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وزارة التعليم العالي والبحث العلمي .

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كلية الآداب واللغات

الجلس العلمي

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manuel pédagogique

سند تربوي للأستاذة: د/ خرباش فطمة....KHERBACHE Fatma

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المعد من قبل: د/ خرباش فطمة....KHERBACHE Fatma

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المجلس العلمي

أ.د/ والي كلاوي ...

رئيس المجلس العلمي

سلمت هذه الشهادة للمعني(ة) لاستعمالها في حدود ما يسمح به القانون.

People's Democratic Republic of Algeria

Ministry of Higher Education and Scientific Research

University of Tlemcen
Faculty of Letters and Languages
Department of English

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An Introductory Course of Phonetics

for 1st Year LMD Students

A Pedagogical Handout prepared by:

Dr. Fatma KHERBACHE

Academic Year: 2022-2023

People's Democratic	الجمهورية الجزائرية
Republic of Algeria	الديمقراطية الشعبية
Ministry of Higher Education	
And Scientific Research	وزارة التعليم العالي والبحث العلمي
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LMD1 PHONETICS SYLLABUS

Teaching Unit: Fundamental   **Level: 1st year**   **Weekly Time: 1h30**

Aims and Objectives

-Develop students' knowledge and awareness of English phonetics.

-Understanding how sounds are produced, how they are transmitted, and how they are perceived (Phonetics)

-Understanding the system of sound and sound combinations in English (Phonology).

-Develop students' knowledge and awareness of English phonetics and phonology.

- Differentiating between consonants and vowels.

- Distinguishing phonemes and allophones.

Learning Outcomes

- Being able to understand and produce English sounds clearly.

- Being able to read and produce phonemic transcriptions.

- Ability to read the dictionary transcription correctly when checking a new word.

-Helping students acquire a pronunciation without too many traces of their native tongue.

COURSE CONTENT

First Semester

1. Some Traditional Views of Phonetics

2. What is phonetics?

3. Linguistics and Phonetics

4. Branches of Phonetics

5. Received Pronunciation

6. International Phonetic Alphabet (IPA)

7. The Production of Speech Sounds (Articulatory Phonetics)

8. English Vowels

9. Exercises

Second Semester

1. English Consonants

2. Phonetics and Phonology

3. Phonemes and Allophones

4. Supra-segmental Phonology

5. Exercises

Preface

I would like firstly to use this preface as a space to thank Professor Dendane Zoubir who put the booklet content under scrutiny. His careful and detailed examination and wise suggestions have been invaluable to me.

Phonetics is essential to English language learners who are not native speakers, for the fact that written English differs widely from spoken English. i.e., English spellings do not match the sounds that are supposed to represent. For example, let's consider the pronunciation of the long vowel sound /u:/ at the end of the words "shoe, too, two, few, blue and through" the spelling forms are extremely varied. Linstead (2014) states: 'You can't tell the spelling from the pronunciation, and you can't tell the pronunciation from the spelling. No wonder people find English difficult'. This introductory course to phonetics is intended to be helpful to undergraduate university students studying English as a Foreign Language (EFL). Its main objective is to help them gain a basic familiarity with English phonetics. In other words, it is meant to enable students to understand and articulate English sounds in a correct and precise way. Following the program of English phonetics for the first-year

licence, this booklet attempts to show the students why there is a need to know about phonetics, if we are interested in the English language and our knowledge of it, as well as introduce the central units and concepts we require for an accurate description of speech sounds.

Accordingly, a detailed knowledge of the English sound system and its basic notions such as consonants, and vowels with a description of the main organs responsible for speech production is provided. It reviews the English sounds and their effective production to guide the learners to produce effective speech patterns. For this purpose, diagrams and figures are provided to illustrate a sharp and precise articulatory movement and control of the organs of speech production mechanism. Students also learn the knowledge and practical skill of reading and writing phonetic transcription, both broad and narrow. In addition, they will be able to describe and classify English sounds and understand their production. The booklet will answer not only the needs of the students concerning explanations of each point in the program but will also provide plenty of exercises and activities.

Upon completion of this course, students will be able to describe a typical articulation for each English sound using tongue height and shape, lip rounding to describe vowels

and place and manner of articulation, and voicing to describe consonants. At the same time, they will be familiar with the terminology used in the sound description.

List of Figures

List of Symbols

1-Phonemic symbols

1-short vowels

ɪ as in 'pit' pɪt

e as in 'pet' pet

æ as in 'pat' pæt

ʌ as in 'putt' pʌt

ɒ as in 'pot' pɒt

ʊ as in 'put' pʊt

ə as in 'upper' ʌpə

2- long vowels

i: as in 'key' ki:

ɑ: as in 'car' kɑ:

ɔ: as in 'core' kɔ:

u: as in 'coo' ku:

ɜ: as in 'cur' kɜ:

3- diphthongs

eɪ as in 'bay' beɪ   əʊ as in 'go' gəʊ

aɪ as in 'buy' baɪ   aʊ as in 'cow' kaʊ

ɔɪ as in 'boy' bɔɪ

ɪə as in 'peer' pɪə

eə as in 'pear' peə

ʊə as in 'tour' tʊə

4- triphthongs

eɪə as in 'player' pleɪə

aɪə as in 'fire' faɪə

ɔɪə as in 'royal' rɔɪəl

2-Non-phonemic symbols

ʔ glottal stop

ʰ aspiration as in 'pin' [pʰɪn]

̥ as in 'trend' [trend̥]

̃ nasalization 'uncle' ['ʌ̃ŋkl]

̩ syllabic consonant, as in 'button'

['bʌtn̩]

3- word stress

' stress as in open ['əʊpən]

4- intonation

rise ↗

fall ↘

VII

əʊə as in   'lower'   ləʊə

aʊə as in   'power' paʊə

5-plosives

p as in 'pea' piː ·   **b** as in 'bee' biː

t as in 'toe' təʊ   **d** as in 'doe' dəʊ

k as in 'cap' kæp   **g** as in 'gap' gæp

6-fricatives

f as in 'fat' fæt   **v** as in 'vat' væt

θ as in 'thing' θɪŋ   **ð** as in 'this' ðɪs

s as in 'sip' sɪp   **z** as in 'zip' zɪp

ʃ as in 'ship' ʃɪp   **ʒ** as in 'measure' meʒə

h as in 'hat' hæt   ## 8- nasals

7- affricates   **m** as in 'map' mæp

tʃ as in 'chin' tʃɪn   **n** as in 'nap' næp

dʒ as in 'gin' dʒɪn   **ŋ** as in 'hang' hæŋ

9-lateral   ## 10- approximants

l as in 'led' led   **r** as in 'red' red

                              j as in 'yet' yet

                              w as in 'wet' wet

Abbreviations and Acronyms

C:	Consonant
EFL:	English as a Foreign Language
IPA:	International Phonetic Alphabet
RP:	Received Pronunciation
V:	Short vowel

Chart of the International Phonetic Alphabet

(Trask, 2007)

© 2005 IPA

CONSONANTS (PULMONIC)

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

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

CONSONANTS (NON-PULMONIC)

Clicks		Voiced implosives		Ejectives	
⊙	Bilabial	ɓ	Bilabial	ʼ	Examples:
ǀ	Dental	ɗ	Dental/alveolar	pʼ	Bilabial
ǃ	(Post)alveolar	ʄ	Palatal	tʼ	Dental/alveolar
ǂ	Palatoalveolar	ɠ	Velar	kʼ	Velar
ǁ	Alveolar lateral	ʛ	Uvular	sʼ	Alveolar fricative

OTHER SYMBOLS

ʍ Voiceless labial-velar fricative

w Voiced labial-velar approximant

ɥ Voiced labial-palatal approximant

ʜ Voiceless epiglottal fricative

ʢ Voiced epiglottal fricative

ʡ Epiglottal plosive

ɕ ʑ Alveolo-palatal fricatives

ɺ Voiced alveolar lateral flap

ɧ Simultaneous ʃ and x

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

VOWELS

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

SUPRASEGMENTALS

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

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

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

TONES AND WORD ACCENTS

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

X

Table des matières

1. Introduction

Language is the most essential means of human communication as it plays a pivotal role in all human business. It has two different manifestations: the spoken and the written forms. The spoken form, or simply speech being the natural form of communication, is the most basic and commonly used communication by all human beings. It has been described by Yule (1993) as the interactional function, which is one of the main interactional functions of language use which plays a vital role in human verbal communication such as maintaining relationships. The transactional function is another task that language serves in human life; it has to do with how humans use linguistic abilities to transfer knowledge from one generation to the next. Via language, people are able, for example, to express their feelings, ideas, and emotions in their daily life using speech sounds combined into words. These latter are, in turn, combined into sentences to reach complete and successful verbal communication. Linguists consider speech as the primary medium of language expression. Thus, they give priority to speech sounds (vocal system).

Every language in the world has its sound inventory known as the phonic medium which is a limited range of all possible sounds used to construct words. This term was first introduced by John Lyons (1981) who described the production of speech as continuous bursts of sounds.

2. Some Traditional Views of Phonetics

Two thousand years ago, an interest in examining and investigating speech sounds took place in ancient India, and ancient Greece, and later in ancient Arab and then in other parts of the world like China. This interest progressed and flourished through time until the 19th century which was marked by the birth of the International Phonetic Association (1888) aimed at designing a standardized representation of all speech sounds in human languages. This representation

1
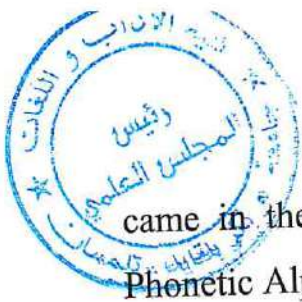
came in the form of a set of phonetic symbols known as the International Phonetic Alphabet (IPA).

Traditionally, phonetics has been considered as a subsidiary field with a marginal role in the overall study of the language. Baudouin de Courtenay was among the first linguists to make a distinction between anthropophonics and psychophonetics now referred to as phonetics and phonology. He stated firmly that only psychophonetics is concerned with the study of language (Diehl, 1991). Anderson (1981)[1], as another example, argued that the importance of phonetics for the linguist is 'to define those aspects of speech communication that are not part of the language'. Saussure put also phonetics out of the domain of phonology and claimed that what constitutes a language is unrelated to the phonic character of the linguistic sign and that 'the vocal organs are as external to language as are the electrical devices used in transmitting the Morse code to the code itself; and phonation'[2]. Trubetzkoy agreed with Saussure's view and claims that:

> The speech sounds that must be studied in phonetics possess a large number of acoustic and articulatory properties. All of these are important to the phonetician since it is possible to answer correctly the question of how a specific sound is produced only if all of these properties are taken into consideration. Yet most of these properties are quite unimportant for the phonologist. The latter needs to consider only *that aspect of sound which fulfils a specific function in the system of language.* (Trubetzkoy: 1969. Quoted in Diehl, 1991)

Though phonetics was restricted for a long time to only articulatory phonetics, it has developed quickly into a greater 'phonetic science' which embraces inter-disciplines (Xiaonong, 2015). Phonetics has become now more theoretically- oriented as general theories are exploited to account for phonetic phenomena (Xiaonong, ibid)

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[1] Quoted in Diehl (1991)
[2] Quoted in Diehl (1991: 121)

2

3. What is phonetics?

Phonetics (pronounced [fə'netɪks] is a branch of linguistics concerned with the scientific study of how human speech sounds are articulated by the speaker and transferred to the hearer and how they are heard and perceived (Rogers, 2000). The sounds that human beings produce are studied in phonetics as physical objects (Zsiga, 2006). The technical term for a speech sound is 'phone'. In segmental phonology, phones are the physical realization of phonemes and they are referred to as allophones.

4. Linguistics and Phonetics

Linguistics and phonetics are often referred to as the linguistic sciences based firmly on the nature of human communication. In this respect, Laver (2003) states: 'If the subject of linguistics is the scientific study of the nature, use, and variety of all aspects of language, the subject of phonetics is the scientific study of the nature, use, and variety of all aspects of speech' (Laver, ibid: 150)

According to Laver (ibid), his definitions are broad for both linguistics and phonetics. However, in the mid-twentieth century, these two subjects developed widely to embrace the modern diversity of both fields. Phonology is one common area of interest between the two subjects where they share the study of communicative aspects of spoken language.

In fact, researchers agree that linguistics contributes to phonetics 'its phonological understanding of the distinctive patterns that make up the coded, conventional aspects of speech which differentiate individual words and other units of spoken language' (Laver, 2003: 150) and, in turn, phonetics contributes to linguistics 'its phonetic understanding of the production and perception of the detailed artefacts of speech that embody those significant phonological patterns' (Laver, ibid). These two contributions complement each other indeed for the reason that the study of formal patterns without reference to the physical

realities of spoken language and the study of the artefacts of speech without identifying them as conventionally coded signals would be fruitless for both fields (Laver, ibid).

Overlapping with linguistics, phonetics has given birth to linguistic and articulatory phonetics (Xiaonong, 2015). Being now part of phonology, it has the syllable as its basic unit (Xiaonong, ibid). The study of spoken language from a phonetic perspective has been termed: linguistic phonetics Ladefoged (1971, 1997).

5. Branches of Phonetics

In the field of phonetics, the phonic medium can be studied from three points of view: the articulatory, the acoustic, and the auditory. These three branches are explained briefly in the following.

5.1. Articulatory phonetics (emission of sounds)

It studies the way speech sounds are produced by speech organs and articulators. For example, the sound produced at the beginning of the word 'mother' is produced by bringing the two lips into contact altogether and releasing air after being held inside the mouth. An understanding of human anatomy and physiology[3] along with the tools used to investigate just what the speech organs is so important in this field. Direct observation such as lip movement and position, and some tongue movement with a combination of, for example, x-ray photography or x-ray cinematography are all important tools in this field. In this course, the focus will be on articulatory phonetics to see how English sounds are produced using speech organs.

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[3] Anatomy is the scientific study of the body and how its parts are arranged. Physiology is the scientific study of the way in which bodies of living things work.

5.2. Acoustic phonetics (transmission of sounds)

It deals with the physical properties of sound waves created by the activity of speech organs. In general, acoustics is a branch of physics which needs specific tools to help measure and analyse sound wave signals that occur within speech and convert them into corresponding electrical activity and analyse the result in terms of frequency of vibration (pitch), amplitudes (loudness) and durations (length). For example, the acoustic energy occurs at higher frequencies in the sounds /s/ and /z/ which is above 3,500 Hz and reaches as high as 10,000 Hz.
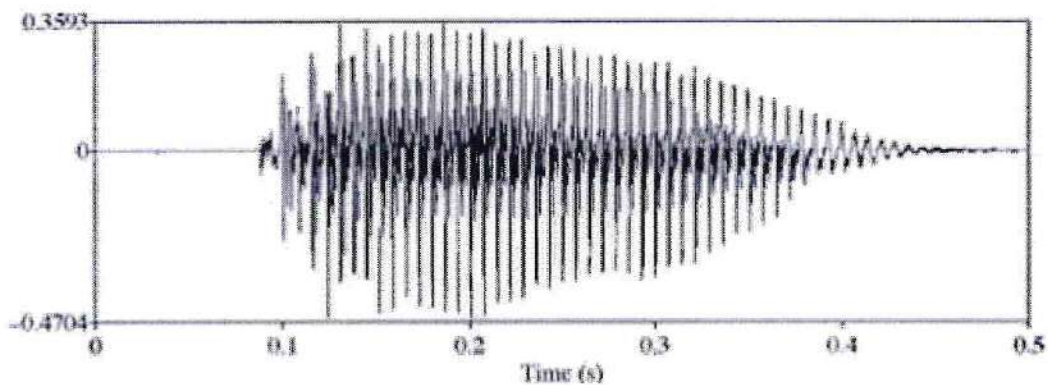
Figure 5.1. A waveform of a vowel Figure 1Figure 2(Ogden, 2009: 30)

5.3. Auditory phonetics (perception of sounds)

It studies the perception of speech sounds, i.e. how they are heard. It also involves the study of the relationship between speech stimuli and the listener's responses to these stimuli using auditory systems like the ear, auditory nerve, and some areas of the brain (Malmkjaer, 2006).

Activity

Before starting to learn English sounds think about the sounds of your mother tongue and say to your classmates all that you know about them. Are you able, later on, to see whether they are similar to or different from the English sounds? Illustrate with examples.

Speech is a complex physical process (Gibbon, 2017). Generally, five main phases are recognized in this process and which are: speech planning, speech production, speech transmission, speech perception and speech comprehension (Gibbon, ibid). The following diagram illustrates how the three branches of phonetics are combined with each other creating a speech cycle.
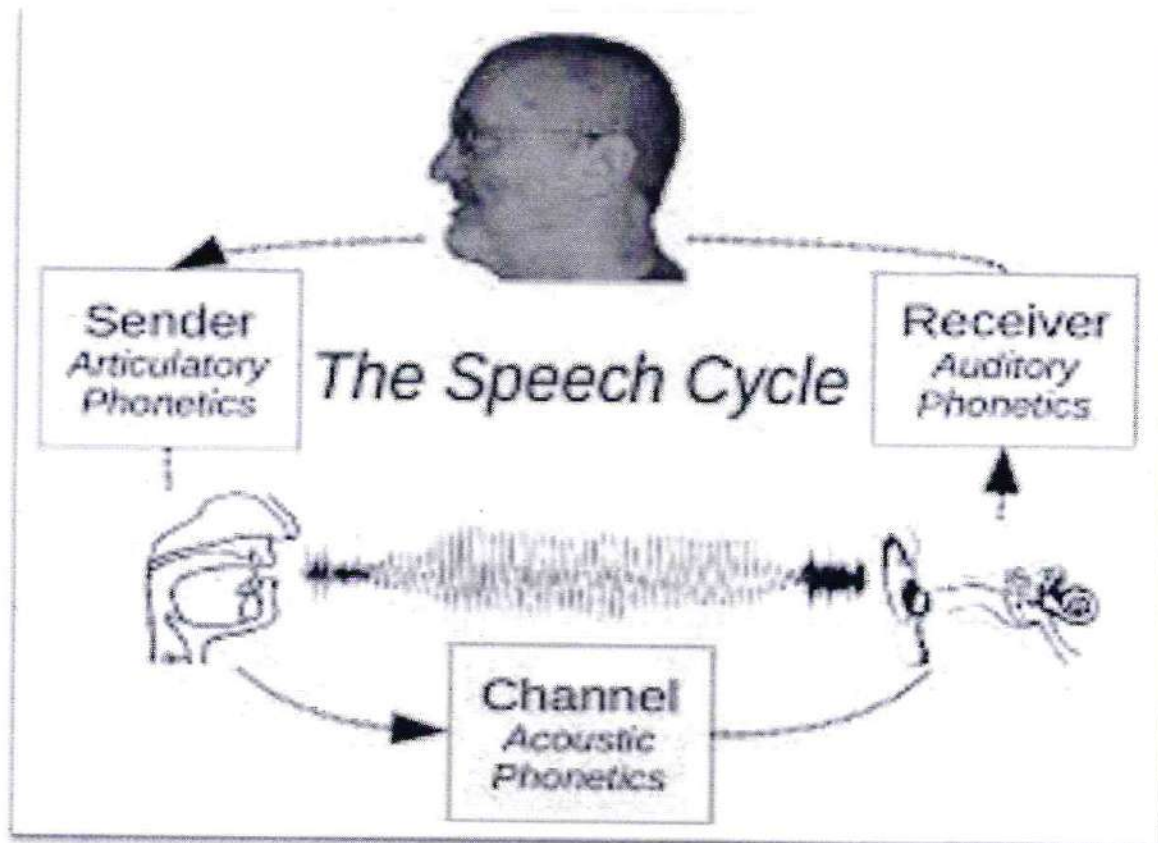

Figure 5.2. The basic speech cycle (Gibbon, 2017)

6. Received Pronunciation

Language has different accents pronounced differently by people from different geographical places, different social classes, different ages, and different educational backgrounds. Thus, English has different regional accents grouped into southern and northern accents. But the one that we will concentrate on is Standard British English, known as RP (Received Pronunciation), which is used by most announcers and newsreaders on BBC (British Broadcasting Corporation) TV and radio, and British independent television broadcasting

channels. It is also used in schools, universities, and in British dictionaries and textbooks.

In fact, it is a misnomer to call it an accent of British English because the number of people speaking it in Ireland, Scotland, and Wales is relatively very small and even a minority of English people speak it (in the southeast of England) (Roach, 2004). We notice that there are differences between British and American accents and also between northern and southern British English, but there is no implication that certain accents are inferior or less pleasant than others.

7. International Phonetic Alphabet (IPA)

It is crucial to make the difference between sounds and letters. Like all world languages, English has two distinct forms; written and spoken. Letters are scripts used in the written form and sounds are used (more properly produced) in the spoken form. Thus, letters (alphabets) are used to write words and sounds (IPA symbols) are used to say these words. In English, some letters of the alphabet match the sounds represented by the IPA symbols such as the letters b, f, s, l, r, and w. However, some other letters of the alphabet can have different representations in the IPA symbols. For example, the vowel letter 'o' in the words 'pot', 'port', 'post', 'some', and 'work' are represented respectively with the symbols [ɒ], [ɔː], [əʊ], [ʌ], [ɜː] in the IPA chart. However, sometimes the same sound may be represented by more than one letter or a combination of letters such as/k/ which represents either the letter 'k' in kid, the letter 'c' in coffee, the letter 'x' in axis, or a combination of letters such as the combination of 'ck' in lock, the combination 'ch' in character, and the combination of 'qu' in quake.

To show more about the inconsistency of the sound and spelling systems in English is that some letters in many words are silent and, hence, are not pronounced. We take, for example, silent 't', 'u', and 'b' in 'listen', 'guest', and

7

'thumb' respectively. Another fact of the sound-spelling issues in English phonology is the intrusion of a sound where there is no spelling to refer to the sound and this might make the pronunciation difficult for EFL learners mainly. For example, /W/ is inserted before the letter 'o' as in 'one' /wʌn/.

As what has been discussed above explains the reality of the English sounds used in the spoken forms do not match up with the letters used in the spelling form. History tells us that during the reinstatement of English as an official language in the 15th century, the spelling form had been tampered with. In the 16th century, and during the Bible wars, foreign printers made matters even worse. In vain, the early lexicographers made little effort and attempt to make spellings match the sounds supposed to represent them. Since then, nothing has changed and English has been left with a great gap concerning the sound-spelling match.

The ultimate solution to this confusion and in order to describe the sounds of a language like English, there was a real need for a conventional (standardized) system of phonetic transcription called: International Phonetic Alphabet (IPA) which was established in 1888. IPA is a system of phonetic notation invented by linguists to provide a standardized and accurate way of representing the sounds of any human language. The basic principle of IPA is to provide a separate and discrete symbol for each discrete sound in human language. Every language has a unique set of speech sounds which is technically termed the phonic medium. The IPA chart contains symbols representing all of the distinct sounds of the world's languages. British English IPA chart uses 44 of the IPA symbols. It consists of 12 vowels, 24 consonants, and 8 diphthongs. There are two types of phonetic transcription:
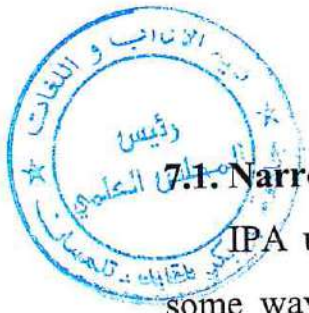
7.1. Narrow Transcription

IPA uses diacritic symbols which are marks used to modify a symbol in some way (Roach, 2009). To understand more, let's consider Roach's (ibid) example of the fourth cardinal vowel which has the symbol [a] (among the eight cardinal vowels indicated on the IPA chart above (page VII). This cardinal vowel [a] may be modified to have another symbol with two dots above it [ä], hence, producing a sound which is closer and nearer to central than [a]. Accordingly, the narrow phonetic transcription, in this cardinal vowel [a] example and in all sound symbols of IPA, gives a detailed transcription and much more information about how exactly human speech sounds are produced. Roach defines narrow transcription as follows:

> [...] much more accurate in phonetic detail, and contained much more information than a phonemic transcription. Such a transcription would be called a **phonetic transcription;** a phonetic transcription containing a lot of information about the exact quality of the sounds would be called a **narrow** phonetic transcription (Roach: 2009, 34)

7.2. Broad Transcription

Unlike narrow phonetic transcription which is based mainly on the exact quality of the sound, broad transcription which is also known as phonemic transcription, gives a distinctive representation of speech sounds. It represents the basic speech sounds i.e. the phonic medium. Crystal provides a comprehensive definition of broad transcription by stating:

> [In this kind of transcription,] the only units to be symbolized are those which have a linguistic function, i.e. the phonemes. [...] A phonemic transcription looks simplest of all as in this only the units which account for differences of meaning will be represented, e.g. /pɪn/, /pen/, /pæn/ (Crystal: 2008, 490)

The following table helps the students understand what a narrow and broad transcriptions areas it displays a comparison between the two types:

9

Broad transcription	Narrow transcription
-Also known as phonemic transcription	- Also known as phonetic transcription
-Abstract mental construct of the sound that gives unique meaning of a given language (phonemes)	-Actual spoken variants of the phonemes
- General representation e.g. cot /kɒt/	-Specific details (like aspiration, devoicing etc.) e.g. cot [kʰɒt]
-Enclosed in /slashes /	-Enclosed in [square brackets]
- Phonemic representation is inferred[4] and not observable	-Phonetic representation is directly observable
- Specific to a particular language	- Used to describe an accent of a language or the speech of a person

8. The Production of Speech Sounds (Articulatory Phonetics)

To be able to pronounce the sounds clearly and correctly, we need to know how they are made. And to know how they are made, we need to be familiar with the different speech organs that produce them as well as the air stream passage.

8.1. Air Stream Mechanism

To understand articulatory phonetics, it is necessary to know about the mechanism of the air stream. Speech sounds are usually produced with a pulmonic[5] egressive airstream, i.e. the airflow direction is: coming from the lungs and going outward. So, when we use air that we push out from our lungs to produce speech sounds, we are using a pulmonic egressive airstream. This is the most common way to create an airstream for use in the production of speech sounds.

All the organs shown in the figure below contribute to the production of speech. However, these organs have other functions which are not connected

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[4]Evidence that phonemic representation is inferred is the example of minimal pairs in phonology where the phonemes are in contrast, e.g. the phonemes/b/ and/f/ in/bit/ and/fit/

[5] Air coming from the lungs.
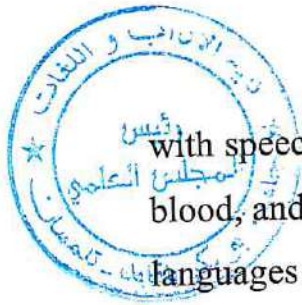
with speech but are biologically primary. The lungs are to supply Oxygen to the blood, and the tongue and the teeth are for eating. However, speech sounds in all languages are produced in the following way: the air stream is expelled by the lungs, goes through the trachea (windpipe) into the larynx where it passes between the vocal cords (also vocal folds) along the vocal tract which begins from the larynx to the lips (oral cavity) and nostrils (nasal cavity) (see the figure below)
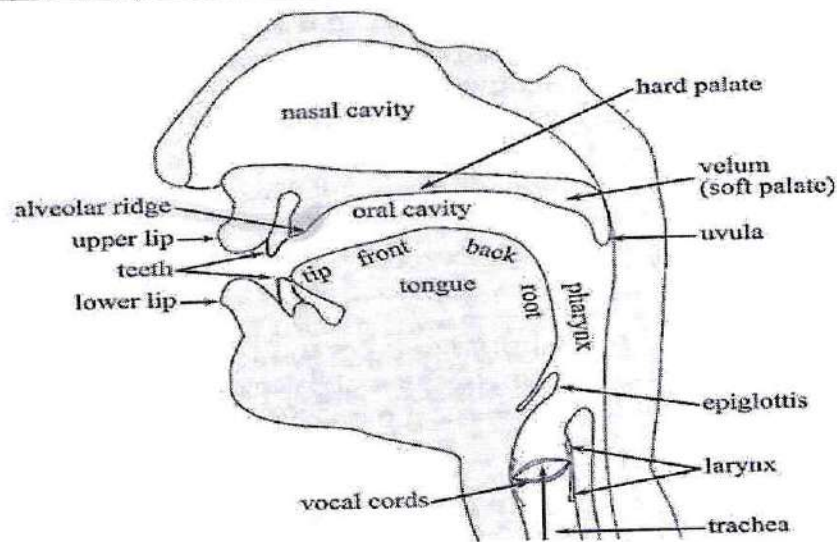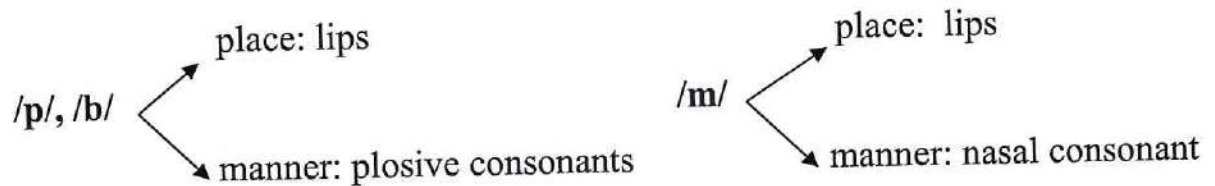

Figure 8.1. The Vocal tract[6]

8.2. The Organs of Speech

As shown in the figure above, the parts of the vocal tract that can be used to form sounds are called articulators or speech organs. Speech sounds are classified in terms of the speech organs that produce them (the place of articulation) and the way in which they are produced (the manner of articulation). We consider the following examples:

/p/, /b/ → place: lips / manner: plosive consonants

/m/ → place: lips / manner: nasal consonant

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[6] https://quizlet.com/de/470195020/the-vocal-tract-flash-cards/

-The pharynx:

It is a tube which begins just above the larynx. It is divided into two (2) parts at its top end: the back of the mouth and the beginning of the way through the nasal cavity. Arabic is a well-known language having the pharynx as a place of articulation of some consonant sounds called pharyngeal sounds.

-The Soft palate (velum):

The soft palate, or the velum, is a muscle located in the back of the roof of the mouth. It is seen in the diagram above in a position that allows air to pass through the nose and the mouth, but it may be seen in three (3) positions:

* Lowered: to allow the air to pass through both nose and mouth.

* Lowered with a complete closure of the oral cavity: so that the air passes only through the nasal cavity.

* Raised: so that the air escapes only from the mouth.

Normal breathing requires an open velar position so the velum remains open at rest.

-The hard palate:

It is part of the palate in general which is often known as often the roof of the mouth. The hard palate is located in the middle of the roof of the mouth between the alveolar ridge at the front of the mouth and the soft palate at its end.

-The alveolar ridge:

It is between the top front teeth and the hard palate. This bony ridge is located behind the upper front.

- The tongue:

This organ is very important in speech articulation to the extent that many languages base their word for 'language on it (Roach, 2009). Its muscle tissue facilitates its shape and movement in different directions inside and outside the mouth. It is so flexible to be moved into many different places and different shapes. It is usually divided into five (5) parts. The tip is the furthest forward

12

part followed by the blade. The widest part that comes after the blade is the front behind which is the back part. The last section of the tongue is the root which is located at the end of the lower jaw. It has almost little role in speech production. The figure below shows these parts:
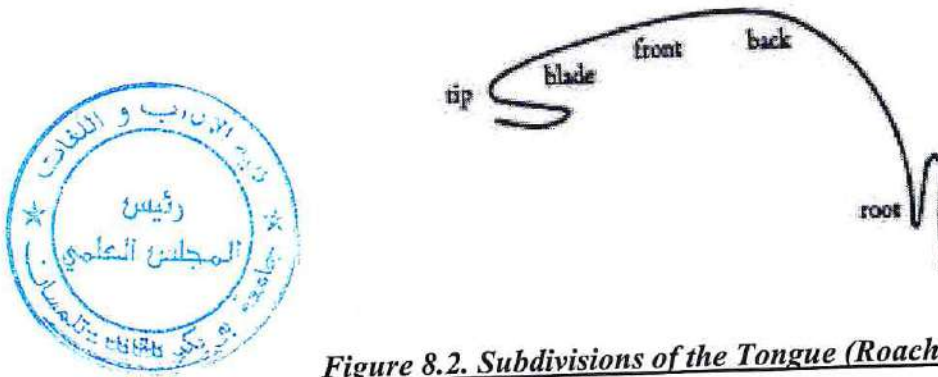

Figure 8.2. Subdivisions of the Tongue (Roach, 2009)

- Teeth:

Like the previous organs, the upper front and even lower front teeth have a role in speech production. The tongue is in contact with the upper teeth for many speech sounds.

- Lips:

Both upper and lower lips are important in speech. They are said to be active and mobile articulators as they can be pressed together to get bilabial /p/, /b/, brought into contact with teeth to get labio-dental /f/, /v/, or rounded to produce vowels like [u:] or spread to produce [i:].

- Nasal cavity:

Is used for nasal sounds like /m/, /n/ where the air goes into the nasal cavity when the velum is completely lowered.

- Larynx:

Commonly known as the voice box, the larynx is situated in the neck at end of the trachea (also windpipe); more exactly at a point commonly called Adam's apple. It has a biological function which is the prevention of food or solids from entering the lungs. It is a very complex articulator made of cartilage with the vocal cords inside.

13

-Vocal cords:

They are also called the vocal folds. They form an important part in the larynx. They are very important for making the difference between voiced and voiceless sounds: if they are kept close together and made to vibrate as the air passes through the glottis (space between the vocal cords), the sound produced is voiced. If the air passes through without vibration, the sound is voiceless. All English vowels [7] are voiced; consonants may be voiced or voiceless. In whispered speech, voiced consonants and vowels are voiceless.

Generally, the articulators are divided into two different categories according to their mobility. Active articulators (such as the tongue and the lips) are those organs of speech that move from their position of rest to articulate against other organs of speech that do not or cannot move which are called passive articulators (such as the teeth and the palate).

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[7]English vowels are called also monophthongs because the articulation is almost unchanging compared to diphthongs and triphthongs where gliding characterizes them.
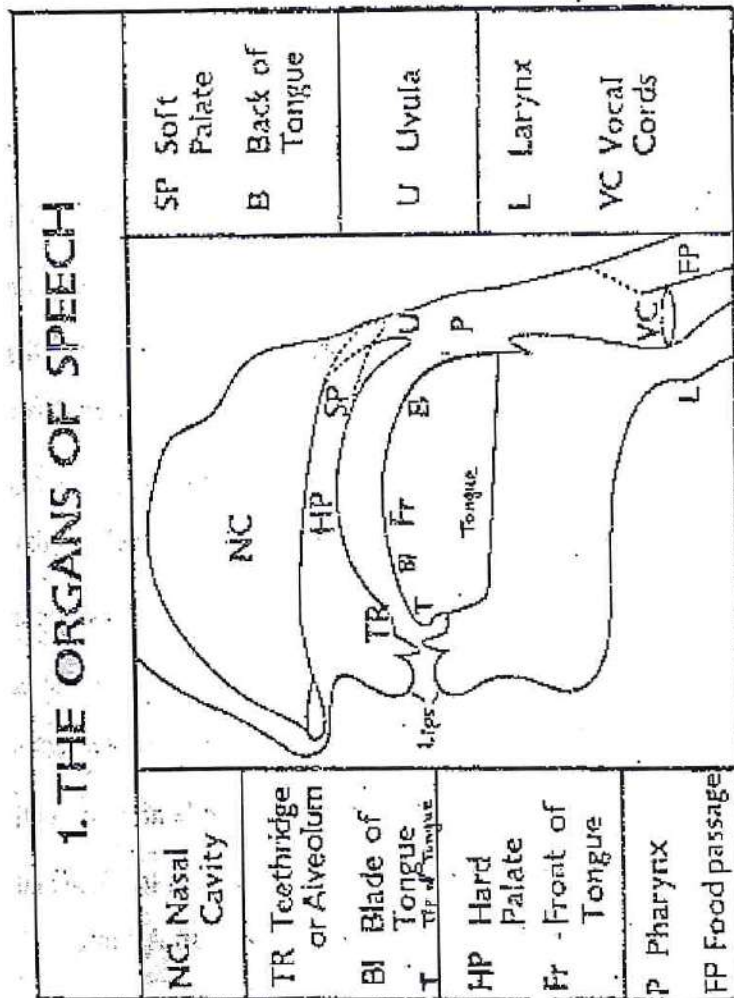
1. THE ORGANS OF SPEECH

SP	Soft Palate
B	Back of Tongue
U	Uvula
L	Larynx
VC	Vocal Cords

NC	Nasal Cavity
TR	Teethridge or Alveolum
Bl	Blade of Tongue
T	
HP	Hard Palate
Fr	Front of Tongue
P	Pharynx
FP	Food passage

Figure 8.3. The Organs of speech

9. Vowels and Consonants

How do vowels differ from consonants? Vowels and consonants are very familiar to us, but scientifically they are not easy to define. The most common view is that vowels are sounds in which there is no obstruction to the flow of air from the larynx to the lips. But, for consonants, it can be clearly felt that we are making it difficult (partial obstruction or impossible – complete or total obstruction) for the air to pass through the mouth (as examples: d and s sounds). However, there are many cases where the decision is difficult to make. For instance, sounds at the beginning of the words 'home' and 'wave' do not really obstruct the flow of air. But, it is possible to distinguish (to make difference) vowels and consonants in another way. Let's consider English words beginning

15

with the sound 'h'. The sound which normally comes after 'h' is a vowel like in 'hospital', 'hotel', 'head', 'hear', 'hat'... and the same thing with the sound 'w' like 'wave', 'well', 'wife'...Thus, we can differentiate between vowels and consonants by looking at the different contexts and positions in which particular sounds can occur. This is the study of the distribution of sounds. If we look at the vowel-consonant distribution in this way, we must say that the most important difference between vowels and consonants is not the way they are produced, but their different distributions. The distribution of vowels and consonants is different for each language.

9.1. English Vowels

Vowels are produced without the obstruction of the air when it moves from the lungs to the vocal tract. This is why they are described to be quite sonorous as they have a pleasant and full deep sound when heard. In what ways do vowels differ from each other? The first thing to consider is the shape and position of the tongue. There are many complex possibilities for the movement of the tongue, but they can be simplified by describing just two (2) things:

1-The vertical distance between the tongue and the palate *(tongue-height differentiation).*
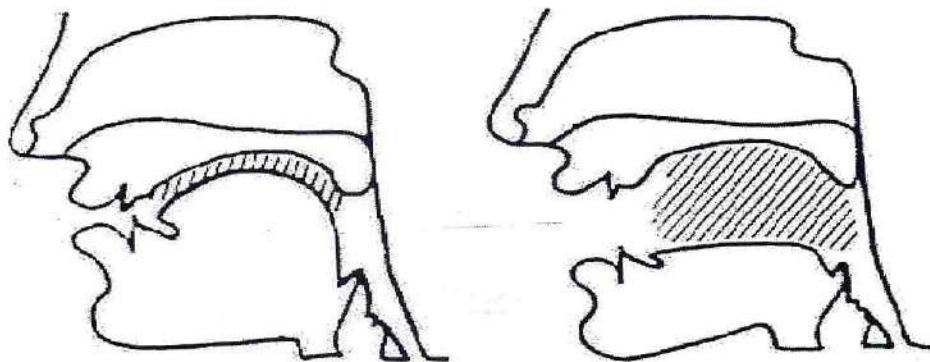
a) tongue is at the highest b) tongue is at the lowest

Figure 9.1. Tongue height differentiations (Thomas, 1976: 56)

2-The part of the tongue (front or back) which is raised highest
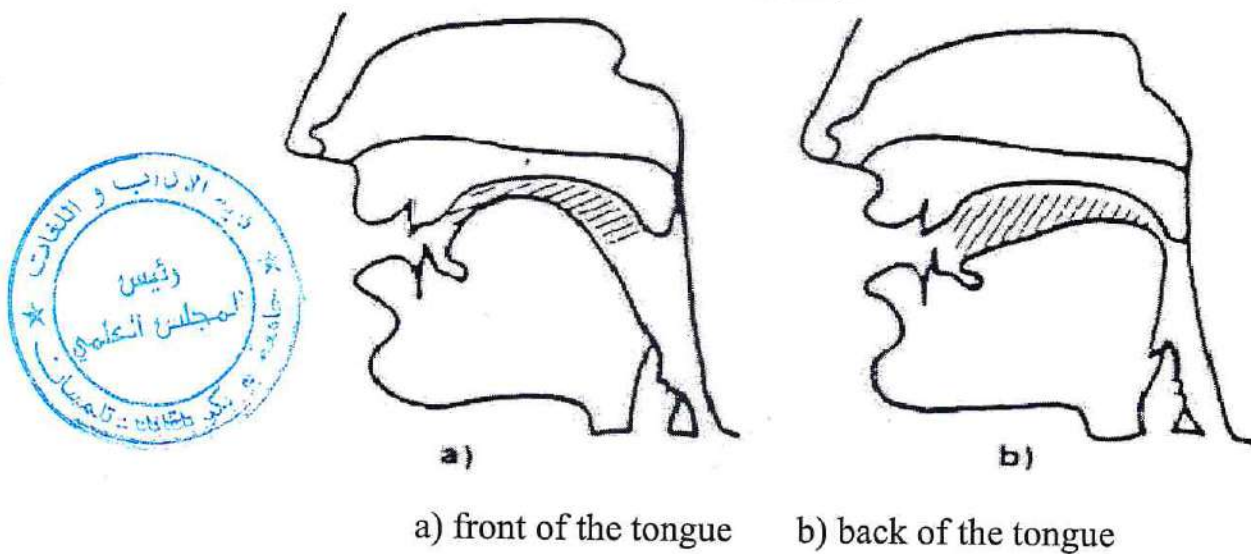
(frontness-backness).

a) front of the tongue   b) back of the tongue

Figure 9.2. Frontness and backness of the tongue (Thomas, 1976: 56)

*Tongue-height differentiation

- [i:]in 'see' ⟶ the tongue is raised close to the palate.

- [æ] in 'cat' ⟶ the distance between the tongue and the palate is much greater.

The difference between [æ] and [i:] is a difference of tongue-height. When describing these vowels, we say that [i:] is a *close* vowel and [æ] is an *open* vowel. The tongue-height can be changed by moving the tongue up and down.

*Frontness vs. backness

By changing the shape of the tongue, we can produce vowels in which a different part (front, back) of the tongue is raised highest. For example: it is the front part of the tongue that is raised in the case of [i:] and [æ]. We could, therefore, describe them as *front* vowels. But, in the production of [a:] (like in dark, arm) and [u:] (like in too), it is the back part of the tongue which is raised highest. Thus, [a:] and [u:] are back vowels.

17

close | front   back ————————→ shape of the tongue

i: u:

æ   a:

open ↓   Position of the tongue
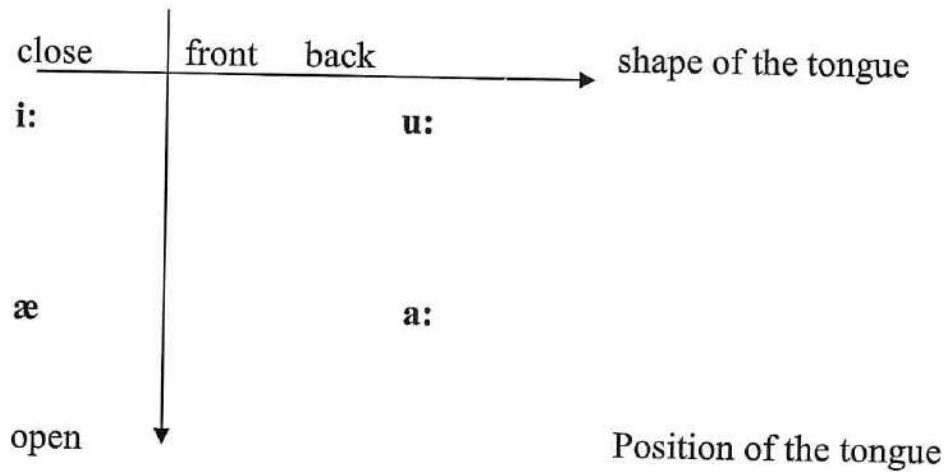
Figure 9.3. Extreme vowel positions

* Cardinal Vowels

They are often known as the eight primary cardinal vowels. In other words, they are standard reference system which helps us in learning about the range of vowels that the humans can produce. It is a useful way of describing, classifying and comparing vowels. The cardinal vowels are not typical of English or any other language. They are rather devised to act as reference points to provide precise descriptions of the vowels of any language.

Figure 9.4. Eight primary cardinal vowels

18

*Lip position

There is another important variable of vowel quality and that is lip-position. There are three (3) possibilities:
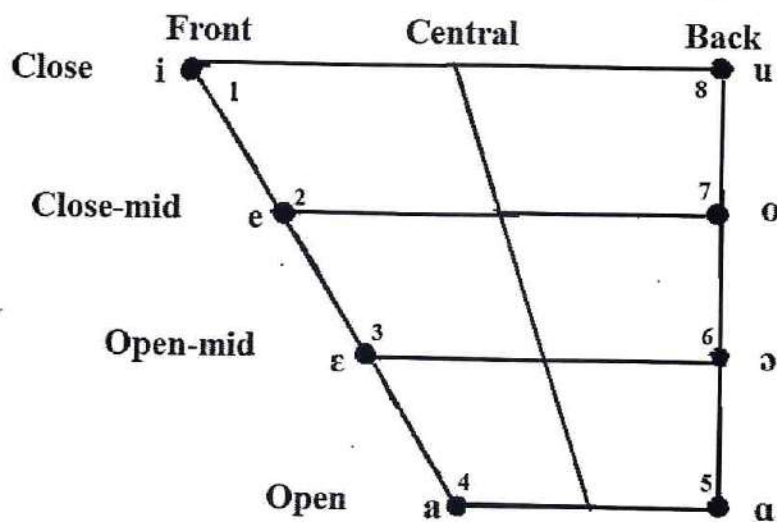
-rounded: the corners of the lips are brought towards each other and the lips are pushed forwards like in [u:]

-spread: the corners of the lips move away from each other like in [i:]

-neutral: the lips are neither rounded nor spread like in about [ə] schwa

Round /u:/   Spread /i:/   Neutral /ɑ:/
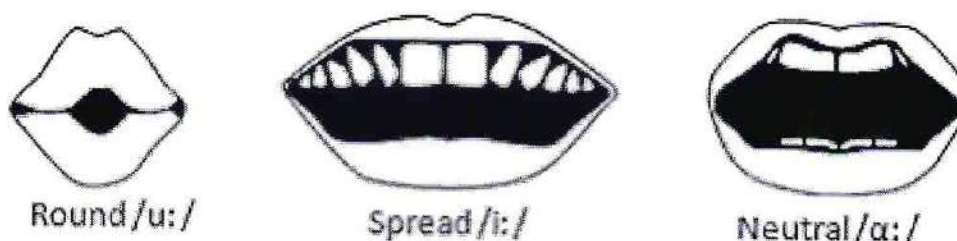
Figure 9.5. Vowel lip position

9.1.1. Short Vowels

We use three (3) principles (tongue height/frontness vs. backness/ lip-position) to describe the English vowels. There is a large number of vowel sounds with different degrees of length (short or long) described in relation to the cardinal vowels.

The English language has seven (7) short vowels. The symbols for these vowels are: ɪ - e - æ - ʌ - ɒ - ʊ - ə

1- ɪ→ as in fish, rich, dish, give.

The diagram below (figure 5) shows that this vowel is in the *close front* area. The lips are *slightly spread*.

2- e → as in yes, men, rest, beg, tell, sell. This is a *front* vowel between *half close and half open*. The lips are *slightly spread.*

3- æ → as in cat, fat, bat, hat. This vowel is *front open*. The lips are *slightly spread*.

19

4- Λ[8] $\rightarrow$ as in but, cut, dust, rush, some, sun, cup. This is a _central_ vowel between _half open and open_. The lips are _neutral._

5-ɒ $\rightarrow$ as in not, hot, dog, rock, top, gone, cross, lot. The vowel is _back_ between _half open and open_. The lips are _slightly rounded._

6- ʊ $\rightarrow$ as in put, push, should, could, book, look. It is near to the cardinal vowel [u] but it is more _open_. The lips are _rounded_.

7-ə $\rightarrow$ as in **o**ppose, p**er**haps, teach**er**. It is a _central_ vowel with _neutral_ lips. It is called schwa.
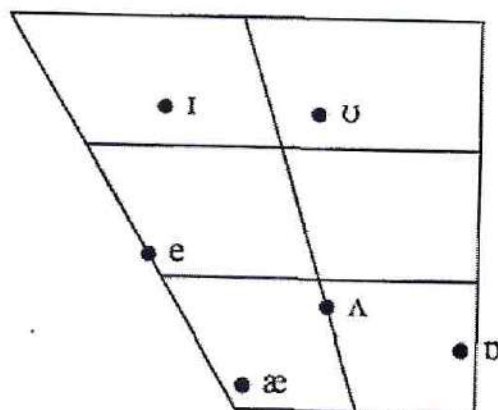
**Figure 9.6. English short vowels (Roach, 2009)**

9.1.2. Long Vowels

There are five (5) long vowels. They tend to be longer than the short vowels. The symbols for these long vowels are: **i: - ɜ: - ɑ: - ɔ: - u:**

1-i: $\rightarrow$ as in see, free, peace, leave, speech. This vowel is near to the cardinal vowel [i]. It is _close front_. The lips are _slightly spread._

2-ɜ: $\rightarrow$ as in first, third, girl, earth, learns. This is a _central_ vowel with _neutral_ lips.

3-ɑ: $\rightarrow$ as in dark, arm, large, half, mark, car. This is an _open back_ vowel near to the cardinal vowel [ɑ]. The lip-position is _neutral._

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[8] The upside down letter v [ʌ] is also called wedge. (Ladefoged, 2001)

4-ɔ:→as in daughter, more, short, for. This is a _back_ vowel between _half close and half open_. The lips are rounded

5-u:→as in food, tool, soon, wood, rule, blue, choose. This vowel is _back close_ with _rounded_ lips. It is near to the cardinal vowel [u].

The long vowels are different from the short vowels not only in _length_ but also in _quality_ (tongue shape and position and lip position). If we compare short ɪ with long **i:** or short ʊ with long **u:** or short æ with long **a:**, we can see differences in tongue _shape_ and _position_ and _lip-position_, as well as in _length._
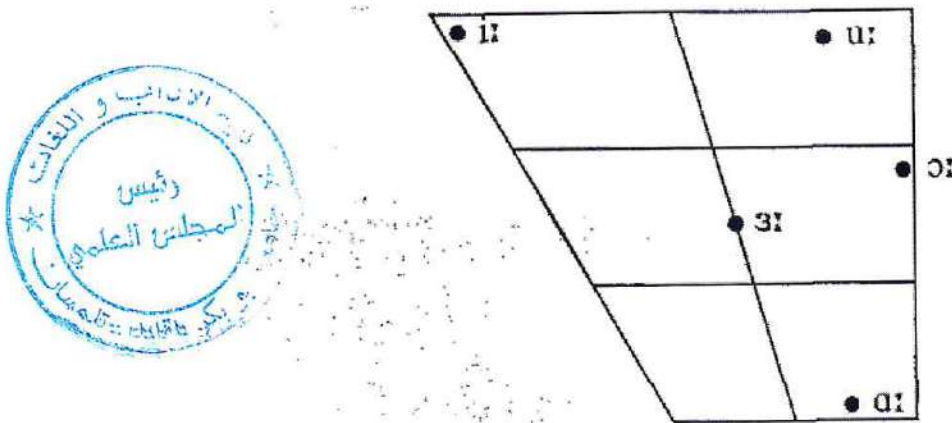
**Figure 9.7. English long vowels (Roach, 2009)**

The English short and long vowels are often called monophthongs as opposed to diphthongs because there is no glide in them. The description of these vowels is summarised in the following table:

Vowel	Description
ɪ	short high front unrounded vowel
e	short mid front unrounded vowel
æ	short low front unrounded vowel
ʌ	short low central unrounded vowel
ɒ	short low back rounded vowel
ʊ	short high back rounded vowel
ə	short mid central unrounded vowel
i:	long high front unrounded vowel
a:	long low back unrounded vowel
ɔ:	long mid back rounded vowel
u:	long high back rounded vowel
ɜ:	long mid central unrounded vowel

Activity

1-Think of words that contain short vowels

2-Think of words that contain long vowels

3-Does Arabic have short and long vowels like English?

4- How many are there?

9.1.3. Diphthongs

RP English has a large number of diphthongs. They are sounds which consist of a movement or a glide from one vowel to another vowel. They are like the long vowels in terms of *length*. The most important thing to remember about the diphthongs is that the first part is much longer and stronger than the second part. The total number of diphthongs is eight (8) as shown below:
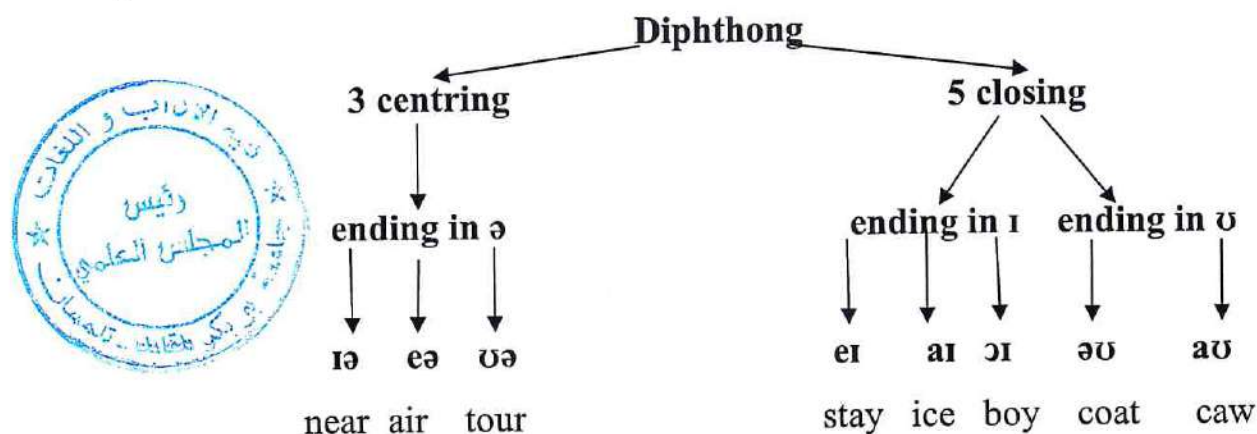
Figure 9.8. English diphthongs

Centring diphthongs

The centring diphthongs glide towards the schwa vowel as it is indicated in the diagram below.

ɪə: diphthong moving from high front unrounded to mid central unrounded

Example: ɪə→near, here, fear

eə: diphthong moving from mid front unrounded to mid central unrounded

Example: eə→fair, air, where, there

ʊə: diphthong moving from high back unrounded to mid central unrounded

Example: ʊə→tour, moor
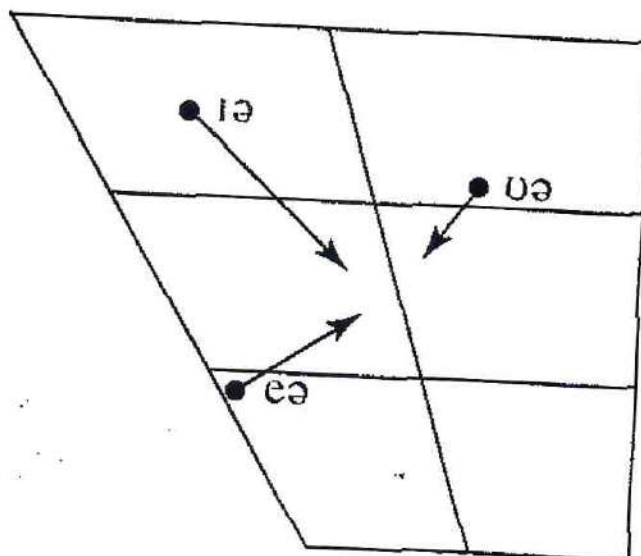
Figure 9.9. Centring diphthongs

Closing diphthongs

The closing diphthongs have the characteristic that they all end with a glide towards a close vowel:

- Three of the diphthongs glide towards short ɪ as described below:

eɪ: diphthong moving from mid front unrounded to high front unrounded

Example: eɪ→stay, play, main, face

aɪ: diphthong moving from low central unrounded to high front unrounded

Example: aɪ→glide, ice, time, nice, five

ɔɪ: diphthong moving from low back rounded to high front unrounded

Example: ɔɪ →oil, boy, voice, join, coin

- Two diphthongs glide towards ʊ

əʊ: diphthong moving from mid central unrounded to high back rounded

Example: əʊ→show, go, most, window

aʊ: diphthong moving from low central unrounded to high back rounded

Example: aʊ→out, now, house
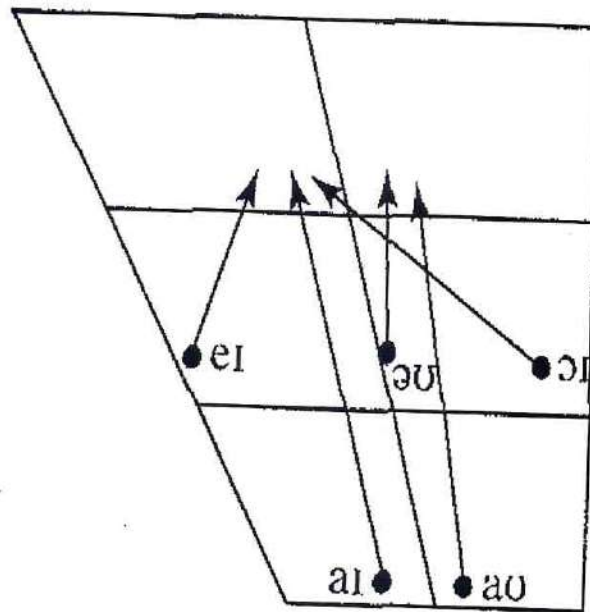
Figure 9.10. Closing diphthongs

Activity

1-Without using the English dictionary, provide words that contain:

- Centring diphthongs

- Closing diphthongs

2- Does Arabic have diphthongs? Provide examples

9.1.4. Triphthongs

They are the most complex English sounds of the vowel type because they are difficult to pronounce and recognize. A triphthong is a glide from one vowel to another and then to a third, all produced rapidly and without interruption. The triphthongs are composed of five closing diphthongs plus (+) schwa added to the end. Thus, we got: **eɪə- aɪə- ɔɪə-əʊə - aʊə.**

eɪə →player- layer

aɪə →liar-fire- empire

ɔɪə →loyal - royal

əʊə →lower - mower

aʊə →power- hour – flower

25

Activity

Using your English dictionary, provide other words containing triphthongs.

9.1.5. Typical Spelling Patterns for Vowels

In a perfect spelling-pronunciation consistency each letter would be represented by only one phonetic symbol and in turn, each sound would have its appropriate letter. This is, absolutely, not the case in English as each alphabet cannot represent one fixed sound and vice versa. This is mainly because the English pronunciation is inconsistent with the English spelling. The spelling-pronunciation inconsistency appears at vowel and consonant levels. As far as the English vowels are concerned in this section, the English vowel sounds change due to the influence of the letters after or before the sounds or letters. The following patterns show how some English letters change the pronunciation of some vowel sounds. Indeed, English vowel pronunciation mostly has no fixed pattern.

How does 'e' change the pronunciation?

a
↗ Without - e: fat – cat – am – plan – hat   /æ/

↘ With - e: gate – late - name – plane – hate   /eɪ/

Practice: man – same – take – that – safe – tap– tape

i
↗ Without - e: sit – in – begin – if – swim   /ɪ/

↘ With - e: invite – fine – wine – wife – time   /aɪ/

Practice: fit – inside – still – mile – hid – hide – ride – like

O   ↗   Without - e: stop – top – not – hot – clock   /ɒ/

     ↘   With – e: hope – home – note – nose   /əʊ/

Practice: job – smoke – stone – nose – god – joke – bone – on – spot

u   ↗   Without – e: bus – run – sun – just   /ʌ/

     ↘   With – e: June – rude – use – tube   /u:/

Practice: much – cube – cub – gun - fun – duke – duck

Exceptions: some [ʌ] – come [ʌ] – one [ʌ] – have [æ] – give [ɪ] – live [ɪ] - love [ʌ]

*Pronunciation of the letter 'a': the rules are as follows:

/eɪ/   ↗   Before consonant + e: ma<u>ke</u> – la<u>te</u> - ta<u>ke</u>

     ↘   Before i + consonant: ra<u>in</u> – Spa<u>in</u> – fa<u>il</u>

/æ/   ↗   Before final consonant: ba<u>n</u> - sa<u>d</u>

     ↘   Before double consonants: a<u>pp</u>le – ha<u>nd</u>

     ↗   Before mute 'r': a<u>r</u>tist

     →   Before 'f': hal<u>f</u>

/a:/   →   Before 's' + consonant: pa<u>st</u> – pa<u>ss</u>

     ↘   Before final 'th': ba<u>th</u>

27

↗ Before final 'w': la<u>w</u> - sa<u>w</u>

/ɔ:/ → before double 'l': ca<u>ll</u> – ta<u>ll</u>

↘ Before 'lk': ta<u>lk</u>– wa<u>lk</u>

/ə/   <u>a</u>bout – <u>a</u>gain – <u>a</u>ttend

*Pronunciation of the letter 'e'

↗   /e/: red – dress – get

e →   /i:/: he – eat – see

↘   /ə/: settlement - /'setlmənt/

Practice: went – meat   – men   – bed   – be – left – read – speak - me

* Pronunciation of the letter 'i'

↗   /ɪ/: before final consonant: si<u>t</u> – i<u>n</u> – big

i →   /aɪ/: before consonant + e: wi<u>ne</u> – fi<u>ve</u> and also before final 'ght': mi<u>ght</u>- ri<u>ght</u>

↘   /3:/: before mute 'r': fi<u>r</u>st – shi<u>r</u>t

*Pronunciation of the letter 'o'

↗   At the end of words in 'oa': coat, boat

/əʊ/

↘   Before consonant + e: ho<u>me</u> – hop<u>e</u>

/ɒ/ →   before final consonant in most other cases: o<u>n</u> – go<u>t</u> – jo<u>b</u>

/ɔ:/ →   for 'or': m<u>or</u>e - sh<u>or</u>t – f<u>or</u>ty (or can be pronounced /ə/ like in f<u>or</u>get – doct<u>or</u>

/3:/ → for 'wor': <u>wor</u>k – <u>wor</u>ld – <u>wor</u>se

↗ For 'o': s<u>o</u>me – <u>o</u>ne - m<u>o</u>ther

/ʌ/

↘ For 'ou': y<u>ou</u>ng – c<u>ou</u>ntry

/ə/ → <u>o</u>ppose – <u>o</u>btain – t<u>o</u>morrow – purp<u>o</u>se

*Spelling of /3:/

↗ 'er': c<u>er</u>tain
↗ 'ir': f<u>ir</u>st
/3:/ → 'ur': b<u>ur</u>n – Th<u>ur</u>sday
↘ 'wor': <u>wor</u>ld – <u>wor</u>k
↘ 'ear': l<u>ear</u>n – <u>ear</u>ly – h<u>ear</u>d

9.2. English Consonants

Consonants are sounds made with partial or full constriction made by articulators at some level in the vocal tract during their production. Unlike vowels which are characterized by tongue height, frontness/backness and lip position, consonants are described and classified on the basis of three aspects: 1- place of articulation   2-manner of articulation   3- voicing.

1- Place of Articulation:

It is in the mouth and refers to the point where the constriction occurs (as two speech organs come close to each other to form this constriction). Following the place articulation, the 24 English consonants are classified into eight types:
-*Bilabial:* the lips are pressed together: **/p/, /b/, /m/, /w/.** Examples are 'pram' [præm] where [p] is voiceless and 'above' [ə'bʌv] where [b] is voiced.
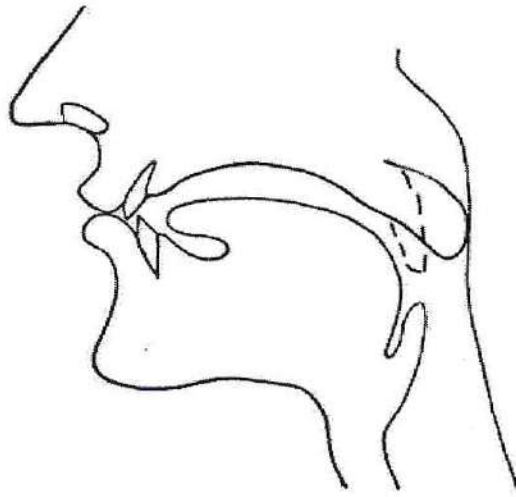
Figure 9.11. Bilabial articulation

-Labio-dental: the lower lip is in contact with the upper teeth: **/f/, /v/.** Examples are 'fate' [feɪt] where[f] is voiceless and 'avow' [ə'vaʊ] where [v] is voiced.
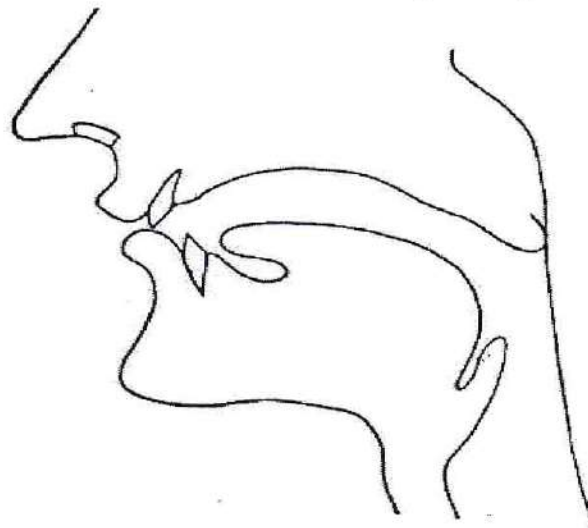
Figure 9.12. Labiodental fricative articulation

-**Dental:** the tip of the tongue is raised against the upper teeth: /Ɵ/, /ð/. Examples are 'thief' [Ɵi:f] where [Ɵ] is voiceless and 'there' [ðeə] where [ð] is voiced.
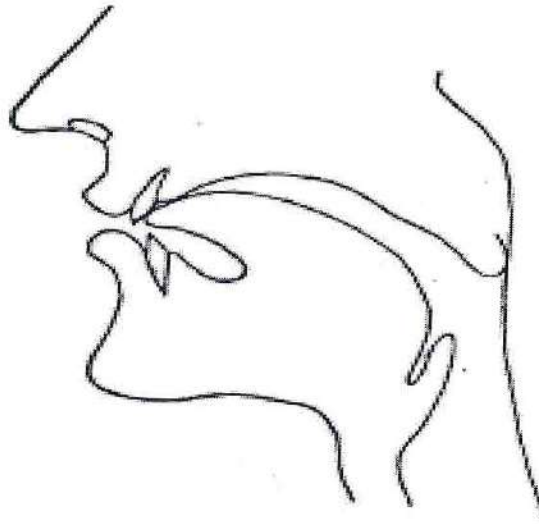
Figure 9.13. Dental fricative articulation

-**Alveolar:** the tip of the tongue is raised against the alveolar ridge: /t/, /d/, /s/, /z/, /n/, /l/. Examples are 'same' [seɪm], 'time' [tʰaɪm] where [t, s] are voiceless and 'adapt' [ə'dæpt], 'zip' [zɪp] , 'name' [neɪm], 'loud' [laʊd] where [d, z, n, l] are voiced.
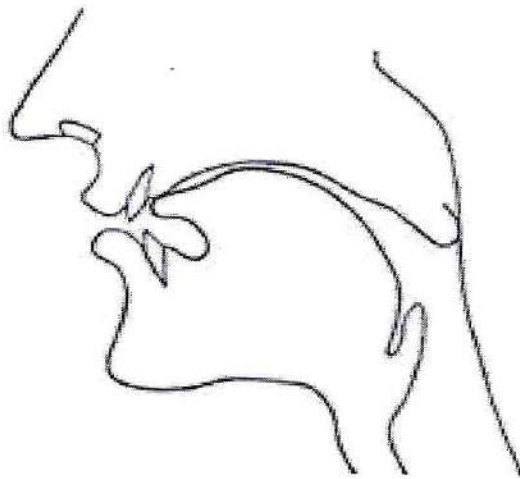
Figure 9.14. Alveolar articulation

31

-*Palato-alveolar (post-alveolar):* the front of the tongue touches the alveolar ridge and the front of the hard palate: /ʃ/, /ʒ/, /tʃ/, /dʒ/, /r/.Examples are'shy' [ʃaɪ], chin [tʃɪn] where [ʃ,tʃ] are voiceless and 'pleasure' ['pleʒə], 'badge' [bædʒ], arrive [ə'raɪv] where [ʒ, dʒ, r] are voiced.

- *Palatal:* the front of the tongue is raised against the hard palate: /j/which is the only palatal sound in English. Examples are 'yes' [jes], 'new' [nju:] where [j] is voiced.
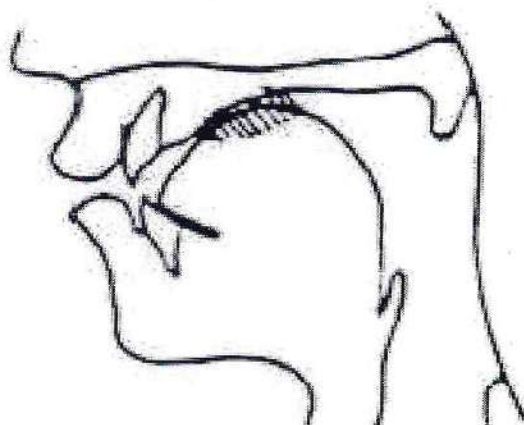
Figure 9.15. Palatal articulation

-*Velar:* the back of the tongue is in contact with the soft palate (velum): /k/, /g/, /ŋ/. Examples are 'kake' [keɪk] where [k] is voiceless and 'agape' [ə'geɪp], 'bang' [bæŋ] here [g, ŋ] are voiced.
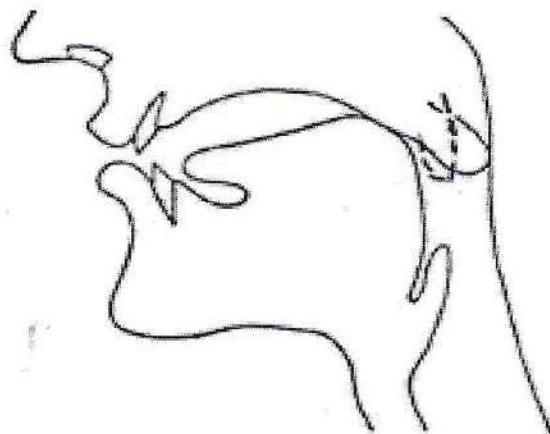
Figure 9.16. Velar articulation

-Glottal: the sounds are produced when the air passes through the glottis (opening between the vocal cords) as it is narrowed: **/h/,** plus the glottal stop **[ʔ]** as an allophonic realization. Example: 'hit' [hIt] where [h] is voiceless.
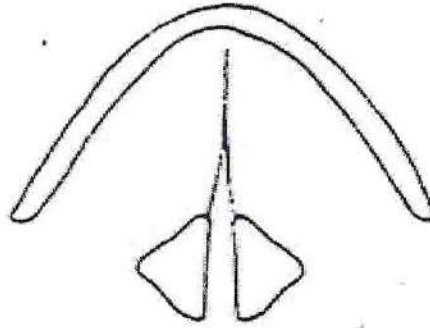
Figure 9.17. Glottal articulation

33

2. Manner of Articulation:

It refers to the kind of constriction, i.e., whether there is a complete, almost complete, or a slight closure of the air passage. In other words, it is the way in which consonants are produced. Taking this aspect into consideration, English consonants are classified into six types:

-Plosives (also called stops): they are sounds produced with a complete closure of the airstream behind the glottis, then a sudden release of air with a plosion: /p/, /b/, /t/, /d/, /k/, /g/.

-Fricatives: they are sounds produced with a partial blocking of air, as it continues to flow through a narrow passage between the articulators making an audible kind of friction: /f/, /v/, /Ɵ/, /ð/, /s/, /z/, /ʃ/, /ʒ/, /h/

-Affricates: just like plosives, the air is blocked at the beginning of their production, and then, like fricatives, they are released with friction through a narrow passage; there are two affricates in English: /tʃ/ and /dʒ/.

-Nasals: these sounds are particular because, during their production, the air escapes through the nasal cavity and nostrils while the velum is lowered, and there is a complete closure in the oral cavity: /m/, /n/, /ŋ/.

-Lateral: in English, there is only one lateral sound /l/. It is called so because during its production the air does not flow the usual way along the tongue as for other consonants, but through the two sides of the tongue which are pulled down while the tip of the tongue is against the alveolar ridge.

-Approximants: during the production of these sounds, the articulators approach each other without making a real contact, allowing the air to pass without a real constriction: /w/, /j/, /r/.

As stated earlier, the manner of articulation which is how air flows through the vocal tract is based on the size and shape of the constriction between

the articulators. The following diagram illustrates air flow in the English consonants:
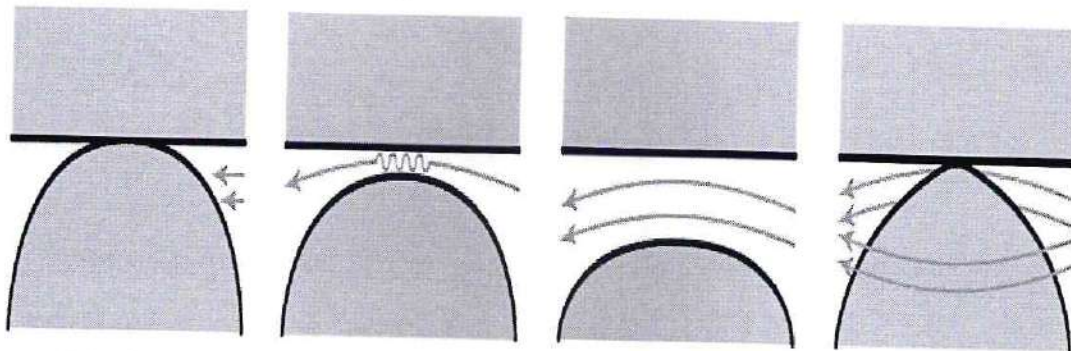
Figure 9.18. Manners of articulation, from left to right: Plosive, fricative, approximant, and lateral[9]

The manners in which the English consonants are produced can be also put into two groups: obstruents and sonorants. The obstruents are consonants usually made with either a complete or partial closure of air passage. This group includes plosives, fricatives, and affricates. The sonorants have less obstruction of the flow of air and are all voiced. This group includes nasals, lateral, and approximants. The manners of the English consonants as obstruents and sonorants are illustrated in the following diagram:

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[9]https://ecampusontario.pressbooks.pub/essentialsoflinguistics2/chapter/3-4-describing-consonants-manner/

```
                          Consonants

          obsruents                        sonorants

  plosives  fricatives  affricates    nasals  lateral  approximants
```
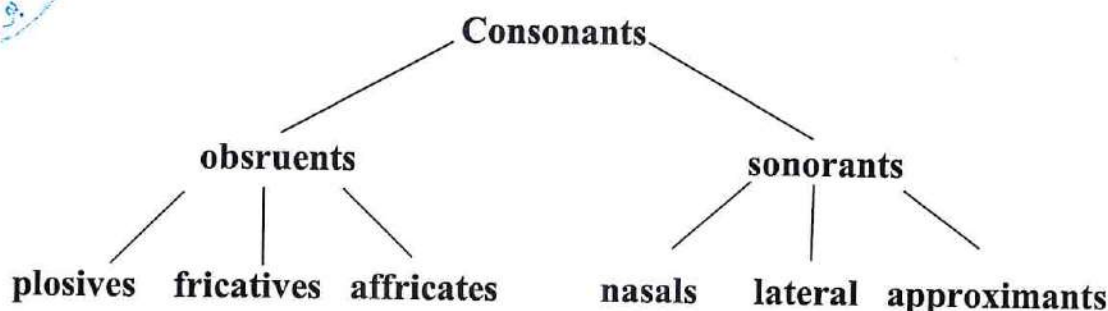
3-Voicing:

This aspect denotes whether the sound is voiced or voiceless. The quality of voicing is the result of the different positions the vocal cords take when articulating sounds. They are inside the larynx which has an important function in speech. Its structure is made of cartilage. The glottis refers to the opening (space) between the vocal cords.

a- When they are wide apart without any vibration (open glottis), the sounds produced are voiceless. English has the following voiceless sounds: /p/, /t/, /k/, /f/, /Ɵ/, /s/, /ʃ/, /tʃ/.

b- When the space between the vocal cords is narrowed (narrow glottis), the result is the voiceless fricative sound /h/.

c- When there is a rapid closing and opening of the vocal cords (position of vocal cords vibration), the air passing through the glottis causes vibration and the sounds produced are voiced. Besides the English vowel sounds which are all voiced, the voiced consonants are: /b/, /d/, /g/, /v/, /ð/, /z/, /ʒ/, /dʒ/, /m, /n/, /ŋ/, /l/, /w/, /j/, /r/.

d- When the vocal cords are tightly closed (firmly pressed together) so that air cannot pass between them, the sudden opening results in a sound called a glottal stop or glottal plosive [ʔ]

Wide Apart

Narrow Glottis

Touched or Nearly Touched

Tightly Closed
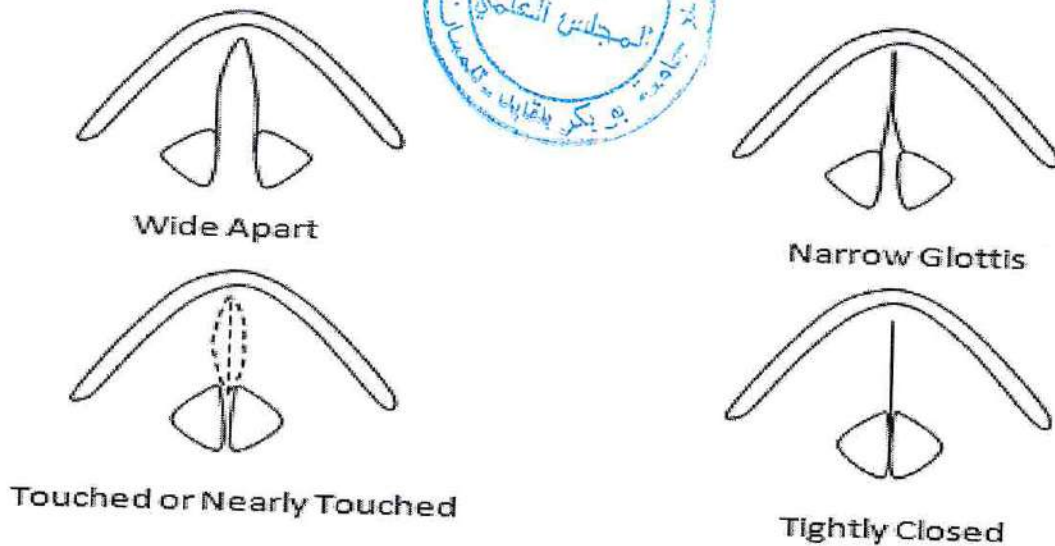
Figure 9.19. Four Different states of the glottis

9.2.1. Plosives /p, b, t, d, k, g/

A plosive is a consonant articulation with the following characteristics: One or two articulators are moved against each other so as to form a stricture (obstruction) that allows no air to escape from the vocal tract. The stricture is the total (complete closure). The air is compressed then, it is suddenly released. When the air escapes it produces a noise called plosion and it can be voiced or voiceless. Generally, a plosive consonant can be described through the following phases of its production:

a- Closure phase: the articulators move to form the stricture.

b- Hold phase: the compressed air is stopped from escaping.

c- Release phase: the articulators are moved so as to allow the air to escape.

d- Post-release phase: this happens immediately after the third phase when the sound is heard. The different phases of the plosive all happen rapidly.

English has six plosive consonants: /p, t, k/, /b, d, g/ + [?] glottal stop.

9.2.1.1. What is a Glottal Stop?

A glottal stop is a sound produced by closing the vocal cords rapidly. It occurs frequently in many dialects of English but in limited phonetic contexts such as:

*An alternative realisation of /p, t, k/ in certain contexts. E.g. picture [pɪʔtʃə] , little [lɪʔl], bottle [bɒʔl], clipboard [klɪʔbɔːd]

/k/→ [ʔ]   /t/ → [ʔ]   /p/ → [ʔ]

* An onset to vowels. E.g. and [ʔænd]   I [ʔaɪ]   you and I [juː ænd aɪ]

Place of Articulation of Plosives

-/p, b/ are bilabial: the lips are pressed together.

-/t, d/ are alveolar: the tip of the tongue against the alveolar ridge.

-/k, g/ are velar: the back of the tongue against the velum.

9.2.1.2. Fortis vs. Lenis

As stated above (section of voicing), the vocal cords which take different positions along with the force of exhalation result in producing voiced and voiceless consonants. Thus, when the force of exhalation and the degree of muscular energy are greater, the sounds produced are voiceless consonants and therefore are referred to as "fortis" consonants which mean strong. Voiced consonants are called "lenis" which means weak and soft because the force of exhalation and the degree of muscular energy are weaker. Thus, voiceless plosives /p, t, k/ are sometimes called fortis consonants (strong) and voiced plosives /b, d, g/ are sometimes called lenis consonants (weak).

9.2.1.3. Minimal Pairs

Minimal pairs are pairs of words where all the sounds are exactly the same except for one sound in the same position. Thus, the difference in meaning between the two words depends on the difference of just one phoneme. The English plosives form minimal pairs in the following words:

Buy vs. pie   tin vs. din   kin vs. Gin

9.2.1.4. Some Characteristics

/p, t, k/ are always voiceless but /b, d, g/ are sometimes fully voiced, and sometimes voiceless (devoiced) depending on the context:

a.   Initial position:

-C + V: the release of /p, t, k/ is followed by an audible plosion. So, in the post-release phase, the air escapes through the vocal cords making a sound like [h]. This is called aspiration.

E.g. part   [pha:t] – time   [thaɪm] – car   [kha:]

Thus, /p, t, k/ are aspirated when they are: followed by a vowel + the syllable is stressed. E.g. paper ['pheɪpə].

But, if /p, t, k/ are:

-preceded by /s/

-followed by /r/, /l/, there is no aspiration i.e. /p, t, k/ are unaspirated.

E.g.   stay   [steɪ]   □preceded by /s/

        cry   [kraɪ]□followed by /r/

              play   [pleɪ]□followed by [l]

-There is also no aspiration when the syllable is unstressed, even if /p, t, k/ are followed by a vowel.

E.g. supper ['sʌpə]   later ['leɪtə]   correct [kə'rekt]

The plosives /b, d, g/ are only partially voiced in the initial position or even voiceless (devoiced). E.g. big [b̥ɪg]

b.   Medial position:

-/b, d, g/ are fully voiced between vowels: ago [ə'gəʊ] about [ə'baʊt] a day [ə 'deɪ]

c. Final position:

-When /b, d, g/ occur in the final position, they are devoiced. E.g. big [bɪg̥] bad [bæd̥]

-Plosives are said to be called stops because during their production there is a complete closure of the oral cavity allowing no air to escape.

-Vowels preceding /**p, t, k**/ are _shorter_ than the vowels preceding /**b, d, g/.** E.g. sat [sæt] vs. sad [sæd̥]

-The English plosives can be presented in the form of a table as shown below:

	Bilabial	Place of articulation alveolar	velar
Fortis (voiceless)	p	t	k
Lenis (voiced)	b	d	g

9.2.2. Fricatives /f, v, θ, ð, s, z, ʃ, ʒ, h/

Fricative consonants are made by pressing and narrowing the air passage via a small gap when air is expelled from the lungs. During their production, the air is not stopped as in plosives but continues to flow through a narrow passage between the articulators making a kind of friction (hissing sound). English has nine fricative phonemes /f,v,θ,ð,s,z,ʃ,ʒ,h/. The eight fricatives except/ h/ go in pairs in terms of their places of articulation:

/**f**/, /**v**/are labiodental: lower lip with the upper teeth.

/**Ө**/, / **ð**/ are dental: the tip of the tongue is raised against the upper teeth.

/**s**/, /**z**/are alveolar: the tip of the tongue is raised against the alveolar ridge.

/**ʃ**/, /**ʒ**/ are palato-alveolar (post-alveolar): the front of the tongue is raised against the alveolar ridge and the front of the palate, i.e. behind the alveolar ridge.

/ **h**/ is glottal: produced in the throat with an open glottis (great space between the vocal cords).

The following diagrams show the five places of articulation:

labio-dental
top teeth & lower lip

/f/ first
/v/ van

dental
tongue & teeth

/θ/ thick
/ð/ these

alveolar
tongue & alveolar ridge

/s/ saw
/z/ zen

post-alveolar
tongue behind alveolar ridge

/ʃ/ she
/ʒ/ casual

glottal
throat

/h/ hard
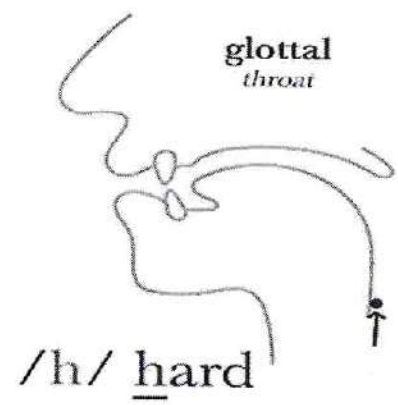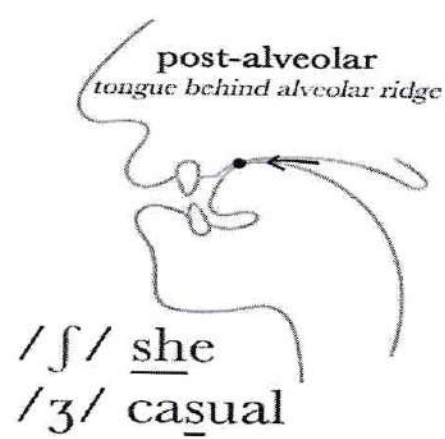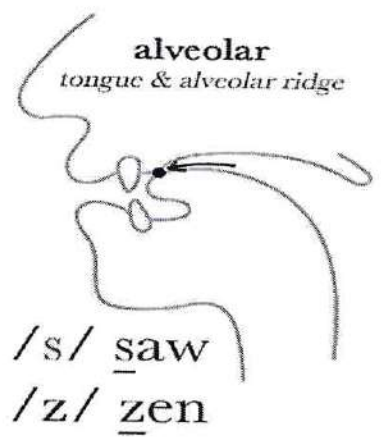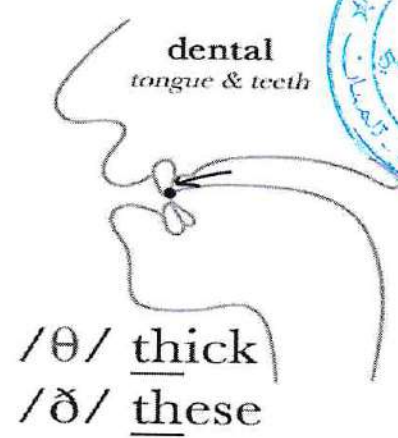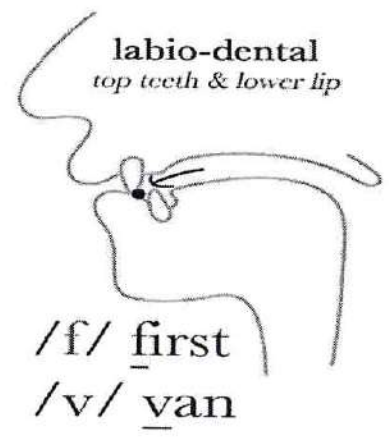
Figure 9.20. Fricatives: place of articulation[10]

9.2.2.1. Some Characteristics of the Phoneme /h/

-The voicing of /h/ depends on its position in the word. It is usually voiceless in the initial position as in heart, he. But, it is voiced between

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[10] https://thesoundofenglish.org/fricative-consonants/

41

vowels like in 'ahead'- 'my head'- 'the hat'. However, /h/ is never found in the final position in English.

-As far as its phonetic realisation is concerned, there is no real obstruction to the flow of air. More or less, it is like vowels but it must be considered as a consonantal distribution [h] followed by a vowel.

9.2.2.2. Some characteristics of /f, v, θ, ð, s, z, ʃ, ʒ/

-Fricatives are said to be called continuant consonants (or simply continuants) because we can continue producing them without stopping as far as there is enough air in our lungs and this contrasts with plosives which are not continuant but they are rather called stops (Roach, 2009).

-The distribution of the fricatives /f/, /v/, /θ/, /ð/, /s/, /z/, /ʃ / shows that they can occur in all positions (initial, medial, and final positions in a syllable), /ʒ/ occurs only in medial and final positions but never in the initial position, and /h/ occurs in initial and medial positions and never in final position (Davenport and Hannahs 2005: 24).

-Like plosives, fricatives influence vowel length in a similar way; vowels occurring before voiceless fricatives are shorter in length than vowels occurring before voiced fricatives (Roach, 2009) e.g. in 'eyes' [aɪ] sounds longer than [aɪ] in 'ice'. In 'teethe' [i:] sounds longer than [i:] in 'teeth'

-The voiced fricatives are devoiced when they occur in initial and final in a word, as in the following examples: vein   →   [v̥eɪn] wave → [weɪv̥] those → [ð̥əʊz̥] with → [wɪð̥]   zen→ [z̥en]

-Fricative sounds form pairs in the following words: fan/van - life/live - sink/think - rice/rise - sip/zip

-Just like plosives, fortis fricatives are realised with more force than the lenis ones. Fortis fricatives are the voiceless ones /f, θ, s, ʃ/ while lenis fricatives are the voiced ones /v, ð, z, ʒ/

42

- Fricatives are presented according to their features in the following table:

Place of articulation

	Labio-dental	dental	alveolar	Palato-alveolar	glottal
Fortis (voiceless)	f	Θ	s	ʃ	h
Lenis (voiced)	v	ð	z	ʒ	

Activity

-Think of other minimal pairs for fricatives. Say them loudly in the classroom.

-Think of minimal pairs from other languages or dialects that you know.

9.2.3. Affricates /tʃ, dʒ/

They start like plosives in the beginning and then end like fricatives: they begin with an articulation which is almost the same as plosives in the closure and hold phases. But, instead of releasing air rapidly with plosion and aspiration at once, the tongue moves to the position of the fricative /ʃ/ producing /tʃ/ as a voiceless affricate and thus, the air continues to flow through a narrow passage like fricatives(Roach, 2009, Zsiga, 2006)

Church /tʃ3: tʃ/ judge /dʒʌdʒ/ teacher /'ti:tʃə/

- Both /tʃ/ - /dʒ/ have the same place of articulation: palato-alveolar.

43

Activity

Transcribe the following words: wish, witch, large, jam, fashion, and region.

9.2.3.1. Glottalisation of /tʃ/

As stated earlier in the section on plosives, voiceless consonants are produced with an open glottis which means the vocal cords are apart from each other. This serves widely for successful voiceless fricatives production (Roach, 2009). Voiceless plosives /p, t, k/ can be produced with a completely closed glottis; this is called glottalised pronunciation (Roach, ibid) where the glottal stop [ʔ] occurs initially before these sounds but only in certain contexts (back to see plosives). The most common glottalisation of affricates is that of /tʃ/ at the end of a stressed syllable (Roach, 2009). Instances of glottalisation 'are words with 'tʃ' sound:

Words	With glottalisation	Without glottalisation
Nature	'neɪʔtʃə	neɪtʃə
Catching	kæʔtʃɪŋ	kætʃɪŋ
Reaches	rɪʔtʃɪz	rɪtʃɪz

(Roach, 2009: 53)

9.2.3.2. Some Characteristics

-Like plosives and fricatives, the two affricates form a fortis/lenis pair: fortis /tʃ/ and lenis / dʒ / in the words: **ch**eap vs. **j**eep   ri**ch** vs. ri**dge** **ch**erry vs. **J**erry

-When occurring at the end of a syllable, the voiceless affricate /tʃ/ has the characteristic of shortening a preceding vowel

-The voiced affricate / dʒ / is devoiced when occurring in initial position of a syllable, except when immediately preceded by a voiced sound.

44

E.g. agenda → [əˈʤendə] [ʤ] is fully voiced

Jack → [ʤæk] [ʤ] is devoiced

9.2.4. Nasals /m, n, ŋ/

What is particular about nasal consonants is that during their production, the air escapes through the nasal cavity and nostrils while there is a complete closure in the oral cavity when the velum is lowered. There are three (3) types of closures according to the place of articulation:

Bilabial /m/: member   /ˈmembə/

Alveolar /n/: name   /neɪm/

Velar /ŋ/: sing /sɪŋ/
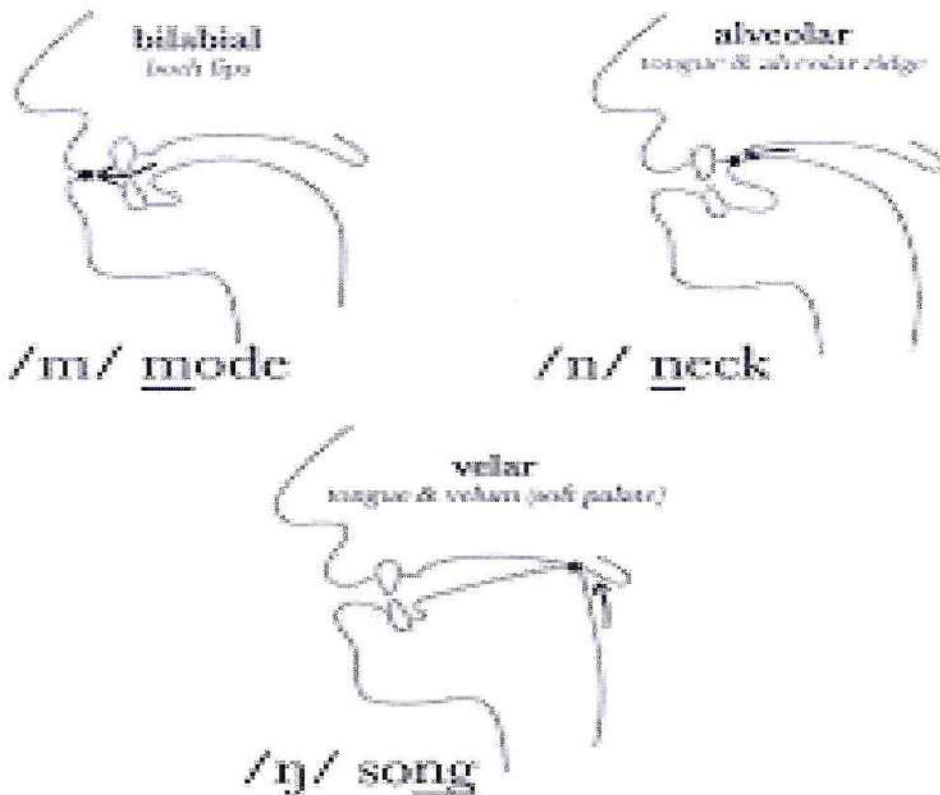
Figure 9.21. Nasals: place of articulation

9.2.4.1. The Realisation of the Phoneme /ŋ/

-The phoneme /ŋ/ is never found in the initial position, but only in the mid and final position like in singing /'sɪŋɪŋ/. The nasal consonants have the same places of articulation as plosives but the manner is different. They are produced with nasality. The plosives are produced with plosion.

As far as the velar nasal consonant /ŋ/ is concerned, the consonant which follows is variably realised.

1. In words ending in 'nk' → /k/ is always pronounced.

E.g. think /Θɪŋk/   bank   /bæŋk/

2. But when the letter (g) follows (n), its pronunciation depends on the morphology of the word:

*/g/ is never pronounced in the final position. E.g. thing /Θɪŋ/, ring /rɪŋ/

* In the mid position (g) is pronounced if the word is, at the same time, one morpheme. E.g. finger /'fɪŋgə/

one morpheme

*(g) is not pronounced if the word is constituted of two (2) morphemes

E.g. singing →   /'sɪŋɪŋ/   singer → /'sɪŋə/

However, there is an exception: (g) is pronounced in mid position with the two morphemes of comparison: er- est

Stronger →   /'strɒŋgə/

The longest →   /'lɒŋgɪst/

9.2.4.2. Some Characteristics of /m, n, ŋ/

-The nasals /m/ and /n/ occur in all positions, i.e. initial, medial, and final positions in words as in 'make, timid, fame' and 'name, end, fun'

-When nasals /m/ and /n/ follow a voiceless fricative /s/ in initial clusters, they are devoiced as in the following example:

46

snake → [sneɪk]

smoke → [sməʊk]

-Nasals are syllabic at the end of a word when they occur immediately after an obstruent, as in: chasm → [kæzm̩] (Ladefoged, 2001)

-Nasals form minimal pairs as in the following words: si**n** vs. si**ng** - su**n** / su**ng** - thi**nk** / thi**ng**   wi**n** vs. Wi**ng**

9.2.4.3. Nasalization of Vowels

Vowels in English are noticeably nasalized[11] when they occur before nasal consonants in the same syllable. Thus, a nasalized vowel is a vowel that occurs before one of the nasal consonants /m, n, ŋ/ and therefore is produced with a lowered soft palate (velum) so that some air escapes through the nose during its production by the mouth. I.e. the air flows through both the nose and mouth. In this case, we may say that the vowel is produced with nasality or nasalized. Rather than representing each nasalized vowel with its own symbol, the property of nasalization is symbolized with a tilde diacritic [~] placed over the vowel, so the phonetic transcription of the following English words would be:

Anger   [ãŋgə]

Limp   [lĩmp]

Fan   [fãn]

Rogers (2000) mentions that there are cases of nasalization when vowels occur after nasal consonants. But, they are quite unimportant compared to vowel nasalization before nasal consonants and are, generally, ignored in transcription (Rogers, ibid). We take the example of

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[11]Nasalization is considered as a case of assimilation. Assimilation in its simplest definition is the process by which two sounds become more similar to each other. In assimilation one sound is affected by the neighbouring sound and hence takes some of its characteristics and features.

the words 'nab' [næb] vs 'ban' [bãn] (no diacritical mark on the vowel [æ] to show nasalization).

9.2.5 Lateral /l /

This consonant is called a voiced alveolar lateral. It is a lateral consonant because, during its production, the air doesn't flow the usual way along the tongue like other consonants but through the two sides of the tongue which are pulled down, while the tip of the tongue is against the alveolar ridge.

9.2.5.1. Some Characteristics

-The phoneme /l/ has two (2) realisations in complementary distribution depending on the context:

-*'clear l'* when followed by a vowel. E.g. alone [ə'ləʊn] – leaf [li:f]. During the production of clear l [l], the tip of the tongue is placed against the alveolar ridge.

-*'Dark l'* when followed by a consonant. E.g. milk [mɪłk] - or in final position e.g. feel [fi:ł].During the production of dark l [ł], the back of the tongue is raised towards the velum.

Light L   Dark L
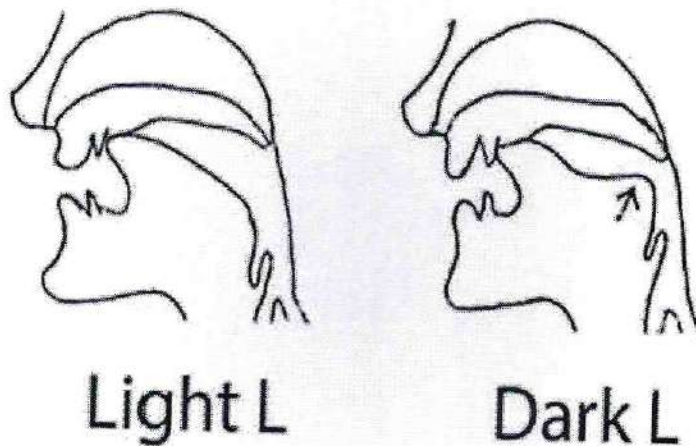
Figure 9.22. Clear and Dark L

48

The phoneme /l/ has two realisations:

/l/
→ [l]   Clear l
→ [ɫ]   Dark l
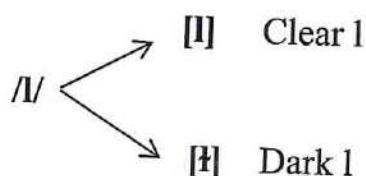
Clear l and dark l are two (2) allophones in complementary distribution where one realisation cannot be substituted for the other one.

- The phoneme /l/ is often syllabic in final position when preceded by a consonant.

/l/ is often syllabic [ɫ̩]+
→ **In final position**
→ **Preceded by a consonant**
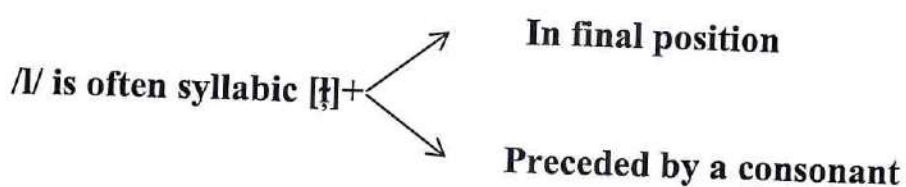
E.g. little ['lɪtɫ̩] /'lɪtl/

-The phoneme /l/ is devoiced when preceded by a voiceless consonant:

Please [pl̥iːz̥]   clean [kl̥iːn]

9.2.6. Approximants /r, w, j/

They are called approximants because, during their production, the articulators approach each other without making real contact (no full closure as in plosives) and without producing turbulent air friction (as in fricatives). Approximants are also termed semi-vowels because the air is not totally blocked (no full oral closure) like plosives and fricatives (Hudson, 2000)

Place of articulation

All three approximants are voiced and the manner of articulation is the same for all of them, but they have different places of articulation.

/w/ is bilabial: both lips come close without real contact.

/r/ is palato-alveolar (post-alveolar):

/j/ is palatal: the front of the tongue is raised against the palate.

9.2.6.1. Some Characteristics of the Phoneme /r/

-/r/ is a voiced palato-alveolar (post-alveolar) approximant in the English language; the tongue is slightly curled backwards bringing the tip to a position slightly further back in the mouth than that of the alveolar ridge area. Then, this approximant is called: post- alveolar.

- Although in RP 'r' is only pronounced when followed by a vowel as in ring [rɪŋ]   arrive   [ə'raɪ̥], it is realised in all positions in many English and American dialects: these are called *rhotic accents* as opposed to RP which is a *non-rhotic accent*. Examples of rhotic accents are: American English: never /'nevər/ Scottish English: hard /ha:rd/

-Just like the phoneme /l/, the phoneme /r/ loses its voicing when it is preceded by voiceless consonants especially /p, t, k/. E.g. pray [pr̥eɪ] cry [kr̥aɪ]   trade [tr̥eɪd̥]

- The approximant / r / can occur in consonant clusters with plosives in words such as pray / **pr**eɪ /, grey / **gr**eɪ /, brace / breɪs/, trace / treɪs/, krill /**kr**ɪl /.

- In English the sound "r" is said to be called linking "r" when it occurs in some contexts. It is an extra sound that is realized by native speakers when they use it between two words in connected speech. In R.P English final "r" is not pronounced, but it is realized as [r] when the word that follows begins with a vowel.

E.g. I need four eggs   ['fɔ: **r** 'egz]

    There is   ['ðər ɪz]

    There are   ['ðər a:]

- Sometimes, "r" appears with no justification from spelling.

E.g. Have you got any idea [r] about that? [aɪ 'dɪərə'baut 'ðæt]

This called intrusive "r". E.g. I saw a film [aɪ 'sɔ:rə'fɪlm]

50

Cuba and China ['kju:bərən 'tʃaɪnə]

9.2.6.2. Some Characteristics of the Phonemes /w, j/

-Traditionally, they were called semi vowels because there is no real obstruction to the flow of air and /w/ is more or less like /u:/ and /j/ is more or less like /i:/ from the phonetic point of view, i.e. their production is more or less the same. But, they are not complete vowels because they are non- syllabic, i.e., unlike vowels, they cannot form the centre of a syllable as each syllable in English has to have one vowel sound as its centre. From a phonological point of view, they must be considered consonants because of their consonantal distribution, i.e. C+V (Roach, 2009).

$$
\left.\begin{array}{l}
\textbf{/w/} \\
\textbf{+ vowel} \\
\textbf{/j/}
\end{array}\right\}
$$

Let consider the following examples to show the consonantal distribution of these phonemes: which / **wɪ**tʃ /   away /ə'**weɪ**/ years /**jɪə**z/ yard /**ja:**d /- /w/, /j/ lose their voicing when preceded by /p, t, k/. E.g. quickly ['kw̥ɪkli] twelve ['tw̥elv̥] pure [pj̥ʊə] tune [tj̥u:n]

-These approximants can occur in consonant clusters with plosivesin words such as: dwell /**dw**el/, twice /**tw**aɪs /, pure /**pj**ʊə /, cute / **kj**u:t /, quite / kwaɪt /

-English approximants form minimal pairs such as: **w**ide vs.**r**ide- **w**ell vs.**y**ell -**r**ap /**y**ap

The following table summarizes the classification of the English consonant sounds on the basis of the three aforementioned aspects.

51

Chart of the English consonant phonemes

Place of articulation

Manner of articulation			bilabial	labio-dental	dental	alveolar	palato-alveolar	palatal	velar	glottal
obstruents	plosives		p, b			t, d			k, g	[ʔ]*
	fricatives			f, v	θ, ð	s, z	ʃ, ʒ			h
	affricates						tʃ, dʒ			
sonorants	nasals		m			n			ŋ	
	lateral					l				
	approximants		w				r	j		

* The glottal stop [ʔ] only occurs as an onset to vowels, as in [(ʔ)ɒʊld], or as an allophonic realisation of /p, t, k/ in certain phonetic contexts or certain dialects, e.g., [pʰrʔtʃə] instead of [pʰɪktʃə].

9.2.7 Typical Spelling Patterns for Consonants

Plosives

/p /: **p**oor, a**pp**le   /d /: **d**own, pa**dd**le, inform**ed**

/b /: **b**ird[12], ra**bb**le /k /: **k**id, **c**offee, lo**ck**, **ch**aracter, **qu**ake, o**cc**ur

/t /: **t**eam, bu**tt**er, talk**ed** /g /: **g**ood, jo**gg**er, e**x**act, **gu**ard

Fricatives

/f/: **f**it, o**ff**er, lau**gh**, **ph**one/s/: **s**ome, mi**ss**, fa**ce**, **c**ircuit, **sc**ience

/v/: bra**v**e, o**f**   / z/: **z**oom, ea**s**y

/θ/: **th**ink   /ʃ/: **sh**ade, **ch**agrin, profe**ss**ion, **s**ure, dona**t**ion[13]

/ð/: **th**is   spe**c**ial, o**c**ean

/ʒ/: bei**g**e, plo**s**ion, mea**s**ure

/h /: **h**it, **wh**ole

Affricates

/tʃ/: **ch**ild, ma**tch**, na**t**ure

/dʒ /: **j**ump, a**ge**, bri**dge**, sol**d**ier, a**dj**ust, gra**du**ate

Nasals

/m/: **m**ad, su**mm**er

/n /: **n**ail, ma**nn**er, **kn**ife, **gn**at, **pn**eumonia

/ŋ /: thi**ng**, thi**nk**, u**nc**le

Approximants

/w/: **w**ave, **wh**at, **o**ne, **qu**ality

/j /: **y**ellow, f**u**el, f**ew**

/r /: **r**ate, **wr**ite, **rh**yme

Lateral

/l/: **l**ow, ta**ll**

---

[12]Note: silent 'b' in limb, lamb, comb, debt, doubt.

[13]The rule for the pronunciation of the letter 't' as [ʃ] is: ti + vowel. E.g. direc**ti**on, pa**ti**ent

9.2.8. Consonant Clusters in English

Consonant clusters in English refer to the sequence of adjacent consonants appearing initially or finally in a syllable without intervening vowels such as the initial [sp-] of 'speak' and [st-] of dust. The syllable in English can begin with a vowel, with one, two or three consonants which are the maximum number of segments in the word-initial consonant cluster in English (Roach, 2009). The syllable can also end with one vowel, with one, two, three or even four consonants which are the maximum number of segments in the word-final consonant cluster in English (Roach, ibid). The following words are instances of word initial and word final consonant clusters in English:

-In initial position: **twin** **spl**ash. Two or three consonants are possible as the initial consonant clusters.

-In final position: te**nt** ado**pts** pro**mpts**. Two, three or four consonants are possible as the final consonant clusters.

EFL learners whose first language does not allow consonant clusters may face problems by mispronouncing the consonants needed one after the other. The best examples of languages that have no consonant clusters are Arabic and Spanish.
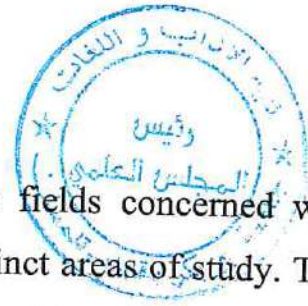
10. Phonetics and Phonology

Although phonetics and phonology are two fields concerned with the study of speech, linguists consider them as two distinct areas of study. The task of phonetics is to describe the sounds used in speaking by covering all the physical aspects of speech production and their relation to speech perception (Levis and Munro, 2012). The task of phonology is to study how phonemes function in language and the relationship between different phonemes. It is the study of the abstract side of the sounds of a language. For Hyman (1975: 2): *'a phonetic study tells how the sounds of a language are made and what their acoustic properties are'*. Phonology has been defined as the study of sound systems. That is, the study of how speech sounds structure and function in languages. Hyman (ibid) states that: *'A phonological study tells how these sounds are used to convey meaning'*. /p/ in English, for example, cannot be combined as /pt/ in initial position. By contrast with phonetics, which studies all possible sounds that the human vocal apparatus can make, phonology studies only those contrasts in sound which make differences of meaning within language. We have to study both phonetics and phonology to acquire a full understanding of the use of sounds in a language.

We consider the following quotation of Trubetzkoy (1939: 10) who is one of the founders of the Prague school of linguistics:

It is the task of phonology to study which differences in sound are related to differences in meaning in a given language , in which way the discriminative elements....are related to each other and the rules according to which they may be combined into words and sentences.

Some differences between phonetics and phonology are stated below:

Phonetics	Phonology
-It is an inventory of speech sounds. E.g. [ɵ] in English and Arabic but not in French -It is concerned with phonetic segments also called phones and units -beats [bi:ts] in English and بيت [bi:ts] (meaning room in most Arabic dialects). The difference between the two realizations is captured in phonological terms i.e. in English final "ts" is a combination of two phonemes /t/+/s/, however, in dialectal Arabic (Tlemcen dialect) final "ts" is just one sound [tˢ]	- Inventory of the phonemic system. - Speakers have a psychological reality of the phonemes of their language. - compare: German salz [zælt͟ˢ] English [sɔ:lt͟s] Equivalent sound sequences but analysed differently by speakers: (tˢ) for German is one phoneme. (ts) for English is two phonemes.

10.1. Phonemes and Allophones

To understand what a phoneme is, it is necessary to consider some fundamental theoretical questions:

        -what is meant by a sound?

        -How are the sounds of English established?

        -How many are there?

Speech is the production of a continuous stream of sounds, but in order to study it, it is necessary to divide this stream into small pieces called *segments.*

E.g. man [m æ n]: three (3) segments. But, it is not always easy to decide on the 1 2 3 number of the segments. E.g. main [m e ɪ n]: three (3) or four (4) segments? 1 2 3 4

The first segment is 'm' and the last is 'n', but should we regard 'eɪ' in the middle as one (1) segment or two (2) segments? Thus, how many sounds are there? Let's consider the set of vowels found in English. Each of these vowels can be pronounced in many slightly different ways so that the total range of vowel sounds produced is practically infinite. But, we are confident that there are only twenty (20) vowels. Why? If we put one of these 20 vowels in place of another, there is a change in the meaning of the word.

E.g. if [æ]is substituted for [e] in the word 'bed' we get a new word 'bad'. We say that these two (2) vowels are *phonemes* because they are capable of changing the meaning of the word. Thus, a phoneme can be defined as the smallest unit capable of changing the meaning of a word. However, in the case of two (2) slightly different ways of pronouncing what is considered the same sound, there is no change in the meaning.

$$[æ^{+}] \nearrow$$
$$/æ/ \longleftrightarrow \quad [æ^{+-}]$$
$$[æ^{-}] \searrow$$
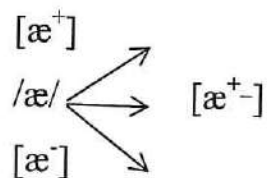
Speech is divided into segments. These segments (units) are called *phonemes* and the complete set of these units is called *the phonic system of the language.* E.g. /p/ is considered a phoneme in the English language, but not in the Arabic language. While /ʔ/ is regarded as a phoneme in the Arabic language ارض- ماء, it is not in the English language. /b/ is sometimes pronounced with *no voicing* but sometimes it is *fully voiced*. E.g. the same phoneme has two (2) different realisations but one can be substituted for the other without affecting

the meaning of the word. These two different realisations are said to be *in free variation.*

$$/b/ \begin{cases} [b] \\ [b] \end{cases}$$
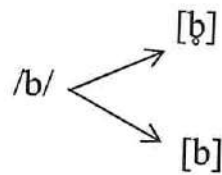
Another case concerns the realisation of /t/ which can be either *aspirated* or *unaspirated.*

$$/t/ \begin{cases} [t^h] \text{ as in tea} \\ [t] \text{ as in eat} \end{cases}$$
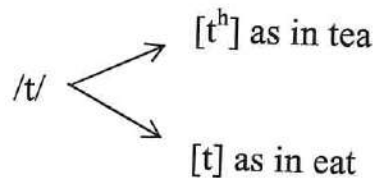
The two different realisations are both recognized as /t/, but aspirated $[t^h]$ will never be found in the place where the unaspirated [t] is appropriate and vice versa. In this case, we say that the two (2) realisations are said to be in complementary distribution (context) which means that one *allophone* (realisation) cannot be substituted for the other. For a precise explanation, we say that the phonetic differences of the same phoneme are predictable and caused by the environment.

10.2. Supra-segmental Phonology

Vowels and consonants are said to be known in phonology as segments of which speech is composed. These segments form together syllables that make up utterances. In turn, these utterances are generally accompanied by some features known as supra-segmental such as stress, pitch, length and intonation. Therefore, within phonology, two branches are recognised: segmental phonology and supra-segmental phonology. Segmental phonology studies and analyses speech sounds into discrete segments (or units) such as phonemes. Supra-segmental phonology studies and analyses those features associated with speech. An illustration of supra-se mental features of speech is the significant

58

sound contrasts (differences) which are not the result of differences between phonemes. in the field of phonetics and phonology they are called word class pairs.

Two syllable words make a good example of word class pairs as the meaning or differentiation between verbs vs. nouns/ adjectives is according to whether the stress is on the first syllable or the second syllable. They are with identical spelling, but they differ in stress according to word class (noun vs. verb/adjective). Stress is on the second syllable of a verb and on the first syllable of a noun or adjective. The following list includes common examples of word class pairs (found in English as nouns and verbs). We consider the following two examples:

1- Stress is important in the word 'import' when it on the first syllable and when it is on the second syllable.

'import ['ɪmpɔ:t] noun

Import

im'port [ɪm'pɔ:t] verb
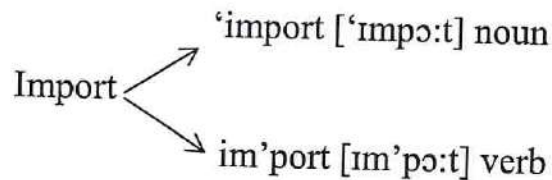
2- Every language has its own speech melody that is generally known as intonation. English is one of the languages that have a complicated and varied intonation. Since English has different dialectal and regional varieties, intonation might also be different from one variety to another. There are quite a few differences between British and American intonation as the speakers of these two English varieties might have, for example, high or low voices or speak fast or slowly.

In general, in the field of phonology, intonation is considered as an important supra-segmental feature as it makes sound contrast in many English words. linguists distinguish between two types of intonation: falling intonation and rising intonation. Let us consider the pronunciation of the word 'right';

when pronounced with a different pitch movement its meaning would be affected.
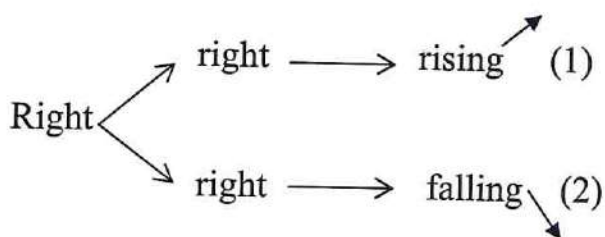
In (1) it is pronounced with a rising tone to indicate a question or invitation.

In (2) it is pronounced with a falling tone to indicate an agreement

11. Conclusion

The English language phonology exhibits peculiarity in its high inconsistency in spelling and sound representation. This inconsistency has only succeeded in making English a unique language compared with world languages. The effective remedy for such spelling and pronunciation mismatch has been the invention of a set of symbols for all world-spoken languages known as the IPA. To show how accurately IPA represents pronunciation we take the following example of English. Basically, the symbols are used for one or two purposes: either they are symbols for phonemes (phonemic or phoneme symbols) or phonetic symbols. The number of phonetic symbols is usually much greater than the number of phonemic symbols because many phonemes may have different realisations or allophones such as:
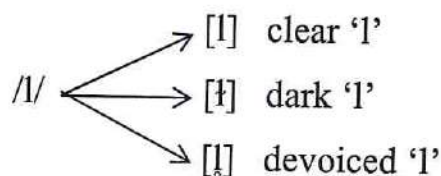
Indeed, we can make many more sounds than the 44 segments in English, especially when we want to represent the pronunciation of the word more

60

accurately (precisely) i.e. by showing all details (narrow phonetic transcription). The best-known system of transcription is the IPA which consists of round a hundred symbols + diacritics to modify these symbols in some way for phonetic detailed transcription.

e.g. /æ/ may be centralized in some dialects [æ̈]

On the other hand, phonemic symbols do not have to indicate precise phonetic quality. From this comes the difference between phonetics and phonology. While phonology is concerned with the function and distribution of phonemes in different contexts, phonetics deals simply with how speech sounds are produced by the speaker and perceived by the hearer. The number of phoneme symbols must be exactly the same as the number of phonemes in the language. For example, there are 44 phonemic symbols in the English language for 44 phonemes. Accordingly, different languages have different phonemic inventions.

12. Exercises

12.1. Exercises on Vowels

Exercise 1

How many sound segments are there in each of the following words?

homophone:..........................   equestrian: ....

broach:..........................   writer:.................................

thatched:............................   middle: ....

knack :.............................   photographer: ....

lesson:...............................   imagination :.........................

Exercise 2

Fill in the blank columns to describe the vowel symbols. An example is provided.

	tongue height	front/back	lip position
ɪ	close	front	slightly spread
ə			
æ			
ʌ			
E			
ʊ			
ɔ			

Exercise 3

On the diagram provided, various articulators are indicated by labelled arrows (a-e). Give the names for the articulators.
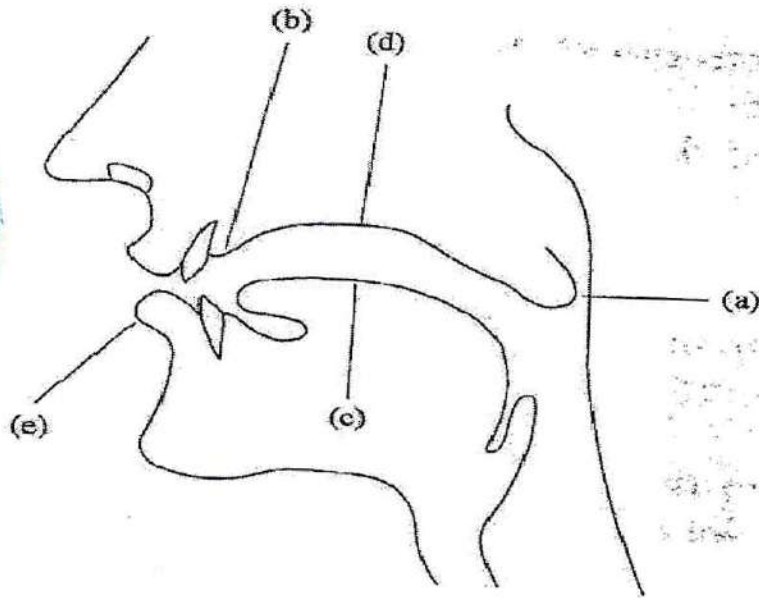
Exercise 4

Write the phonetic symbols for the vowels in the following words:

a) bread
b) rough
c) foot
d) hymn
e) pull
f) cough
g) mat
h) friend

Exercise 5

Write the phonetic symbol for each vowel.

Heard – been – root – heart – caught – all – beef – rude – urn – car – far

....

leaving – speaker – fever – nurse – happy – half – between – beat – pull – luck

....

lock – course – sir – give – meet – hot – for – some – did – dove – are – number

....

Exercise 6

Write in spelling form the following transcriptions.

kʌt – tɒp – mæn – men – pʊt – bʌt – kʊd – bæt – mæd – mʌd – sʌm – tɪp –

....

betə – blʌd – ki:p – lʌv – nɒk – bɜ:d – va:st – du:m – rɪpi:t– mɔ: – ɒfə

....

Exercise 7

Transcribe the vowels.

Loud – care– make – ride – boy – coat – down – same – right – close –

....

main– coal – shaking – invitation – tower – lawyer – desire – tour – there

....

Exercise 8

Write the <u>symbol</u> that corresponds to each of the following phonetic transcriptions, and then give an <u>English word</u> that contains that sound.

Vowel	Tongue position	Tongue shape	Lip position	Example
	half close and half open	front	slightly spread	
	close	back	rounded	
	Half open and open	central	neutral	

Exercise 9

List the phonetic properties of each of the following vowel sounds, and then give an English word that contains that sound.

Vowel	Tongue position	Tongue shape	Lip position	Example
e				
ʊ				
ʌ				

Exercise 10

Put the following words in their corresponding columns.

caught – shirt – owe - deep - sore –mow - word - scowl – fair - brow - door – third – paw - hair - goat – flaw - poor – dear – dean - church – near - loaf – green – mean – floor

ɔ:	ɜ:	i:	əʊ	aʊ	eə

Exercise 11

On the vowel diagram provided below, indicate the glides for the diphthongs in the following words.

oust -   tear -moist – eight - tour - here
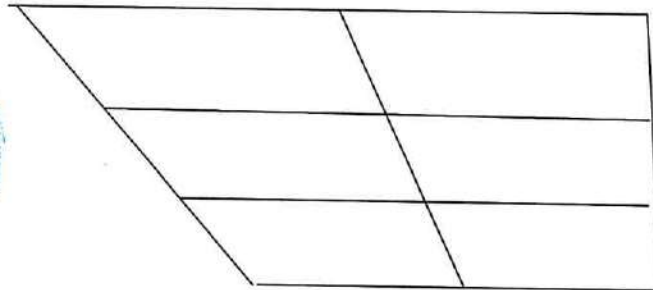
Exercise 12

Fill in the boxes for the first vowels of the following words.

	park	ocean	make	ember	hamper	fought	hypocrite	chew
Tongue height								
Frontness/ Backness								
Lip position								

Exercise 13

Circle the words (when pronounced) that contain a:

a) Close vowel sound

   Sat-suit - got - meet - mud

b) Low vowel sound:

   Weed - wad - load - lad - rude

c) Front vowel:

   Gate - caught - cat - kit - put

d) Central or back vowel:

   Maid - weep - coop - cop - good

e) [+round] vowel:

   Who - me - us - foot - him

Exercise 14

On the basis of the word vowel, insert the following words in the appropriate column: same - shot - ear – how – look - sat – fine – leg – hurt – low – born - tour - feel - bar – there – one –boy - loom

ɔɪ	uː	ʌ	eə	aː	əʊ	iː	ʊə	ɔː
ɜː	**e**	**aɪ**	**æ**	**ʊ**	**aʊ**	**ɪə**	**ɒ**	**eɪ**

Exercise 15

Find the errors in the transcription of the vowel sounds in the following words. In each word there is one error. Circle this error, and write the correct symbol in the space provided after the word.

Word	transcription	Correct transcription
1-Man-made	['manmeɪd]	
2-tea chest	['titʃest]	
3-tomcat	['tomkæt]	
4-tiptoe	['tɪptoʊ]	
5-avoid	[æ'vɔɪd]	
6-remain	[rɪ'maɪn]	
7-roommate	['rɔmmeɪt]	
8-umbrella	[um'brelə]	
9-manage	['mænædʒ]	
10-football	['fʊtbol]	

69

12.2. Exercises on Consonants

Exercise 1

State whether the place of articulation is the same (S) or different (D) in the *initial consonants* of each pair. In either case, state the place of articulation

Example: now – pneumonia   Same: alveolar

                sun – sugar   Different: alveolar vs. palato-alveolar

Words	Answer
goose – gerrymander	
simple – shackle	
curious – cereal	
phonetic – fictional	
manners – wicker	
normal – location	
wander – yesterday	
those – Thursday	
scissors – zipper	
temperate – chestnut	
chromosome – chief	
baker – delegate	
happened – usual	
neuron – market	
painting – broccoli	
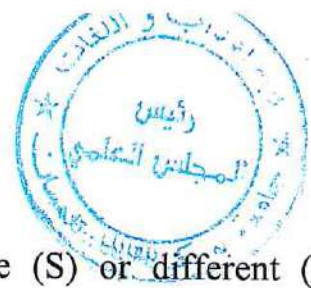
Exercise 2

State whether the manner of articulation is the same (S) or different (D) in the *final consonants* of each pair. In either case, state the manner of articulation

Example: bomb – ten   Same: nasal

rough – zip   Different: fricative vs. stop

Words	Answer
album – broken	
ideal – keepsake	
prologue – confine	
aqueous – sociable	
variable – watch	
waste – adage	
barometer – finish	
inch – gauge	
fiord – equip	
barb – relief	
alive – fiftieth	
laughing – hydraulic	
opulence – paramedic	
outrage – swivel	
dominion – eminent	

Exercise 3

Give the phonetic symbols for the following English sounds.

(a) voiceless stops: ....

(b) voiced fricatives: ....

(c) approximants: ....

(d) alveolar obstruents: ....

(e) nasals: ....

(f) voiced obstruents: ....

Exercise 4

Give a complete description of the consonant sound represented by the symbol ad then supply an English word containing the sound

Example: /tʃ/

Answer: voiceless alveo-palatal affricate

1. /Ɵ/:...

2. /ʒ/:...

3. /ŋ/:...

4. /r/:...

5. [ɫ]:...

6. /j/:...

Exercise 5

Fill in the boxes with the appropriate label for the *final sounds* of each word.

	sipped	latex	triumph	bridge	rough	fought	dogs	palm
Upper articulator								
Lower articulator								
Voicing								
Manner of articulation								

Exercise 6

Do the same for the *initial sounds* of the same words.

	sipped	latex	triumph	bridge	rough	fought	dogs	palm
Upper articulator								
Lower articulator								
Voicing								
Manner of articulation								

Exercise 7

Provide a broad transcription beneath each word. Underline the consonant clusters occurring initially or finally.

| Access | glimpsed | splash | round | helped | quality |

....

| Attempts | quantity | expect | sixth | exaggerates | quarrel |

....

| Executive | twelfths | exodus | strength | fixed | exploit |

....

| Shrimp | expire | filmed | accent | extract | contexts |

....

Exercise 8

Read the following words and decide whether the first sound in each pair is the same or different

1. skill- psychology
2. fire - photo
3. card- ceiling
4. net - knee
5. ten- thin
6. pot - bell
7. Chad - chateau
8. go- gym
9. right - write
10. dad - that

Exercise 9

Give the correct term for the sounds produced in the following ways:

a. the tip of the tongue touching the upper teeth:...............................

b. the tip of the tongue touching the alveolar ridge:............................

c. the back of the tongue touching the soft palate:...............................

d. the lips coming together:...

e. the front of the tongue touching the hard palate:............................

Exercise 10

Give the symbol for each of the following sounds with an example of its use in a word:

1. voiceless bilabial plosive:.............   6. voiced alveolar nasal...............

2. voiceless alveolar continuant..........   7. voiced velar plosive.................

3. voiceless dental fricative ....   8. voiced alveo-palatal affricate......

4. voiced alveolar lateral ....   9. voiceless labiodental fricative......

5. voiced palatal consonant..............   10. voiced velar nasal...................

Exercise 11

(a) In which of the following words is the /l/ likely to be dark (velarized)?

Alive   middle   Carl   pal   kill   play   loom   feel   flack

....

(b) In which of the following words are /p/, /t/, /k/ likely to be aspirated?

Plotter – filter – pattern – quite – tap – type – scale – calm – careful –

....

cupboard – party – cap – pack – stable – spotting – paraphrase – stuck

....

Exercise 12
What phonetic property distinguishes each of the following pairs of sounds
/k/ and /g/
....
/b/ and /d/
....
/d/ and /z/
....
/z/ and /ʒ/
....
/ʃ/ and /ʒ/
....
/d/ and /g/
....

Exercise 13

Correct the mistakes in the description of the English consonants in the table below then complete the columns.

Description	Correction	Phonetic symbol of the sound	One example with phonetic transcription
Voiced dental plosive			
Voiceless velar fricative			
Voiceless glottal plosive			
Voiceless bilabial fricative			
Voiced palato-alveolar plosive			
Voiceless labio-dental plosive			

Exercise 14

Write the phonetic symbol for the letter or combination of letters highlighted in the following words. Give a full broad transcription of each word.

-**Sh**arm - **g**ym

-Trea**s**ure - men**ti**on

-Lar**ge** - do**g**

-Fri**dge** - **c**loth

-**Qu**ack - **ph**one

-**Ch**oose - **sh**oes

-**Ch**aracter - fea**th**er

76

-<u>X</u>erox   -   lau<u>gh</u>

- In<u>s</u>ure   -   pier<u>ce</u>

-Lik<u>ed</u>   -   lov<u>ed</u>

Exercise 15

Each of the following sets contains three similar sounds and an odd one. Pick out the odd (different) member and explain why it is different.

1. b, p, s, t:..

2. b, k, t, p:..

3. b, m, p, s: ....

4. l, f, v, s:...

5. t, n, l, p:...

Exercise16

Each of the following contains one error in transcription; i.e. it indicates an impossible pronunciation of the word for a native speaker of English. Give the word and supply the correct transcription.

Example: /piːtsæ/   word: pizza   transcription /piːtsə/

    (a)   /sɪteɪʃən/

    (b)   /sʊnflaʊə/

    (c)   /ɔɪstərs/

    (d)   /mægɪkəl/

    (e)   /neɪbərhəd/

    (f)   /ɔrəəpɪdɪk/

Exercise 17

Give broad transcription of the following words.

Parochial   habitual   parliament   hallucination   embarrassment

....

Cucumber   delinquent   questionnaire   jewelry   giant   literature

....

Exercise 18

Give narrow transcription of the following words.

Bridge   bang   cracker   pocket   king   subtle   quick   fry

....

flywrap   stupid   pure   cure   sure   donate   flocks   bottle

....

Exercise 19

Complete the diagrams so as to illustrate the position of the vocal organs during the first consonants in each of the following words. If the sound is voiced, schematize the vibrating vocal cords by a wavy line at the glottis. If it is voiceless, use a straight line. (Source: Ladefoged, 2001)
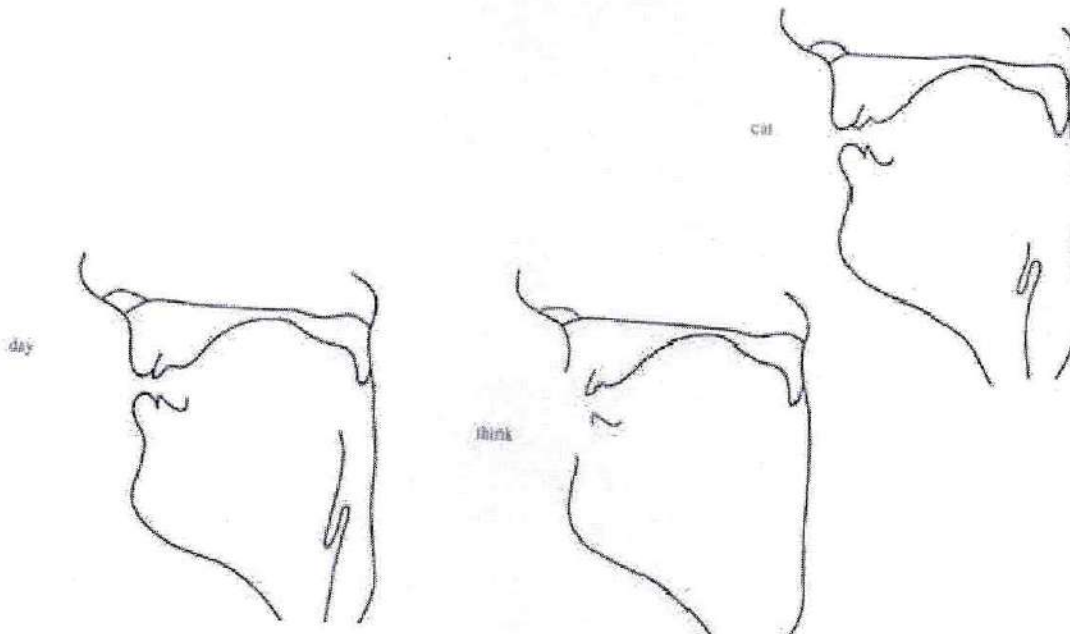
Exercise 20

Find the errors in the transcription of the consonant sounds in the following words. In each word there is one error. Circle this error, and write the correct symbol in the space provided after the word.

Word	Transcription	Correct transcription
1-strength	['strengθ]	
2-crime	['craɪm]	
3-wishing	['wɪshɪŋ]	
4-wives	['waɪvs]	
5-these	['θi:z]	
6-hijacking	['haɪjækɪŋ]	
7-chipping	['tʃɪppɪŋ]	
8-yelling	['yelɪŋ]	
9-sixsteen	['sɪxti:n]	
10-thesis	['ði:sɪs]	

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82

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Appendix 1

Read about cardinal vowels

Peter Roach (2009:12)

Phoneticians have always needed some way of classifying vowels which is independent of the vowel system of a particular language. With most consonants it is quite easy to observe how their articulation is organised, and to specify the place and manner of the constriction formed; vowels, however, are much less easy to observe. Early in the 20th century, the English phonetician Daniel Jones worked out a set of "cardinal vowels" that students learning phonetics could be taught to make and which would serve as reference points that other vowels could be related to, rather like the corners and sides of a map. Jones was strongly influenced by the French phonetician Paul Passy, and it has been claimed that the set of cardinal vowels is rather similar to the vowels of educated Parisian French of the time.

From the beginning it was important to locate the vowels on a chart or four-sided figure (the exact shape of which has changed from time to time), as can be seen on the IPA chart. The cardinal vowel diagram is used both for rounded and unrounded vowels, and Jones proposed that there should be a primary set of cardinal vowels and a secondary set. The primary set includes the front unrounded vowels [i, e, ɛ, a], the back unrounded vowel [ɑ] and the rounded back vowels [ɔ, o, u], while the secondary set comprises the front rounded vowels [y, ø, œ, Œ], the back rounded [ɒ] and the back unrounded [ʌ, ɣ, ɯ]. For the sake of consistency, I believe it would be better to abandon the "primary/secondary" division and simply give a "rounded" or "unrounded" label (as appropriate) to each vowel on the quadrilateral.

Phonetic "ear-training" makes much use of the cardinal vowel system, and students can learn to identify and discriminate a very large number of different vowels in relation to the cardinal vowels.

Appendix 2

Word class pairs

Further examples of word class pairs in English

Word	noun	verb
Conduct	ˈkɒndʌkt	kənˈdʌkt
Contrast	ˈkɒntraːst	kənˈtraːst
Subject	ˈsʌbdʒɪkt	səbˈdʒekt
Rebel	ˈrebl̩	rɪˈbel
Insult	ˈɪnsʌlt	ɪnˈsʌlt
Object	ˈɒbdʒɪkt	əbˈdʒekt
Desert	ˈdezət	dɪˈzɜːt
Record	ˈrekɔːd	rɪˈkɔːd
Export	ˈekspɔːt	ɪkˈspɔːt
Permit	ˈpɜːmɪt	pəˈmɪt
Protest	ˈprəʊtest	prəˈtest
Contract	ˈkɒntrækt	kənˈtrækt
Escort	ˈeskɔːt	ɪˈskɔːt
Import	ˈɪmpɔːrt	ɪmˈpɔːt
Present	ˈpreznt	prɪˈzent

Appendix 3

Diacritics in English for narrow phonetic transcription

The narrow phonetic transcription in English gives more details about how exactly the sound is produced. In this type of transcription, diacritics are used to give accurate pronunciation. Thus, what are diacritics?

In phonetics, diacritics are small marks to a symbol to refine the way it is pronounced. Diacritic marks or diacritics include various accents. Diacritics are used to indicate, for example, aspiration, e.g. [pʰaɪ_] 'pie', vowel nasalization, e.g. wing [wĩŋ], and devoicing, e.g. [b̥ɪɡ].

Some diacritics that modify the value of a symbol (adapted from: Ladefoged, 2001: 61)

̥	devoiced	w̥	l̥	kw̥ɪk, pl̥eɪs	quick, place
ʰ	aspirated	tʰ	kʰ	tʰæp, kʰɪs	tap, kiss
̪	dental	t̪	l̪	æt̪ ð̪ə, hel̪θ	at the, health
̃	nasalized		æ̃	mæ̃n	man
̴	velarized	ɫ		pɪɫ	pill
̩	syllabic	n̩	l̩	mɪʔn̩	mitten

87

Appendix 4

Waveforms of some consonants

The waveforms of the words "tie" and "die"

FIGURE 3.1   The waveforms of the words "tie" and "die."
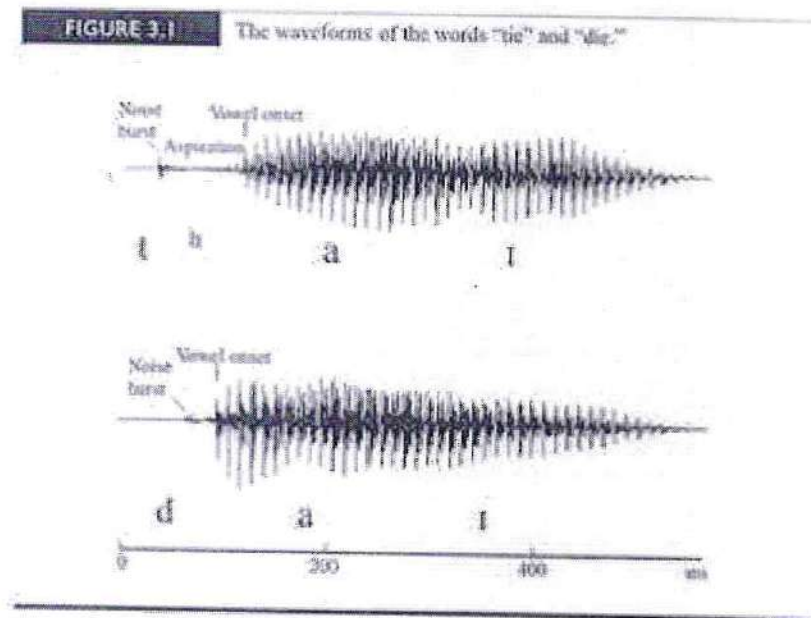
Source: Ladefoged , 2001: 44)

The waveform of the word "sty"

FIGURE 3.2   The waveforms of the word "sty."
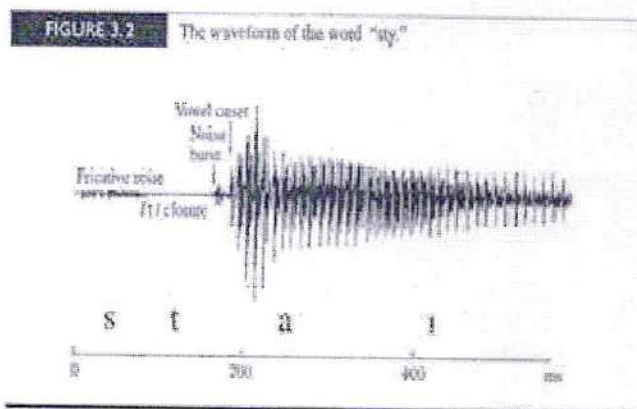
Source: Ladefoged, 2001: 45

The waveforms of the words "mat" and "mad"

FIGURE 1.3   The waveforms of the words "mat" and "mad."
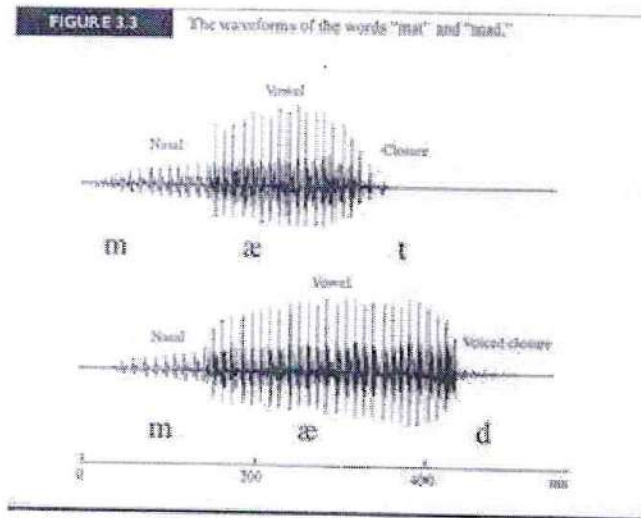
Source: Ladefoged, 2001: 46

Appendix 5

Practise English pronunciation: unknown author of this poem

English is the oddest language: look at the plural form

We'll begin with a box, and the plural is boxes,
But the plural of ox should be oxen, not oxes,

Then one fowl is goose, but two are called geese,
Yet the plural of moose should never be meese.

You may find a lone mouse or a nest full of mice,
Yet the plural of house is houses, not hice.

If the plural of man is always called men,
Why shouldn't the plural of pan be called pen?

The cow in the plural may be cows or kine,
But the plural of vow is vows, not vine.

I speak of my foot and show you my feet,
If I give you a boot, would a pair be called beet?

If one is a tooth, and a whole set are teeth,
Why shouldn't the plural of booth be called beeth?

If the singular is this and the plural is these,
Why shouldn't the plural of kiss be named kese?

Then one may be that, and three may be those,
Yet the plural of hat would never be hose;

We speak of a brother, and also of brethren,
But though we say mother, we never say methren.

The masculine pronouns are he, his and him,
But imagine the feminine she, shis, and shim!

So our English, I think, you all will agree,
Is the craziest language you ever did see.

I take it you already know
Of tough and bough and cough and dough?
Others may stumble, but not you,
On hiccough, thorough, slough, and through?

Well done! And now you wish, perhaps
To learn of less familiar traps?

Beware of heard, a dreadful word,
That looks like beard and sounds like bird.

And dead; it's said like bed, not bead;
For goodness sake, don't call it deed!
Watch out for meat and great and threat;
They rhyme with suite and straight and debt.

A moth is not a moth in mother,
Nor both in bother, broth in brother.

And here is not a match for there,
Or dear and fear for bear and pear.

And then there's dose and rose and lose,
Just look them up, and goose and choose.

And cork and work and card and ward,
And font and front and word and sword.

And do and go, then thwart and cart.
Come, come, I've hardly made a start.

A dreadful language? Why, man alive,
I'd learned to talk it when I was five,
And yet to write it, the more I tried,
I hadn't learned it at fifty-five!