bju:ʃn/ may account for the pronunciation /'kɒntrɪbjʊ:t/, /dɪstrɪbjʊ:t/ (*contribute*, *distribute*) instead of the more usual /kən'trɪbjʊ:t/, /dɪs'trɪbjʊ:t/, where the first syllable is totally weakened and the last retains only a certain qualitative prominence. The case of such a word as *dispute* (n.), for which /dɪ'spju:t/ is now more common than /'dɪspju:t/, illustrates an accenting of the noun by analogy with the related verb (see the stressing of pairs of dissyllabic nouns and verbs in the following section).

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 dissyllables of French origin) may or may not involve phonemic changes of quality.

(1) A relatively small number⁶ 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	/'æksnt/ or /'æksnt/	/æk'sent/ or /ək'sent/
digest	/'daɪdʒest/	/daɪ'dʒest/ or /dɪ'dʒest/
torment	/'tɔ:ment/	/tɔ:'ment/
transfer	/'trænsfɜ:z/	/træns'fɜ:z/ or /træns'fɜ:z/
transport	/'trænspɔ:t/	/træn'spɔ:t/ or /træn'spɔ:t/

(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 RP, 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'bain/
compress	/'kɒmpres/	/kəm'pres/
concert	/'kɒnsət/	/kən'sət/
conduct	/'kɒndʌkt/	/kən'dʌkt/
consort	/'kɒnsɔ:t/	/kən'sɔ:t/
contract	/'kɒntrækt/	/kən'trækt/
contrast	/'kɒntrɔ:st/	/kən'trɔ:st/
convict	/'kɒnvɪkt/	/kən'vɪkt/
desert	/'dezət/	/dɪ'zɜ:t/
export	/'ɛkspɔ:t/	/ɪk'spɔ:t/
object	/'ɒbdʒɪkt/	/əb'dʒekt/
perfect**	/'pɜ:fɪkt/	/pə'fekt/
permit**	/'pɜ:mit/	/pə'mɪt/
present	/'preznt/	/prɪ'zent/
proceeds	/'prəʊsɪ:dz/	/prə'si:dz/
produce	/'prɒdʒu:s/	/prə'dʒu:s/
progress	/'prəʊgres/	/prə'gres/
project	/'prɒdʒekt/	/prə'dʒekt/
protest	/'prəʊtest/	/prə'test/

⁶ The small number of dissyllables involved in such accentual oppositions is shown in Gulerre (1979). Out of a corpus of more than 10,000 dissyllabic words, only 85 exhibited changes between verbal, nominal, or adjectival functions by means of a shift of accented syllable.

⁷ Also with /træ:n-/,

<i>rebel</i>	/ˈreɪbəl/	/rɪˈbeɪl/
<i>record</i>	/ˈrekɔ:d/	/rɪˈkɔ:d/
<i>refuse</i>	/ˈrefju:s/	/rɪˈfju:z/ ⁸
<i>segment</i>	/ˈseɡmənt/	/seɡˈment/
<i>subject</i>	/ˈsʌbdʒɪkt/	/sʌbˈdʒekt/
<i>survey**</i>	/ˈsɜ:veɪ/	/səˈveɪ/

(** In these words, the opposition of /ɜ:/ and /ə/ in the first syllable amounts to an opposition of vowel quantity; it is to be noted that the verb *survey* may have the same accentual pattern as the noun in the particular sense of 'to carry out a survey'.)

Several dissyllables do not conform to the general noun/verb accentual pattern distinction or exhibit instability, e.g. *comment* /ˈkɒment/ for both noun and verb; *contact* /ˈkɒntækt/ (n.) and /ˈkɒntækt/, /kɒnˈtækt/ or /kənˈtækt/ (v.); *detail* /ˈdeɪteɪl/ (n.) and /ˈdeɪteɪl/ or /diˈteɪl/ (v.); *contrast* has a verbal form /ˈkɒntrɑ:st/ in addition to the more usual form given above. In all these cases, and in that of *dispute*, already mentioned, the noun form is tending to supersede the verbal pattern.

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
<i>associate</i>	/əˈsəʊʃjət, -sɪət, -fət/	/əˈsəʊʃiət, əˈsəʊʃiət/
<i>attribute</i>	/ˈætrɪbjʊ:t/	/əˈtrɪbjʊ:t/
<i>compliment</i>	/ˈkɒmplɪmənt/	/kɒmplɪˈment/ /ˈkɒmplɪment/
<i>envelope</i>	/ˈenvələʊp/	/ɪnˈveləp/
<i>estimate</i>	/ˈestɪmət/	/ˈestɪmeɪt/
<i>interchange</i>	/ɪntəˈtʃeɪndʒ/	/ɪntəˈtʃeɪndʒ/
<i>prophecy</i>	/ˈprɒfəsi/	/ˈprɒfɪsaɪ/
<i>reprimand</i>	/ˈreɪprɪmə:nd/	/reɪprɪˈmɑ:nd/
<i>supplement</i>	/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
<i>absent</i>	/ˈæbsənt/	/æbˈsent/
<i>abstract</i>	/ˈæbstrækt/	/æbˈstrækt/
<i>alternate</i>	/ɔ:lˈtə:nət/	/ɔ:lˈtə:nɪt/
<i>frequent</i>	/ˈfri:kwənt/	/fri:kˈwɛnt/
<i>intimate</i>	/ˈɪntɪmət/	/ɪntɪmeɪt/
<i>separate</i>	/ˈsepəreɪt/	/ˈsepəreɪt/

⁸ The noun and verb forms of *refuse* differ also in the final consonant and the resulting variation of vowel length of /u:/.

There is alternation between noun and adjective between *compact* /ˈkɒmpækt/ (n.) and *compact* /kəmˈpækt/ (adj.) and between *minute* /ˈmɪnɪt/ (n.) and *minute* /maɪˈnju:t/ (adj.)

10.6 Acquisition of Word Accent by Native Learners

Little is known in detail about the children's acquisition of word accent. 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 therefore generally place the primary accent on the correct syllable of words. However, they frequently omit unaccented syllables before the primary accent, e.g. *banana* [ˈnɑ:nə], *guitar* [tɑ:], *elastic* [ˈlæti], or, alternatively, all such syllables may be reduced to a single shape, e.g. [rɪˈnɑ:nə], [rɪˈtɑ:], [rɪˈlæti].

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, 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 dissyllables, e.g. *report*, *delay*, *select*, *reserve*, *account*, 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 §6.2.3, 8.13). The same process of reduction, with resultant contraction, may be observed in operation in PresE. 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, colloquial speech, whereas more formal speech tends to retain the fuller form under the preservative influence of the spelling. The examples of elided word forms in colloquial, speech which are given below are independent of the type of reduction affecting particular words and syllables under weak accent in connected speech (see §12.4.6). They are also to be distinguished from reduced forms in various types of regional and popular speech, which are often regarded as vulgar, e.g. *recognize* as /'rekənaɪz/, *satisfactory* as /sæ'sfæktrɪ/, *cigarette* as /sɪ'gret/, *possible* as /'pɒsbl/, *Waterloo* as /wɔ:'lu:/, *lovely* as /'lʌli/.

(1) Vowel elision⁹

(a) *Established*—Loss of vowels under weak accent within the word has occurred at various stages of the language's development and is now for example established: initially in, *state*, *scholar*, *sample*; medially in, *Gloucester*, *marriage*, *evening*, *chimney*, *curtsey*, *forecastle* /'fɔ:ksl/, *gooseberry*; and in the final syllable in *time*, *name*, *loved*, *hands* (< *handes*), *eaten*, *written*, *cousin*.

(b) *Present colloquial*—In PresE, such elision is likely to take place especially in a sequence of unaccented syllables, where /ə/ and /ɪ/ are involved. Thus, in positions after the primary accent, particularly in the sequence consonant + /ə/ + /ɪ/ + weak vowel, the /ə/ between the C and the /ɪ/ is regularly lost, e.g. in *preferable* /'prefrəbl/; similar reductions occur in *repertory*, *temperature*, *comparable*, *territory*, *lavatory*, *temporary* /'tempərətɪ/, *anniversary*, *vicarage*, *category*, *factory*, *robbery*, *labour-exchange* /'leɪbərɪks'tʃeɪnʒ/, *murderer* /'mɜ:drə/, *customary*, *camera*, *honourable*, *scullery*, *suffering*, *beverage*, *rhinoceros*, *nursery*, *Nazareth*, *fisheries*, *treasury*, *natural* /'nætʃrəl/, *dangerous*, *utterance*, *history*, *ordinary*. Though labelled here as 'colloquial' these elisions may occur regularly within the speech of an individual, the fuller version not forming a part of his idiolect. A more recent development¹⁰ 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 RP), e.g. *barracking* /'bærkɪŋ/, *Dorothy* /'dɒrəθɪ/, *pterodactyl* /ter'dæktɪl/.

In the same way, there may be an elision of a weak vowel following a consonant and preceding /l/, or the reduction of syllabic [ɹ] to syllable-marginal /l/, in words like *grappling*, *doubling*, *fatalist*, *padding*, *bachelor*, *specialist*, *usually*, *insolent*, *easily*, *carefully*, *buffalo*, *novelist*, *family*, *panelling*, *chancellor*. Note, too, frequent loss of post-primary /ə/ or /ɪ/ in *university* /ju:nɪ'vɜ:stɪ/, *probably* /'prɒbəl/, *difficult* /'dɪfɪklt/, *national* /'næʃnl/, *fashionable* /'fæʃnəbl/, *reasonably* /'ri:znəbl/, *parliament* /'pɑ:lmənt/. 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 [ŋ] replaced by a non-syllabic consonant

⁹ For absorption of the second element of a diphthong before another vowel (smoothing), see §8.11.

¹⁰ Windsor Lewis (1979).

marginal to the syllable. Thus /'fleɪvəriŋ/, /'laɪtnɪŋ/ and /'θɪkniŋ/ in place of /'fleɪvəriŋ/, /'laɪtəniŋ/ and /'θɪkəniŋ/ 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* /'laɪtnɪŋ/ and *lightening* /'laɪtəniŋ/.

In pre-primary positions, /ə/ or /ɪ/ of the weak syllable preceding the primary accent is apt to be lost in very rapid speech, especially when the syllable with primary accent has initial /l/ or /r/,¹¹ e.g. in *police*, *Palladium*, *parade*, *terrific*, *correct*, *collision*, *believe*, *balloon*, *barometer*, *direction*, *delightful*, *gorilla*, *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* /p'hæps/ and of /ɪ/ in *geometry* /'dʒəmətri/, *geography* /'dʒəgrəfi/.

(2) Consonant elision

(a) *Established*—The reduction of many consonant clusters has long been established, e.g. initial /w,k,g,h/ in *write*, *know*, *gnaw*, *loaf*, *ring*, *nut*; medial /t/+n/ or /l/ in *fasten*, *listen*, *often*, *thistle*, *castle*; post-vocalic /h/(=[x,ç]) in *brought*, *night*; post-vocalic [ʃ] in *baulk*, *talk*, *walk*; and final /mb,mn/ in *lamb*, *hymn*.

(b) *Present colloquial*—In PresE, simplification of clusters continues to take place, especially involving the loss of the alveolars /t,d/ when medial in a cluster of three consonants. In the following examples, retention of the alveolar plosives is characteristic of careful speech: *exactly*, *facts*, *mostly*, *handsome*, *windmill*, *handbag*, *wristwatch*, *friendship*, *kindness*, *landlord*, *lastly*, *restless*, *landscape*, *Westminster*, *coastguard*, *dustman*, *perfectly* (and less commonly /t/ in such words as *attempts*, *prompts*). /θ/ is normally elided from *asthma* and *isthmus* and may sometimes be omitted from *months*, *twelfths*, *fifths*, *clothes*; and, in rapid speech, elision of /k/ in *asked* and /l/ in *only* may occur. [ʃ] is apt to be lost when preceded by /ɔ:/ (which has a resonance similar to that of [ʃ]), e.g. *always* /ɔ:wɪz/, *already* /ɔ:redɪ/, *although* /ɔ:ðəʊ/, *all right* /ɔ:raɪt/, *almanac* /ɔ:mənæk/.

/p/ may be lost in clusters where its position is homorganic with that of an preceding plosive e.g. *glimpse* /glɪms/. Elision is less common in the sequence /ŋks/ in *inks*.

Whole syllables may be elided in rapid speech, especially in the vicinity of /r/ or where there is a sequence of [r] sounds, *literary* /'lɪtri/, *meteorological* /mi:trə'lɒdʒɪkl/, *temperature* /'temptʃə/, *temporarily* /'tempərətɪ/, *restaurant* /'restrɒnt/, *library* /'laɪbrɪ/, *February* /'febrʊ/, *prerogative* /'prɒɡətɪv/, *government* /'ɡʌvnmənt/.

(3) *Epenthesis*¹²—The elision of /t/ in words like *vents* is sometimes counterbalanced by the tendency to insert an epenthetic /t/ in words like *dance*, *fence*,

¹¹ Such elisions in word-initial syllables are more likely when the preceding word, belonging to the same group, ends in a vowel, e.g. *the police* /ðə'plɪs/, *I believe* /aɪ'bi:lv/, but *local police* /ləʊkl pə'li:z/, *can't believe* /kɑ:n bə'li:v/.

¹² See Fourakis and Port (1986) and Blankenship (1992). Yoo and 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/.

sense, bounce, etc., 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* /ˈænt(θ)əm/, *persion* /ˈpen(t)ʃən/ (but in the latter there is no coalescence to /fʃ/). Such alternation does not apply in RP 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* /ˈtraɪəm(p)fs/, *warmth* /wɔ:m(p)θ/, *confuse* /kəm(p)ˈfuz/, *Kingston* /ˈkɪŋ(k)stən/.

Epenthesis is less common before a voiced fricative as in *wins* being pronounced the same as *winds* /wɪn(d)z/ and in *lambs* /læm(b)z/, *rings* /rɪŋ(g)z/. If there is epenthesis in *king-size*, note that it is a /g/ that is inserted, i.e. /ˈkɪŋ(g)səz/, suggesting that *king* has a different base form from *Kingston* /ˈkɪŋ(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 RP speakers. Even with the exclusion of cases of differing phonemic inventories—e.g. the choice between using /hw/ or /w/ for *wh* words or /ɔ:/ or /ɒ/ 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:

(1) Vowels

- /i:/-/ɪ/ acetylene, economy; -/e/ economics, premature; -/eɪ/ deity, detour; -/aɪ/ Argentine, iodine
- /ɪ/-/eɪ/ alphabet, orchestra; -/aɪ/ privacy, dynasty; -/eɪ/ magistrate, holiday; -/ə/ believe, system, adequate
- /e/-/eɪ/ again, maintain; -/ə/ accent, hymen
- /æ/-/ɑ:/ graph, translate; -/eɪ/ patriot, apical; -/ə/ agnostic, vapidity
- /ɒ/-/ɒ/ constable, combat; -/ə/ bankrupt, dandruff
- /ɒ/-/ɔ:/ salt, wrath, Australia; -/ə/ obscure, obligatory
- /ɔ:/-/və/ sure, poor
- /ʊ/-/u:/ room, groom
- /u:/-/ju:/ suit, supreme
- /eɪ/-/ɑ:/ data, esplanade
- /əʊ/-/ə/ allocate, phonetics

(2) Consonants

- /t/-/tʃ/-/tʃ/ amateur; /tʃ/-/tʃ/ actual, Christian; /dʒ/-/dʒ/ educate, grandeur
- /dʒ/-/ʒ/ garage; /g/-/dʒ/ pedagogic; /rʃ/-/rʃ/ French, branch; /rɒdʒ/-/rɒz/ revenge, strange; /k/-/kw/ quoits; /ŋk/-/ŋ/ anxious; /ŋg/-/ŋ/ English, language, linguistic
- /s/-/sɪ/-/sɪ/ associate; /s/-/ʃ/ issue, sexual; /z/-/z/ usual, azure; /ʃ/-/ʒ/ Asia
- /s/-/z/ usage, unison; /t/-/p/ diphthong, naphtha

10.10 Phonotactics

English does not exploit, in the word and the syllable, all the possible combinations of its phonemes. For instance, long vowels and diphthongs do not precede final /ŋ/;¹³ /e,æ,ʌ ɒ/ do not occur finally; and the types of consonant cluster permitted are subject to constraints in both initial and final positions. Initially, /ŋ/ does not occur; no combinations are possible with /tʃ,dʒ,ð,z/; /r,ɹ,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,ɹ,w/ do not occur in the type of phonemic analysis used here (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*, /g/ -/ *gules*. Such sequences are generally included in the statements of potential clusters given under §10.10.1.

(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.

(3) Some sequences are exemplified only in recently imported foreign words, often themselves proper names, e.g. a number of words, including *Schnapps* and *Schwepes*, involving initial clusters beginning with /ʃf/. If such words are judged to be in common use, the clusters they exemplify are included in the statements in §10.10.1.

(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 §10.10.1, 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 /nʃ,nɒdʒ/ or /nʃ,nɒz/; again, since the former is more common, the possibility of the latter is excluded. On the other hand, though many speakers do not distinguish the final clusters of *prince* and *prints* (see §10.8.1(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* /æks/, *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

¹³ It should be noted that such combinations do occur as a result of assimilation. See §12.4.5.

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, this simplification is not applied here.

10.10.1 Word-initial and Word-final Phoneme Sequences

(1) V

The following ten vowels constitute monosyllabic words:

/i:/ the letter <e>, /ə/ a, /ɑ:/ are, /ɔ:/ or, /ɜ:/ err

/ei/ the name of the letter <a>

/aɪ/ the name of the letter <i>, /əʊ/ owe, /ɪə/ ear, /eə/ air

In addition, /i:/ and /u:/ occur as reduced forms for *he* and *who*, 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* /ʊpˈsɑ:lə/ and *Urdu* /ˈʊɹdu:/.

(3) Initial CV

/ŋ/ does not occur initially. /ʒ/ occurs initially before /ɪ/, /i:/, /æ/ /ɒ/ and /ɑ:/ in such foreign words as *Genet*, *gigolo*, *gigue*, *Zhivago*, *jabot*, *genre*, *gite* and *gendarme*. The other consonants generally occur before all vowels, though marked deficiencies are evident before /ʊə, u, ɔɪ/.

(4) Initial CCV

(a) Initial CC clusters pattern as follows:

p + l, r, j

t + r, j, w

k + l, r, j, w

b + l, r, j,

d + r, j, w

g + l, r, j, w

m + j

n + j

l + j

f + l, r, j

v + l, r, j

θ + r, j, w

s + l, r, j, w, p, t, k, m, n, f, v

ʃ + l, r, w, m, n

h + j

(b) /mj/ occurs in *muesli*, /vl-/ and /vr-/ in *Vladivostok* and *vroom*, /sr-/ and /sv-/ in *Sri Lanka* and *svelte* and /ʃl-/ and /ʃw-/ and /ʃm-/ and /ʃn-/ in a number of imports from German and Yiddish, e.g. *Schlesinger*, *Schweppes*, *Schmalz*, and *Schnapps*. /Cj/ occurs only before /u:/ or /ʊə/, e.g. *cute*, *cure* or occasionally /ʊ/, *nebulous*. Initial /tw,dw,gw/ occur only before only a restricted set of vowels; /hw/ is excluded as an initial RP sequence, /hw/ in other dialects generally corresponding to /w/ in RP.

(5) Initial CCCV

(a) Initial CCC clusters pattern as follows:

s + p + l, r, j

s + t + r, j

s + k + l, r, j, w

(b) /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-, st-, stw-/ do not occur. /CCj/ occurs only before /u:/ or /ʊə/, e.g. *excuse*, *skewer*; /skl-/ occurs only before /ə/, though the items *sclerosis*, *sclerotic* admit the variants /skle-, skl-, skliə-/.

(c) The name of the bird *smew* provides a single example of the initial sequence /smj-/.

(6) Final V

All vowels except /e,æ,ʌ,ɒ/ occur finally. /u/ may occur word-finally in *to* before a word beginning with a vowel or in pre-pausal position (as well as in certain pronunciations of words like *statue*). No short vowels occur in accented open syllables.

(7) Final VC

/r,h,j,w/ do not occur finally in the present phonemic analysis of RP (see note to §8.2). /ʒ/ occurs finally only after /i:,ɑ:,u:,eɪ/ in words of recent French origin, like *liege*, *camouflage*, *rouge* and *beige*. /ŋ/ occurs only after /ɪ,æ,ʌ,ɒ/.

(8) Final VCC

(a) Final CC clusters pattern as follows:

p + t,

t +

k + t,

b +

d +

d,

θ, s

θ, s

s

z

z

g +		d,			z
tʃ +	t				
dʒ +		d			
m + p,		d,	f,	θ,	z
n +	t,	d, tʃ, dʒ,		θ, s,	z
ŋ +		d,			z
l + p, t, k, b,		d, tʃ, dʒ,	m, n, f, v,	θ, s,	z, ʃ
f +	t,			θ, s	
v +		d,			z
θ +	t,				s
ð +		d,			z
s + p, t, k					
z +		d			
ʃ +	t				
ʒ +		d			

(b) Final CC clusters can be divided into two groups:

(i) Nasal, lateral or /s/ plus another consonant, e.g. *jump*, *bend*, *dent*, *think* /θɪŋk/, *quilt*, *whist*, *cask*, *culp*.(ii) A consonant plus one of the apicals /t,d,s,z,θ/. The majority of such clusters arise from non-syllabic suffixation of past tense /t,d/; from possessive, plural or third person singular present tense /s,z/; or from ordinal or noun-forming /θ/ or noun-forming /t/, e.g. *laughed*, *behaved*, *dogs* or *dog's*, *cat's* or *cats*, *leads*, *hits*, *fifth*, *depth*, *product*. There are a few monomorphemic words of this sort, e.g. *act*, *adze*, *axe*, *corpse*, *lapse*.(c) In the present analysis of RP /r,h,j,w/ do not combine with other consonants in final positions. (/r/ occurs in such positions in General American); and if the diphthongs /eɪ,aɪ,ɔɪ,əʊ,əʊ/ were analyzed as sequences /eɪ,aɪ,ɔɪ,əʊ,aw/, then /j,w/ would be said to occur in such positions (see §8.5). /g,ŋ/ do not occupy final position in a final CC cluster. /θ/ is of limited occurrence in this position: /-pθ/ occurs only after /e/, e.g. *depth*, /-mθ/ only after /ɔ:/, e.g. *warmth* and /fθ/ only after /t/, e.g. *fifth*. /-ln/ occurs only after /i/, e.g. *kiln* and /-lj/ only after /e/, e.g. *Welsh*. Only /-dz/ occurs after all vowels; /-nz, -lz/ occur after all but two vowels. All other CC clusters show considerable restrictions in their ability to combine with preceding vowels.

(9) Final VCCC

(a) Final VCCC clusters pattern as follows:

(i) Final /t/ preceded by one of the following sequences:

p +	s
t +	s
k +	s
d +	s
m +	p
n +	s, tʃ
ŋ +	s, k
l +	s, p, k, tʃ
s +	p, k

(ii) Final /d/ preceded by one of the following sequences:

n +	dʒ, z
l +	dʒ, m, v

(iii) Final /s/ preceded by one of the following sequences:

p +	t, θ
t +	θ
k +	t
m +	p, f
n +	t, θ
ŋ +	k
l +	p, t, k, f, θ
f +	t, θ
s +	p, t, k

(iv) Final /z/ preceded by one of the following sequences:

n +	d
l +	b, d, m, n, v

(v) Final /θ/ preceded by one of the following sequences:

k +	s
n +	t
ŋ +	k
l +	f

(b) Final CCC clusters can be divided 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* /æktz/ (but these are all commonly reduced to /fɪfs/, /ˈprɒdʌks/, /æks/), but there are two common monomorphemic words, *text* and *next* pronounced /tekst/, /nekst/ when they are not reduced (but also commonly reduced to /teks/ and /neks/).

(c) CCC clusters predominantly follow short vowels. Eleven of the 49 CCC final clusters occur after only one vowel (5 after /t/, 4 after /e/, 1 after /ɪ/, 1 after /ə/).

(10) Final VCCCC

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*; /-lktz/ *mulctz*; /-lpts/ *sculptz*; /-lfθs/ *twelfthz*; /-ntθs/ *thousandthz*. Such clusters are regularly reduced from CCCC to CCC by omission of the third element of the cluster. In cases like /-kstz/ *texts*, /-ksθs/ *sixthz* there is less likelihood of reduction though even these may become [tekz:], [sɪks:] with a double length representing /ss/.

(11) 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 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.

(12) 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 utilized. Thus, such unused monosyllabic words as the following conform to an already existing pattern: /fauð, saɪç, mɒmp, bru:ʃ, plɪ:k, splak, streɪç/. If, in addition, gaps are filled on the grounds of general patterning, it would be possible to construct words of an English phonological character with, for instance, initial /fɔ-, rɜ-, glɔ-, skæ-, sprəu-/ or final /-ɔ:g, -aɪf, -u:nt, -ɑ:ndʒ, -ʌkst/ etc.

10.10.2 Word-medial Syllable Division

Word-medial consonant sequences are of course longer than those in initial and medial 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.ˈrəu.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,¹⁴ 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 is¹⁵ also suggests a general preference for onset syllabification.

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.tv/, 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*.

¹⁴ See Selkirk (1982).

¹⁵ For experimental information on syllable division word-medially, see Fallows (1981), Treiman and Davis (1988) and Treiman *et al.* (1992). Such experimentation is based principally on speakers being asked to divide up nonsense words.

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 /si:kwəl/ and /sɪk.wəl/ are divisions which accord with the phonotactic principle. However, /si: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, protein, 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 /ˈwɪn.dəʊ/ and /ˈwɪnd.əʊ/; the maximal onset principle decides in favour of /ˈwɪn.dəʊ/. The phonotactic principle would give us /ˈplæs.tɪk/ but the allophonic principle suggests /ˈplæ.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.¹⁶

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.ˈkwɪəʃ/, /ɪ.ˈkwɛst/, /ə.ˈplɔ:z/, /ə.ˈstju:t/, /ə.ˈspærəgəs/. Similarly, in those, less frequent, cases where a full vowel precedes the primary accent, the phonotactic principle usually applies, e.g. /meɪn.ˈteɪm/, /sep.ˈteɪmbə/, and /bæp.ˈtaɪz/.

Most of the examples above have concerned dissyllabic 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.sai.kləʊ.ˈpi:diə/, /æl.ju:ˈmɪn.təm/, /kæŋ.gəˈru:z/, /ˈmæk.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.

¹⁶ Treiman *et al.* (1992) confirmed /s/ in the onset in such sequences but found /t/ in the coda in sequences like /fl/ in *afflict*.

g +	d,	z
ʃ + t		
ɔŋ +	d	
m + p,	d,	f, θ, z
n + t,	d, ʃ, ɔŋ,	θ, s, z
ŋ + k,	d,	z
l + p, t, k, b,	d, ʃ, ɔŋ, m, n, f, v, θ, s,	z, ʃ
f + t,		θ, s
v +	d,	z
θ + t,		s
ð +	d,	z
s + p, t, k		
z +	d	
ʒ + t		
ʒ +	d	

(b) Final CC clusters can be divided into two groups:

(i) Nasal, lateral or /s/ plus another consonant, e.g. *jump, bend, dent, think* /θɪŋk/, *quilt, whist, cask, cusp*.

(ii) A consonant plus one of the apicals /t,d,s,z,θ/. The majority of such clusters arise from non-syllabic suffixation of past tense /t,d/; from possessive, plural or third person singular present tense /s,z/; or from ordinal or noun-forming /θ/ or noun-forming /t/, e.g. *laughed, behaved, dogs or dog's, cat's or cats, leads, hits, fifth, depth, product*. There are a few monomorphemic words of this sort, e.g. *act, adze, axe, corpse, lapse*.

(c) In the present analysis of RP /r,h,j,w/ do not combine with other consonants in final positions. /t/ occurs in such positions in General American; and if the diphthongs /eɪ,aɪ,ɔɪ,əʊ,əʊ/ were analyzed as sequences /eɪ,aɪ,ɔɪ,əʊ,əʊ/, then /j,w/ would be said to occur in such positions (see §8.5). /g,ŋ/ do not occupy final position in a final CC cluster. /θ/ is of limited occurrence in this position: /-pθ/ occurs only after /e/, e.g. *depth*, /-mθ/ only after /ɔ:/, e.g. *warmth* and /fθ/ only after /t/, e.g. *fifth*. /-ln/ occurs only after /t/, e.g. *kiln* and /-lj/ only after /e/, e.g. *Welsh*. Only /-dz/ occurs after all vowels; /-nz, -lz/ occur after all but two vowels. All other CC clusters show considerable restrictions in their ability to combine with preceding vowels.

(9) Final VCCC

(a) Final VCCC clusters pattern as follows:

(i) Final /t/ preceded by one of the following sequences:

p + s	
t + s	
k + s	
d + s	
m + p	
n + s,	ʃ
ŋ + s,	k
l + s, p, k,	ʃ
s +	p, k

(ii) Final /d/ preceded by one of the following sequences:

n + ɔŋ,	z
l + ɔŋ,	m, v

(iii) Final /s/ preceded by one of the following sequences:

p + t,	θ
t +	θ
k + t	
m + p,	f
n + t,	θ
ŋ +	k
l + p, t, k, f,	θ
f + t,	θ
s + p, t, k	

(iv) Final /z/ preceded by one of the following sequences:

n + d	
l + b, d, m, n, v	

(v) Final /θ/ preceded by one of the following sequences:

k +	s
n + t	
ŋ +	k
l +	f

(b) Final CCC clusters can be divided 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* /'prɒdʌkts/, *acts* /æktz/ (but these are all commonly reduced to /fɪfs/, /'prɒdʌks/, /æks/), but there are two common monomorphemic words, *text* and *next* pronounced /tekst/, /nekst/ when they are not reduced (but also commonly reduced to /teks/ and /neks/).

(c) CCC clusters predominantly follow short vowels. Eleven of the 49 CCC final clusters occur after only one vowel (5 after /ɪ/, 4 after /e/, 1 after /ʌ/, 1 after /ə/).

(10) Final VCCCC

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*; /-lktz/ *mulctz*; /-lptz/ *sculptz*; /-lfθz/ *twelfthz*; /-ntθz/ *thousandths*. Such clusters are regularly reduced from CCCC to CCC by omission of the third element of the cluster. In cases like /-ksts/ *texts*, /-ksθz/ *sixths* there is less likelihood of reduction though even these may become [teks:], [sɪks:] with a double length representing /ss/.

(11) 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 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.

(12) 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 utilized. Thus, such unused monosyllabic words as the following conform to an already existing pattern: /faud, saɪdʒ, mɒmp, bru:tʃ, plɪk, splak, streɪdʒ/. If, in addition, gaps are filled on the grounds of general patterning, it would be possible to construct words of an English phonological character with, for instance, initial /fə-, rɜ:-, glɒ-, skɔ-, sprəu-/ or final /-ɔ:g, -aɪf, -u:nt, -a:mɔ:g, -lɛkst/ etc.

10.10.2 Word-medial Syllable Division

Word-medial consonant sequences are of course longer than those in initial and medial 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.ˈrəu.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,¹⁴ 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 is¹⁵ also suggests a general preference for onset syllabification.

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*.

¹⁴ See Selkirk (1982).

¹⁵ For experimental information on syllable division word-medially, see Fallows (1981), Treiman and Davis (1988) and Treiman *et al.* (1992). Such experimentation is based principally on speakers being asked to divide up nonsense words.

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 /si.kwəl/ and /sɪk.wəl/ are divisions which accord with the phonotactic principle. However, /ˈsi.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, protein, 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 /ˈwɪn.dəʊ/ and /ˈwɪnd.əʊ/; the maximal onset principle decides in favour of /ˈwɪn.dəʊ/. The phonotactic principle would give us /ˈplæs.tɪk/ but the allophonic principle suggests /ˈplæ.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.¹⁶

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.ˈkwɛst/, /ə.ˈplɔ:z/, /ə.ˈstju:t/, /ə.ˈspærəgɔ:s/. Similarly, in those, less frequent, cases where a full vowel precedes the primary accent, the phonotactic principle usually applies, e.g. /mɛm.ˈteɪn/, /sep.ˈteɪnbə/, and /bæp.ˈtaɪz/.

Most of the examples above have concerned dissyllabic 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.sai.kləʊ.ˈpi:diə/, /æɪ.ju:ˈmɪn.iəm/, /kæn.gə.ˈru:z/, /ˈmæk.m.tɔʃ/. 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.

¹⁶ Treiman *et al.* (1992) confirmed /s/ in the onset in such sequences but found /f/ in the coda in sequences like /fl/ in *afflict*.

10.10.3 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* /ɪks'klu:əd, ɪks'klu:ədɪd/; *guard* /gɑ:d, 'gɑ:dɪd/; *rot* /rɒt, 'rɒtɪd/; *target* /'tɑ:ɡɪt, 'tɑ:ɡɪtɪd/. Otherwise:

(b) If the stem ends in any voiced sound (apart from /d/), add /-ɪd/ e.g. *buzz* /bʌz, bʌzɪd/; *hammer* /'hæmə, 'hæmədɪd/; *kill* /kɪl, kɪldɪd/; *listen* /'lɪsn, 'lɪsndɪd/.

(c) If the stem ends in any voiceless consonant (apart from /t/) add /-t/, e.g. *arch* /ɑ:tʃ, ɑ:tʃt/; *immerse* /ɪ'mɜ:s, ɪ'mɜ:st/; *kick* /kɪk, kɪkt/; *sniff* /snɪf, snɪft/.

(2) Plural/possessive/third person singular present tense

(a) If the stem ends in a sibilant (/s, z, ʒ, ʒ, ʒ, ʒ, ʒ/), add /-ɪz/ e.g. *address* /ə'dres, ə'dresɪz/; *arch* /ɑ:tʃ, ɑ:tʃɪz/; *graze* /greɪz, 'greɪzɪz/; *judge* /dʒʌdʒ, 'dʒʌdʒɪz/; *rush* /rʌʃ, 'rʌʃɪz/. Exceptionally, the voicing of the fricative in *house* changes: /haus, 'hauzɪz/. Otherwise:

(b) If the stem ends in any non-sibilant voiced sound, add /-z/ e.g. *blow* /bləʊ, bləʊz/; *pattern* /'pætən, 'pætənz/; *regard* /rɪ'gɑ:d, rɪ'gɑ:dz/; *thrill* /θrɪl, θrɪlz/.

(c) If the stem ends in any non-sibilant voiceless consonant, add /s/ e.g. *laugh* /lɑ:f, lɑ:fs/; *pick* /pɪk, pɪks/; *resort* /rɪ'zɔ:t, rɪ'zɔ:ts/.

(3) Present participle

In all cases, add /-ɪŋ/ e.g. *kill* /kɪl, 'kɪlɪŋ/; *laugh* /lɑ:f, 'lɑ:fɪŋ/; *sing* /sɪŋ, 'sɪŋɪŋ/; *trim* /trɪm, 'trɪmɪŋ/. For cases where the stem ends in /ɑ:, ɔ:, ɜ:, ɪə, eə, uə/, see (6) below. For stems ending in syllabic [ŋ] or [l] the syllabic nature of the nasal or lateral is frequently retained, e.g. *handle* ['hændl, 'hændlɪŋ]; *widen* ['waɪdɪn, 'waɪdɪnɪŋ]. However, some speakers may insert a /ə/, retaining the same number of syllables, thus /'hændəlɪŋ, 'waɪdənɪŋ/; while for others the nasal or lateral may lose its syllabic function, thus ['hændl, 'hændlɪŋ]. It should be noted that in such cases, the quality of the /l/ is altered, the dark, syllabic [ɫ] of [hændɫ] 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* /'i:zi, 'i:ziə (or 'i:ziə), 'i:zi:st/; *great* /greɪt, 'greɪtə, 'greɪtɪst/; *big* /bɪɡ, 'bɪɡə, 'bɪɡɪst/.

(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, 'lɒŋgə, 'lɒŋɡɪst/. In all other cases, the /ŋ/ is followed immediately by the suffix, e.g. participle *-ing* in *longing* /'lɒŋɪŋ/, adjectival modifier *-ish* in *longish* /'lɒŋɪʃ/, or agentive *-er* in *hanger* /'hæŋgə/, *singer* /'sɪŋgə/. It should be

noted that monomorphemic words (not formed of a stem and affix) exhibit the sequence /-ŋg-/ intervocally, e.g. *anger* /'æŋgə/, *finger* /'fɪŋgə/.

(6) /r/-links in suffix formation

In the case of words which end in /ɑ:, ɔ:, ɜ:, ɪə, eə, uə/ (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* /blɜ:, 'blɜ:rɪŋ/; *secure* /sɪ'kjʊə, sɪ'kjʊərɪŋ/; *stare* /steə, 'steərɪŋ/; *store* /stɔ:, 'stɔ:rɪŋ/; comparative and superlative adjectives (stem + /ə, ɪst/) *clear* /klɪə, 'klɪərə, 'klɪərɪst/. This process applies to derivational as well as to inflexional suffixes, e.g. adjectival *-y*, e.g. *star* /stɑ:, 'stɑ:rɪ/; agentive noun *-er*, e.g. *murder* /'mɜ:də, 'mɜ:dərə/; verb-forming *-ize*, e.g. *familiar* /fə'mɪliə, fə'mɪliərəɪz/. /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* /'drɔ:ɪŋ, 'nɔ:ɪŋ/ (see §§12.4.7 (1), 12.7 (3)).

10.10.4 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 individually 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* → [mæk], *spin* → [pɪn], *please* → [pi:], *queen* → [ki:n]. 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* → [fɪŋ], *sleep* → [hi:p], *smoke* → [mæk]. 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* [s'pɔ:t] or [s:pɔ:t], *slow* [s'ləʊ] or [s:ləʊ].¹⁷ Some sequences give particular problems: /st/ sometimes occurs with metathesis as /ts/ (no doubt 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.

10.10.5 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'pɔ:t/ (and hence

¹⁷ See Gilbert and Purves (1977).

homonymous with *support*), or as /eˈspɔ:t/ or /əˈspɔ:t/ (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 postthetic vowel, e.g. a [ə] may be added to *bit* making it sound like *bitter*.

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-alveolarization (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* → [gɔg], although occasionally the process can be progressive (i.e. in a forward direction), e.g. *cushion* → [ˈkʊkən], *bottom* → [ˈbɒpəm].

II

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 the polysyllabic word. 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 their neighbours. Accentuation in connected speech differs, however, from the usual case of a polysyllabic word in that the situation of the accent in connected speech is determined largely by the meaning which the utterance is intended to convey, in the particular circumstances in which it is uttered. So, in terms of accent and reduced vowels, *She can* may be like the verb *insult* or like the noun *insult*, but not like *beacon* (i.e. the accent can go on *She* or *can* but the vowel in *can* cannot be reduced to /ə/ like the second syllable of *beacon*).

Although accentual patterns of connected speech are freer than those of the word and are largely determined by the meaning to be conveyed, some words are predisposed by their function in the language to receive accent. 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 (FUNCTION words), are more likely to be unaccented, although they, too, may be exceptionally accented if the meaning requires it.

The example given above illustrates the freedom of accentual patterning in utterances taken without a context. But 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 are always curtailed by the constraints imposed by its context. In the case of an opening remark, or when a new topic is introduced into a conversation, there is very limited scope for variations 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!'¹ (i.e. 'Wasn't it the week before?') 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* (emphasizing the continuous nature of the rain) or *It`rained every day!* (where the fact of raining is emphasized). On the other hand the constraints on the accentuation in the following dialogue, produced both by the context and by the nature of the lexical words, are such that little variation is possible (those words likely to be most strongly accented being printed in italic):

'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 *sightseeing*, when it was too *wet* to go on the *beach!*'

Many monosyllabic function words are subject to qualitative variation (usually including variation between full and reduced vowels) according to whether they receive the accent or not. But use of a reduced vowel in an unaccented function word may be inhibited by its position, e.g. *can* /kən/ or /kɪ/ in unaccented initial and medial positions in the utterance, but /kæn/ in an unaccented final position, as in the example of *'She can* in the first paragraph above. Monosyllabic lexical words usually retain their full vowel value even in unaccented positions, e.g. *How in How`can she?*; or again, in *We put the case in the hall, case and hall* will always keep their full vowel wherever the primary accent is concentrated.

More than one word in an utterance may receive a primary accent. A deliberate, emphatic or excited style of speaking often exhibits a proliferation of primary accents; a more rapid and matter-of-fact delivery is likely to show fewer primary accents.

In an extended dialogue in normal conversational style, the number of syllables with reduced vowels (or syllabic consonants) tends to exceed that 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 70 years the notion of 'stress-timing' is invoked to explain English rhythm;² by such a theory 'stressed' syllables (including pitch accents and other syllables made prominent by 'stress' alone) govern the rhythm of English utterances, an equal amount of

¹ Note that the sign ` here shows the place of the primary accent. As the symbol ` implies, the most common primary accent involves a falling pitch; however, /laɪs wɪk/ is in these examples at least as likely to have a high-rising pitch.

² Pike (1945), Abercrombie (1967), Halliday (1967) and numerous TESOL textbooks, e.g. Bright and McGregor (1970), Abbott and Wingard (1981).

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.

They | couldn't have | chosen a | better | time for their | holiday.

• ● • • ● • ● • ● • • ● • •

However, all attempts to show such timing instrumentally have been unsuccessful³ and such groups are often clearly far from ISOCHRONOUS. 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 because of the full vowel on the word *their*.

Indeed, the occurrence of full vowels 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 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/, and /ɪ/ and /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 RULE⁴ whereby a syllable with a reduced vowel 'borrows time' from any immediately preceding syllable containing a full vowel.⁵ 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 the rule is shown in the following two examples (chosen to compare the predictions of full-vowelled rhythm and stress-timed rhythm) (' and ` indicate pitch accents and F and R full and reduced vowels):

(a) Those `wallabies are `dangerous

F F- R R R F- R R

(b) Those porcupines aren't `dangerous

F F F F F F- R R

In these examples, syllables marked F are equally long, those marked R are equally short, and those marked F- are long syllables shortened by the following reduced-vowelled syllables. So *dangerous* is the same in the two examples, the first syllable

³ Thompson (1980), Roach (1982), Dauer (1983).

⁴ This rule was first put forward in Bolinger (1981) and applied to TESOL in Faber (1986).

⁵ 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'.

being shortened by the following reduced vowel, but the rhythms of *wallabies* are and *porcupines aren't* are different because the first syllable of *wallabies* is shortened by the following reduced vowel, whereas the first syllable of *porcupines* is not shortened because it is followed by a full vowel. (Whereas by a theory of stress-timed rhythm both sentences would be predicted to have the same rhythm.) A sequence of F- followed by R is equal to a single F; but any further following Rs do not take time from the F-, e.g. the single syllable of *speed* will be shortened when turned into *speedy* but will be no further shortened when turned into *speedily*.

11.3 Weak Forms

Lexical words (both monosyllables and polysyllables) generally have in connected speech the quantitative pattern of their isolate form and therefore retain some measure of prominence based on the occurrence of a full vowel even when no pitch prominence is associated with them.

However, many function words have two or more qualitative and quantitative patterns according to whether they are unaccented (as is usual) or accented (in special situations or when said in isolation).⁶ As compared with the accented realizations of these words (the STRONG forms), the unaccented WEAK forms of these words show reductions of the length of sounds, obscuration 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, second, in their less usual⁷ accented strong form:

	Unaccented	Accented
<i>a</i>	/ə/	/eɪ/
<i>am</i>	/m, ɪ, əm/	/æm/
<i>an</i>	/n, ɪ, ən/	/æn/
<i>and</i>	/ənd, ɪd, ən, n, ɪ/	/ænd/
<i>are</i>	/ə/ + consonant /ər, r/ + vowel	/ɑ:/ /ɑ:r/
<i>as</i>	/əz/	/æz/
<i>at</i>	/ət/	/æt/
<i>be</i>	/bi/ (or [bi])	/bi:/
<i>been</i>	/bi:n/	/bi:n/
<i>but</i>	/bət/	/bʌt/
<i>can</i> (aux.)	/kən, kɪ/	/kæn/
<i>could</i>	consonant + /kəd/ vowel + /kd/	/kud/

⁶ For a full treatment of English weak forms, see Obendorfer (1998).

⁷ The following 42 items occur in the first 200 most common words in connected speech: *a, am, an, and, are, as, at, be, been, but, by, can, do, for, from, had, has, have, he, her, him, his, I, is, me, my, of, or, shall, she, some, that, the, them, there, to, us, was, we, will, you, your*. It is significant that of these the following 19 have over 90% unaccented occurrences with a weak form: *a, and, an, as, at, be, been, but, for, her, his, of, or, shall, the, them, to, was, we*.

<i>do</i> (aux.)	vowel + /d/ + consonant /də/ + consonant	/du:/
<i>does</i> (aux.)	/dɒz, z, s/ (e.g. <i>What's (= does) he like?</i> <i>When's (= does) he arrive?</i>)	/dɒz/ /wɒts i: 'laɪk/ /wenz i: ə 'raɪv/
<i>for</i>	/fə/ + consonant /fər, fr/ + vowel	/fɔ:(r)/
<i>from</i>	/frɒm, frɒ/	/frɒm/
<i>had</i> (aux.) ⁸	/həd, əd, dɪ ⁹	/hæd/
<i>has</i> (aux.)	/həz, əz, z, s/	/hæz/
<i>have</i> (aux.)	/həv, əv, v/	/hæv/
<i>he</i>	/hi:, i:/ (or [hi])	/hi:/
<i>her</i> ¹⁰	/hə, z, ə/ + consonant /hər, z:r, ər/ + vowel	/hɜ:(r)/
<i>him</i> ¹⁰	/ɪm/ ¹¹	/hɪm/
<i>his</i>	/ɪz/	/hɪz/
<i>is</i>	/s, z/	/ɪz/
<i>me</i>	/mi/ (or [mi])	/mi:/
<i>must</i>	/mɒst/ ¹²	/mʌst/
<i>not</i>	/nt, ɪ/	/nɒt/
<i>of</i>	/əv, v, ə/	/ɒv/
<i>saint</i>	/sənt, sɪt, sən, sɪ/	/seɪnt/
<i>shall</i>	/ʃəl, ʃ/	/ʃæl/
<i>she</i>	/ʃi/ (or [ʃi])	/ʃi:/
<i>should</i>	/ʃəd/	/ʃud/
<i>sir</i>	Vowel + /ʃd/ /sə/ + consonant /sər/ + vowel	/sɜ:/ /sɜ:r/
<i>some</i> (adj.) ¹³	/səm, sɪ/	/sʌm/
<i>than</i>	/ðən, ðɪ/	/ðæn/
<i>that</i> (conj. and rel. pron.) ¹⁴	/ðət/	/ðæt/

⁸ The distinction between auxiliary *have* and the main verb may be illustrated by examples such as *He considered what he /həd/ left* (weak form of auxiliary verb = what had been left by him) and *He considered what he /hæd/ left* (main verb, non-weakenable = what he still possessed).

⁹ A weak form with /ɪ/ is normally used when unaccented following a pause.

¹⁰ Reflexive pronouns *himself, herself, themselves* have weak forms like their simple equivalents.

There are also common weak forms of *yourself, yourselves* [jə'self, jə'selvz] as in *Help yourself*.

¹¹ The weak form occurs when *his* is a possessive adjective; as a possessive pronoun the weak form is unlikely, e.g. *he has his and I have mine*.

¹² Often /məʊ/ with elision of /t/. See §12.4.6.

¹³ Some does not occur in a weak form when used as a pronoun, e.g. /sʌm maɪt 'seɪ/, /əɪd 'laɪk sʌm/.

¹⁴ *That* as a demonstrative adjective or pronoun always takes a full vowel, e.g. *that man* /ðæt 'mæn/, *that's the one* /ðætɪz ðə 'wʌn/.

<i>the</i>	/ði/ ([ði]) + vowel ¹⁵ /ðə/ + consonant	/ði:/
<i>them</i>	/ðəm/, /ðm/ also /əm, m, n/	/ðəm/
<i>there</i> (indef. adv.) ¹⁶	/ðə/ + consonant /ðeə/ + vowel	/ðeə/ (rare) /ðeə/ (rare)
<i>to</i> (and <i>into, onto, unto</i>)	/tə/ + consonant /tw,tu/ ([tu]) + vowel	/tu:/
<i>us</i>	/əs, s/	/əs/
<i>was</i>	/wəz/	/wəz/
<i>we</i>	/wi/ (or [wi])	/wi:/
<i>were</i>	/wə/ + consonant /wə/ + vowel	/wə:/ /wə:/
<i>who</i>	/u:/, /hu/ (or [hu]) ¹⁷	/hu:/
<i>will</i>	/əl, l, l/	/wɪl/
<i>would</i>	consonant + /wəd, əd/ vowel + /d/	/wʊd/
<i>you</i>	/ju/ (or [ju])	/ju:/

Particularly common uses of reduced forms involve auxiliary verb plus *not* and pronoun plus auxiliary verb. 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?* /ɑ:nt aɪ/); similarly *wasn't, weren't, can't* /kɑ:nt/, *couldn't, doesn't, don't* /dɒnt/, *hasn't, haven't, shan't* /ʃɑ:nt/, *shouldn't, won't* /wɒnt/, *wouldn't*. Reduced forms in pronoun plus auxiliary combinations are shown in *I'm, he's, she's, we're* /wə/, *you're* /ju:/, *they're* /ðeə/ and all subject pronouns plus *will, would, have, had*, e.g. /wi:l//ju:d//ðeɪv/, plus sequences like *you would have* /'ju:dəv/. Note also the question forms: *do you* /dɔ:ju:/, *don't you* /'dɒntju:/, *did you* /'dɪdju:/, *didn't you* /'dɪdn'tju:/, *would you* /'wʊdju:/, *wouldn't you* /'wʊdn'tju:/, *let us* /let's/.

Pronouns are the only weak forms which can end sentences. Thus verb forms 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 coming?* /I am /æm/; *Who's got it?* /I have /hæv/.

Similarly, some prepositions, e.g. *to, from, at, for, apart* from having a strong form when receiving a primary accent, also have a qualitative prominence when final and unaccented, e.g. *Where have they gone to?* /tu:/, also /tə/, but not /tə/; *Where's he come from?* /frəm/ rather than /frəm/; *What are you laughing for, at?* /fɔ:,æt/. 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 /æt/ and solved the problem;* or *people who can afford to /tu:/ (= 'do so'), buy luxuries, cf. people who can afford to /tə/ buy luxuries, do so.* When a preposition occurs before an unaccented pronoun, either the strong or the weak form may be

¹⁵ 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 (2007) notes it as occurring in British English but only with an obligatory [r] before the vowel.

¹⁶ As a demonstrative adverb, *there* will have a full vowel, e.g. *there's the book* /ðeəz ðə 'bʊk/.

¹⁷ A weak form with /h/ would normally be used when unaccented but following a pause.

used for the preposition, e.g. *I gave it to you* /tə/ or /tu:/; *I've heard from him* /frəm/ or /frɒm/; *I waited for you* /fə/ or /fɔ:/; *I looked at her* /ət/ or /æt/.

Some function words, not normally possessing an alternative weak form for unaccented occurrences, may show such reductions in very rapid speech, e.g. *I (ə) don't know; What's your (jə) name?; I go by (bə) bus; Do you know my (mə) brother?; for love nor (nə) money; two or (ə) three; ever so (sə) many.* These weak forms are common in a limited number of phrases, e.g. *what are you doing?*; and, in the case of *or*, particularly occur in linking two numbers as in the example above. In the case of the dissyllables *any, many*, a qualitative prominence may be retained on the first syllable—/eni, 'meni/, but fully reduced, unaccented forms may be heard following a vowel in rapid speech, e.g. *Have any more come?* /hævni 'mɔ: kʌm/; *How many do you want?* /hau mni dʒu: 'wɒnt/. Other monosyllabic function words normally retain their strong vowels in unaccented positions, e.g. *on, when, then, one*, but again although rather less commonly, reduced vowel forms may be heard in very rapid speech, especially when the word is adjacent to a strongly accented syllable, e.g. *What on (ən) or (ŋ) earth!; When (wɒn) all's said and done; Then (ðən) after a time; One (wɒn) always hopes.*

The more rapid the delivery, the greater the tendency to reduction and obscuration of unaccented words.¹⁸ Even monosyllabic lexical words may be reduced in fast 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* /hɪ:l kʌm bæk/, and /e/ in *Don't get lost* /dɒnt get 'lɒst/. /ɪ/ and /ʊ/, often representing a reduced form of /i:/ and /u:/, may themselves be further reduced to /ə/, e.g. *You sit over here* /ju: sət əvə 'hɪə/, *He put it there* /hi: pʊt ɪt 'ðeə/. The more prominent short vowels /æ,ɒ/ are only occasionally liable to reduction, e.g. /æ/ in *They all sat down on the floor* /ðeɪ ɔ:l sət daʊn ən ðə 'flɔ:/, /ɒ/ in *We want to go* /wi: wɒnt tə ɡəʊ/. 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 kɑ:nt ɡə 'wɪt ɪm/; *He's going to do it* /hɪz ɡɒnə 'du: ɪt/.

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,*

¹⁸ See Shockey (2003) for many instances of hyperreductions in casual (often rapid and/or casual) speech.

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 learn¹⁹ 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.

11.6 Intonation²⁰

The acoustic manifestation of intonation is fundamental frequency (see §3.2.1 above) 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; (ii) they signal syllables with primary and secondary accent, both in the citation of isolated words as already mentioned in §10.1 and §10.2 and in the longer utterances of speech; and (iii) the shape of the tunes produced by pitch changes can carry various types of meaning, primarily discursive (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 RP is described in the following sections. Differences between RP and GA are relatively limited; differences between RP and that of a number of northern British cities are considerable (see under §11.6.3 below).

11.6.1 The Forms of Intonation²¹

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

¹⁹ See Windsor Lewis (2007) for priorities for foreign learners in the learning of function words.
²⁰ For a more complete treatment of English intonation, see O'Connor and Arnold (1973), Cruttenden (1997), Wells (2006).

²¹ Much recent work on the form of English intonation has been done in a newer tradition represented by Pierrehumbert (1980/87) and Pierrehumbert and 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.

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 webpage / 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:²² in the piece above, *years* and *-ses* and *-nies* 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 the sentence-initial reduced syllables of *and then be-* and *that if we* above are likely to be pronounced very rapidly and hence such syllables are also very likely to involve reduced vowels. These external 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 be higher than low-pitched syllables at the end.

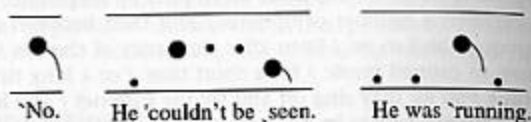
11.6.1.2 Primary Accents The pronunciation of single words and of longer intonational phrases are both described in terms of an obligatory PRIMARY ACCENT and an optional SECONDARY ACCENT. The realization of primary accent has already been discussed in §10.2 in relation to single words. There it was stated that the final pitch accent in a word or intonational phrase 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 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

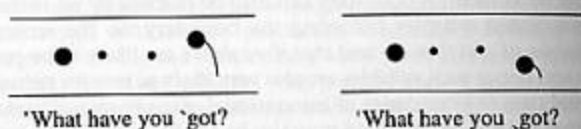
(1) *Falling nuclear tones* (ˈ) —A falling glide may start from the highest pitch of the speaking voice and fall to the lowest pitch, marked ˈ (a HIGH FALL) or from a

²² See Beckman and Edwards (1990).

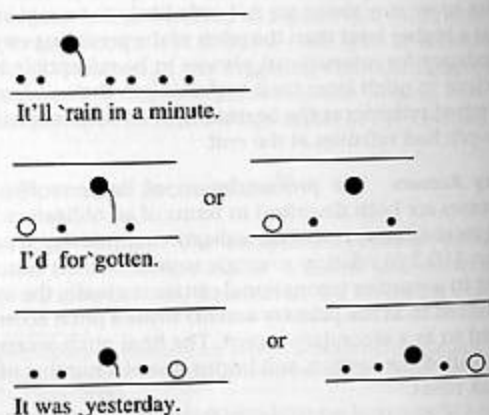
mid pitch to the lowest pitch, marked \downarrow (a LOW FALL). Where there are high syllables before the primary accent, a high fall will involve a step-up and the low fall a step-down. The falling glide is most perceptible when it takes place on a syllable containing a long vowel or diphthong or a voiced continuant (e.g. /m, n, ŋ, l, z/ etc.) (\cdot indicates a high level secondary accent—see §11.6.1.4 below), e.g.²³



When a fall occurs on a syllable containing a short vowel followed by a voiceless consonant (especially the stops /p, t, k/), the glide, particularly of a low fall, is so rapid that it is not easily perceptible or may be realized merely as a low level pitch in relation to a preceding higher pitch, e.g.

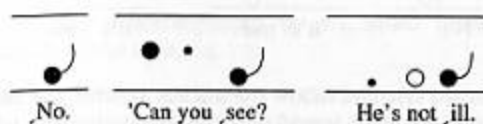


Again, when syllables follow the nucleus—called the TAIL—the fall may be realized as the juxtaposition of relatively high pitch on the nuclear syllable and low pitches on the syllables of the tail, cf.

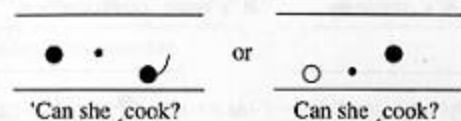


²³ The type of transcription used in the diagrams is called 'interlinear tonetic'. Each ring indicates a syllable. A large filled ring indicates a pitch accent, either primary or secondary. A filled ring sometimes has a tail indicating pitch movement on the accented syllable itself. A large unfilled ring indicates a syllable made prominent by having an unreduced vowel.

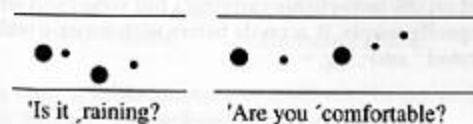
(2) *Rising nuclear tones* (\cdot)—Rising glides may extend from low to mid, or from low or mid to high. When the rise ends at a high point, it is marked by \cdot (a HIGH RISE); when it ends at a mid point, it is marked by \cdot (a LOW RISE). Rising glides are more easily perceptible when they occur on a syllable containing a long vowel or diphthong or a voiced continuant consonant, e.g.



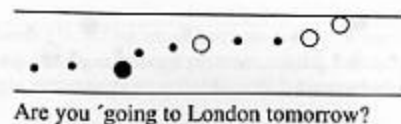
When a low rise occurs on a short syllable, it must necessarily be accomplished much more rapidly or may merely consist of a relatively high level pitch in relation to a preceding low pitch, e.g.



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.

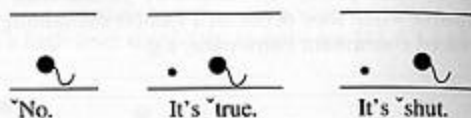


When the tail is a long one, the ascending sequence of syllables of a high rise may be interrupted by a level plateau before a final upward kick e.g.

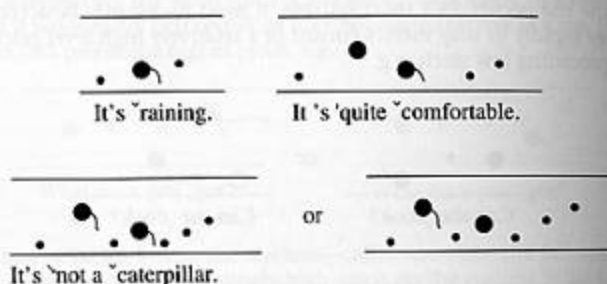


(3) *Falling-rising nuclear tones* (FALL-RISE) (\cdot)—The fall and rise may be confined within one syllable, the glide beginning at about mid level and ending at the same level (or slightly above or below); in the case of a short syllable, the dip in

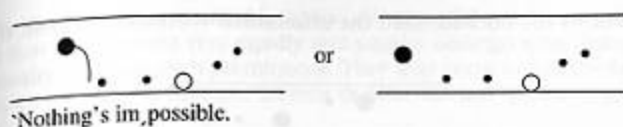
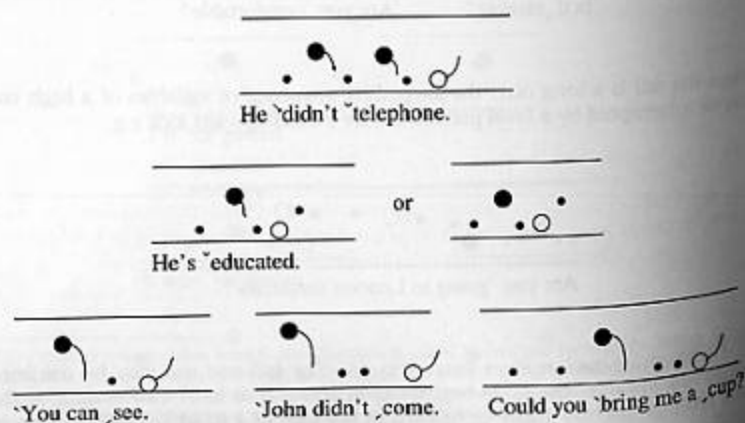
pitch is made extremely rapidly and may be realized as an instant of creaky voice or even of cessation of voice, e.g.



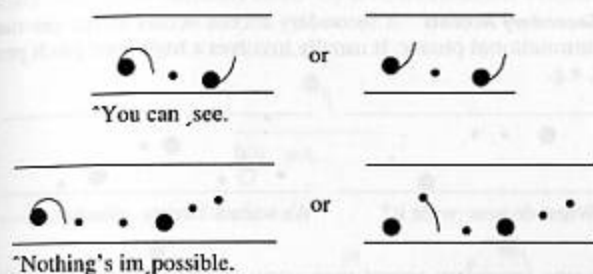
When an unaccented syllables follow the nuclear syllable, the fall occurs on the nuclear syllable and the rise is spread over the tail (^ˈindicates a falling secondary accent—see the section on secondary accents in §11.6.1.4 below), e.g.



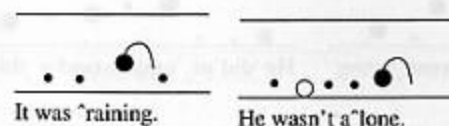
When full vowels occur in tails, the fall takes place on the nuclear syllable and the rise is initiated on the last syllable carrying a full vowel and where the fall and the rise are on separate words, it accords better with tonetic reality to mark the tone with a separated ^ˈ and , e.g.



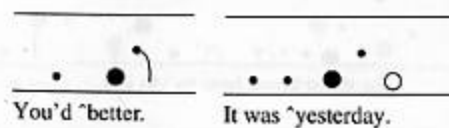
Sometimes a fall-rise is accompanied by an added initial rise, giving a RISE-FALL-RISE variant of the tone, e.g.



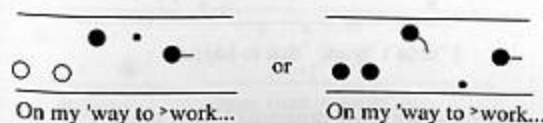
(4) *Rising-falling nuclear tones (RISE-FALL) (ˈ)*—A fall may be reinforced by an introductory rise, being realized as a continuous glide on a long syllable (which may be given extra length), e.g.



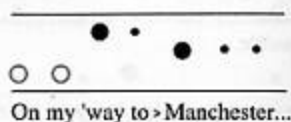
A rise-fall on a short syllable followed by a tail may be realized as a low accented nuclear syllable followed by a fall on the tail, e.g.



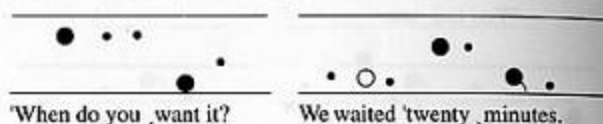
(5) *Level nuclear tones (˘)*—The most common level tone is a mid level, which is a very frequent tone in intonational phrases which are non-final in a sentence. If it occurs on a single syllable that syllable will be lengthened, e.g.



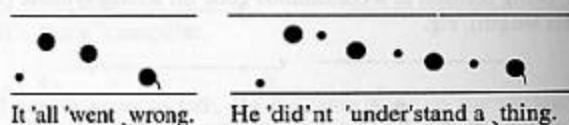
If a tail follows the nucleus, then the unaccented syllables remain on the same level, e.g.



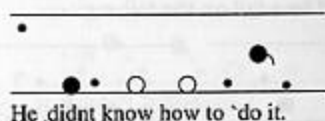
11.6.1.4 Secondary Accents A secondary accent occurs in the pre-nuclear section of an intonational phrase. It usually involves a high-level pitch prominence (marked '), e.g.



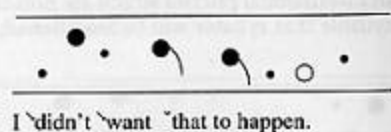
More than one secondary accent may occur in the pre-nuclear position (note that to achieve prominence each succeeding secondary accent involves a step-down), e.g.



A pitch prominence (and hence a secondary accent) may also be achieved by a step-down to a low pitch (marked .) following initial high unaccented syllables, e.g.



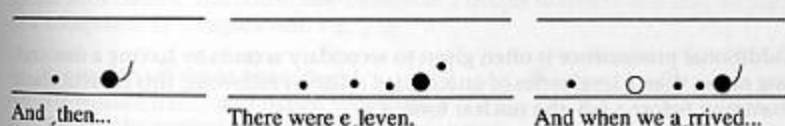
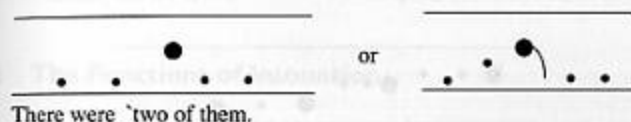
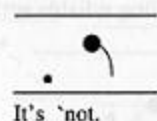
Another common variant of secondary accent(s) uses one or a series of glides-down rather than levels, e.g.



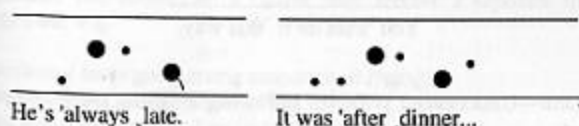
Glides-down of this sort are more prominent than steps.

11.6.1.5 The Pitch of Unaccented Syllables Unaccented syllables, in addition to the fact that they are said very rapidly 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).

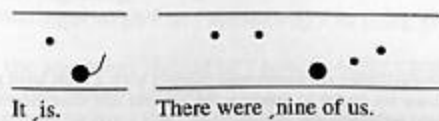
(1) *Pre-nuclear*—Unaccented syllables occurring before a nucleus (where there is no secondary accent) are normally relatively low, whether the nucleus is a fall or a rise, e.g.



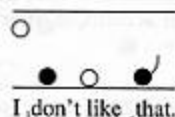
Unaccented syllables before a secondary accent are also usually said on a relatively low pitch, the accent having prominence in relation to them, e.g.



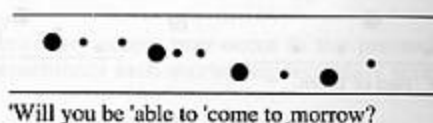
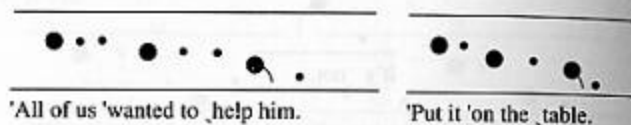
If pre-nuclear unaccented syllables, their weak quality remaining, are said on a relatively high pitch, the effect is more emphatic and animated than if they are low in pitch, particularly if they are followed by a low nuclear tone, e.g.



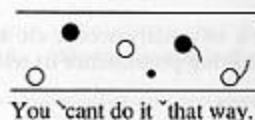
And, as mentioned under §11.6.1.4 above, high unaccented syllables may sometimes be used to give pitch prominence to a low accented syllable,²⁴ e.g.



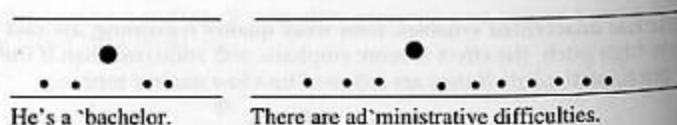
(2) *After syllables with secondary accent*—Unaccented syllables usually remain on almost the same pitch as a preceding syllable with secondary accent, e.g.



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.

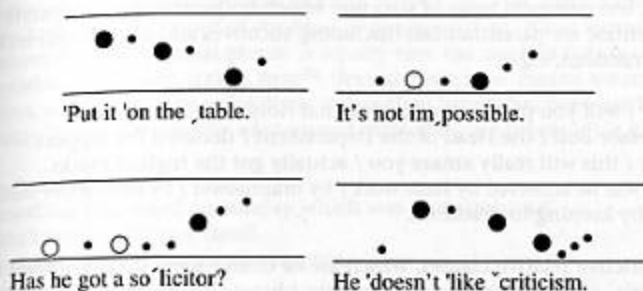


(3) *Post-nuclear*—Unaccented syllables following a falling nucleus remain on a low level, e.g.



²⁴ These high unaccented syllables are sometimes marked with a high level mark 'ˊ'. We have not used this mark because we prefer to preserve the general rule that the tone marks in the text always represent accented syllables.

After a rising nucleus, unaccented syllables continue (or effect) the rise; similarly the rise of a falling-rise 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, 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 big business/
/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 frequently 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 three to four words in length and only in under 10% of cases will they be over eight words in length.²⁵ 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 item²⁶ (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 a`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.)

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 / ,usually.
 It wasn't a very nice `day / un,fortunately.

If a final sentence adverbial in final position takes the sole nucleus, it is contrastive, e.g.

I go there ,usually.

²⁵ Quirk *et al.* (1964: 683), Crystal (1969: 256), Altenberg (1987: 25).

²⁶ Altenberg (1987: 174) found the nucleus occurring on the last lexical item in 78% of cases.

Those sentence adverbials which are usually classified as conjuncts, e.g. *incidentally, therefore*, cannot take a sole nucleus in this way

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 a quite a `tall man / whereas his brother is 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 (the tone will change to high rise), e.g.

(I couldn't `do it.) You couldn't `do it?

11.6.2.3 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 $\bar{\cdot}$). 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%).²⁷ Simple rises and fall-rises are generally estimated to account for a further 40% of tones. The preponderance of falls is usually slightly higher in conversation than in other types of speech, e.g. 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 discursive 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 discursive 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 tones²⁸ which follows is divided according to the following categories: (1) major declaratives; (2) minor declaratives; (3) wh-interrogatives; (4) yes/no-interrogatives; (5) tag-interrogatives; (6) imperatives; (7) exclamatives; (8) social formulae. In general, falling nuclear tones (whether \cdot or $\bar{\cdot}$ and including the rise-fall) are separative, matter-of-fact and assertive, the higher the fall the more vigorous the degree of finality involved; whereas both simple rises (\cdot and $\bar{\cdot}$) and fall-rises ($\bar{\cdot}$) 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 patronizing 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 `book.
The parcel arrived on `Thursday.

²⁷ Quirk *et al.* (1964: 681), Crystal (1969: 225), Altenberg (1987: 36). But see also the higher figure reported in §12.7(1).

²⁸ For further information on the meanings of tones, see Halliday (1967), O'Connor and Arnold (1973), Cruttenden (1997), Wells (2006).

Fall-rise is common on major declaratives with a variety of meanings, in particular, reservation, contradiction, contrast and warning as in:

I like his ^ˈwife / even if I don't like him.
(It's the twenty-fifth today, isn't it?) Twenty-^ˈsixth.
John didn't succeed / but ^ˈPhilip did.
If you don't do it / John'll be very ^ˈcross.

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 ^ˈblue?
So you didn't ^ˈgo?

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 patronizing (this sequence is very common in speech to children):

You'll ^ˈonly over.do things.
There's ^ˈno point in .rushing.

This sequence is frequent on imperatives (see below) with a similar sort of meaning. Finally, the least common nuclear tone²⁹ 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 ^ˈLondon.
Oh, in^ˈdeed / How ^ˈnice for you.

Rise-fall is often used for gossip:

Have you heard? / Jill's ^ˈpregnant.

(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

²⁹ For the frequency of nuclear tones, see Quirk *et al.* (1964: 681), Crystal (1969: 225), Altenberg (1987: 37).

'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 ^ˈlike / is a drink of tea.
The ^ˈbest person to do it / would be Bill Bailey.
The ^ˈcrucial issue / is that . . .
We took the .car / and drove to Birmingham.
On my way to ^ˈwork / it started to rain.
Un^ˈfortunately / it doesn't work like that.
(cf. Un^ˈfortunately / 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^ˈsides / he's had more time than he should have.
By the ^ˈway / 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 .year.
It didn't work / un^ˈfortunately.
He turned bright red / ^ˈliterally.

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 ^ˈill / because I hadn't had enough to .eat.
I began to feel ^ˈill / because I hadn't had enough to ^ˈeat.

(3) *Yes/no-interrogatives*

In RP, 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 ^ˈthink so?
(I'm really enjoying myself.) Is ^ˈthis your ^ˈfirst visit to London?
(The large size costs a pound.) Is that the ^ˈnew price?

A falling tone (high fall or low fall) on a yes/no-interrogative marks it as brusque and demanding:

(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 it got to do with 'her?
(You mustn't tell her.) Why 'not?
(She didn't get the job.) How do you 'know?

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.) When are you 'leaving?
(I'm afraid it didn't work.) Why did you do it ,that 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 demanding or inviting 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 / 'didn't you?
(He asked me to drive him there.) But you won't be able to go / ,will you?
(Who was that woman he was with?) It was his sister / ,wasn'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 / ,won't he?
(Rachel's gone out with John.) She's still seeing him / ,is she?

(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 ,angry about it.
(I'm afraid I've had enough of you.) Give me another ,chance.
(I have a very delicate job to do here.) Be 'careful.

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 yourself / ,won't you?
(Her nerves are terrible.) See if you can help / ,will you?
(I'm doing my best.) Well / hurry up / ,can'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 pa'laver!

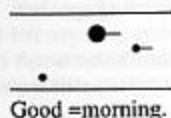
Similarly individual words, particularly nouns and adjectives, can be given exclamatory force by the use of a falling tone, e.g.

'Nonsense! You 'idiot! 'Marvellous!

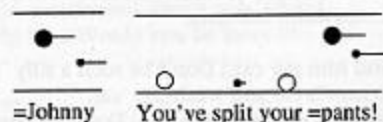
(8) *Social formulae*

It is difficult to give rules for the intonation of social formulae 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 'stylized' 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,³⁰ e.g.



(9) Tonal sequences

In the preceding sub-sections 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 [~]work.
- The [~]usual excuse / is that there's not enough [~]time.
- Because he gave up too [~]early / he lost two thousand [~]pounds.
- He staked everything on [~]winning / and ended up with [~]nothing.

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 [~]thing / [~]usually.
- That's the best way to [~]do it / [~]isn'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!

³⁰ For full details of this tone in English, see Ladd (1986b).

11.6.2.4 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 RP 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 that.*

11.6.3 Regional Variation in Intonation

Within the UK, the most marked variation compared with RP concerns the more extensive use of rising tones in many northern cities; it is reported for Belfast, Birmingham, Glasgow, Liverpool, Manchester and Newcastle.³¹ Rises in these cities are more frequent on declaratives than in RP 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). Belfast³² (and Derry³³) have both types and have 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).

General American has less variation compared with RP 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;³⁴ it seems to be used as a check 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;³⁵ 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

³¹ Cruttenden (1995, 2001, 2007).

³² Lowry (2002).

³³ McElholm (1986).

³⁴ Guy et al. (1986), Britain (1992).

³⁵ Bradford (1997), Shobbrook and House (2003).

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*, a new paratone being marked by a wide key and the end of a paratone by a narrow key³⁶ (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, for 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 conventionalized. 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.

³⁶ See, in particular, Brazil (1975, 1978, 1985).

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' (§11.6.2.3 (1)), with a low rise very frequently in yes/no-questions and approximately half the time in tag-questions, but more 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 Learners³⁷

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.³⁸ 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 yet 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.³⁹

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.

³⁷ Crystal (1986).

³⁸ Peters (1977).

³⁹ Cruttenden (1974, 1985).

(2) Putting the nucleus on the focal point in the sentence. Some languages (like French, Italian and Spanish) more regularly have the primary accent 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 RP) 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.⁴⁰ 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 RP, filled pauses are generally filled with [ə] or [m] or a combination of the two, e.g.

I don't agree with that / I [ə:] think it would be better if . . .

You see/the myth is / and I'm [ə:] I can see from the applause . . .

Well [əm:] I don't think I will.

This type of filled pause used in RP is not necessarily the type of filled pause used in other dialects of English or in other languages. Scottish English uses [e], French uses [ø:] and Russian uses [n:]. 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.

⁴⁰ Cruttenden (1997: 30-2).

11.8 Voice quality⁴¹

Even more so than intonation the area of voice quality has very little scientific work associated with it, particularly on a cross-linguistic basis and this section is therefore 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 characterize 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 RP. 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. Nasalization 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:⁴² RP 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. Breathiness is said to be used by many speakers of Danish and Dutch, creaky voice is used by many speakers of RP and particularly by speakers of Refined RP, while ventricular voice is a characteristic of many speakers of Scottish English and speakers of Cockney. Within RP (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'.

⁴¹ See Laver (1980), Henton and Bladon (1988).

⁴² The terms are also often used to distinguish between the short and long vowels of English (see §8.4.1 (h) above and Chomsky and Halle (1968)).

12

Words in Connected Speech

12.1 Citation Forms and Connected Speech

Words as separable linguistic units are recognized 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 form 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 casual or formal nature of speech, the more formal and careful (and probably slower) the delivery, the greater the tendency to preserve a form nearer to that of the isolate word.

12.2 Neutralization 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 neutralized when unaccented. Such neutralization generally causes no problem to listeners because of the high rate of redundancy of meaningful cues; only rarely does the context

allow a variety of interpretations of an unaccented form... The examples of neutralization which follow might occur in casual (and usually rapidly) RP:¹

/ə/ = unaccented *are, a* (and, less commonly, *her, or, of*)

The 'plays *are* 'poor

He 'plays *a* 'poor man

She 'wants *a* 'dog

She 'wants *her* 'dog (less rapidly, with reduced /ɜ:/ for *her*)

'One *or* 'two of them *are* 'coming (or /ɔ:/ for *or*, /əv/ for *or* - of)

'Two books *are* 'mine

'Two books *of* 'mine (or, less rapidly, /əv/ for *of*)

/əv/ = unaccented *have* (aux.), *of*²

Some *of* .one piece ...

Some *have* .won ...

The boys *of* 'Eton 'fish

The boys *have* 'eaten 'fish

(The last two utterances being identical, the meaning is clear only from the larger context.)

/ər/ = unaccented *are, or*

'Ten *or* 'under (less rapidly, /ɔ:ɾ/ for *or*)

'Ten *are* 'under

/ðə/ = unaccented *the, there*

There 'seems *a* 'chance

The 'seams *are* 'crooked

/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*, less commonly *does*) he 'put it?

'Where's ('s = *is*) he 'going?

¹ Byrd (1992a) found women reducing less than men.

² Native speakers often make written mistakes of the sort 'I could of gone' illustrating this neutralization.

/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, do it? / 'didn i:, du: it/
He 'did *and* he `didn't /hɪ 'dɪdn i: `dɪnt/

/d/ = unaccented *had, would*

I'd ('d = *had, would*) 'put it `here

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, if, in connected speech, a strong accent follows closely, 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 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 the placing of primary accents on adjacent syllables that 'accent shift' occurs in phrases such as 'Chinese `restaurant (but *Chi`nese*), 'outside `world (but *out`side*), 'aquamarine `necklace (but *aquama`rine*). Where the accents are separated by an unaccented syllable, the accent shift is optional, 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, generalized label—a voiceless alveolar plosive—it is nevertheless true that the actual phonetic realization 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 [wɪθ]. 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 realization 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 [i:])
 - /n/—dental in *tenth* (influence of [θ])
 - /m/—labiodental in *nymph, infant* (influence of [f])
 - /ŋ/—retracted in *result* (influence of [ʃ])
 - /u:/—fronted in *music* (influence of [j])

(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* /'əʊpm/, *bacon* /'beɪkŋ/

(b) *at word boundaries (only in close-knit sequences):*

/l,r,w,j/—devoiced following voiceless consonants, e.g. *at last* [ə'tlɑ:st], *at rest* [ə'trest], *at once* [ə'wʌns], *see to it* ['si:tɪt], *thank you* ['θæŋkjʊ:]

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?* ([v]); *Can you breathe?* ([ð]); *It's his* ([z]); *near the bridge* ([dʒ]); *They've* ([v]); *come; with* ([ð]) *some; He's* ([z]) *seen it; George* ([dʒ]) *can; (lʃ)* *very good* ([dʒ]); ([ð]) *there; (z)* *Zinc does* ([z]).

(3) *Lip position*—under the influence of adjacent vowels or semivowels.

(a) *within word:*

	lip-spread	lip-rounded ³
/p/	<i>pea, heap</i>	<i>pool, hoop, upward</i>
/t/	<i>tea, beat</i>	<i>two, boot, twice, outward</i>
/k/	<i>keep, speak</i>	<i>cool, spook, quite, backward</i>
/m/	<i>mean, seem</i>	<i>moon, loom, somewhat</i>
/n/	<i>knee, seen</i>	<i>noon, onward</i>
/l/	<i>leave, feel</i>	<i>bloom, fool, always</i>
/t/ ⁴	<i>read</i>	<i>rude</i>
/f/	<i>feel, leaf</i>	<i>fool, roof</i>
/s/	<i>seat, geese</i>	<i>soon, goose, sweep</i>
/ʃ/	<i>sheet, leash</i>	<i>shoot, douche, dishwasher</i>
/h/	<i>he</i>	<i>who, whom, hoot</i>

(b) *at word boundaries (only in close-knit sequences):* e.g. /t,k,n,ŋ,l,s/ are somewhat labialized in such cases as *that one, thick one, thin one, wrong one, shall we, this way*, when the syllables with initial /w/ carry no accent; a rounded vowel

(as opposed to semivowel) in an adjacent word does not seem to exert the same labializing influence, e.g. /u:/ does not labialize /s/ markedly in *Who said that?* nor does /ɔ:/ in *this ought to*.

(4) *Nasal resonance*⁵—resulting particularly from regressive but also from progressive lowering of the soft palate in the vicinity of a nasal consonant.

(a) *within word:* nasalization 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 nasalization of vowel following /m,n/, as in *meal, now*.

(b) *at word boundaries:* vowels may sometimes be nasalized 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, /l/ in every night*. Approximants may also be nasalized 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 /s/ or a coalesced form /ʃ/. Historically a phonemic change within a word can sometimes be due to assimilation to surrounding sounds, e.g. by labialization /wɑ:(ɪ)/ → /wɒ/ or /wɔ:/ (*swan, water*); /ɪr,er,ur/ coalesced into /ər/ (later /ɜ:/) under the influence of the post-vocalic /r/ (*first, earth, curse*); and /s/ or /z/ and /j/ combined their phonetic characteristics to give /ʒ/ (*mansion, vision*).

Many phonemic changes occur in connected speech at word boundaries (i.e. change 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, more particularly, 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 realized as the corresponding voiceless fricative, if the two

³ This will apply only for those speakers who have appreciable rounding of the vowels and semivowels.

⁴ For some speakers /t/ has inherent labialization and will not be lip-spread even before a lip-spread vowel.

⁵ See Cohn (1990).

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 realized in the reduced form appropriate to a syllable closed by a voiceless consonant (see §8.4.1 (4)–(7), 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* /kæts/ vs *the dog's paw*, *the dog's gone* /dɒgz/.

It is unusual in RP 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 northern England, e.g. the /d/ of *good time* and the /g/ of *big case* may be realized as /t,k/.

It is to be noted that word- or morpheme-final voiceless consonants in English do not show assimilation to their voiced counterparts: such pronunciations of *nice boy*, *black dress*, *half-done*, *they both do*, *wishbone*, *birthday*, as /'naɪz bɔɪ, 'blæk dres, 'hɑ:v'dʌn, ðeɪ 'bəʊð 'du:, 'wɪʒbəʊn, 'bɜ:ðdeɪ/ are typical of many foreign learners.

12.4.4 Nasality and Labialization

Phonemic assimilations involving nasality (i.e. anticipation or perseveration 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; nasalization of other sounds, e.g. /l/ or vowels, is never phonemic, there being no nasalized counterpart with approximately homorganic mouth articulation. Such phonemic nasalization as does occur concerns mainly the alveolars, especially adjacent to the negative *n't* /n(t)/ and is characteristic of very rapid speech, often as a popular form unacceptable in RP (marked † in the examples below), e.g.

- /d/ → /n/—*He wouldn't do it* /hɪ 'wʊnd(t) 'du: t/ *good news* /'gʊn 'nju:z/
 /d/ → /g/ → /ŋ/—*He wouldn't go* /hɪ 'wʊnd(t) 'gəʊ/
 /d/ → /b/ → /m/—*Good morning* /gʊm 'mɔ:ɪnɪŋ/
 /v/ → /m/—*You can have mine* /ju kən hæv 'maɪn/
 /z/ → /n/—*He doesn't know* /hɪ 'dʌn(t) 'nəʊ/
 /ð/ → /n/—*He wasn't there* /hɪ 'wɒn(t) 'neə/
 to win the race /tə 'wɪn nə 'reɪs/†

(In the above examples, the nasalized assimilated form may be elided altogether.) The extension of labialization produces no changes of a phonemic kind, since lip-position is not a distinctive feature opposing any two phonemes in RP. /b/ and /g/ come nearest to having an opposition of lip action, but the lip-rounding for /b/ 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 /a:/ type (and, therefore, might be expected to exert a rounding influence), either labialization has become established at an earlier stage of the development of the language (e.g. in *was*, *what*, *war*, *water*, etc.) or two pronunciations are today permitted, e.g. *qualm* /kwa:m/ or /kwɔ:m/, *quaff* /kwɒf/ or /kwɔ:f/. Labialization of /a:/ involving a phonemic change to /ɔ/ or /ɔ:/ does not extend beyond word boundaries, e.g. in *two arms* or *The car won't go*. Some confusion may, however, occur between a strongly centralized form of /əʊ/ and /ɜ:/ in a labial context, cf. *They weren't wanted* and *They won't want it*; also, with the influence of a strongly labialized form of /r/ in such a pair as *They weren't right*, *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-alveolarization. Though such changes are normal in colloquial speech, native speakers are usually unaware that they are made. The phenomenon is essentially the same as that resulting in non-phonemic assimilation of place. Electropalatographic research⁶ 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* → /bæb 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.⁷

- /t/ → /p/ before /p,b,m/, e.g. *that pen*, *that boy*, *that man* /ðæp 'pen, ðæp 'bɔɪ, ðæp 'mæn/
 → /k/ before /k,g/, e.g. *that cup*, *that girl* /ðæk 'kʌp, ðæk 'gɜ:l/
 /d/ → /b/ before /p,b,m/, e.g. *good pen*, *good boy*, *good man* /gʊb 'pen, gʊb 'bɔɪ, gʊb 'mæn/
 → /g/ before /k,g/, e.g. *good concert*, *good girl* /gʊg 'kɒnsət, gʊg 'gɜ:l/
 /n/ → /m/ before /p,b,m/, e.g. *ten players*, *ten boys*, *ten men* /tem 'pleɪəz, tem 'bɔɪz, tem 'men/
 /n/ → /ŋ/ before /k,g/, e.g. *ten cups*, *ten girls* /ten 'kʌps, ten 'gɜ:lz/
 (As a result of word-final assimilations, /ŋ/ may be preceded by vowels other than /i,e,æ,v,ʌ/. Thus /ŋ/ can occur after long vowels as a result of assimilation, e.g. *I've been* /bi:ŋ/ *gardening*, *She'll soon* /su:ŋ/ *come*, *his own* /əʊŋ/ *car*, etc.).

⁶ See Nolan and Kerswill (1990). They also found girls less likely to assimilate than boys and /n/ more likely to assimilate than /d/.

⁷ See also §12.7 for stylistic variation in the frequency of assimilation.

Assimilations to alveolars and between labials and velars are generally felt to be substandard in RP, although they may sometimes be heard in fast speech, e.g. *same night* /seɪn `nait/, *king Charles* /kɪn `tʃɑ:lz/, *same kind* /seɪn `kaɪnd/, *blackmail* /ˈblækmeɪl/.

/s/ → /ʃ/ before /ʃ, tʃ, dʒ, ʒ/, e.g. *this shop*, *cross Channel*, *this judge*, *this year* /θɪz `jɔ:p, krɒʃ `tʃænəl, ðɪʃ `dʒʌdʒ, ðɪz `jɪə/.
/z/ → /ʒ/ before /ʃ, tʃ, dʒ, ʒ/, e.g. *those young men* /ðəʊz `jʌŋ `men/, *cheese shop* /tʃi:z ʃɒp/, *those churches* /ðəʊz `tʃɜ:ʃɪz/, *has she?* /hæz ʃi/ or /hæʃ ʃi/.

Other assimilations involving fricatives are generally felt to be substandard in RP, although /θ, ð/ may assimilate to /s, z/ in fast speech, e.g. *I loathe singing* /aɪ læʊz `sɪŋɪŋ/, *What's the time?* /wɒts zə `taɪm/, *Has the post come?* /hæz zə `pəʊs kʌm/.

Alveolars have a high frequency of occurrence in word-final position, especially when inflexional and so their assimilation leads to many neutralizations in connected speech, e.g. /ræn `kwɪklɪ/ (*ran* or *rang* quickly), /raɪp `peəz/ (*right* or *ripe* pears or pairs), /laɪk `kri:m/ (*like* or *light* cream), /hɒp mənʃuəl/ (*hot* or *hop* manure), /pærɪʃ `ʃəʊ/ (*Paris Show* or *parish show*), /wɒtʃ ʃɔ: `weɪt/ (*What's* or *Watch* your weight),⁹ or, with a neutralization to a labiodental articulation, /greɪp vaɪn/ (*great* or *grape* vine), /rʌŋ fə ʃɔ: `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* /dɒʊmp/ *be late*, *He won't* /wɒnʃk/ *come*, *I didn't* /dɪŋk/ *go*, *He found* /faʊnd/ *both*, *a kind* /kaɪŋd/ *gift*, *red and black* /reb m `blæk/.

(2) Coalescence of /t, d, s, z/ with /j/

The process which has led historically to earlier /t, d, s, z/ + /j/ giving /tʃ, dʒ, sʒ/ medially in a word (*nature*, *grandeur*, *mission*, *vision*—§9.3.1) may operate in contemporary colloquial speech at word boundaries, e.g.

/t/ + /j/—*what you want* /wɒtʃu: `wɒnt/
/d/ + /j/—*Would you?* /wʊdʒu:
/s/ + /j/—*in case you need it* /ɪŋ keɪfju: `ni:d ɪt/
/z/ + /j/—*Has your letter come?* /hæzɔ: `letə kʌm/, *as yet* /ə `zet/

The coalescence is more complete in the case of /t, d/ + /j/ (especially in question tags, e.g. *didn't you?*, *could you?*, etc.); 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!* /dɒmp mɪʃɔ: `treɪn/.

In very careful speech, some RP speakers may use somewhat artificial, uncoalesced, forms within words in words like *nature*, *question*, *unfortunate*, *soldier*

⁸ Byrd (1992b) found around 78% of sequences of /s, z/ plus /j/ reduced to a palato-alveolar articulation only (in the NMR database of American English), with no effect from syntax, sex or dialect.

⁹ If the utterance is reduced to /wɒtʃɔ: `weɪt/, there is also the possibility of the interpretation *watch* or *wait*.

/neɪtʃə, `kwɛstʃən, ən `fɔ:tʃənət, `səʊldʒə/. 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 §12.7 below.)

(3) *Progressive* (or *perseverative*) 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* /hæpən, `ə:bəm/; and /n/ → /ŋ/ after /k, g/ in *second chance*, *organ* as /sekən `tʃɑ:ns, `ɔ:ŋŋ/.

12.4.6 Elision

Apart from word-internal elisions (see §10.8) and those associated with weak forms, sounds may be elided in fast colloquial 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 RP, /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* /haɪ `i:nə/ smoothed to [haɪ `i:nə]) may result in neutralization, thus *layer* /leɪə/ with smoothing is the same as *lair* /leɪə/, *mower* /məʊə/ with smoothing is the same as *myrrh* /mɜ:/. Similar smoothing occurs across word boundaries, e.g. *go away* /gə: `weɪ/, *I may as well* /aɪ meɪz `wel/, *I enjoy it* /aɪ ɪn `dʒɔɪt/, *try again* [tra ə `gen] or [tra: `gen].

(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 `ləʊn], *get another* [get `nʌðə], *run along* [rʌn `ɒŋ], *he was annoyed* [hi wəz `nɔɪd]; or again, when final /ə/ occurs with following linking /t/ (see §12.4.7) and word-initial vowel, /ə/ may be elided, e.g. *after a while* /ɑ:ftə `waɪl/, *as a matter of fact* /əz ə mətəv `fækt/, *father and son* /fɑ:ðərən `sʌn/, *over and above* /əʊvərən ə `bʌv/.

(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, -ft, -nd, -ld, -zd, -ðd, -vd/) followed by a word with an initial consonant,¹⁰ e.g. *next day*, *raced back*, *last chance*, *first light*, *west region*,

¹⁰ 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.

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, -ʃt, -bd, -gd, -gd/) 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 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 /h/ are usually kept in a coalesced form, i.e. as /tʃ/ and /dʒ/, e.g. *helped you, liked you, lost you, left you, grabbed you, lend you, told you, etc.*

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. Such is the instability of the alveolar plosives in such a position of apparent inflexional significance that it can be assumed that the context regularly carries the burden of tense distinction. Where the juxtaposition of words brings together a cluster of consonants (particularly of stops), 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.

The /t/ of the negative /-nt/ is often elided, particularly in dissyllables, before a following consonant, e.g. *You mustn't lose it* /jʊ məsn 'lu:z it/, *Doesn't she know?* /dʌzn ʃi 'nəʊ/, and sometimes before a vowel, e.g. *Wouldn't he come?* /wʊdn i: 'kʌm/, *You mustn't over-eat* /jʊ məsn əʊvə 'i:t/. Less common is the omission of the stops in the negative /-nt/ component of monosyllables, e.g. *He won't do it* /hə wəʊn 'du: it/.

Clusters of word-final /t/ and word-initial /t/ or /d/ are sometimes simplified in informal speech, e.g. *I've got to go* /aɪv gɒtə 'gəʊ/, *What do you want?* /wɒdə ju: 'wɒnt/ or /wɒdʒu: 'wɒnt/, and less commonly /d/ before /t/ or /d/, e.g. *We could try* /wɪ kʊ 'traɪ/, *They should do it* /ðeɪ ʃə 'du: it/.

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The elision of one of a boundary cluster of only two consonants sometimes occurs in casual speech, but is usually characterized as substandard, e.g. *He went away* /hɪ wen ə 'weɪ/, *I want to come* /aɪ 'wɒntə kʌm/ (< /aɪ 'wɒntə kʌm/, which frequently occurs), *Give me a cake* /gɪv mi ə 'keɪk/, *Let me come in* /lemɪ kʌm 'ɪn/, *Get me some paper* /gɛm sʌm 'peɪpə/, as well as the very reduced forms of *I'm going to* /aɪm ɡəʊɪŋə, 'aɪŋə, 'aɪŋə/. The /v/ in *of* can be elided in casual speech before a consonant, e.g. *a piece of cake* /ə pi: ə 'keɪk/. Clusters in adverbs formed with *-ly* are also liable to reduction in rapid and/or casual speech, e.g. *stupidly* /'stju:pɪdli, ɒpənli /'əʊpənli/.

12.4.7 Liaison

(1) *Linking /r/*. As has been mentioned in §9.7 (2) (a), RP introduces word-final post-vocalic /r/ as a linking form when the following word begins with a vowel. The vowel endings to which an /r/ link may be added are /ɑ:,ɔ:/ and those single or complex vowels containing final [ə] (/ə,ɜ:,ɪə,ɛə,ʊə/), e.g. in *far off, four aces, answer it, far inside, near it, wear out, secure everything*. Prescriptivists seek to limit the allowability 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 'ʃjɑ:nə/, *drama and music* /drɑ:mər əm 'mju:zɪk/, *idea of* /aɪ'dɪə əv/, *India and Pakistan* /ɪndɪə ən pə'ki:stɑ:n/, *area of agreement* /ə'reɪ əv ə'grɪ:mənt/, and rather less frequently after final /ɑ:,ɔ:/ e.g. *law and order* /lɔ: ənd 'ɔ:də/, *awe-inspiring* /'ɔ:ɪnspɪərɪŋ/, *raw onion* /rɔ:ɪ 'ʌnʃən/. Spelling consciousness remains an inhibiting factor in the use of linking /r/, but the present general tendency among RP speakers is to use /r/ links, even—unconsciously—among those who object most strongly.¹¹ The comparative rarity of potential contexts for 'intrusive' /r/'s following /ɑ:,ɔ:/ tends to make speakers more aware of the 'correct' forms; thus *I saw it* /aɪ 'sɔ:ɪt/, *drawing*, /'drɔ:ɪŋ/, 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* /sɪ:kjuə ɪt/, *War and Peace* [wɔ: ʔənd 'pi:s]. 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 RP or in RP-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'.

<i>stir</i>	<i>stirring</i>	<i>stir it in</i>		
/stɜ:	'stɜ:ɪŋ	'stɜ:ɪt 'ɪn/		
<i>dear</i>	<i>dearer</i>	<i>my dear Anna</i>	<i>idea of it</i>	
/dɪə	'dɪərə	maɪ dɪə 'ænə	aɪ'dɪə əv ɪt/	
<i>roar</i>	<i>roaring</i>	<i>roar angrily</i>	<i>raw egg</i>	<i>straw</i>
/rɔ:	'rɔ:ɪŋ	rɔ:ɪ 'æŋgrəlɪ	rɔ:ɪ 'eg	'strɔ:ɪn/
<i>star</i>	<i>starry</i>	<i>a star in the sky</i>	<i>the spa at Bath</i>	<i>schwaish</i>
/stɑ:	'stɑ:ɪ	ə stɑ:ɪ ɪn ðə 'skaɪ	ðə spɑ:ɪ ət 'bɑ:θ	'ʃwɑ:ɪʃ/

¹¹ Intrusive /r/ is decried as a vice as early as Sheridan (1762).

There appears, however, to be some graduation in the likelihood of occurrence as follows:

(a) The insertion of /r/ is obligatory before a suffix beginning with a vowel, where the /r/ is historically justified.

(b) The insertion of /r/ is optional, though generally present, before a following word beginning with a vowel, where the /r/ is historically justified.

(c) After [ə], even an intrusive /r/ (i.e. historically unjustified) is generally used before a following word, e.g. *vanilla essence* /vənɪlər ˈesəns/, *vodka and tonic* /vɒdkə ən ˈtɒnɪk/.

(d) After /ɑ:/ and /ɔ:/, an intrusive /r/ is often avoided before a following vowel, e.g. *nougat and chocolate* /nu:ɡət ən ˈtʃɒklɪt/, *straw in the wind* /strɔ: ɪn ðə ˈwɪnd/.

(e) The insertion of intrusive /r/ before a suffix is often strongly stigmatized, e.g. *strawy* /ˈstrɔ:ɪ/, *gnawing* /nɔ:ɪŋ/.

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* /mɔ: ɪs/ is shorter than that of *more rice* /mɔ: ˈraɪs/, the latter also being associated with accent onset and possible pitch change (cf. §12.4.8).

(2) *Linking* [ʲ, ʷ]. In vocalic junctures where the first word ends in /i:/, /ɪ/, /eɪ/, /aɪ/, or /ɔɪ/, a slight linking [ʲ] may be heard between the two vowels, e.g. *my arms* [maɪ ˈɑ:ɪmz], *may ask* [meɪ ˈɑ:sk], *he ought* [hi: ˈɔ:t], *annoy Arthur* [ənoɪ ˈɑ:ðə], *beauty and* [bju:tɪ ˈænd]. 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 ˈjɜ:z] vs *my years* [maɪ ˈjɜ:z], and *I eam* [aɪ ˈjɜ:n] vs *I yearn* [aɪ ˈjɜ:n]. Similarly a linking [ʷ] may be heard between a final /u:/, /əʊ/ and /aʊ/ and a following vowel, e.g. *window open* [ˈwɪndəʊ əʊpən], *now and then* [naʊ ənd ðen], *you aren't* [ju: ˈɑ:nt]; and minimal pairs illustrating linking [ʷ] and phonemic /w/ can be found, e.g. *two-eyed* [tu: ˈwaɪd] vs *too wide* [tu: ˈwaɪd]. Alternative pronunciations, more frequent in faster 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* [ənoɪ ˈɑ:ðə], *my ears* [maɪ ˈjɜ:z], *window open* [ˈwɪndə 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 ˈæŋɡrɪ] (see further §9.2.8). However, 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 /rɪ ˈnɒf, gɪ ˈvɪn, le ˈsɒfn/ (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 [ge ˈtʰʌp, lʊ ˈkʰaʊt, stɒ ˈpʰɑ:ɡjʊŋ] (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 [ə ˈtʰəʊm, nɒt ə ˈtʰɔ:t]; 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. Thus, the phonemic sequence /pi:stɔ:ks/ may mean *peace talks* or *pea stalks* according to the situation of the word boundaries (i.e. /pi:s+tɔ:ks/ or /pi:+stɔ:ks/). In this case, if the boundary occurs between /s/ and /t/, the identity of the words *peace* and *talks* may be established by the reduced /i:/ (in a syllable closed by a voiceless consonant) and by the aspiration of /t/; on the other hand, if the boundary occurs between /i:/ and /s/, this may be signalled by the relatively full length of /i:/ (in an open word-final syllable) and by the unaspirated allophone of /t/ (following /s/ in the same syllable), as well as by the stronger /s/. Such phonetic differentiation depends upon the speaker's consciousness of the word as an independent entity.

The following examples illustrate various ways in which phonetic cues may mark word boundaries:

- | | | | |
|-----|--------------------|-------------|--|
| (a) | <i>I scream</i> | /aɪ skri:m/ | : long /aɪ/, strong /s/, little devoicing of /r/ |
| | <i>ice cream</i> | /aɪs kri:m/ | : reduced /aɪ/, weak /s/, devoiced /r/ |
| (b) | <i>why choose</i> | /waɪ tʃu:z/ | : long /aɪ/, short [ʃ] as element of /tʃ/ |
| | <i>white shoes</i> | /waɪt ju:z/ | : reduced /aɪ/, long /ʃ/ |
| (c) | <i>a name</i> | /ə neɪm/ | : relatively long /n/ (beginning accent) |
| | <i>an aim</i> | /ən eɪm/ | : relatively short /n/ (accent onset on /eɪ/), possibility of glottal stop before /eɪ/ |

It must be noted that 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). Overuse of glottal stop in such positions is typical of some foreign learners of English.

Similarly, simple word entities may be distinguished from words composed of separable morphemes:

- | | | | |
|-----|-------------------|-------------|--|
| (a) | <i>nitrate</i> | /naɪtreɪt/ | : devoiced /r/ |
| | <i>night-rate</i> | /naɪt reɪt/ | : little devoicing of /r/ |
| (b) | <i>illegal</i> | /ɪli:gl/ | : clear [l] before vowel |
| | <i>ill eagle</i> | /ɪl i:gl/ | : dark [t] in word-final position
possibility of glottal stop before /i:/ |

It is to be noted, however, that such junctural cues are only potentially distinctive and, in any case, merely provide cues to word identification additional to the

large number provided by the context. Junctural oppositions are, in fact, frequently neutralized in connected speech or may have such slight phonetic value as to be difficult for a listener to perceive.

12.5 Frequency of Occurrence of Monosyllabic and Polysyllabic Words

In a running text of a conversational kind, the following approximate percentages of occurrence of words containing different numbers of syllables are to be expected: one syllable—81%; two syllables—15%; three syllables—3%. The remaining 1% of words have four syllables or more, those with five or more syllables accounting for a minute proportion of the total word list. If the 1,000 most common words used are examined,¹² it has been calculated that some 15% admit of the kind of phonemic variability mentioned in §10.9 and §11.3. Half of such words permitting phonemic variation are monosyllables whose phonemic structure depends upon the degree of accent placed upon them.

12.6 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 (German speakers, in particular, should avoid 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 ˈlaɪk ðæt/ (incorrect voicing) or *I was there* /aɪ wəð ˈðeə/ (incorrect dental modification of the place of articulation). If 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; in the speech of the native, however, the outline of these words will frequently be modified as has been seen.

The foreign learner is recommended to aim at a relatively careful pronunciation of English in his own speech and, at the same time, to be aware of the features which characterize the more colloquial pronunciation he is likely to hear from native speakers. The following dialogue illustrates some of the differences which may be found between a more careful and a more colloquial pronunciation:

- A. What do you think we should do this evening?
 (1) 'wɒt duː juː θɪŋk wiː ʃʊd ˈduː ðɪs ɪvniŋ
 (2) 'wɒdʒu θɪŋk wi ʃʊd ˈduː ðəs ɪvniŋ

¹² Gimson (1969).

- B. How many of us will there be?
 (1) 'haʊ mæni ʊv əs wɪl ðeə ˈbiː
 (2) 'haʊ mni əv əs ɪ ðə ˈbiː

- A. There are the two of us, and probably the two
 (1) ðeə ə ðə ˈtuː əv ˌʌs/ ənd ˈprɒbəbli ðə ˈtuː
 (2) ðə ə ðə ˈtuː əv ˌʌs/ m ˈprɒbbli ðə ˈtuː

- girls from next door. That'll be four of us/ already
 (1) ɡɜːlz frəm ˈnekst ˈdɔː/ ðætɪl bi ˈfɔː əv əs/ ɔːɪ redɪ
 (2) ɡɜːlz frɪm nekst ˈdɔː/ ðætɪl bi ˈfɔː əv əs/ ɔːɪ redɪ

- I think they're a nice young couple, don't you?
 (1) aɪ ˈθɪŋk ðeɪ ə ɪ ə ˈnaɪs jʌŋ ˌkʌpl/ ˈdaʊnt juː
 (2) a(t) θɪŋk ðeə ə ˈnaɪs jʌŋ ˌkʌpl/ ˈdaʊn juː

- B. I've only talked to them once, but they seemed nice
 (1) aɪv əʊnli ˈtɔːkt tə ðəm ˌwʌns/ bət ðeɪ ˈsiːmd ˌnaɪs
 (2) a(t)v əʊnli ˈtɔːk tə ðəm ˌwʌns/ bət ðe(t) ˈsiːm ˌnaɪs

- I wonder if we should go to the theatre
 (1) aɪ ˈwʌndə ɪf wi ʃʊd ɡəʊ tə ðə θiːətə
 (2) a(t) ˈwʌndr ɪf wi ʃɡ ɡəʊ tə ðə θiːətə

- I can try and book some seats round the corner
 (1) aɪ kən ˈtraɪ ən ˈbʊk səm ˌsiːts/ ˈraʊnd ðə ˈkɔːnə
 (2) a(t) kɪ ˈtraː m ˈbʊk sm ˌsiːts/ ˈraʊn ðə ˈkɔːnə

12.7 Stylistic Variation¹³

All the features of connected speech discussed in this chapter are common in the normal, fluent speech of native speakers of English and the lack of such features would be abnormal. But RP is not a monolithic accent and displays considerable variation even within the speech of one speaker, particularly in the use of the features detailed in this chapter. Many factors influence this variation and a major factor is style of discourse, e.g. whether a speaker is being either casual or formal.

It is important to avoid equating 'casual' and 'rapid', since slow speech is possible in a casual situation and rapid utterances can occur in more formal circumstances, although casualness and rapidity frequently co-occur. Moreover the average rate of delivery¹⁴ differs from speaker to speaker regardless of discourse style.

¹³ The information on casual and formal speech in this section is based on Ramsaran (1978) who used data drawn from 20 hours of tape-recorded conversation involving six RP speakers in casual and formal situations.

¹⁴ 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 women speaking 6.2% faster than men.

(1) *Accent and 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% and 70% in most conversations. The falling-rising nuclear tone accounts on average for roughly 20%. 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 formal speech. Intonation patterns in casual speech generally show no particularly marked patterns of use of nuclear tones. Formal speech often shows a concentration of fall-rises or simple rises, e.g. *If you pull them off / and put them in a glass of water / they grow little roots / and then / you plant them in soil / and they grow / and then you've got a nother 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 formal situations results from additional accents. The alternation of strong and weak forms is entirely regular in both formal and casual styles of speech: weak forms occur unless the grammatical word is accented. Since accents are more frequent in the intonational phrases of formal speech, strong forms occur more often.

(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 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, regardless of rate of utterance.

The fact that rate of utterance has no direct effect on the use of assimilation may be illustrated by examples taken from the conversation of one speaker who had /dʒʌʃ ʃʌtɪŋ/ for *just shutting* (also exhibiting elision of /t/) when speaking at a medium pace in a comparatively formal situation, but /ʃ'hɔ:s ʃəʊ/ for *horse show* when speaking very rapidly in a casual situation.

In general, although all types of anticipatory de-alveolar assimilation do occur, speakers use palato-alveolar assimilations (of the kind /speɪf ʃʌt/ for *space shuttle*) and bilabial assimilations (of the kind /ðæp ʰpɜ:sn/ for *that person*) far less commonly than they use velar assimilations (of the kind /ʃɔ:k ʰkʌt/ for *short cut*). Such velar assimilation is also more common than coalescent assimilations (such as /d/ + /j/ → /dʒ/ as in /nəʊtɪ ʰdʒɔ:tsmən/ for *noted yachtsman* or /z/ + /j/ → /ʒ/ as in /bɪkəʒu:/ for *because you*). However, coalescence is frequent in common phrases such as the auxiliary verbs + pronouns of *did you, can't you* etc. /dɪdʒu:, ʰkɑ:n'tju:/ and may occur even in very formal conversation, e.g. *Would you like a cup of tea?* /'wʊdʒu: ʰlaɪk ə ʰkʌp əv ʰti:/.

(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 formal speech they are almost entirely regular (e.g. alveolar plosives may be elided interconsonantly, /ə/ in pre-nuclear unaccented syllables, and /h/ in unaccented

non-initial grammatical words), in casual speech they are less rule-bound. Casual speech may contain unpredictable elisions such as those of /l/ and /ð/ in *Well, that's all right /we ʰæts ɔ: ʰraɪt/.*

(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. The preceding sections (1)–(5) indicate some tendencies in the likelihood of occurrence. If, then, such processes do operate, they will follow the regular patterns described in §§12.4.5–12.4.7. Disregarding the occasional irregular elisions that may occur in casual and/or rapid speech, it should be added that an utterance often contains instances of both assimilation and elision in conjunction with each other, since alveolar consonant clusters are not infrequent in word-final position: after the elision of a final /t/ or /d/ the remaining fricative or nasal may be assimilated to the place of articulation of the initial consonant of the following word, e.g. *closed shop* /kləʊzd ʰʃɒp → kləʊz ʰʃɒp → kləʊz ʰʃɒp/, *hand made* /hænd ʰmeɪd → hænd ʰmeɪd → hænd ʰmeɪd/, and *just shutting* /dʒʌst ʰʃʌtɪŋ → dʒʌs ʰʃʌtɪŋ → dʒʌs ʰʃʌtɪŋ/. The conjunction *and* has a common weak form with /d/ elided and the /ə/ may also be elided, leaving the nasal to function syllabically, particularly after plosives. The resulting syllabic [ŋ] is itself susceptible to assimilation, which accounts for such pronunciations as [wʊdʒ ʰglɑ:s] (*wood and glass*).

(7) *Plosive release*

An important type of variation concerns a non-phonemic variation in the release of plosives, particularly the voiceless series. As is explained in §9.2.4 (2), a plosive usually has an inaudible release when followed by another stop consonant. However, in the most formal social situations, there is a marked increase in the number of audibly released plosives in such a context, e.g. *I looked quizzical* [aɪ lʊktʰ ʰkwɪzɪkəl]. Women release their final stops more than men.¹⁵

(8) *Summary*

No feature is unique to one style, but some features are more common in one style than another. In particular, preconsonantal plosives may be audibly released when speech is formal, whereas assimilations increase in frequency as speech becomes more casual. Elision is the only feature that bears a definite relation to rate, occurring more frequently as the rate increases, however formal the situation may be. There is more fluctuation of rate in casual speech.

¹⁵ Byrd (1992c).

PART IV

Language Teaching and Learning

English as an Additional Language

1. The Place of Pronunciation

One of the central issues in language teaching is the place of pronunciation. This is a topic that has been discussed in many different ways over the years. In the past, pronunciation was often seen as a technical skill that could be taught in a straightforward manner. However, more recent research has shown that pronunciation is a complex skill that is influenced by a number of factors, including the learner's first language, the context of the language, and the learner's own attitudes and beliefs. This chapter will explore the place of pronunciation in language teaching and learning, and will discuss the different ways in which it can be taught and learned.

One of the main reasons why pronunciation is so important in language teaching is that it is often the first thing that learners notice when they hear a native speaker. This is because pronunciation is so closely tied to the meaning of the words that it can be difficult to understand what someone is saying if they do not know how to pronounce the words correctly. This is especially true for learners whose first language is not English, as they may not have any prior knowledge of the sounds and rhythms of the English language.

Another reason why pronunciation is so important is that it is often the most noticeable difference between a native speaker and a non-native speaker. This is because pronunciation is so closely tied to the meaning of the words that it can be difficult to understand what someone is saying if they do not know how to pronounce the words correctly.

Teaching and Learning the Pronunciation of English as an Additional Language

13.1 The Place of Pronunciation¹

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 lesser and lesser 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 RP or GA, but that in other cases it

¹ For a state-of-the-art review, see Setter and Jenkins (2005).

may be a model formed by an amalgam of features from various native-speaker standards (including RP and GA); and that this amalgam may be further altered by reducing the number of contrasts between sounds and changing the usual (the 'default') realization of sounds, to take account of likely L1 transfer and to form a possible international English *lingua franca*.² 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 Received Pronunciation (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 RP 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 USA 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 RP, 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 RP is not.

13.2.2 RP and Regional RPs

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

² For a review of English as a *lingua franca* (ELF), its relationship to standard languages and ELF accent attitudes, see Jenkins (2007).

with L1 speakers; such learners will probably wish to have a native-standard English as a model. RP 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; the available textbooks and the standard pronouncing dictionaries are based on General RP.³ In section §7.3(3) we spent some time discussing Regional RPs, i.e. versions of RP 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. /æ/ before voiceless fricatives (or a nasal plus a voiceless fricative) in words where standard RP has /ɑ:/, e.g. *task*, *bath*, *dance*. It also applies to some features of popular London speech, particularly the use of a vocalic realization 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 realization of a number of vowels before /l/, e.g. a near Cardinal [u:] for /u:/. But note that some features of popular London, e.g. glottal stop replacing /t/ intervocally in e.g. *daughter* [dɔ:ʔə] and [ɑ:] as a realization of /au/ in e.g. *about* [əba:t], are less acceptable even in a London Regional RP (see discussion of 'Estuary English' under §7.6.3).

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 RP 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

³ E.g. Roach (2000), Wells (2000), Jones et al. (2006).

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 pronunciation competence. But all learners of English should 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. Moreover 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 they so often are when listening to a foreign language.

13.3 RP and Regional RPs: Priorities and Tolerances

If the teacher or learner sets RP as a target he is aiming at a level of attainment in production which is equivalent to that of a native RP speaker and a level of competence in listening which allows him to understand without difficulty variation within RP. 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 RP. As long as the learner acquires only one type of Regional RP 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 RP is the target, it is essential that the aspiration of voiceless /p,t,k/ in accented positions (§9.2.1(3)) 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 realized as [pæt] rather than [p^hæt], 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 primarily by [l̥] and [r̥] in *plead* and *pray* versus [l] and [r] in *bleed* and *bray*.

The articulation of /t,d/ must be clearly alveolar (§9.2.6), and when followed by the homorganic syllabics [ŋ] and [ʃ], 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, RP 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* or /lnz/ as in *kilns*. 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,ʒ,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. [bɪg^ʔ], 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 /tʃ/ and /dʒ/ must be insisted on, as must the distinctions between /tʃ/–/tr/, /dʒ/–/dr/, /tʃ/–/ʃ/, /dʒ/–/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. [l̥, l̥̥]. Similarly, /r/ should have a post-alveolar approximant articulation rather than any kind of trill or flap (§9.7.2 (2, 5)). High performance RP will make use of the linking /r/, e.g. for *far away* /fɑ:r əˈweɪ/ is more typical than /fɑ: əˈweɪ/; and for *pour out* /pɔ:r əʊt/ is preferred to [pɔ: əʊt] or [pɔ: ʔəʊt].

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).

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 as opposed to single consonants has only a 20% occurrence) 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 RP (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 /i:/ 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 realizations. The three front short vowels /ɪ, e, æ/ vary considerably in their degree of openness in various Regional RPs (e.g. closer in London, more open in the north of England) and areas of tolerance are shown in Fig. 52. Too open or diphthongized pronunciations of these vowels give an impression of Refined RP which can be viewed as comic, even more so if not matched by Refined RP pronunciations elsewhere. Contrasts between /ɪ, i:/ and between /æ, ʌ/ should have high priority since they carry high functional loads.

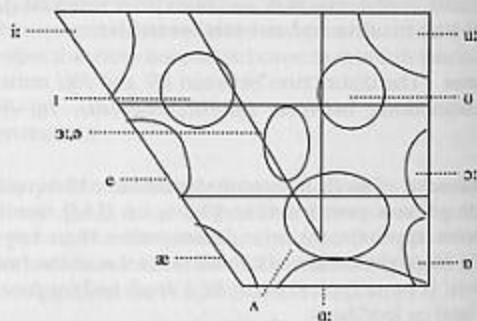


Figure 52 RP monophthongs: acceptable areas.

/i:/ and /u:/, which are usually pronounced in RP with a slight glide from a more open, centralized 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 RP 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 50 years or so the standard pronunciation has shifted to [i], i.e. the quality of the vowel is now similar to that of /i:/ but the length remains similar to that of /ɪ/ (there is a theoretical problem about whether to assign this sound to the /i:/ phoneme or the /ɪ/ phoneme—in this book we have assigned it to /i:/). A learner who wishes to sound modern in his pronunciation of RP should use [i]; a pronunciation with [ɪ] sounds somewhat old-fashioned and is a characteristic of Refined RP.

The theoretical areas of tolerance for /ɑ:/ and /ɔ:/ are extensive, the limitations being imposed by the presence of /æ/ = [æ:], e.g. in an opposition such as *cad-card*, and of /u:/, e.g. in *food-ford*. Of the variations shown in §8.9.6 and §8.9.8 [ɑ:] and [ä:] may be permitted for /ɑ:/, but [a:] is likely to be too near to /æ/, and [ɔ:] and [ɔ:] may be permitted for /ɔ:/ as long as /əʊ/ is not realized as monophthongal [o:] (see below). Similarly, the variants for /ɜ:/ shown in §8.9.11 may be safely used, provided that they do not overlap with the realization of /ɑ:/, e.g. if an open variety of /ɜ:/ is used in a word such as *burn*, this will necessitate a more retracted /ɑ:/ in *barn*.

Use of an open variety of /ə/ (particularly in word-final positions), like the pronunciations of /ɪ, e, æ/ mentioned above, smacks of Refined RP 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* (especially after /t/) as in *merrily*, and for *-ate* as in *fortunate*. /ə/ or /ɪ/ are equally acceptable in the terminations *-less*, *-ness*, *-ace*, e.g. *hopeless*, *goodness*, *palace*, with /ə/ gaining ground; but it is preferable to retain /ɪ/ in *-et* as in *carpet* and *essential* to have /ɪ/ in *-age* as in *cabbage*, as well as in *-es*, *-ed* as in *horses*, *waited*, although pronunciations with /ə/ are gaining ground in these inflexions (besides being the norm in Australian English).

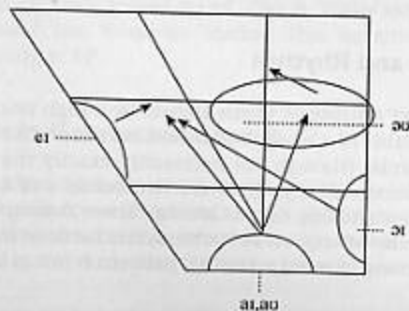


Figure 53 RP closing diphthongs: acceptable onset areas.

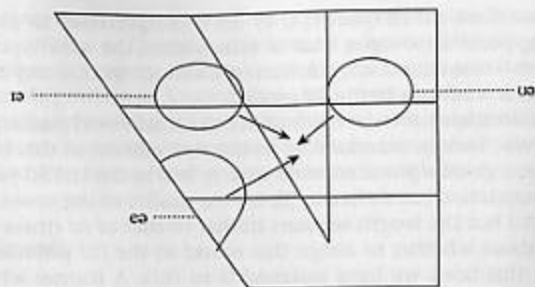


Figure 54 RP centring diphthongs: acceptable onset areas.

As for the eight RP 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 53, 54). The regional connotations of the quality of the starting-points (as described in §§8.10–8.12) should be borne in mind: if, for instance, /eɪ/ is said with a starting-point more open than Cardinal [e], the impression given may be that of basilectal London speech. In the case of /aɪ, aʊ/, there can be a common (open central) starting-point (§§8.10.2, 8.10.5). The smoothing of /aɪ, aʊ/ (§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. As for /əʊ/ (§8.10.4), the General RP form [əʊ] is most widespread and should thus be recommended. While the somewhat conservative [oʊ] and the regional [o:] are acceptable (though, as noted above, there is possible confusion if a close realization of /ɔ:/ is used), learners are advised to avoid the diphthong having a fronted onset [ɛ], this variant being regarded as excessively affected. The same applies to the finishing-point for the three centring diphthongs /ɪə, eə, uə/ which must not be below half-open, which would smack too much of Refined RP, sounding posh and affected. It should also be noted that /ʊə/ is increasingly replaced by /ɔ:/ in such words as *poor, sure, moor, tour*, etc. (§8.12.3 (4)).

13.3.3 Accent and Rhythm

Accenting the correct syllable of words should be a high priority for learners of RP. 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* /ˈkɛnɪŋtən/ and one called *Canning Town* /ˈkænɪŋ ˈtaʊn/⁴ but if either is pronounced with the other's accent pattern, it is liable to be misunderstood by Londoners. The learning of word accentual patterns is not as large a task as might

⁴ For other similar examples, see Cutler (1984).

be imagined since in conversation monosyllables may account for more than 80% of words. 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 /ænd, bət, æt, ɒv/ rather than the more common /ənd, bət, ət, əv/. They will generally be unaware that such words are usually unaccented 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 ˈdɔ:/, describing such a pronunciation as careless. Thus it is wiser to listen to the way in which the native speaks rather than to ask his opinion. Similarly, many dictionaries record the strong pronunciation of these grammatical words without giving the weak alternatives. 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 /kæn/ come, I'm going ˈto /tu:/ 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 very 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 a /ə/ will produce a rhythm which is seriously different from that of native-speaker RP (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.⁵

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 ˈhand, This is 'Water ˈloo* and the attributive variants *A 'secondhand ˈcar, 'Waterloo ˈStation*. This 'accent-shift' is part of the target for those aiming at RP.

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

⁵ Minimally reduced forms can be employed if they prove easier, e.g. /ənd/ for *and* rather than /ən/, /nd/ or /n/. See García Lecumberri and Maidment (2000).

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 fast 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 (§12.7). Some of these follow from the elision of medial /t/ and /d/ in consonant clusters mentioned above, e.g. *shouldn't go* → /ʃʊdŋ ˈgəʊ/. The foreign learner must always be careful that in seeking to adopt an informal, colloquial style of English speech he does not introduce assimilatory habits which are characteristic of his own native language but not of English (§12.6), e.g. voicing assimilation, e.g. *black dog* → [blæg ˈdɒg].

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 §11.6.2.3). 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 RP, 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 RP (again unlike many other languages).

Learners should note that, despite what is often stated in textbooks on English language teaching, rises (usually low rise) and falls (usually high fall) both 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 (§11.6.2.3 (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 (§11.6.2.3 (1)).

Finally, learners aiming at a native-like RP 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 RP 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 RP may sound aggressive. On the other hand a series of glides-up (often heard in Norwegian and Swedish) will sound too 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 also be avoided (even though this does sometimes happen even within RP—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 realization of intervocalic /d/ as a flap [ɾ], as is common in many types of American English, should be avoided, because this can lead to confusion with /t/. 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). Palatalization 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 allowable in this model.

13.4.1.2 Fricatives The place of articulation differences between the fricatives should be maintained. The distinction between the pairs is less important as mentioned in the discussion of RP 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 high 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 defended: 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 stigmatized as 'uneducated' by many native speakers that anyone anticipating 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 /tʃ,dʒ/: pronunciations with [tʃ,dʒ] or with greater or lesser lip rounding or spreading are permissible. But care must be taken not to confuse /tʃ,dʒ/ with the sequences /tr,dr/ since there are many minimal pairs. These distinctions can be certain to be clear if /r/ is realized as an alveolar flap as discussed in the next paragraph.

13.4.1.4 Approximants Considerable latitude can be allowed in the realization of /l/. As detailed in section §9.7.1 (3) there is much regional variation. Learners at this level of competence can have clear [l] in all positions or dark [ɫ] in all positions or any distribution of the two, and can change dark [ɫ] to [u] in post-vocalic position. But a vocalic realization 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 realized as a flap rather than an approximant (as it is in

SSE and GA), the flap being more used worldwide while the approximant is a relatively rare sound. Use of [ʊ] 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 /sɪŋɪŋg/.

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 RP—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].

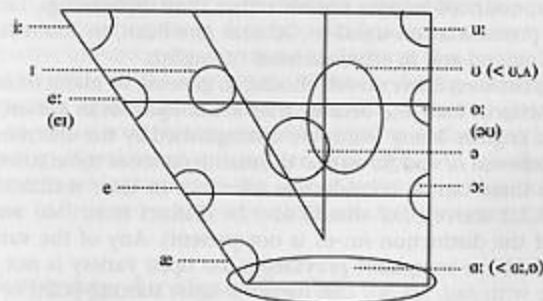


Figure 55 Amalgam English: monophthongs.

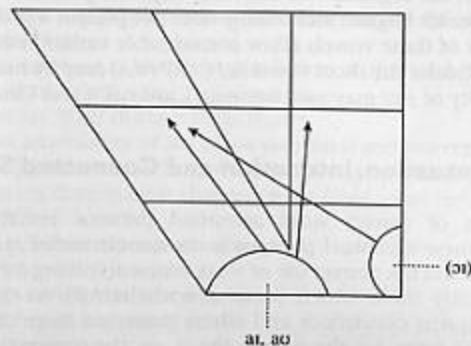


Figure 56 Amalgam English: diphthongs.

13.4.2 Vowels

The number of vowels and vowel contrasts can be reduced. /ɪ, e, ʊ, ə, ɜ:/ are not necessary if post-vocalic and pre-consonantal /r/ are used (see under §13.4.1.4 above), e.g. *beard*, *bare*, *cure* will be pronounced /bɪ:rd/, /beɪr/ and /kjʊ:ɪr/ and *burn*, *skirt* and *fern* as /bɜ:rn/, /skɜ:rt/ and /fɜ:rn/. Furthermore there may be loss of contrast between /æ, e, ɛ/ before /r/, e.g. *marry*, *merry*, *Mary* may be pronounced the same (as occurs in many American varieties). Certain other vowel contrast 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 /u:/ (or pronounced the same as in many types of Scottish English, e.g. [y]). For this target it is unnecessary to make a distinction between /a:/ and /ɒ/ (there is no distinction in General American), both being pronounced with a vowel more like /a:/ and indeed /a:/ itself is allowable as [a:] (as, for example, in Australian English) provided it is not conflated with /æ/, e.g. *ham* and *harm* should be pronounced differently. /eɪ/ and /əʊ/ can be pronounced as pure vowels rather than diphthongs, i.e. as [e:] and [o:] 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 /i, e, æ, ʌ/ and between /ɪ/ and /i:/ so that the maintenance of these vowels is important, although there can be considerable tolerance in their realization (as mentioned in §13.3.2 above). /ɔ:/ should also be distinct from /əʊ/ and from /a:/ (particularly if the distinction /ɑ:-ɒ/ is not present). Any of the variants of /ɜ:/ shown in §8.9.11 are acceptable provided a too open variety is not used which might overlap with /a:/. /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 a number of these vowels allow considerable variation as shown in Figs 55 and 56. In particular the short vowel /ʊ/ (>RP /ʊ, ʌ) may be nearer to /ʌ/, or to /ə/; and the quality of /a:/ may vary between Cardinal 4 and Cardinal 5.

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 intonational 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 discursual 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 /tʃ, dʒ/ distinct from /tr, dr/
 - (iv) Allow any variety of /l/. Allow prepausal and pre-consonantal /r/ and /r/ = [r]. Allow insertion of /g/ following /ŋ/. Discourage /w/ = [v]
 - (v) Insist on consonantal clusters (apart from usual reductions allowable in RP)
- (3) Vowels: a possible reduced inventory:
 - (i) Short vowels /ɪ, e, æ, ʊ, ə/
 - (ii) Long vowels /i:, e:, a:, ɜ:, o:, u:/
 - (iii) Diphthongs /aɪ, əʊ, ɔɪ/
- (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.⁶ 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 13.4.1 concerning consonants in the previous model 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 plosid and in sequences of plosives is also allowable. The realization 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/→[θ] 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 /f,ʒ/ were expendable; for the present model even the somewhat higher functionally loaded /t̪,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 realizations are acceptable.

13.5.1.3 Affricates The same applies here as applied in the previous model: /f,dʒ/ should be kept distinct from /t,r,dʒ/ (where /r/ may be [ɾ]—see next section) but realizations as [tʃ,dʒ] or [tʃ,dʒ] are acceptable. The contrast between /f/ and /dʒ/ 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. [l̪][ɫ], and [ɹ] in post-vocalic position). /r/ can be pronounced in all positions where it is in the spelling and a flap (either [r] or [ɾ]) 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 [v] 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 /ŋ/ 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 RP). 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 consonants⁷ and a medial intrusive vowel is to be preferred to initial intrusive vowel, e.g. for *sport* /səpɔ:t/ rather than /espɔ:t/ rather than /pɔ:t/ (all three are of course likely to include an /r/ from the spelling as well, e.g. /səpɔ:rt/).

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, a large part

⁶ This whole section is in the nature of a hypothesis about what constitute the characteristics of such a model. The only book which confronts this problem and presents some evidence is Jenkins (2000).

⁷ Lin (2003).

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, /i,i:/ become /i,i:/; /e,e:/ become /e,e:/; /æ,a:/ become /æ,a:/; /ɔ:,ə:/ become /o:/ (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,u,ʌ/ may become /u/ while /u:/ mains as /u:/. The vowel /ʌ/ (<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. /ə,eə,uə/ and /ɜ:/ will be lost because post-vocalic /r/ will be used as in Amalgam English. Two diphthongs will remain: /aɪ/ (<ai,ɔɪ) and /aʊ/ (these may be equatable with [aj] and [aw] in a learner's L1). The ten-vowel system (excluding the two diphthongs) is shown in Fig. 57.

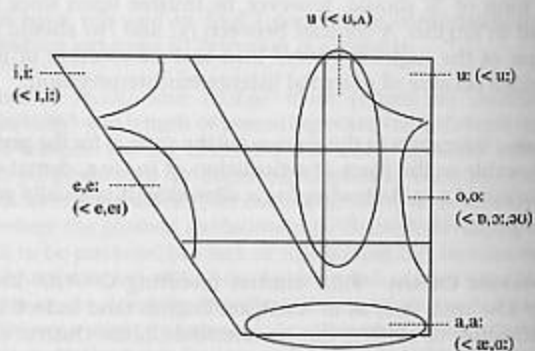


Figure 57 International English: vowels.

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 /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 overall sound of what is usually referred to as a 'syllable-timed' language (see §11.2, in particular footnote 5). Similarly the compound weak forms (*aren't* . . .) need not be used. As for 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 [v] 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 native intonation patterns of English.

13.6 Teaching Methods⁸

Most but not all of what is said in this section will not apply to International English where there are only a limited 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 he learning in a class with a teacher or by himself with the help of recordings or broadcast lessons? Is she learning English pronunciation as part of a course extending perhaps over several years or is she attempting 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 he or she 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.

⁸ See, for example, Kenworthy (1987, 2000), Brown (1991).

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 discursive or attitudinal context; he 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 memorize 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 emphasizing 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 his 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 to him 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 his students (and of their particular local variety of this first language). By contrasting the features of the two languages, he will be able to predict the problems which will arise and on which he should concentrate his drills; he will also be able 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 /i/ to a vowel of the cardinal [e] type, which exists in many languages not possessing a centralized vowel such as English /i/. For

those aiming at a type of RP, many learners who cannot easily articulate the English 'dark' [ɨ] may in their own language have a vowel of the cardinal [o] quality, which is an excellent starting-point (or even substitute) for English [ɨ] (and is indeed used by many native speakers for [ɨ]—§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 RP 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 RP 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 RP /r/ a sound like [ə] or [ɜ:] 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. [i:ɔ:n] for *yawn* and [u:ɛst] for *west*, /tʃ,dʒ/ 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 RP or Amalgam English (i.e. the (at least) ten-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 close or more open position. Sometimes a specific hint can be used for a particular vowel, e.g. /ɑ:/ 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 RP and Amalgam English) the reduction of weak syllables in the utterance.

In the case of polysyllabic words, correct pattern identification (preferably by using such nonsense sequences as ['lɪlɪ,lɪ'lɪ] or ['lɑ:lɑ:lɑ, lɑ:lɑ:lɑ], 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 RP 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 RP 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 dictionaries 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 RP) will make use of a monolingual dictionary designed for non-native learners like the *Oxford Advanced Learner's Dictionary* (2005).⁹ 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 RP 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 RP which also give American variants, those of Wells (2000), Upton *et al.* (2001) and Jones *et al.* (2006). 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, which provides 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 RP. This is generally given first for each

⁹ See also the *Oxford Student's Dictionary* (2007), the *Cambridge Learner's Dictionary* (2007), the *Cambridge Advanced Learner's Dictionary* (2005), the *Collins Cobuild Student's Dictionary* (2005), the *Collins Cobuild Advanced Learner's English Dictionary* (2006), the *Macmillan Essential Dictionary for Intermediate Learners* (2003), the *Macmillan English Dictionary for Advanced Learners* (2007).

entry, with alternative pronunciations following, including American and some 'substandard' pronunciations. The phonemic system and the transcription in Wells (2000) and Jones *et al.* (2006) is virtually the same as that in this book; that by Upton *et al.* (2001) (and the pronunciation guide by Olausson and Sangster (2006)) has a number of differences including: /e/→/ɛ/, /ea/→/e:/ and /aɪ/→/aɪ/. All three pronouncing dictionaries use [i,u] to represent reduced forms of /i:,u:/ used in pre-vocalic positions as in [ri'ækt] and [sɪfʊ'eɪʃnz], in the weak form of *to* pronounced [tu] and in the common pronunciation of <y> word-finally as [i], e.g. in *happy, usually, folly* and sometimes in words derived from them, e.g. *follies* as [ˈfɒlɪz]. Additionally Upton *et al.* make use of the composite symbols barred [i] and [u] for those places where [i] and [ə] and [u] and [ə] are alternatives. All these books also make use of additional symbols for sounds in foreign words and primary accent 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 realized phonetically and 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, that /r/ is usually a post-alveolar approximant, etc.

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 (2000) also gives information on British pronunciations which are not part of RP; this information often indicates pronunciations which the learner will meet as part of a Regional RP, e.g. /æ/ in *dance* and *example*. In varying degrees the dictionaries give notes on the pronunciation of particular words, notably the weak forms. Wells (2000) has 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'stænʃl] 93% and [səb'stɑːnʃl] 7%. Olausson and Sangster (2006) have similar text boxes, including very useful ones giving digests of the sound system of many other languages.

Marking the division into syllables is generally a useful aid to pronunciation (even though the dictionaries differ slightly in how they do this). 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. Also, since allophonic distribution often depends on syllable position, indicating syllabification aids correct pronunciation, e.g. syllabifying *appear* as /ə.pɪə/ rather than /əp.ɪə/ shows that the /p/ should be strongly aspirated.

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 he has derived from a

passage of colloquial 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 RP and various other native-speaker varieties but also if possible types of Amalgam English and of International English).¹⁰ 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).¹¹ 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 discursive 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 recognized 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 RP (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, since it is he who must judge (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.

¹⁰ See Collins and Mees (2003) for a wide selection of varieties of English.

¹¹ Jenkins (2000).

Bibliography

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. The titles of periodicals are abbreviated as follows:

<i>AJP</i>	<i>American Journal of Psychology</i>
<i>AL</i>	<i>Applied Linguistics</i>
<i>CLP</i>	<i>Clinical Linguistics and Phonetics</i>
<i>ELL</i>	<i>English Language and Linguistics</i>
<i>ELTJ</i>	<i>English Language Teaching Journal</i>
<i>ES</i>	<i>English Studies</i>
<i>ET</i>	<i>English Today</i>
<i>EW</i>	<i>English Worldwide</i>
<i>IJAL</i>	<i>International Journal of American Linguistics</i>
<i>IRAL</i>	<i>International Review of Applied Linguistics</i>
<i>JASA</i>	<i>Journal of the Acoustical Society of America</i>
<i>JCL</i>	<i>Journal of Child Language</i>
<i>JEP</i>	<i>Journal of Experimental Psychology</i>
<i>JIPA</i>	<i>Journal of the International Phonetic Association</i>
<i>JL</i>	<i>Journal of Linguistics</i>
<i>JML</i>	<i>Journal of Memory and Language</i>
<i>JPhon</i>	<i>Journal of Phonetics</i>
<i>JS</i>	<i>Journal of Sociolinguistics</i>
<i>JSHR</i>	<i>Journal of Speech and Hearing Research</i>
<i>Lang</i>	<i>Language</i>
<i>LI</i>	<i>Linguistic Inquiry</i>
<i>LIS</i>	<i>Language in Society</i>
<i>LS</i>	<i>Language and Speech</i>
<i>LT</i>	<i>Language Teaching</i>
<i>LVC</i>	<i>Language Variation and Change</i>
<i>MPh</i>	<i>Miscellanea Phonetica</i>
<i>MPh</i>	<i>Le Maître Phonétique</i>
<i>Phon</i>	<i>Phonetica</i>
<i>PMLA</i>	<i>Publications of the Modern Language Association of America</i>
<i>TPS</i>	<i>Transactions of the Philological Society</i>
<i>UCLA, WPP</i>	<i>University of California at Los Angeles, Working Papers in Phonetics</i>
<i>ZPh</i>	<i>Zeitschrift für Phonetik</i>

Dictionaries are listed under title apart from pronouncing dictionaries and handbooks which are listed by author (under Jones *et al.*, Olausson and Sangster, Upton *et al.* and Wells).

Useful blogs on English pronunciation (chiefly RP and aimed at foreign learners) are those of John Wells at <http://www.phon.ucl.ac.uk/home/wells/blog.htm> and Jack Windsor Lewis <http://www.yek.me.uk/blog.html>.

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