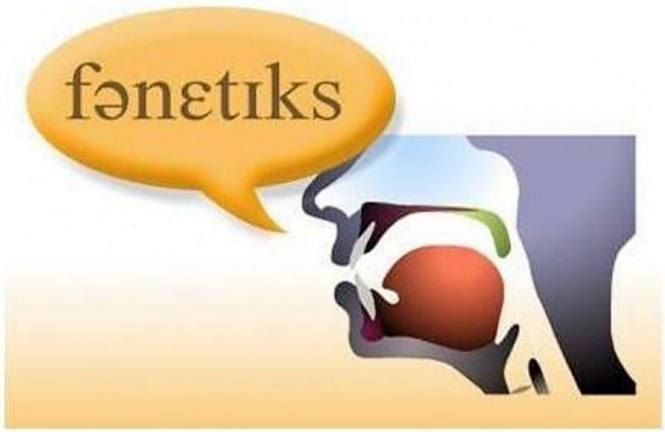

Dr. Rewaa Anwer

PHONETICS

THIRD YEAR

ENGLISH DEPARTMENT

GENERAL EDUCATION

DR. REWAA AHMED ANWER

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FOREWORD

This course is meant to help English as a Foreign Language (EFL) university students familiarise themselves with the basics of English phonetics. It covers the English phonetics syllabus, which is generally taught in the 1st semester of an English philology programme at the university level. It provides information on the sound system of English and deals specifically with some specific problems faced by Lithuanian as well as by international EFL learners. This course focuses on segmental phonetics and beyond: the structure and linguistic function of the articulatory apparatus, the characteristics and classification of vowels and consonants, the International Phonetic Alphabet and its use in phonetic transcription. It also briefly expands on the syllable and word stress. It basically serves as a background for further readings on suprasegmental phonetics and aspects of connected speech.

Because the course is organised so as to cover the workload of one semester, it does not compete with other more extensive introductory courses to phonetics. Bearing in mind that there already exist excellent introductions to phonetics, extensive theory and practice books containing pronunciation drills and exercises, phonetics seems to be a well-provided field. This course, however, attempts to present a short, synthesised, and systematic approach to English phonetics and serves as a guideline for further reading for students. The theoretical framework is principally based on the work of Clark and Yallop (1992), Roach (2009), Crystal (2004, 2008), Gimson and Cruttenden (2008), Collins and Mees (2003) and the other works mentioned in the list of references. Last, but not least, the course aims to continue the work of the Lithuanian phoneticians R. Aprijaskytė and L. Pažūsis whose invaluable contribution to the field motivates and provides us with comprehensive knowledge.

This course contains nine sections that are arranged according to the course's unit content. Section 1 opens with an explanation of the terms dialect and accent as well as a justification for the choice of received pronunciation (RP). Section 2 introduces the readers to the key sound concepts: phone, phoneme, and allophone. It also annotates the science of phonetics and phonology. In Section 3, articulatory apparatus and sound production are examined. Section 4 familiarises the students with the International Phonetic Alphabet and introduces the development of

transcription skills. Sections 5 and 6 present the characteristics and classifications of vowels, consonants, and sonorants. In Section 7, several complex phonemes and their allophones are detailed in terms of their articulation and distribution. Section 8 expands beyond the segmental level and briefly dwells on the concept and the structure of the syllable. In addition, stress placement is discussed with reference to complex stress patterns in longer words and compounds. Finally, strong versus weak forms of function words are presented under the influence of sentence stress in Section 9.

Each section also features a list of further reading options, a terminology self-assessment, and several study questions and exercises, which are predominantly focused on the formation of transcription skills. Students are also provided with a glossary that uses Lithuanian equivalents to help explain the key terms and complex anatomy concepts.

The course is not intended to overload the students with theory reading, thus allowing considerable time and opportunity for practice in a language laboratory and offering flexibility for incorporating the instructor's personal preferences for teaching the course. For the extension of this particular course, a suprasegmental study should follow to give students the full picture of English phonetics.

Orthography

For the purpose of convenience, the following orthographic notations are used: target spelling entries are written in *italics*, e.g. *team*, and target transcription entries are highlighted in navy blue and inserted either between slashes for phonemic transcription, e.g. /tiːm/ or, in rare cases, between square brackets for allophonic transcription, e.g. [tʰiːm] (for further details see Section 4). To visually distinguish the basic theory concepts and terms, they are written in **bold**.

The text also features tables, which give synthesised theory concepts and examples, as well as several figures either adapted from Roach (2009) or referenced to their original sources.

1. VARIETIES OF ENGLISH

1.1. Varieties of Language

Varieties of language refer to the differences in the systems of a language that emerge from social, historical, geographic, social, and other changes. In other words, a language variety is "a system of linguistic expression whose use is governed by situational variables" (Crystal 2008: 509). A **dialect** is governed by regional or social distinctiveness and is identified by particular vocabulary, pronunciation, and grammatical structures. Crystal (2008) states that languages develop dialects when they are used by a large number of speakers and if there are "geographical barriers separating groups of people from each other or […] divisions of social class" (2008: 509). All people speak a dialect. A group of people who speak a certain dialect is often referred to as a **speech community**. A language variety that is defined on social grounds is called a **sociolect**. It primarily applies to a particular social class of people or to an occupational group. A regional dialect or **regiolect**, conversely, describes the language spoken in a particular geographic area. An **idiolect** is the individual and unique use of language restricted to a single speaker. This term implies an awareness that each individual speaks in a different manner in terms of vocabulary, grammar, pronunciation, and levels or styles of language use. An **accent** refers to pronunciation only. An accent may be considered to be a spoken representation of a dialect because it reflects "those features of pronunciation which identify where a person is from, regionally or socially" (Crystal 2008: 3). As all people speak a dialect, all people have an accent. A predominating dialect may become the official or **standard** form of the language. Often it is referred to as a prestige variety or, as Crystal (2008) calls it, an "institutionalised form" (2008: 450), the term which is used in the mass media, foreign language teaching, etc. **Nonstandard** varieties, consequently, are defined as dialects which "do not conform to this norm" (Crystal 2008: 450).

1.2. Standard English

Internationally, there are many varieties of English as it is spoken worldwide as a first or a second official language. As a first language, it is spoken in the United

Kingdom, the United States of America, Canada, Ireland, Australia, New Zealand, South Africa, and some islands in Central America. Today all English-speaking nations have their own national varieties of English. A **national variety** is defined as the speech of a nation, e.g. British English, American English, Australian English, Canadian English, etc. Each national variety holds its standardised language as Standard English, General American, etc.

This course is based on **Standard English (SE),** the norm of British English. Trudgill (1999) calls SE "the most important dialect in the English-speaking world from a social, intellectual and cultural point of view" (1999: 123). SE is not regionally based, but instead, it is a purely social dialect. It is the variety of English associated with high status, promoted by educational institutions, used in government, law courts, the church, and media. It is used for printed texts and formal speeches. The linguistic features of this standard variety, however, are matters of grammar and vocabulary, but not pronunciation. As a result, SE is spoken in various accents that vary according to their regional origin, and the social group, or ethnicity of the speaker. The accent which is most often associated with SE is known as **Received Pronunciation.**

1.3. Received Pronunciation

Received Pronunciation (**RP**) is the pronunciation that is associated with the educated, typically the middle and upper classes of the community. As with the SE dialect, RP is also identified not so much with a geographical region as with a certain social group. It has connotations of prestige and authority and is an indicator of formal speech. Various terms for RP include **The Queen's English, Public School Accent, Oxford English, BBC English, the accent of the Court**, etc. All the expressions mentioned above reflect important historical and social aspects of RP.

1.3.1. History of RP

The historical origins of SE can be traced back to the 16th century (Fisher, 1993) when prestige and authority became attached to one accent, particularly the accent used by the court and the central administration in London. Being the language of the educated "upper social class" people, this pronunciation was perceived as the correct and accepted version, whereas other accents were treated as corrupted forms of the norm.

The 19th century saw a flowering of the prestige public schools and this contributed greatly to the growing importance placed on the accepted accent. During the course of the century, the royal family and the upper-class members of the society, attended boarding schools such as Eton, Winchester, Harrow, Charterhouse, Westminster, or Rugby, and they graduated from Oxford and Cambridge Universities. The prestigious accent they used gained a unique status and "became the kind of pronunciation passed down from one educated generation to the next" (Crystal 2004: 3). The term "Received Pronunciation" was proposed in 1869 by the linguist A. J. Ellis, however it was not a widely used term until the phonetician D. Jones adopted it in the second edition of the English Pronouncing Dictionary in 1924.

RP probably received its most accepted status in 1922 when it was adopted as the British Broadcasting Cooperation (BBC) broadcasting standard. The BBC only employed announcers and newsreaders who were RP speakers. To supplement its language policy, the BBC Advisory Committee on Spoken English was established in 1926. After World War II, it was renamed "the BBC Pronunciation Unit", and its authority diminished to that of providing guidelines to newsreaders on the pronunciation of geographical and personal names. The unit still functions today, although modern BBC newsreaders and announcers more often speak in mild local accents and modified RP rather than in its pure form. Moreover, the BBC Overseas Service has taken to using a number of newsreaders from regional stations whose English, by British standards, has a strong foreign accent. Nevertheless, Roach (2009) claims the BBC is still respected by many people in Britain and abroad as a model of good English and can still be classed as **BBC English**.

1.3.2. RP Today

Recent estimates suggest only 3-5% of the UK population speaks RP today. Despite its statistical insignificance, it is still the language of the educated, the most widely studied, and the most frequently described variety of spoken English in the world. Moreover, as England is a place where a person's accent still represents an important index as to the social and educational background of the speaker, RP still maintains its high status.

As well as being a prestigious accent, RP is also a concept in phonetics. Phonemic transcriptions in dictionaries are based on this particular accent, and it serves as a standard for EFL learners in Europe. Therefore, the current social and linguistic status of RP is of special relevance to EFL university students. Moreover, in the field

of accent studies, RP is widely used as a reference accent for comparison with other varieties.

1.3.3. Types of RP

RP, like all accents, changes constantly and incorporates new phenomena, while others are lost. Consequently, different subtypes of RP can be distinguished, which are more or less conservative or progressive, and which are spoken by different age groups. Gimson and Cruttenden (2008) identify three main types of RP:

1. **Conservative RP**, which is the most resistant to change and is characteristic of older generations. It is traditionally used by certain professions or social groups;
2. **General RP**, which is commonly defined as the pronunciation adopted by the BBC and is the type most commonly in use;
3. **Advanced RP**, which typifies attempts to change and is chiefly used by young people of exclusive social groups.

Wells (1982) makes a similar distinction by reducing the number to two types:

1. **Mainstream RP,** which largely corresponds to general RP and is the unmarked and modern type of RP, traditionally spoken by BBC newsreaders.
2. **Upper-Crust RP**, which is a more conservative and old-fashioned type of RP, mostly associated with elderly people, the upper class, or the members of the royal family.

It is also common to distinguish between RP and what Wells (1982) calls **Near-RP** accents. These are close to Mainstream RP but accommodate mild regionalisms and therefore do not fall completely within the boundaries of RP.

1.4. On Cockney and Estuary English

Cockney is a British accent, which originated in the East End of London. It is often associated with London's working class, and originally attributed to those who were "born within the sound of Bow Bells" (Wells 1982: 302), i.e. the bells of Saint Mary-le-Bow Church in Cheapside in London. For some time, the Cockney accent was scorned and regarded as inferior. However, it is currently an accent trending among middle-class Londoners. McArthur and McArthur (2005) indicate the following pronunciation features typified for Cockney accent: glottal stops (see p. 43), /l/ vocalisation (see p. 43), th-fronting (/v/ and /f/ sounds instead of /θ/ and /ð/),

and other phonetic features that have become characteristic in and around London and are notably favoured by the young.

Estuary English (EE) is the term, which seems to best reflect the predominant modern accent in London. EE seems to comprise both the prestige of RP and the back-to-modern features of working-class Cockney. Rosewarne (1994: 3) calls it "the accent between Cockney and the Queen." EE "supposedly originated in the counties adjacent to the estuary of the River Thames" (Crystal 2008: 173), and thus displays the influence of London regional speech. Rosewarne (1994) claims that this form of speech is a new sort of standard, which has replaced RP and is favoured by the young upwardly mobile people in all spheres of life, including professionals. Roach (2009) states that EE is not really an accent, but more a modern deviation from RP used in the London area and characterised by glottal stops and /l/ vocalisation.

1.5. Global English

English has become an international language not only because it is used by so many people all over the world, but also because it has developed into the essential means of global communication, embracing access to the world's intellectual and technical resources. Crystal (2003) defines a global language as a language that "achieves a global status when it develops a special role that is recognised in every country" (2003: 3). Thus, English is often referred to as **Global English** or **World English** and is used as a lingua franca[1] in all spheres of global activity. No other language has such global exposure as English, which is used around the globe for specific purposes other than language. The term **World Englishes** embodies all varieties of English developed in different regions of the world, especially those that emerged in nations colonised by the UK or influenced by the US. Some scientists (e.g. Widdowson 1994) claim that the extensive number of people who now use English means that it is no longer the property of native speakers, which consequently results in the deprivation of the standard dialects and accents. Some scientists (e.g. Jenkins 2000) introduced the term **intelligible pronunciation** to define the extent of the phonological features of the language that make the message recognisable by a listener. Consequently, the pedagogical priorities in pronunciation are reduced to features necessary to adopt international intelligibility only. This course, however,

[1] A **lingua franca** is "a term used in sociolinguistics, and often in everyday speech, to refer to an auxiliary language used to enable routine communication to take place between groups of people who speak different native languages; also sometimes called an interlingua" (Crystal 2008: 282).

points the EFL university students in the direction of a near-native pronunciation – what Gimson calls the target of "high acceptability" (Cruttenden 2014: 328).

Further reading options: Roach (2009: 1-7)**,** Collins and Mees (2003: 2-6, 268-272), Trudgill (1999: 123-125).

Terminology check:
dialect, accent, sociolect, social community, idiolect, national variety, Standard English, RP, BBC English, Cockney, Estuary English, World English, World Englishes, intelligible pronunciation

Study questions:

1. What is the difference between a dialect and an accent?
2. What is a sociolect?
3. What is an idiolect?
4. What is the difference between SE and RP?
5. What are the different types of RP?
6. What are the different names for RP? Why are they called so?
7. What is the difference between RP, Cockney, and Estuary English?
8. What native dialect / accent do you speak?

2. PHONETICS AND PHONOLOGY

2.1. The Object of Phonetics and Phonology

Phonetics and phonology are the branches of linguistics concerned with sounds, thus the main object of investigation in this course is **a sound**. The English alphabet is comprised of 26 letters, while the sound system of English contains 44 sounds as phonemes (see explanation of phonemes below). Both branches investigate the sounds from different perspectives:

- **Phonetics** is concerned with the physical manifestation of language in sound waves and how they are produced, transmitted, and perceived, and also "provides methods for their description, classification, and transcription" (Crystal 2008: 363).
- **Phonology** "studies the sound systems of languages" (ibid: 365) and how sounds function in relation to each other in a language.

Although phonetics and phonology are indistinguishable from one another in most instances, the scope of these pages deal with phonetics essentially and only touches upon a few concepts in phonology for practical purposes.

2.2. On Phone, Phoneme, and Allophone

The term **sound** is often regarded as not being a precise one in the fields of phonetics and phonology and is thus replaced by the term **phone.** Sound could mean any noise or sound, while phone is restricted to the human voice ('Phone' comes from a Greek word 'phone' [human voice] and is regarded as a speech sound which can be cut out from the speech stream. Crystal (2008) defines phone as "the smallest perceptible discrete segment of sound in a stream of speech" (2008: 361).

A **phoneme** includes all the phonetic specifications of phones and is the smallest independent unit that can bring about a change in meaning. Roach (2009) calls phonemes "abstract sounds" as there may be slightly different ways to realise the same phoneme. An example of a phoneme is the sound /t/ in the words ***t****eam* and *s****t****eam*. The slight difference in the realisation of this phoneme is that the /t/ in ***t****eam*

is aspirated [tʰ], while the /t/ in *steam* is not [t]. Phones that belong to the same phoneme, such as [t] and [tʰ] for English /t/, are called **allophones**. Allophones do not affect the semantic meaning of the word, while a substituted phoneme could bring a semantic change. For example, ***t**eam* pronounced with any allophone of the phoneme /t/ maintains its meaning, but if it is substituted with the phoneme /b/, then it brings about a semantic change. These two words then (*team* /**t**i:m/ and *beam* /**b**i:m/) form a **minimal pair**, which is an opposition of two words showing the existence of these two phonemes. For a set of words to form a minimal pair, they may differ in one phoneme only. Phonemes cannot, in fact, be pronounced – in actual speech, they are realised through allophones.

2.3. The Branches of Phonetics

Adopting the different perspectives referred to in the description of phonetics above, it can be viewed as investigating three distinct areas that are represented in the following **branches of phonetics**:

- **articulatory phonetics**, which studies the ways the vocal organs are used to produce speech sounds;
- **acoustic phonetics**, which investigates the physical properties of speech sounds (duration, frequency, intensity, and quality) that are generally measured by spectrographs to depict waveforms and spectrograms;
- **auditory phonetics,** which is concerned with how people perceive speech sounds, i.e. how the sound waves activate the listener's eardrum, and how the message is carried to the brain in the form of nerve impulses.

Further reading options: Roach (2009: 31-38), Crystal (2008: 361-365).

Terminology check:
phonetics, phonology, phone, phoneme, allophone, minimal pair, articulatory phonetics, acoustic phonetics, auditory phonetics

Study questions:

1. What is the difference between phonetics and phonology?
2. What is the difference between a letter and a sound?
3. How many sounds are there in the English sound system?

4. What is the number of sounds and letters in your native language?
5. Why is phone a more appropriate term than sound?
6. What is the difference between phoneme and allophone?
7. What is a minimal pair?
8. What branches of phonetics are distinguished, and what does each branch investigate?

Exercises:

1. Write the number of letters and the number of sounds in these words:

Word	Number of letters	Number of sounds
enough		
philosophy		
Christmas		
answer		
furniture		
Chinese		
picturesque		
delicious		
Wednesday		
colonel		
honour		
thorough		
naughty		
scene		
business		

2. Create minimal pairs substituting the sounds in bold in the following words:

Word	Minimal pairs with that word								
let /**l**et/									
let /le**t**/									
kid /kɪ**d**/									
got /**g**ɒt/									
keen /**k**iːn/									
book /**b**ʊk/									
come /kʌm/									

3. SPEECH MECHANISMS IN ARTICULATORY PHONETICS

3.1. The Stages in Sound Production

For practical purposes, of the three main branches of phonetics, articulatory phonetics will be discussed as an enhanced awareness of the articulatory apparatus and the exact production of each sound can help students to form conscious and physically correct articulation. Articulatory phonetics focuses on the organs of speech and their role in producing speech sounds, which is predominantly based on data provided by other sciences, such as human anatomy and physiology. Human beings do not possess organs used exclusively in the production of speech sounds. Instead, these organs primarily serve other functions (digestive, respiratory, etc). This actually raises an interesting question: whether we were born to speak or whether speech developed accidentally in the evolution of mankind. Either way, the production of speech sounds happens either simultaneously or alternatively with the physiological processes mentioned above.

Speech is the result of neuromotor activity, thus the sound originates in the brain. After the creation of the message in the mind, a number of commands are executed by the organs of speech to physically produce the sound. The physical production initiates in the lungs and undergoes important modifications in the respiratory tract before it is realised. The different stages involved in this process are referred to as a **speech chain**. Clark and Yallop (1992) view this process as a kind of **speech mechanism** involving the active or passive functioning of the organs of speech. The stages in physical speech mechanism are presented in *Figure 1* and are listed as follows:

1. **Initiation or Respiration** (the lungs provide the energy source);
2. **Phonation** (the vocal folds convert the energy into an audible sound);
3. **The Oronasal Process** (the soft palate distributes the audible sound into the oral cavity or nasal cavity);
4. **Articulation** (the organs of speech transform the sound into an intelligible speech sound).

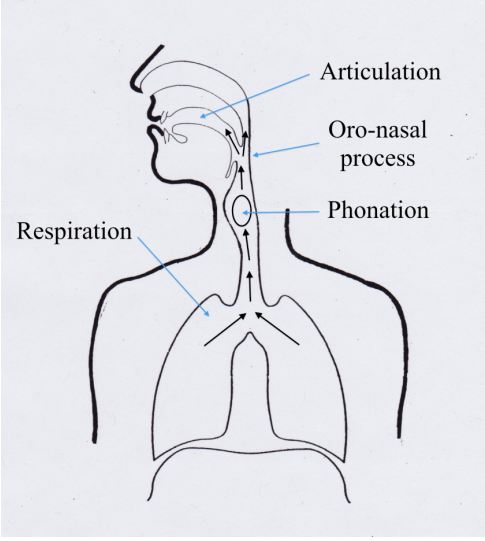


Figure 1. Stages in speech mechanism *(adapted from Roach 2009:25)*

3.2. Initiation or Respiration

The physical initiation process starts in the **lungs**. Clark and Yallop (1992: 21) describe the lungs as the "reservoir for airflow in much of speech". The lungs consist of spongy material that are filled with air when we inhale. The lungs are located in the thoracic cavity within the rib cage and are surrounded at the front by the ribs and at the ventral base by the diaphragm (see *Figure 2*). During the **inspiration** phase, the diaphragm lowers and the rib cage moves upwards and outwards, increasing the dimensions of the thoracic cavity and lowering the air pressure. This enlargement

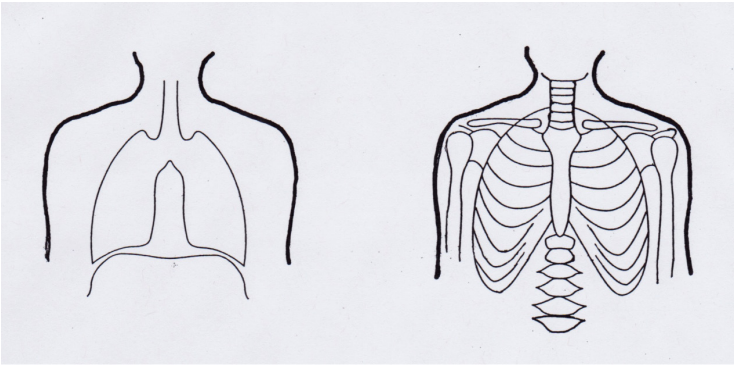


Figure 2. The lungs and the rib cage *(adapted from Roach 2009: 25)*

of the thoracic cavity increases the lung volume, which consequently allows air to flow into the lungs. In the **expiration** phase, the rib cage is pulled downwards and the lung volume is reduced, which in turn forces the airflow out of the lungs and generates an **egressive** airflow. It is during the latter phase that speech production takes place in English, and it is for this reason that the sounds produced are known as **egressive.**

3.3. Phonation

The airflow passes from the lungs into the vocal tract and then to the **larynx**. In the larynx, some of the essential features of the sound production take place as they contain the **vocal folds** (vocal cords). Clark and Yallop (1992) describe the larynx as a skeletal frame situated at the top of the trachea and made of a series of cartilages, with the two main cartilages (the thyroid and the cricoid) playing the crucial role in the process of phonation (see *Figure 3)*. Inside the thyroid cartilage, there is a so-called voice box, which consists of two plates joined together at an angle at the front. The vocal folds are two plates, or rather two thick flaps of tissue and are made of the so-called vocal ligament and a vocal muscle. At the back, the vocal folds are attached to a pair of arytenoid cartilages which move in rotational and sliding motions that shape the position of the vocal folds.

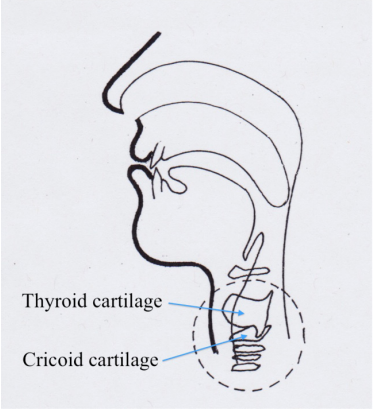


Figure 3. The larynx and the cartilages *(adapted from Roach 2009: 25)*

The vocal folds play a crucial role in one of the most important phonetic processes, which is that of **voicing**. The vocal folds can be brought together and when the airstream is forced between them, they vibrate and produce voice. When the vocal folds are wide apart, the airstream passes between them freely, meaning

that the vocal folds do not vibrate and no voice is produced. This position is set for breathing, so that air can pass in and out of the lungs unimpeded. The laryngeal aperture (or space) between the vocal folds is called the **glottis.** Clark and Yallop (1992: 32) characterise the glottal opening as being approximately 17 to 22 mm long in males and about 11 to 16 mm long in females. Vowels, vowel-like sounds (sonorants), and a number of consonants are produced by the vibration of the vocal folds, and consequently, they are defined as **voiced**. The open glottis with an absence of vibration in the vocal folds is characteristic for **voiceless** sounds. See *Figure 4* for the closing (a) and the opening (b) of the vocal folds.

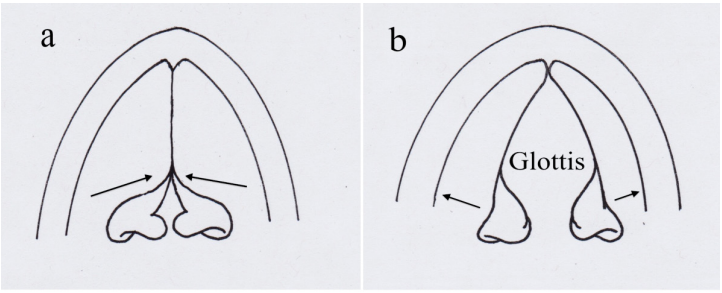


Figure 4. The closing and the opening of the vocal folds

Clark and Yallop (1992: 37) describe the **phonation cycle** in the following stages:

1. the vocal folds are drawn together fairly tightly;
2. the expiratory airflow builds up the pressure and forces the vocal folds apart;
3. as the airflow escapes through the glottis, the pressure is reduced, and the focal folds close again.

By varying the status of the vocal folds (more tense or relaxed, longer or shorter, higher or lower rate of vibration, etc.), we can change the quality of the voice (from loud to quiet, clear, harsh, creaky, etc.). Roach (2009: 25) identifies three basic differences in the **pressure** of the vocal folds as described below:

1. variation in **intensity** (loudness);
2. variation in **frequency** (high and low pitch);
3. variation in **quality** (harsh, breathy, creaky sounds).

Consequently, by manipulating the vocal folds in diverse ways, it is possible to distinguish various sets of categories generally referred to as the **modes of phonation**. Clark and Yalop (1992) recognise five main phonation modes as featured below in *Table 1*:

Table 1. **The modes of phonation** ***(adapted from Clark and Yallop 1992: 59-60)***

voiceless	the absence of any phonation, the airflow passes freely through the glottis;
voiced	the normal vocal fold vibration occurring along most or all the length of the glottis;
whisper	significant turbulence at the glottis, which is narrowed;
breathy voice	the normal vibration of the vocal folds accompanied by some continuous turbulent airflow, which occurs when glottal closure during the vibratory circle is not complete;
creaky voice	low frequency vibration of the vocal folds when the folds open for a very short time, often at irregular intervals.

3.4. The Oronasal Process

The next stage in sound production involves the airflow in the **upper vocal tract** and the configuration of the cavities through which it passes once it has left the larynx.

Clark and Yallop (1992: 42) describe the **pharynx** as a "tube of muscle shaped rather like an inverted cone". It lies between the larynx and the base of the skull and serves as a kind of crossroads between the upper respiratory system and the lower respiratory system, including the larynx. The pharynx functions as an air passage during breathing, and it branches into two cavities that act as resonators for the upward airflow: the **oral cavity** and the **nasal cavity**. The soft palate (velum) plays a significant role in the pharynx because it is the organ that directs the airflow into either of the two cavities. If the soft palate is raised, it closes the entrance to the nasal cavity and directs the air through the oral cavity (mouth) to produce **oral sounds** (see *Figure 5 (a)*). If the soft palate is lowered, the airflow is directed

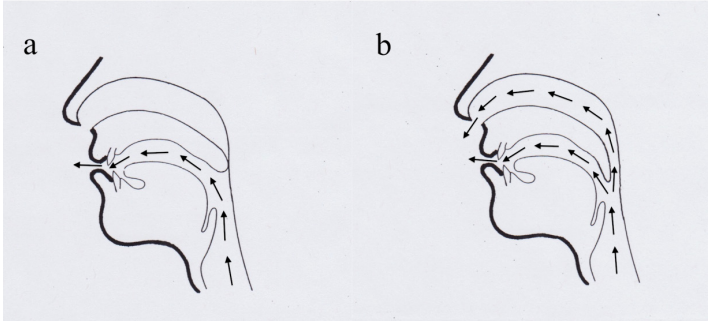


Figure 5. The production of oral and nasal sounds

through both cavities, escaping through the nostrils and mouth at the same time. During this pattern of airflow, the sounds produced are defined as **nasal sounds** (see *Figure 5 (b)*). The complex acoustic structure of the nasal cavity produces nasal sounds that sound relatively quiet as compared to oral sounds.

3.5. Articulation

After the initiation and phonation processes in the larynx and the pharynx, the audible sound is formed into a concrete sound with the help of the **organs of speech (articulators)** situated in the oral cavity. The main organs of speech are illustrated in *Figure 6* and are briefly described below.

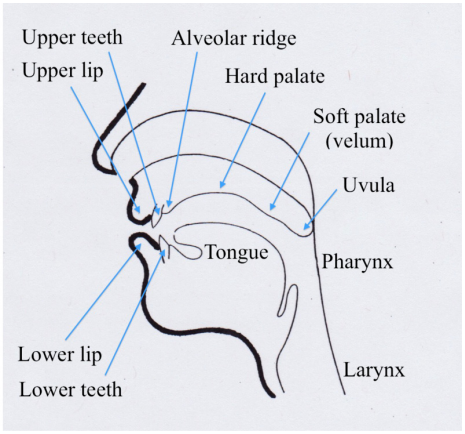


Figure 6. Organs of speech

The most important and flexible of all the organs of speech is the **tongue**, which is situated in the oral cavity and makes the greatest contribution to the articulation process. Gimson and Cruttenden (2008: 14) characterise it as "capable of assuming

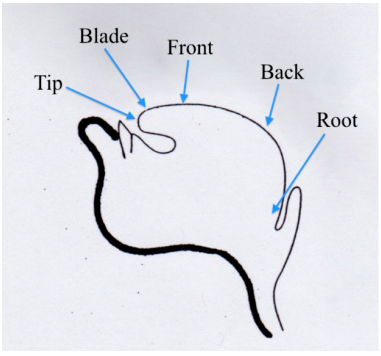


Figure 7. The subdivisions of the dorsum of the tongue

a great many varieties of positions of articulation for both vowels and consonants". The upper surface of the tongue, which comes into contact with other organs of speech is called the **dorsum**. For purposes of phonetic description, the dorsum is subdivided into several parts. Because there are no clear boundaries on the tongue itself, this division is somewhat arbitrary. The basic subdivisions of the dorsum are the **tip,** the **blade,** the **front,** the **back,** and the **root** as indicated in *Figure 7*.

The tongue comes into contact with several other articulators, which are either flexible and mobile or are stable and immobile. The **palate** is a smooth curved surface in the upper part of the mouth and consists of two parts: the **hard palate** and the **soft palate** or **velum** (with its pendent **uvula**). The hard palate is a stable articulator and is essential for the production of several consonants when in contact with the tongue. The soft palate and uvula are flexible and take place in the oronasal process of sound production. The **lips (upper and lower)** are quite mobile and may be shut or held apart to give a shape to the oral cavity. The **upper teeth** and **alveolar ridge** (located behind the upper teeth) are stable (immobile) articulators, while the **lower teeth** and **lower jaw** are mobile. Many organs of speech are located in the upper part of the oral cavity, a region deemed **the roof of the mouth** (*see Figure 8*) by Gimson and Cruttenden (2008: 13).

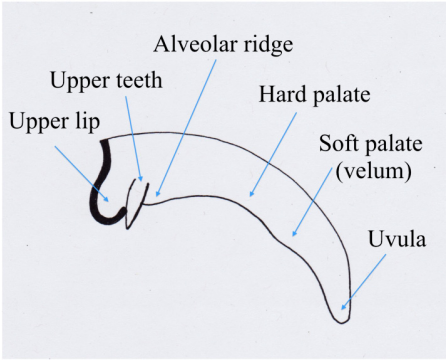


Figure 8. The roof of the mouth

From this discussion, we can see that numerous **organs of articulation** or **articulators** are involved either actively or passively in the production of speech, thus are referred to as active or passive (see Roach 2009a). The **organs of speech** are summarized in *Table 2*.

Although the organs of speech are universal in all people, the position and movements of the articulators differ for certain sounds. **Articulatory settings**, as

Table 2. **Active and passive organs of speech**

Active (flexible) organs of speech (because they can be moved into contact with other articulators)	
the lungs **the vocal folds** **the tongue** **the soft palate (velum)** **the uvula**	**the upper lip** **the lower lip** **the lower jaw** **the lower teeth**
Passive (stable) organs of speech (because they are stable (immobile) in sound production and their most important function is to act as the place of an articulatory stricture)	
the upper teeth **the alveolar ridge** **the hard palate**	**the pharynx** **the larynx** **the vocal tract**

defined by Collins and Mees (2003: 221), refer to "the overall way in which the speech organs (i.e. lips, tongue, mouth and throat muscles, velum, larynx) are held throughout the speech process". It is also worth noting that the settings vary not only between languages but also between different varieties of the same language. EFL learners typically find the acquisition of the articulatory settings of the English language to be the greatest challenge. However, working on these articulatory settings can often produce better results in pronunciation for EFL learners.

Further reading options: Roach (2009: 8-10, 22-24), Clark and Yallop (1992: 9-13, 21-25, 48-56), Collins and Mees (2003: 25-35, 221-225).

Terminology check:
articulatory phonetics, speech chain, initiation or respiratory stage, phonation, voicing, pressure of vocal folds, modes of phonation, glottis, oronasal process, articulation, active and passive organs of speech, the tongue, the roof of the mouth, articulatory settings

Study questions:

1. What stages are involved in sound production?
2. Why is the airflow in the initiation of the sound called egressive?

3. Why is the larynx an essential organ of speech?
4. Describe the phonation process in more detail.
5. Describe how the status of the vocal folds (tense vs relaxed, longer vs shorter, higher vs lower rate of vibration, etc.) is varied.
6. What process takes place in the pharynx, and what articulators are involved?
7. Which organs of speech are called active and which are called passive? What is the difference between an active and a passive articulator?
8. In what cavities does sound resonate?
9. Compare the articulatory settings of English with those of your native language

Exercises:

1. Slightly press two fingers against your throat and try to feel the vibration of vocal folds when you pronounce the sound /b/ and the absence of vibration when you pronounce /p/. Using the same method, decide whether the following sounds are voiceless or voiced:

The sound	Voiced/voiceless
/k/	
/g/	
/n/	
/z/	
/s/	
/r/	
/e/	
/f/	
/v/	

2. Imagine the work of your organs of speech and decide what sounds could be made when they act in the following ways:

Position of organs of speech	The possible sounds
Both lips shape an oval	
The lower lip nearly touches the upper teeth	
The tip of the tongue touches the alveolar ridge	
The lower jaw and the lower teeth are down, the mouth is wide open	
The back part of the tongue touches the hard palate	
The velum along with the uvula are down	

3. Decide which articulators are active and which are passive to produce the following sounds **/v/**, **/m/**, **/w/**, **/ʌ/**, **/n/**, **/e/**, **/k/**, **/h/**, **/ʊ/**, **/p/**:

Sounds	Active organ of speech	Passive organ of speech
/v/		
.		
.		

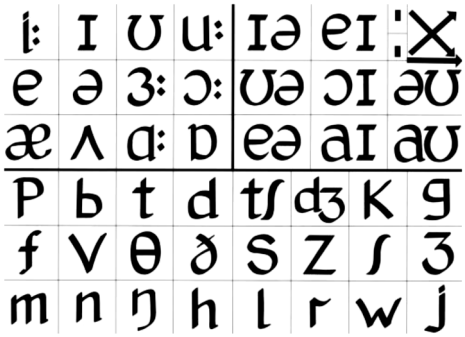
4. ENGLISH PHONEMES

4.1. The International Phonetic Alphabet and Transcription

Articulatory phonetics deals not only with the organs of speech but also with the categorisation and classification of the production features of phones. An extensive knowledge of how concrete vowels and consonants are articulated by particular organs of speech is essential for successful articulation.

There are 44 phonemes in English. **The English Phonemic Chart,** as presented by Underhill (1994) and given in *Table 3,* exhibits clear sets of vowels (monophthongs and diphthongs), consonants, and sonorants.

Table 3. **The English Phonemic Chart**



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The symbols for the English phonemic chart have been compiled from the **International Phonetic Alphabet (IPA)** devised by **International Phonetic Association** (also abbreviated **IPA**). The association was established in 1886, and since then, it has been functioning as the major as well as the oldest representative organisation for world phoneticians. The association's mission is to promote the scientific study of phonetics by providing phoneticians worldwide with a notational standard for the phonetic representation of all languages, i.e. the IPA. The alphabet

is based on the Latin letters and **diacritics** that indicate slight alterations to the usual value of phonetic symbols, e.g. [n̩] (meaning /n/ is syllabic). The latest version of the alphabet was published in 2005.

The term **transcription** refers to the process and "the methods of writing down speech sounds in a systematic and consistent way" (Crystal 2008: 490). Each sound must be identified and written in an appropriate symbol. Principally, there are two kinds of transcription: phonemic and phonetic transcription. **Phonemic transcription** gives only a basic idea of the sounds, and is thus often termed as **broad transcription**. It uses the 44 English phonemic symbols and does not show any phonetic details of the sounds. The symbols are enclosed in slashes / /, e.g. /t/; /taɪp/.

Phonetic transcription has a high degree of accuracy and shows a lot of articulatory and auditory details. It is often termed as the **narrow transcription** or **transcription proper** because it aims to represent actual speech sounds in the narrowest sense and uses additional diacritics. The symbols are therefore enclosed in square brackets [ ]. For example, [tʰ] means that /t/ is aspirated, and [spiːd̥] means that /d/ is a bit devoiced at final position.

4.2. Sound Classes: Vowels, Consonants, and Sonorants

Speech sounds are generally divided into two classes: vowels and consonants. Vowels are produced with a comparatively open vocal tract for the airflow to pass unimpeded. As a result, vowels are considered to be open sounds, whereas consonants are produced with a certain constriction in the vocal tract. Roach (2009a) gives the following characterisation of the sounds:

- **Vowel**s are the class of sounds that are associated with the least obstruction to the flow of air during their production.
- **Consonant**s are the class of sounds that are associated with obstructed airflow through the vocal tract during their production.

Vowels can also be distinguished from consonants as they display a different acoustic energy: vowels are highly resonant and intense and have greater sonority than do consonants. Vowels also have the function to be syllabic (a syllable can contain a minimum of one vowel), while consonants are units that function at the margins of syllables, either singly or in clusters, and are optional (see Section 8). Vowels typically involve the vibration of vocal folds, so they are voiced, while consonants split into voiced and voiceless forms.

A special set of consonants that demonstrate reduced levels of obstructed airflow during their production are called **sonorants (sonants, semivowels)**. According to Roach (2009):

- **Sonorants** are sounds that are voiced and do not cause sufficient obstruction to the airflow to prevent normal voicing from continuing.

A list of the **20 vowel phonemes** in English with word examples is given in *Table 4*:

Table 4. **Vowel phonemes**

/ɪ/	as in *sit*	**/eɪ/**	as in *may*
/iː/	as in *speak*	**/aɪ/**	as in *kite*
/ʊ/	as in *book*	**/ɔɪ/**	as in *toy*
/uː/	as in *tool*	**/ɪə/**	as in *near*
/ʌ/	as in *cup*	**/eə/**	as in *dare*
/ɑː/	as in *heart*	**/ʊə/**	as in *cure*
/ɒ/	as in *box*	**/əʊ/**	as in *cold*
/ɔː/	as in *door*	**/aʊ/**	as in *mouth*
/e/	as in *bed*		
/æ/	as in *cat*		
/ɜː/	as in *bird*		
/ə/	as in *ago*		

A list of the **17 consonant phonemes** in English with word examples is given in *Table 5*:

Table 5. **Consonant phonemes**

/p/	as in *pipe*	**/z/**	as in *zoo*
/b/	as in *be*	**/θ/**	as in *think*
/t/	as in *time*	**/ð/**	as in *that*
/d/	as in *do*	**/ʃ/**	as in *sure*
/k/	as in *car*	**/ʒ/**	as in *casual*
/g/	as in *go*	**/tʃ/**	as in *church*
/f/	as in *fine*	**/dʒ/**	as in *gin*
/v/	as in *vet*	**/h/**	as in *hat*
/s/	as in *sad*		

A list of the **7 sonorant phonemes** in English with word examples is given in *Table 6*:

Table 6. **Sonorant phonemes**

/m/	as in *map*
/n/	as in *nose*
/ŋ/	as in *king*
/l/	as in *love*
/r/	as in *red*
/j/	as in *yacht*
/w/	as in *wet*

Further reading options: Roach (2009; 2-3, 31-35), Underhill (1994: 5-7, 29-30).

Terminology check:
English Phonemic Chart, International Phonetic Association, International Phonetic Alphabet, diacritics, phonetic transcription, broad transcription, narrow transcription, vowel, consonant, sonorant

Study questions:

1. What are the responsibilities of the International Phonetic Association?
2. Compare the sonority in vowels, consonants, and sonorants.
3. How many vowels, consonants, and sonorants are there in your native language?
4. Which of the 44 English phonemes are not present in your native language? Compare and find similarities with the remaining phonemes.

Exercises:

1. Transcribe the vowel phonemes in the following words:

Word	Vowel	Word	Vowel
cup		*how*	
said		*hear*	
sea		*float*	
ash		*foot*	
blow		*first*	
glance		*dare*	
wash		*pool*	
sign		*cream*	
walk		*pill*	

2. Transcribe the consonant phonemes in the following words:

Word	Consonant	Word	Consonant
fee		*the*	
too		*palm*	
egg		*thin*	
show		*view*	
chew		*zoo*	
old		*massage*	
hair		*large*	

3. Transcribe the sonorant phonemes in the following words:

Word	Sonorant	Word	Sonorant
oil		*song*	
use		*knee*	
wave		*yolk*	
comb		*twelve*	
rice		*thumb*	

4. Spell out seven words for each of the 44 sounds.

No	Sound	Word examples						
1.								
.								
.								

5. CHARACTERISATION AND CLASSIFICATION OF VOWELS

The characterisation and classification of vowels is challenging. Clark and Yallop (1992) state that the quality of vowels depends on the size and shape of the tract, which can be modified using the tongue and the lips. The major challenge is to define the position of the tongue as it moves without forming any significant obstruction in the oral cavity. As a result, vowels are produced without any specific point of blockage. The other fundamental articulatory feature of vowels is determined by the shape and degree of protrusion of the lips.

5.1. The Cardinal Vowel Diagram

The cardinal vowel diagram devised by the IPA provides a set of reference points for the articulation and recognition of vowels. In the diagram, vowels are located on a four-sided figure, which in a way represents the shape of the tongue. Two dimensions of the diagram correspond to the positions of the tongue vertically and horizontally. The vertical axis represents tongue height, and the horizontal axis represents tongue fronting or advancement. The current diagram was systematised by D. Jones in the early 20th century, though the idea goes back to earlier phoneticians,

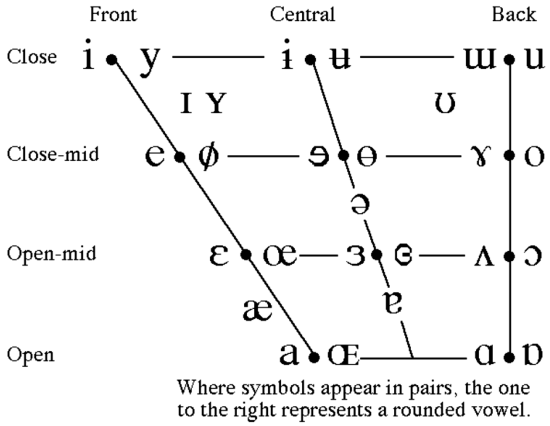

Figure 12. The cardinal vowel diagram *(reproduced by kind permission of the International Phonetic Association, see References)*

most notably A. J. Ellis and A. M. Bell. The cardinal vowel diagram illustrates the extremes of vowel quality that the vocal tract is able to produce, and thus the cardinal vowels are not the sounds of a particular language. Clark and Yallop (1992: 65) claim, that they "are best taken to be auditory qualities rather than articulatory specifications". Phoneticians recognise and articulate these artificial sounds so that they can describe all natural vowels in relation to the nearest cardinal vowel. The cardinal vowel diagram is given in *Figure 12*.

The characterisation of English vowels that follows will use the classification aspects of the cardinal vowel diagram.

5.2. The Height of the Tongue

The vertical movement of the tongue depicts the **height** of the body of the tongue and refers to how high or low the tongue is positioned in the mouth (see *Figure 11*). Carr (2013: 17-21) categorises the following groups of vowels in relation to the Cardinal Vowel Diagram:

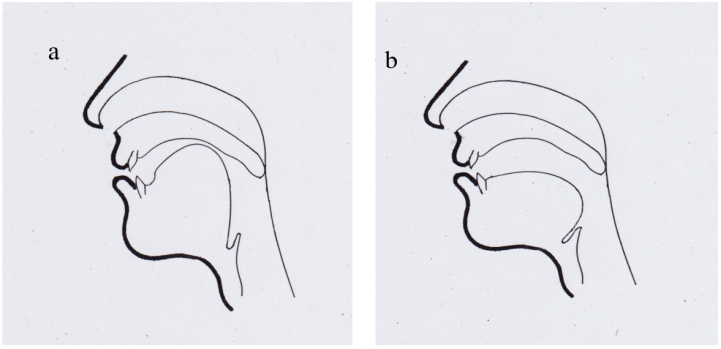

Figure 11. Vertical positions of the tongue

- **high** or **close** vowels articulated with the tongue located as high as possible in the oral cavity, thus narrowing the passage for the airflow: /ɪ/, /iː/, /ʊ/, /uː/;
- **mid** or **mid-open** vowels with the tongue lowered to the mid position in the oral cavity: /æ/, /ɒ/, /ʌ/, /ɑː/;
- **low** or **open** vowels produced with the tongue positioned as low as possible in order to leave a lot of space for the airflow: /e/, /ɔː/, /ɜː/, /ə/.

5.3. The Advancement of the Tongue

The horizontal movement of the tongue, or **tongue advancement** to the front position (see *Figure 10 a*) or back position (see *Figure 10 b*) is essential in forming the following groups of vowels as given by Carr (2013: 17-21):

- **front** vowels articulated with the tongue far forward in the oral cavity toward the hard palate: /iː/, /ɪ/, /e/, /æ/;
- **central or mixed** vowels produced with the tongue retracted to the middle position in the oral cavity: /ʌ/, /ɜː/, /ə/;
- **back vowels** produced with the tongue retracted as far as possible to shape the space in the front part of the oral cavity: /ɒ/, /ɔː/, /ʊ, /uː/, /ɑː/.

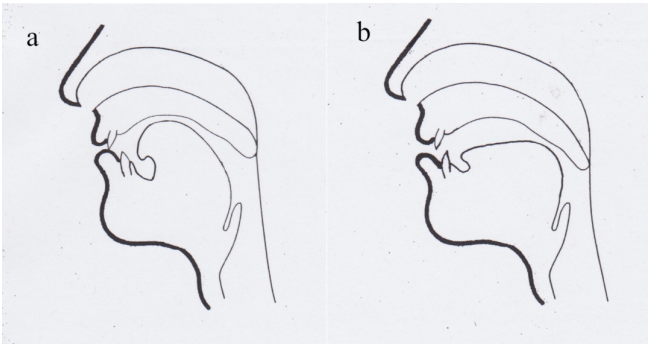

Figure 10. Horizontal position of the tongue

5.4. The Shape of the Lips

Vowels may also be different from each other with respect to the rounding and shaping of the lips necessary to enlarge or diminish the space within the mouth. The following sets of vowels are identified:

- **rounded** vowels**,** as the lips shape into a circle or a tube: /ʊ/, /uː/, /ɒ/, /ɔː/;
- **spread** vowels**,** as the corners of the lips are moved away from each other: /ɜː/, /e/, /iː/, /ɪ/, /æ/;
- **neutral** vowels, as the position of the lips is not noticeably rounded or spread: /ʌ/, /ɑː/, /ə/.

These various lip shapes are illustrated in *Figure 15*:

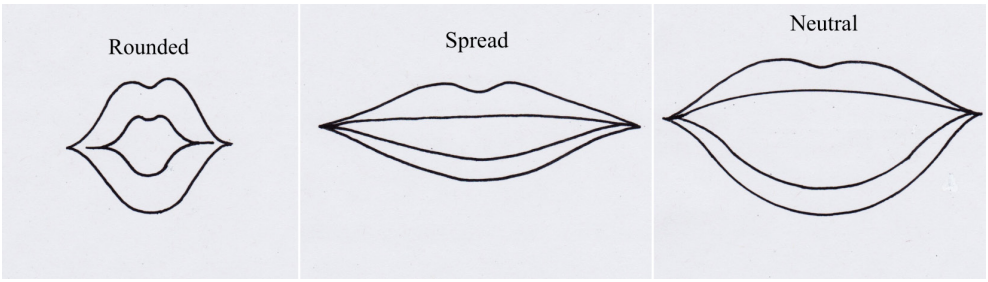

Figure 15. The shape of the lips *(adapted from Clark and Yallop 1992: 66)*

5.5. Tenseness and Length

According to the tenseness of the organs of speech, vowels are classified into one of two groups: **tense** and **lax**. Tense vowels are relatively higher and more marginal, while lax are shorter, lower, and slightly more centralised. Carr (2008: 175) claims that "tense vowels are articulated closer to the periphery of the vowel space and are typically longer than their lax counterparts". Of 12 English pure vowels, five are termed as **long** in duration: /ɑː/, /ɔː/, /iː/, /uː/, /ɜː/, and the remaining seven are termed as short in duration: /ʌ/, /ɔ/, /ɪ/, /ʊ/, /e/, /æ/, /ə/. The symbols for long vowels are followed by a **length mark** of two vertical dots. In addition, length seems to relate to several pairs of vowels:

/ɑː/ - /ʌ/ /ɔː/ - /ɔ/ /iː/ - /ɪ/ /uː/ - /ʊ/ /ɜː/ - /ə/

However, this is just a functional division. Phonology research shows that the length of vowels can only be contrasted in comparable contexts as there is no a clear-cut long/short distinction of one and the same vowel. An example of /iː/ and /ɪ/ having various lengths in centiseconds is illustrated in *Figure 13:*

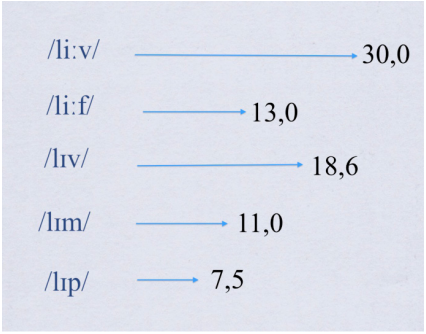

Figure 13. The length of vowels in contrasted contexts *(adapted from Gimson 1980: 98)*

The difference in length is normally accompanied by a difference in the sound quality. Thus, the members within a pair in length (e.g. /ɔː/ and /ɒ/) have slightly different positions concerning the height and advancement of the tongue. *Figure 14* displays English short and long vowels in the cardinal vowel diagram.

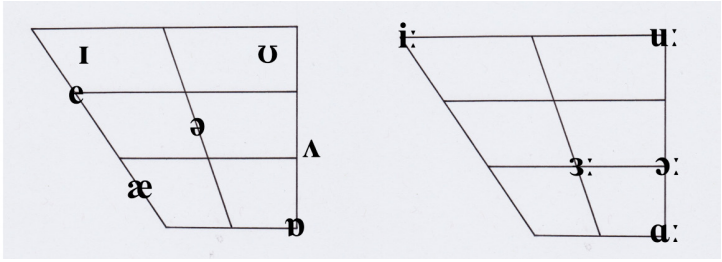

Figure 14. English short and long vowels in the cardinal vowel diagram

The /ə/ sound stands out from all other vowels and requires some further comment. It appears to be the shortest possible vowel, and in some forms of words, it is even omitted. It is known as the **schwa** (from Hebrew, meaning 'emptiness') or the **neutral vowel.** Furthermore, it is the most frequently occurring vowel in English, and it only appears in weak syllables, e.g. *across* /əˈkrɒs/, *character* /ˈkærəktə/.

Another remark should be made regarding the two intermediate sounds in the broad transcription: /i/ and /u/. These can be generally specified as **archiphonemes** because they represent the intermediate status between the phonemic contrasts in length in /iː/ and /ɪ/ as well as /uː/ and /ʊ/. This neutralisation of length suggests that the two sounds /i/ and / u/ have the quality of the respective long vowels and the length of the respective short vowels. Skandera and Burleigh (2011: 51) specify the following phonetic environments for the intermediate /i/:

- in word final position, e.g. *lucky* /ˈlʌki/;
- in prefixes like *re-*, *pre-*, and *de-* when followed by a vowel, as in *react* /riˈækt/, *deactivate* /diˈæktɪveɪt/;
- in suffixes like *-tal*, *-iate*, and *-ious* when they are pronounced as two syllables, e.g. *appreaciate* /əpriːʃieɪt/;
- in many function words (*he, she, we, me, be, the*, etc.) when followed by a vowel, e.g. *the air* /ði eə/.

The intermediate /u/ is much less common and usually occurs in unstressed syllables in these phonetic environments:

- in some function words (*you, to, into, do*, etc.) when followed by a vowel, e.g. t*o us* /tu ʌs/.
- before a vowel within a word, when they are pronounced as two syllables, e.g. *eventually* /ɪˈventʃuəli/, *evacuate* /ɪˈvækjueɪt/ (ibid: 51)

5.6. Diphthongs and Triphthongs

So far, the discussion has characterised pure vowels with a single perceived auditory quality, which are known as **monophthongs**. Such vowels remain constant in their articulation process and do not glide. There are 12 monophthongs in English: /ɪ/, /iː/, /ʊ/, /uː/, /ʌ/, /ɑː/, /ɒ/, /ɔː/, /e/, /æ/, /ɜː/, /ə/.

Diphthongs are vowels in which two vowel qualities can be perceived, and the articulators move from the production of one vowel to the other. The first part of the diphthong is longer and stronger than the second and is often referred as to the **nucleus** of the diphthong. The second part is just a **glide** whose full formation is generally not accomplished. The quality of the phoneme reduces to quite short and decreases in loudness. The organs of speech only move toward the articulation of the glide, but they are not set to pronounce it fully. The total number of diphthongs is eight: /eɪ/, /aɪ/, /ɔɪ/, /ɪə/, /eə/, /ʊə/, /əʊ/, /aʊ/. Diphthongs are usually grouped into the following three categories, depending on the height and advancement of the tongue:

- the diphthongs that glide toward the vowel /ə/ in the centre of the oral cavity are known as **centring to /ə/**: /ɪə/, /eə/, /ʊə/;

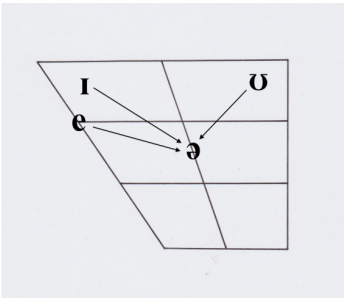

Figure 16. Centring diphthongs in the cardinal vowel diagram

- the diphthongs that glide toward a higher position in the mouth to reach the close sound /ɪ/ are known as **closing to /ɪ/**: /eɪ/, /aɪ/, /ɔɪ/;

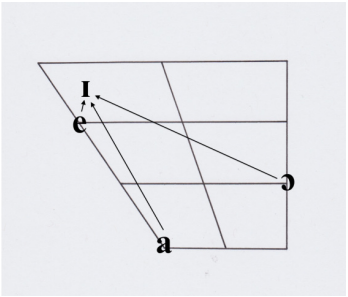

Figure 17. Closing to /ɪ/ diphthongs in the cardinal vowel diagram

- the diphthongs that glide toward a higher position in the mouth to reach the sound /ʊ/ and are known as **closing to /ʊ/**: /əʊ/, /aʊ/.

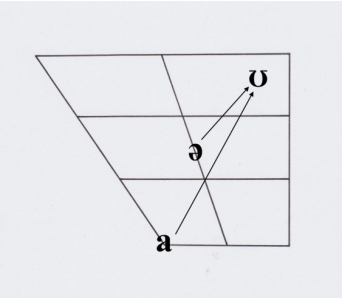

Figure 18. Closing to /ʊ/ diphthongs in the cardinal vowel diagram

There are also **triphthongs** – the most complex type of vowels. These are sounds in which three vowel qualities can be perceived as they glide from one vowel to another and then to a third. Roach (2009: 19) describes triphthongs as "composed of the five closing diphthongs […] with a schwa added on the end". The five examples of triphthongs are given below:

Table 7. **Triphthongs in English**

/eɪə/	as in *player*
/aɪə/	as in *fire*
/ɔɪə/	as in *lawyer*
/əʊə/	as in *lower*
/aʊə/	as in *our*

Further reading options: Roach (2009: 13-19), Gimson and Cruttenden (2008: 35-39), Collin and Mees (89-118), Carr (2013: 17-21).

Terminology check:
the cardinal vowel diagram, the height of the tongue, the advancement of the tongue, tenseness, length, schwa, the shape of the lips, monophthongs, diphthongs, nucleus, glide, triphthongs

Study questions:

1. According to what aspects are vowels classified?
2. Describe the characteristics of the vowels according to the movement of the tongue.
3. What does the cardinal vowel diagram represent?
4. Explain the relationship between tenseness and length of English vowels?
5. What quality do vowels have as monophthongs, diphthongs, and triphthongs?

Exercises:

1. Give the characteristics of the twelve pure vowels in the chart below:

No.	Sound	Tenseness	Length	Shape of the lips	Position of the Tongue	
					Height	Advancement
1.						
.						

2. Spell out 7 words for each of the 5 triphthongs.

No.	Sound	Word examples						
1.								
.								

6. CHARACTERISATION AND CLASSIFICATION OF CONSONANTS

All consonants have certain properties in common that identify them from vowels. There are 24 consonants in English, although seven of them are referred to as sonorants because they share several features (sonority and continuation) with vowels: /m/, /n/, /ŋ/, /l/, /r/, /j/, /w/. The pure 17 consonants are narrowed to the term **obstruents** because the airflow is always obstructed to a great extent when the sounds are articulated: /p/, /b/, /t/, /d/, /k/, /g/, /f/, /v/, /s/, /z/, /θ/, /ð/, /ʃ/, /ʒ/, /tʃ/, /dʒ/, /h/.

Sonorants function in the English language the same way as consonants, and both groups of sounds have a lesser or greater obstruction of the airflow. Therefore, it is customary to attach sonorants to the class of consonants. Consonants can be described in terms of the location of the constriction, the manner of the constriction, and the type of phonation it supports (see Clark and Yallop 1992: 76). In short, consonants are classified by **place, manner,** and **voicing** as detailed below.

6.1. The Place of Obstruction

In the classification system for consonants, "place" denotes the location or place of obstruction and the active organ of speech involved in the articulation stage of the production of the consonants. Clark and Yallop (1992: 79) list the following groups of consonants in which various tongue positions are combined with various locations:

- **bilabial** sounds are produced with the upper and lower lips pushed together (see *Figure 19*): /p/, /b/, /m/, /w/;

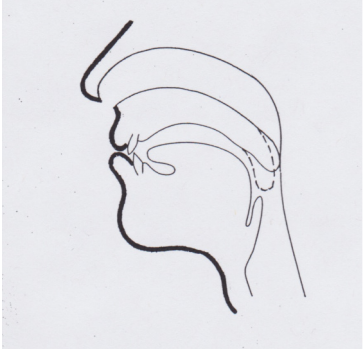

Figure 19. Bilabial sounds

- **labio-dental** sounds are articulated with contact between the lower lip and the upper teeth (see *Figure 20*): /f/, /v/;

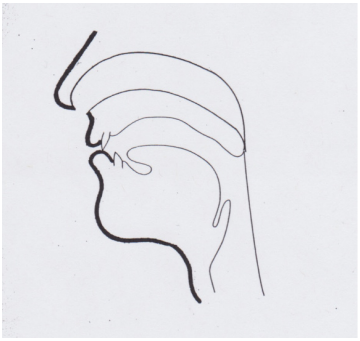

Figure 20. Labiodental sounds

- **apico-dental** sounds are generated with the tip of the tongue protruded between the lower and the upper teeth (see *Figure 21*): /θ/, /ð/;

Figure 21. Apicodental sounds

- **apico-alveolar** sounds are made by advancing the tip of the tongue toward the alveolar ridge (see *Figure 22*): /t/, /d/, /n/, /l/, /s/, /z/;

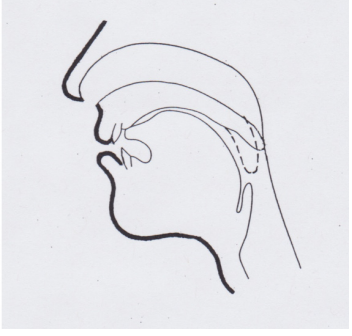

Figure 22. Apico-alveolar sounds

- **lamino-alveolar** sounds are produced by raising the blade of the tongue toward the alveolar region (see *Figure 23*): /ʃ/, /ʒ/, /tʃ/, /dʒ/;

Figure 23. Lamino-alveolar sounds

- **apico-postalveolar** sound is made by upturning the tip of the tongue behind the alveolar ridge (see *Figure 24*): /ɾ/;

Figure 24. Lamino-alveolar sounds

- **lamino-palatal** sounds are pronounced by advancing the blade of the tongue toward the highest part of the hard palate (see *Figure 25*): /j/;

Figure 25. Lamino-palatal sounds

- **velar** sounds are made as the tongue body makes contact with the soft palate (see *Figure 26*): /k/, /g/, /ŋ/;

Figure 26. Velar sounds

- **glottal** sound is produced by the narrowing of the glottis as the wall of the pharynx makes contact with the root of the tongue (see *Figure 27*): /h/.

Figure 27. Glottal sounds

6.2. The Manner of Obstruction

The **manner of obstruction** is concerned with the degree or extent of the obstruction and the way in which it is formed in the vocal tract (see Clark and Yallop 1992: 81). The variables range from total closure of the vocal tract to nearly open. When the obstruction totally blocks the airflow, it is called a complete or **occlusive** obstruction**.** The obstruents and sonorants with this type of obstruction are classified under one of two terms:

- **plosive obstruents:** /p/, /b/, /t/, /d/, /k/, /g/**;**
- **nasal sonorants**: /m/, /n/, /ŋ/.

In the production of the plosive obstruents, the air is obstructed and then released with a small burst of noise (plosion). They are also defined as **stops** because they cannot be prolonged. The following organs of speech form the full closure: lips pressed together for /p/, /b/; the tip of the tongue pressed against the alveolar ridge for /t/, /d/; and the body of the tongue pressed against the velum for /k/and /g/**.** Nasal sonorants have a stoppage at some point in the oral cavity, and the velum is lowered for the air to escape through the nasal cavity.

When the closure is not quite complete, it is called **constrictive**. The air either escapes through a narrow passage and makes a hissing sound for obstruents, or it penetrates through the sides of the obstruction and escapes rather freely through the nasal or oral cavity for sonorants. The following sounds are produced with constriction:

- **fricative obstruents**: /f/, /v/, /s/, /z/, /θ/, /ð/, /ʃ/, /ʒ/, /h/;
- **constrictive sonorants**: /l/, /r/, /j/, /w/.

Clark and Yallop (1992: 83) differentiate between fricatives and approximants by comparing the degree of the constriction. In the production of fricatives, the constriction is narrowed to generate turbulent airflow. The turbulence results in a sound with a hissing or sibilant quality. Moreover, fricatives are all continuant consonants: they can be continued for a long time. Approximants have an articulation in which the constriction is not great enough to cause turbulence, so the airflow penetrates in higher volume. Some phoneticians (e.g. Collins and Mees 2003) subdivide the approximants into lateral /l/ and medial /r/, /j/ and /w/ to demonstrate the escape of the airflow via the rims of the tongue and the middle of the tongue, accordingly.

A few sounds are generated with a double-sided obstruction, which may be defined as **occlusive-constrictive**. Affricates are the two sounds that are produced in this manner: /tʃ/, /dʒ/. The initial complete closure of the plosive sounds /t/ and /d/ is released through a constriction for the fricative sounds /ʃ/ and /ʒ/. In addition, the two affricates are **homorganic**, which means that the place of articulation of the plosive is the same or nearly the same as that of the paired fricative.

6.3. Voicing

All the consonants are subclassified as either **voiced** or **voiceless**. At the phonation stage, the vocal folds are in tight contact for the production of voiced consonants, while the air for voiceless consonants passes through the glottis with vocal folds set apart. All the sonorant sounds are voiced. *Table 8* presents the list of voiced and voiceless consonants and sonorants:

Table 8. **Voiced and voiceless consonants and sonorants**

Obstruents		Sonorants
Voiced	**Voiceless**	**Voiced**
/b/	**/p/**	**/m/**
/d/	**/t/**	**/n/**
/g/	**/k/**	**/ŋ/**
/v/	**/f/**	**/l/**
/z/	**/s/**	**/r/**
/ʒ/	**/ʃ/**	**/j/**
/ð/	**/θ/**	**/w/**
/dʒ/	**/tʃ/**	
	/h/	

According to the force of articulation or energy with which they are articulated and perceived, consonants are subdivided into relatively strong (**fortis)** or relatively weak (**lenis;** see Roach 2009: 28). English voiced consonants are lenis, whereas English voiceless consonants are fortis. The latter seem to be pronounced with a stronger muscular tension and breath force. For example, compare *pow* /**p**aʊ/ and *bough* /**b**aʊ/. The force of articulation is not easy to define and measure, however some phoneticians prefer to use the terms fortis and lenis rather than the terms voiceless and voiced.

6.4. Articulation of the Plosive Consonants

Roach (2009: 26) details the articulation of the plosive consonants and describes them as starting with **the closing phase** when articulators are pushed together to form a complete closure behind which the air will be trapped. During the **holding phase**, the vocal tract is completely closed. Air cannot escape through the nose because the soft palate is raised. However, the lungs are still forcing the air out of the vocal tract, so the pressure behind the closure builds up. Finally, in the **release phase,** a plosion takes place, allowing the air trapped behind the closure to escape. Because of the pressure, this release generates a burst of noise.

Further reading options: Roach (2009: 26-30, 39-55), Underhill (1994: 29-47), Clark and Yallop (1992: 83-88).

Terminology check:
obstruents, bilabial, labiodental, apicodental, apico-alveolar, lamino-alveolar, apico-postalveolar, lamino-palatal, velar, glottal, occlusive, constrictive, occlusive-constrictive, plosive, fricative, affricate, homorganic, nasal sonorant, lateral approximant, medial approximant, fortis, lenis

Study questions:

1. Why are consonants termed as obstruents?
2. What are the basic features that characterise consonants?
3. What are the various types of obstructions?
4. How do plosives differ from fricatives?
5. How are approximants subdivided?
6. Why are affricates called homorganic sounds?
7. Describe the phases in the production of plosive sounds.

Exercises:

1. Divide each of the following groups of phonemes into sets of three that share common characteristics. The first set is done as an example.

Group of phonemes	Set 1		Set 2	
	Phonemes	Characteristic feature	Phonemes	Characteristic feature
/p/ /m/ /t/ /n/ /k/ /ŋ/	/p/ /t/ /k/	plosive obstruents	/m/ /n/ /ŋ/	nasal sonorants
/s/ /l/ /p/ /m/ /v/ /ʃ/				
/r/ /f/ /j/ /s/ /w/ /ʃ/				
/k/ /g/ /l/ /s/ /n/ /z/				
/t/ /k/ /d/ /s/ /g/ /z/				
/ʒ/ /ð/ /t/ /z/ /k/ /g/				

2. Give the characteristics of consonants and sonorants in the chart below. The first sound is done as an example.

Sound	Voice	Place	Manner		Consonant
/p/	voiceless	bilabial	occlusive	plosive	obstruent
.					
.					

7. ABOVE THE SEGMENTAL LEVEL: ALLOPHONES AND THEIR CONTEXTS

Up to this point in the course, phonemes have been described as phonetic segments as if they existed in isolation and did not affect one another. However, speech production is not a series of isolated events. Instead, it is a complex chain of events, with the organs of speech operating independently and many fine adjustments being made as we speak. As a consequence, allophones are used for actual speech production, and they have different **distribution,** i.e. occupy different **contexts** and **environments**.

7.1. Pre-Fortis Clipping

Clipping is the process of "the reduction of duration of sonorous sounds when followed in the same syllable by a fortis consonant" (Ashby and Maidment 2005: 197). This type of reduction generally affects vowels. In return, a clipped vowel is pronounced quicker when it is located next to a voiceless consonant. Compare the following minimal pairs:

rice /raɪs/ (with clipped /aɪ/) and *rise* /raɪz/

sit /sɪt/ (with clipped /ɪ/) and *seat* /si:t/

7.2. Aspiration

The plosive voiceless (fortis) sounds /p/, /t/, /k/, after they are released, undergo a post-release phasein which the sounds are followed by a brief additional puff of air. Cruttenden (2014: 164) defines the post-release phase as "a voiceless interval consisting of strongly expelled breath between the release of the plosive and the onset of the following vowel". This special feature of articulation is termed **aspiration,** and the plosives are said to be **aspirated**. The IPA diacritics for aspiration are transcribed as a superscript: [ʰ]. The degree and duration of aspiration depend on the context of the sound. Aspiration is the strongest in the initial position of a syllable, e.g. *type* [tʰaɪp], in the initial position of a stressed syllable, e.g. *potato* [pə'tʰeɪtəʊ], and before a long vowel or a diphthong, e.g. *keep* [kʰi:p].

Aspiration is lost when a fricative sound (usually /s/) follows the voiceless plosives (see Cruttenden 2014: 164). Compare the following pairs of words with the strongest level of aspiration in the first word and absence of aspiration in the second one:

team [tʰiːm] and *steam* [stiːm]
tone [tʰəʊn] and *stone* [stəʊn]
Kate [kʰeɪt] and *skate* [skeɪt]
cold [kʰəʊld] and *scold* [skəʊld]

7.3. Palatalised /l/

The term **palatalisation** refers to a process by which a sound, usually a consonant, is articulated with the tongue shifted near the hard palate (see Crystal 2008: 347). The sound /l/ can be realised as a palatalised allophone with the tongue slightly raised toward the palate. This allophone is called **clear /l/,** and it occurs before vowels (e.g. *light, love*). The nonpalatalised allophone, the **dark/l/,** is realised in other contexts: before consonants and in the final positions of words (e.g. *milk, ball*). It has a special allophonic symbol [ɫ]. However, palatalisation is highly dependent on the dialectal use that is specific to RP speakers. In several nonstandard varieties of English, the dark /l/ may be articulated like a vowel or a sonorant: /w/, /ɒ/ or /ʊ/, e.g., *milk* /mɪʊk/ or *feel* /fiːw/. This is called **/l/ vocalisation** and is a notable feature of Cockney and Estuary English.

7.4. Allophonic Release of the Plosives

In certain contexts, the six plosive sounds are released in a different manner as they acquire the features of their neighbouring sounds (see Roach 2009a for each type of the release below). A plosive sound followed by another plosive sound seems to have **no audible release**, which is typically referred to as **loss of plosion** or incomplete plosion. In the IPA, this allophonic realisation of the consonants is denoted with a diacritic in the upper right corner [t̚], e.g. *expect* [ɪkˈspek̚ t], *dog bite* [ˈdɒg̚ baɪt].

Nasal plosion (nasal release) occurs when a plosive sound is followed by a nasal sound. The release of the plosive sound happens by lowering the soft palate so that air escapes through the nose. The plosive sound becomes nasalised, and the whole process is referred to as **nasalisation** (see Roach, 2009a). The plosive and the nasal are homorganic because they share the same place of articulation. The special

diacritic is a small [ⁿ] symbol above the sound as in [tⁿ], e.g. *goodnight* [gʊdⁿ naɪt], *black magic* [blækⁿ ˈmædʒɪk].

L**ateral plosion** (lateral release) takes place when the compressed air for the production of a plosive sound is released by lowering the sides of the tongue before the lateral sound /l/. The plosive sound becomes lateralised, and the process is called **lateralisation,** which is indicated by a vertical line as in [tˡ], e.g. *plosive* [ˈpˡləʊsɪv], *lightly* [ˈlaɪtˡli].

A glottal release of several plosives is widely found in contemporary English pronunciation. This is termed as a **glottal stop** or **glottalisation**. Instead of the plosive articulation, a complete closure is made at the glottis to cause a period of silence, which is very typical of the sound /t/. The symbol for glottal stop is /ʔ/, e.g. bottle /bɒʔl/; *water* /wɔːʔə/. The glottal closure may occur immediately before plosive sounds at the end of a syllable, which is typical of the plosives /p/ /t/ /k/ and the affricate /tʃ/, e.g.:

butter /ˈbʌtə/ or /ˈbʌʔtə/
atmospheric /ætməsˈferɪk/ or /æʔtməsˈferɪk/
accurate /ˈækjərət/ or /ˈæʔkjərət/
teaching /ˈtiːtʃɪŋ/ or /ˈtiːʔtʃɪŋ/

7.5. Treatment of /ŋ/

The nasal /ŋ/ needs to be discussed separately because this is a sound that often causes problems for EFL students. Roach (2009: 47) gives a thorough explanation on the distribution of the sound. The /ŋ/ sound is never found in the initial position of a syllable or a word. In the medial position, /ŋ/ is always followed by the plosive /k/ if the word has *–nk-* in spelling, e.g. *think* /θɪŋk/ or *banknote* /ˈbæŋknəʊt/. The difficulty starts when /ŋ/ is expected to be followed by the sound /g/ in the words with *–ng- in* spelling. When /ŋ/ occurs at the end of a morpheme (at the end of a minimal unit of meaning), /g/ is not present, e.g. *sing* (root) + *er* (suffix) /ˈsɪŋə/. When /ŋ/ occurs in the middle of a morpheme, it is followed by the plosive /g/, e.g. *finger* /ˈfɪŋgə/, *anger* /ˈæŋgə/.

There are exceptions, however. The main exception to the morpheme-based rule is the pronunciation of /ŋ/ in comparative and superlative forms of adjectives and adverbs: even when /ŋ/ occurs at the end of a morpheme, it is pronounced /ŋg/ when it is followed by the comparative suffix *-er* or the superlative suffix *–est*, e.g. *longer* /ˈlɒŋgə/, *longest* /ˈlɒŋgəst/.

7.6. Treatment of /r/

The approximant /r/ is another case to be considered, as its articulation and distribution are not the same in different accents of English. Most British accents like RP are **non-rhotic,** which means that speakers exclude the sound /r/ before a consonant or in final positions of words before a prosodic break. Meanwhile, **rhotic accents** generally realise /r/ in all contexts, e.g. General American. Accordingly, in the following examples of words in RP, the sound /r/ is not pronounced:

car /kɑː/
ever /ˈevə/
nurse /nɜːs/
farm /fɑːm/
stairs /steəz/

7.7. Treatment of Final /s/, /z/ and /ɪz/

Many students often confuse /s/ and /z/ sounds at the end of words when, in spelling, they write *–s*. This is essentially relevant for the plural forms of nouns, the possessive case of nouns, and the third person singular form of verbs. Actually, there are three types of endings, and they are determined by the voice quality of the preceding sound as presented in *Table 9*:

Table 9. **Treatment of final /s/, /z/, and /ɪz/** ***(adapted from Celcia-Murcia et al 2007: 248)***

/s/	after voiceless consonants	*books, roofs, aunt's, wife's, month's, stops, writes*
/z/	after voiced consonants and vowels	*sons, songs, walls, heroes, dog's, pupil's, goes*
/ɪz/	after /s/ /z/ /ʃ/ /ʒ/ /tʃ/ /dʒ/	*churches, languages, judge's, actress's, teaches*

7.8. Treatment of Final /t/, /d/, and /ɪd/

The past form of regular verbs in spelling *–ed* may be pronounced as /t/, /d/, or /ɪd/, which is again determined by the voice quality of the preceding sounds (see *Table 10*):

Table 10.* Treatment of final /t/, /d/, and /ɪd/ *(adapted from Celcia-Murcia et al 2007: 252)

/t/	after voiceless consonants	*looked, missed, passed, baked, crossed*
/d/	after voiced consonants and vowels	*played, served, appeared, spammed, bottled*
/ɪd/	/t/ /d/	*hated, started, wanted, speeded, voted, loaded*

The allophones and their contexts described in the section are the objects of investigation in suprasegmental phonetics. When combined, sounds are often affected by the neighbouring environment and undergo various modifications Because the scope of this course is generally limited to segmentals, just a few allophonic realisations have been discussed.

Further reading options: Roach (2009: 46-51), Cruttenden (2014: 163-164), Ashby and Maidment (2005: 197).

Terminology check:
distribution, clipping, aspiration, palatalisation, clear /l/, dark /l/, /l/ vocalisation, loss of plosion, nasal plosion, lateral plosion, glottalisation, glottal stop, non-rhotic accent

Study questions:

1. Why is the distribution of allophones important?
2. How does a voiceless consonant affect a preceding vowel?
3. What three environments are necessary for the strongest level of aspiration?
4. In what context is /l/ palatalised?
5. How is glottal stop different from glottal reinforcement?
6. In what cases is the sound /ŋ/ followed by the plosive /g/?
7. What does the term **non-rhotic accent** mean?
8. Under what influence is the *–s* ending in the plural of nouns pronounced in three different ways?

Exercises

1. Give minimal pairs showing the existence of a clipped and unclipped vowel.

Minimal pair		Minimal pair	
Clipped vowel	Unclipped vowel	Clipped vowel	Unclipped vowel

2. Underline the plosive sounds that may have the strongest level of aspiration in the given environments:

/fənˈtæstɪk/	/ˈpəʊites/	/kəmˈpeə/	/riˈkɔːl/	/priˈkɔːʃəs/	/ˈtəʊtəlaɪz/	/kəmˈpəʊnənt/

3. Which of the following words are pronounced with clear /l/ and which are pronounced with dark /l/?

Word	Clear /l/ / dark /l/
alphabet	
meal	
bell	
glow	
especially	
milk	
social	
glare	
stumble	
familiar	

4. How are the plosive sounds released in the following words and phrases?

Word / phrase	Loss of plosion / nasal plosion / lateral plosion
bad man	
respect	
nutmeg	
blackleg	

big lad	
big man	
bed covers	
glow	
kidnap	

5. Which of the following words are pronounced with /ŋ/ and which are pronounced with /ŋg/: ***England, strongest, ringer, anger, anguish, banging, hanger, jingle, mongoose, Tango, younger, bungalow, angriest, angry, finger, dangle, language, hungriest.***

/ŋ/	/ŋg/

6. Complete this chart by writing the sound that correctly ends each of these words:

Word	/s/ /z/ /ɪz/	Word	/t/ /d/ /ɪd/
inventions		*placed*	
professors		*allotted*	
coughs		*characterised*	
pronounces		*mentioned*	
matches		*pronounced*	
cultures		*remembered*	
Spencer's		*suggested*	
chocolates		*crusaded*	
Mary's		*computed*	
Gimson's		*argued*	
examples		*flowered*	
entertains		*frightened*	
manages		*masked*	
devotes		*accomplished*	
saves		*bleached*	
attaches		*annoyed*	

8. THE SYLLABLE

8.1. The Structure of the Syllable

The syllable may be defined as an uninterrupted unit of utterance that is typically larger than a single sound and smaller or equal to a word, e.g. *see* /siː/, *simplify* /ˈsɪm.plɪ.faɪ/ (Crystal 2008: 467). In English, a **minimum syllable** is formed by a single vowel, e.g. *are* /ɑː/, *or* /ɔː/. Longer syllables have one or more consonants preceding or following the vowel, e.g. *meet* /miːt/, *consonant* /ˈkɒn.sə.nənt/.

Phonologically, the syllable is "a unit of phonological organisation whose central component is a nucleus, which is normally a vowel, and which may be preceded or followed by consonants" (Carr 2008: 171). The vowel in the centre of the syllable is called the **syllable nucleus,** and the optionally surrounding consonants or sonorants are defined as **margins**. The initial margin is the **onset**, whereas the final margin is called the **coda**. See *Figure 28*:

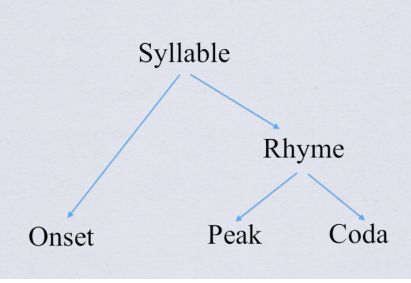

Figure 28. The syllable structure *(adapted from Roach 2009: 60)*

Some syllables have **syllabic sonorants** as their nucleus. Words like *bottle* /ˈbɒtl/, *trouble* /ˈtrʌbl/, *pigeon* /ˈpɪdʒn/, *often* /ˈɒfn/ are formed by two syllables, though they do not have a vowel as the nucleus. Instead, sonorants may serve the function of the nucleus, and in these positions, they are noted with a small vertical diacritics underneath the symbol, e.g. /ˈtrʌb̩/, /ˈpɪdʒn̩/. The typical syllabic sonorants are /l/ and /n/, yet /r/, /m/, and /ŋ/ can also acquire syllabic positions, especially under the influence of some processes in connected speech. If distributed in word final position

or if preceded by a vowel, sonorants do not count as syllabic. Compare the following examples:

sadden /sædn̩/ – *sand* /sænd/
doesn't /dʌzn̩t/ - *don't* /dəʊnt/

The division of words into syllables is referred to as **syllabification** or syllabication, which helps to distinguish between **monosyllabic, disyllabic**, **trisyllabic** and **polysyllabic** words according to the number of syllables they possess.

Syllables are often defined as **strong** or **weak** (see Roach 2009: 64). The strong syllables are relatively longer, more intense, and different in quality as they appear in stressed positions of a word (see section on Word Stress). The weak syllables contain either /ə/, /i/ or /u/ and are never stressed. Syllabic sonorants are also counted as forming weak syllables.

The **transcription** of monosyllabic words is very straightforward. It involves the recognition of concrete sounds and relating them to their phonemic symbols. Monosyllabic content words represent strong syllables only and may hold any phonemes, except for /ə/, /i/ or /u/. Function words, however, may be realised in strong and weak syllables (see Section 9). The usefulness of transcription is undeniably important as it enables the learners to extract precise information on the pronunciation of any word from a dictionary.

8.2. Word Stress

Syllabification is closely connected with the accentual structure of words, which is known as the **word stress** or **lexical stress.** In transcription, a superscribed vertical line appears before the stressed syllable, e.g. *never* /ˈnevə/, *agree* /əˈgriː/. Every disyllabic or polysyllabic word is pronounced with one or more syllables emphasized more than the remaining syllables in the word. Stress is usually equated with the notions of **emphasis** and **strength,** as the stressed syllables seem to be pronounced

Table 11. **The prominence characteristics of stressed and unstressed syllables** (adapted from Roach 2009: 74)

	Loudness	**Vowel length**	**Vowel quality**	**Pitch**
Stressed syllables	loud	long	strong	high
Unstressed syllables	quiet	short	weak	low

with more effort than unstressed ones. Clark and Yallop (1992: 295) say that this emphasis is "signalled by pitch as well as by supporting factors, notably loudness and duration". Roach (2009: 73) defines it as a **prominence** that is determined by four main factors: loudness, vowel length, vowel quality and pitch. In *Table 11* the stressed syllables are opposed to unstressed ones:

8.2.1. Levels of Stress

In some words it is possible to determine a second, weaker, stressed syllable as contrasted to the syllable holding the **primary stress**. This is considered to be the **secondary stress** and is notated by subscripting a low vertical line before the stressed syllable, e.g. pronunciation /prəˌnʌnsiˈeɪʃn/. There is also a third level of stress that is regarded by Roach (2009: 75) as '**unstressed'** and is characterised by the weak prominence factors mentioned above. It should be noted, however, that the syllables containing weak vowels /ə/, /i/, /u/ or a syllabic sonorant will sound even less prominent then the unstressed syllable with any other vowel. Consider the relative prominence of the first syllable in these words:

poetic /pəʊˈetɪk/ the first syllable is more prominent;
pathetic /pəˈθetɪk/ the first syllable is less prominent.

8.2.2. Placement of Stress

The position of the stress determines the different types of it as described below. In many languages, word stress is fairly predictable, i.e. it is determined by rules that apply to the majority of entries in the vocabulary. These languages are said to have **fixed stress**. However, languages with **free stress** have a vocabulary for which stress placement is difficult to predict. English is a free stress language. Moreover, free word stress may be either **constant** (remaining on the same syllable in different word class or in different derivatives from the same root, e.g. ***won**der, **won**derful, **won**derfully*) or **shifting** (varying between the syllables, e.g. ***pro**verb, pro**ver**bial*).

Although English is a free stress language, it is possible to predict the stress placement according to the following information as indicated in Roach (2009: 76): the syllable number in the word, the phonological structure of the syllable, the grammatical category of the word, and the morphological structure of the word. The basic stress patterns are given in the tables below, but there are exceptions, thus learners should treat each single case individually.

Syllabification is one of the factors that support the prediction of stress placement. *Table 12* presents the context when the stress is influenced by strong and weak syllables.

Table 12. **Stress patterns according to syllabification** ***(adapted from Roach 2009: 77-78)***

Disyllabic words	**Nouns**	Stress on the first syllable	*object*	/ˈɒbdʒekt/
			speaker	/ˈspiːkə/
			center	/ˈsentə/
	Verbs	Stress on the final syllable (if the final syllable is strong)	*arrange*	/əˈreɪndʒ/
			release	/rɪˈliːs/
			admit	/ədˈmɪt/
		Stress on the first syllable (if the final syllable is weak)	*fasten*	/ˈfɑːsn̩/
			open	/ˈəʊpən/
			answer	/ˈɑːnsə/
	Adjectives	Stress on the final syllable (if the final syllable is strong)	*polite*	/pəˈlaɪt/
			discrete	/dɪˈskriːt/
			correct	/kəˈrekt/
		Stress on the first syllable (if the final syllable is weak)	*lovely*	/ˈlʌvli/
			fatal	/ˈfeɪtl̩/
			shabby	/ˈʃæbi/
Trisyllabic words	**Nouns**	Stress on the first syllable	*chocolate*	/ˈtʃɒklət/
			paragraph	/ˈpærəgrɑːf/
			emperor	/ˈempərə/
		Stress on the second syllable (if the first syllable is weak)	*confusion*	/kənˈfjuːʒn̩/
			potato	/pəˈteɪtəʊ/
			behaviour	/bɪˈheɪvjə/
	Verbs	Stress on the final syllable (if it is strong)	*entertain*	/ˌentəˈteɪn/
			disconnect	/ˌdɪskəˈnekt/
			resurrect	/ˌrezəˈrekt/
		Stress on the preceding final syllable (**penultimate**) (if the final syllable is weak)	*remember*	/rɪˈmembə/
			acknowledge	/əkˈnɒlɪdʒ/
			determine	/dɪˈtɜːmɪn/
		Stress on the first syllable (if the final and the preceding final syllables are weak)	*motivate*	/ˈməʊtɪveɪt/
			monitor	/ˈmɒnɪtə/
			celebrate	/ˈseləbreɪt/
	Adjectives	Stress on the first syllable	*insolent*	/ˈɪnsələnt/
			positive	/ˈpɒzɪtɪv/
			shimmering	/ˈʃɪmərɪŋ/

Another important factor in stress determination is the **morphological structure** of the words. Some suffixes and prefixes in complex words may influence the level of stress (see *Table 13*).

Table 13. **Stress patterns according to suffixes** ***(adapted from Roach 2009: 83-84)***

Self-stressed suffixes (carry the primary stress themselves)	*-ee*	*refugee*		/ˌrefjʊˈdʒiː/	
	-eer	*engineer*		/ˌendʒɪˈnɪə/	
	-ese	*Portuguese*		/ˌpɔːtʃʊˈgiːz/	
	-ette	*kitchenette*		/ˌkɪtʃɪˈnet/	
	-esque	*sculpturesque*		/ˌskʌlptʃəˈresk/	
Neutral suffixes (do not affect stress placement)	*-able*	*knowledge*	/ˈnɒlɪdʒ/	*knowledgeable*	/ˈnɒlɪdʒəbl̩/
	-ous	*continue*	/kənˈtɪnjuː/	*continuous*	/kənˈtɪnjʊəs/
	-age	*cover*	/ˈkʌvə/	*coverage*	/ˈkʌvərɪdʒ/
	-al	*rebut*	/rɪˈbʌt/	*rebuttal*	/rɪˈbʌtəl/
	-er	*advertise*	/ˈædvətaɪz/	*advertiser*	/ˈædvətaɪzə/
	-ate	*affection*	/əˈfekʃn̩/	*affectionate*	/əˈfekʃənət/
	-en	*threat*	/θret/	*threaten*	/ˈθretn̩/
	-ful	*wonder*	/ˈwʌndə/	*wonderful*	/ˈwʌndəfəl/
	-ess	*steward*	/ˈstjʊəd/	*stewardess*	/ˌstjʊəˈdes/
	-hood	*like*	/ˈlaɪk/	*likelihood*	/ˈlaɪklɪhʊd/
	-man	*business*	/ˈbɪznəs/	*businessman*	/ˈbɪznəsmæn/
	-like	*child*	/tʃaɪld/	*childlike*	/ˈtʃaɪldlaɪk/
	-less	*power*	/ˈpaʊə/	*powerless*	/ˈpaʊəlɪs/
	-ish	*fool*	/fuːl/	*foolish*	/ˈfuːlɪʃ/
	-ly	*hurried*	/ˈhʌrɪd/	*hurriedly*	/ˈhʌrɪdli/
	-ment	*acknowledge*	/əkˈnɒlɪdʒ/	*acknowledgment*	/əkˈnɒlɪdʒmənt/
	-ness	*discursive*	/dɪˈskɜːsɪv/	*discursiveness*	/dɪˈskɜːsɪvnəs/
	-ous	*poison*	/ˈpɔɪzn̩/	*poisonous*	/ˈpɔɪzənəs/
	-fy	*glory*	/ˈglɔːri/	*glorify*	/ˈglɔːrɪfaɪ/
	-ship	*relation*	/rɪˈleɪʃn̩/	*relationship*	/rɪˈleɪʃnʃɪp/
	-some	*burden*	/ˈbɜːdn̩/	*burdensome*	/ˈbɜːdnsəm/
Influencing suffixes (influence stress in the stem)	*-al*	government	/ˈgʌvənmənt/	*governmental*	/ˌgʌvn̩ˈmentl̩/
	-eous	advantage	/ədˈvɑːntɪdʒ/	*advantageous*	/ˌædvənˈteɪdʒəs/
	-graphy	photograph	/ˈfəʊtəgrɑːf/	*photography*	/fəˈtɒgrəfi/
	-ate	origin	/ˈɒrɪdʒɪn/	*originate*	/əˈrɪdʒəneɪt/
	-ic	climate	/ˈklaɪmət/	*climatic*	/klaɪˈmætɪk/
	-ion	transport	/træns ˈpɔːt/	*transportation*	/ˌtrænspɔːˈteɪʃn̩/
	-ious	injure	/ˈɪndʒə/	*injurious*	/ɪnˈdʒʊərɪəs/
	-ity	banal	/bəˈnɑːl/	*banality*	/bəˈnæləti/
	-ive	*prospect*	/prəˈspekt/	*prospective*	/prəˈspektɪv/
	-nda	*agent*	/ˈeɪdʒənt/|	*agenda*	/əˈdʒendə/

Most **compounds words** have two stresses: primary and secondary. Depending on how compounds function in the sentence, the following stress patterns are found (see *Table 14*):

Table 14. **Stress patterns in compounds** ***(adapted from Roach 2009: 85-86)***

Compound nouns	General rule	Primary stress on the first element, secondary stress on the second element	*wristwatch*	/ˈrɪstˌwɒtʃ/
			swimming pool	/ˈswɪmɪŋ ˌpuːl/
			goldfish	/ˈgəʊldˌfɪʃ/
	If the first element is an ingredient of the second element	Primary stress on the second element, secondary stress on the first element	*apple pie*	/ˌæpl ˈpaɪ/
			strawberry milkshake	/ˌstrɔːbri ˈmɪlkʃeɪk/
			chicken bouillon	/ˌtʃɪkɪn ˈbuːjɒn/
			beef stew	/ˌbiːf ˈstjuː/
	Except compounds ending in cake, juice or water	Primary stress on the first element, secondary stress on the second element	*chocolate cake*	/ˈtʃɒklət ˌkeɪk/
			lemon juice	/ˈlemən ˌdʒuːs/
			rosewater	/ˈrəʊz ˌwɔːtə/
Compound adjectives	General rule	Primary stress on the second element, secondary stress on the first element	*blue-eyed*	/ˌbluː ˈaɪd/
			open-minded	/ˌəʊpən ˈmaɪndɪd/
			kindhearted	/ˌkaɪnd ˈhɑːtɪd/
	If the first element is a noun	Primary stress on the first element, secondary stress on the second element	*homesick*	/ˈhəʊm ˌsɪk/
			handmade	/ˈhænd ˌmeɪd/
Compound verbs		Primary stress on the second element, secondary stress on the first element	*overboil*	/ˌəʊvə ˈbɔɪl/
			underestimate	/ˌʌndəˈrestɪmeɪt/
			outrun	/ˌaʊtˈrʌn/

8.2.3. Stress in Word Class Pairs

There are words with identical spelling that represent different parts of speech. These words are differentiated by means of **shifting of the stress**. A small group of words for which the noun is differentiated from a verb by stress without a change in sound quality, e.g.:

increase /ˈɪnkriːs /, Noun, whereas *increase* /ɪnˈkriːs/, Verb
insult /ˈɪnsʌlt/, Noun, whereas *insult* /ɪnˈsʌlt /, Verb
impress /ˈɪmpres/, Noun, whereas or *impress* /ɪmˈpres/, Verb

Next follows another group of words for which the shifting of the stress may or may not be accompanied by a change in the quality of the vowel in the unstressed syllable of the verbs, e.g.:

transport /ˈtrænspɔːt/, Noun, whereas *transport* /trænˈspɔːt/ or /trənˈspɔːt/, Verb
torment /ˈtɔːment/, Noun, whereas *torment* /tɔːˈment/ or /təˈment/, Verb

Finally, there is a large group of words for which the shifting of the stress is accompanied by a change in the quality of the unstressed vowel, e.g.:

combine /ˈkɒmbaɪn/, Noun, whereas *combine* /kəmˈbaɪn/, Verb
conduct /ˈkɒndʌkt/, Noun, whereas *conduct* /kənˈdʌkt/, Verb
contrast /ˈkɒntrɑːst/, Noun, whereas *contrast* /kənˈtrɑːst/, Verb

There are also quite a few nouns that can form compounds but that can also be used like adjectives to make phrases with other nouns. When they constitute a compound, the main stress is placed on the first element. If they function as a phrase, the second element acquires the main stress (see Carr 2013: 86). Consider the following examples:

a blackboard /ˈblækbɔːd/ as a compound noun;
a black board /ˌblæk ˈbɔːd/ as an adjective and noun.

8.2.4. Stress Shift

When the change in stress placement is caused by the context, this is known as **stress shift** (Roach, 2009a). When a polysyllabic word with a stress placed at the end of it is followed by another word with the stress placed in the beginning of it, there is a tendency for the stress in the first word to shift towards the beginning, especially if it has a syllable that is capable of receiving stress, e.g.:

Japanese /ˌdʒæpəˈniːz/, but a *Japanese student* /ˈdʒæpəˌniːz ˈstjuːdnt/

Further reading options: Roach (2009: 56-68, 82-88), Crystal (2008: 467), Cruttenden 2014: (51-54).

Terminology check:
minimum syllable, the syllable nucleus, margins, onset, coda, syllabic sonorants, syllabification, monosyllabic, disyllabic, trisyllabic, polysyllabic, word stress, primary stress, secondary stress, fixed stress, free stress, constant stress, stress shift

Study questions:

1. What is the structure of an English syllable?
2. What is the meaning of the term syllabification?
3. Why is English called a free stress language?
4. What are the levels of stress?
5. What factors may help predict word stress in English?
6. How are word class pairs with identical spelling stressed and pronounced?
7. Under what circumstances does stress shift happen?

Exercises:

1. Transcribe these monosyllabic words:

Word	Transcription	Word	Transcription
Comb		*Choose*	
Last		*Month*	
Feel		*Year*	
Rose		*Quick*	
Bug		*Sword*	
Pack		*Hear*	
Gloves		*Laugh*	
Short		*Large*	
Long		*Five*	
Chair		*Write*	
Want		*Back*	
One		*Hold*	
Three		*Rude*	
Six		*Young*	
Town		*Use*	
Watch		*Joke*	
Age		*Front*	
Worm		*How*	
Warm		*Air*	
Walk		*Fire*	
News		*Wife*	
Phone		*Teeth*	
Next		*Voice*	
Quite		*File*	
Thanks		*Foot*	

Please		*Shoes*	
Kiss		*Check*	
Oil		*John*	
Half		*Jeep*	
Worse		*Chain*	
Wood		*Jazz*	
Twelve		*Bridge*	
Lunch		*Word*	
Thumb		*Chop*	
Each		*French*	
Taught		*Cheese*	
Though		*Cash*	
Bank		*Ash*	
Clothes		*Wage*	
Know		*Says*	
Corn		*Draw*	
Wrong		*Both*	
Wash		*Shelf*	

2. Transcribe the following polysyllabic words:

Word	Transcription	Word	Transcription
Capital		*Apply*	
Picture		*Pleasure*	
Support		*Sentence*	
Additional		*Dictionary*	
Ballad		*Personnel*	
Dramatic		*Future*	
Prefer		*Ordinary*	
Popular		*Philology*	
Particular		*Ability*	
Knowledge		*Learner*	
Affirm		*Command*	
Attempt		*Authentic*	
Activity		*Trainer*	
Teacher		*Register*	
Parents		*Number*	
Nature		*Traditional*	
Approach		*Historically*	
Personal		*Volume*	

Confidence		*Significant*	
Capacity		*Material*	
Example		*Perform*	
Interesting		*Student*	
Practice		*Yesterday*	
Difficult		*Telephone*	
Available		*Happens*	
Separately		*Customer*	
Alone		*Passenger*	
Unit		*Envelope*	
Edition		*Architect*	
Trouble		*Structural*	
Garden		*Brackets*	
Lovely		*Minimal*	
Careful		*Attention*	
Spelling		*Purpose*	
Money		*Surprise*	
Hospital		*Together*	
Husband		*Forever*	
Comfortable		*Another*	
Village		*Energy*	
Perhaps		*Exercise*	
Author		*Expression*	
Leather		*Statement*	
Clothing		*Atmosphere*	
Polite		*Component*	
Computer		*Produce*	
Remember		*Develop*	
Catastrophe		*Generate*	
American		*Translation*	
Important		*Family*	
Entrance		*Circus*	
Appreciate		*Twisters*	
Answer		*Memorable*	
Wonderful		*Although*	
Vegetable		*Feature*	

3. First underline the primary and secondary stresses in these words and then transcribe them.

Word	Transcription	Word	Transcription
Intonation		*Entertainment*	
Pronunciation		*Generation*	
Examination		*Fragmentation*	
Intermediate		*Cooperation*	
Capitalization		*Homogeneous*	
Photographic		*Application*	
Congratulations		*Topicality*	
Understand		*Transportation*	
Acquisition		*Volunteering*	
Opportunities		*Workaholic*	
Education		*Evolution*	
University		*Proportionality*	
Comprehension		*Illumination*	
Supplementary		*Particularisation*	
Punctuation		*Organisational*	
Lexicology		*Normalisation*	
Orthographic		*Neurological*	
Orientation		*Moralistic*	
Obligation		*Mineralogist*	
Acceleration		*Memorisation*	
Accommodation		*Legibility*	
Composition		*Hemispheric*	
Characterisation		*Harmonisation*	
Civilisation		*Gubernatorial*	
Capitalistic		*Guarantee*	
Enthusiastic		*Futurology*	

4. Decide what function the compounds serve in the sentence and transcribe the compounds according to the proper stress pattern:

Word	Function	Transcription	Word	Function	Transcription
Secondhand			*Overreact*		
Post office			*Movie star*		
Childlike			*Fall apart*		
Keyboard			*Undergo*		
Duty-free			*Colour-blind*		

Well-mannered			*Whitehouse*		
Turn away			*Shortsighted*		
Makeup			*Break-through*		
Make up			*Fall apart*		
Notebook			*Olive oil*		
Air-conditioned			*Handmade*		
Bedroom			*Seasick*		
Teapot			*Haircut*		
Look forward			*Toothpaste*		
Windscreen			*Waterproof*		
Trouble-free			*Quick-tempered*		
Update			*Tennis shoes*		
Tongue-tied			*Trainspotting*		
Middle-aged			*Upgrade*		
Outrun			*Software*		
Passer by			*English-speaking*		
Blacklist			*Washing machine*		
Car wheel			*Far-reaching*		
Brightly-lit			*Open-minded*		
Time-saving			*Underworld*		
Well-behaved			*Old-fashioned*		
Sun-dried			*Downsize*		
Long-lasting			*School-teacher*		

9. STRONG AND WEAK FORMS IN RELATION TO SENTENCE STRESS

9.1. Content Words and Function Words

Up to this point in the course, stress patterns have been attached to words in isolation. Stress operates at the word level and at the sentence level. In natural connected speech, however, not all words are stressed. Traditionally, the main meaningful words (those that carry the main semantic content) are stressed, while the other words that convey minor information in sentences are not stressed. The meaningful words, i.e. those that have an independent meaning and refer to a thing, an event, a property, etc. are called **content words,** and they include nouns, verbs, adjectives and adverbs. As opposed to content words are function words that have no or very little lexical meaning and are usually not stressed. They convey only grammatical information and express various grammatical relations. Depending on whether they are stressed or unstressed, the function words have several pronunciations. There are approximately 50 function words in English, including auxiliary verbs, prepositions, conjunctions, particles, etc. Typically, when they are unstressed, they are pronounced in their **weak form.** However, in some rare contexts, they can be stressed and appear in their **strong form**.

9.2. Reduction

The weak form is also often referred to as the **reduced form** because it is generally distinguished from the strong form of the word and undergoes the process of reduction. **Reduction** is the process that affects the quality and quantity of the sound. Thus, depending on the character of the change, reduction may be purely quantitative, qualitative, or zero. The reduction is called **quantitative** when it affects the length of sounds, e.g. *me* /miː/ to /mɪ/. The reduction is called **qualitative** when the vowel changes its quality to a neutral sound, e.g. *can* /kæn/ to /kən/. **Zero realisation** or **elision** is the process when sounds are elided, e.g. *of* /əv/ to /v/ (see Roach 2009: 113). *Table 15* presents the most common English function words in their strong and weak form:

Table 15. **Strong and weak forms of function words** ***(adapted from Collins and Mees 2003: 239-241)***

Function word	Strong form	Weak form
Determiners		
the	/ðiː/	/ði/ (before vowels)
		/ðə/ (before consonants)
a	/eɪ/	/ə/
an	/æn/	/ən/
some	/sʌm/	/səm/
Pronouns		
his	/hɪz/	/(h)ɪz/
him	/hɪm/	/(h)ɪm/
her	/hɜː/	/(h)ə/
you	/juː/	/ju/ (before vowels)
		/jə/ (before consonants)
your	/jɔː/	/jə/
she	/ʃiː/	/ʃi/
he	/hiː/	/(h)i/
we	/wiː/	/wi/
me	/miː/	/mi/
them	/ðem/	/ðəm/
us	/ʌs/	/əs/
who	/huː/	/(h)u/
that	/ðæt/	/ðət/
Prepositions and Particles		
then	/ðen/	/ðən/
at	/æt/	/ət/
for	/fɔː/	/fə/
from	/frɒm/	/frəm/
of	/ɒv/	/əv/
into	/ˈɪntuː/	/ˈɪntu/ (before vowels)
		/ˈɪntə/ (before consonants)
through	/θruː/	/θru/
to	/tuː/	/tu/ (before vowels)
		/tə/ (before consonants)
as	/æz/	/əz/
there	/ðeə/	/ðə/
Conjunctions		
and	/ænd/	/ənd/ /ən//n̩/
but	/bʌt/	/bət/

that	/ðæt/	/ðət/
than	/ðæn/	/ðən/
or	/ɔ:/	/ə/
Auxiliary verbs		
can	/kæn/	/kən/
could	/kʊd/	/kəd/
have	/hæv/	/(h)əv/
has	/hæz/	/(h)əz/
had	/hæd/	/(h)əd/
will	/wɪl/	/wɪl/ /l/
shall	/ʃæl/	/ʃəl/ /ʃl̩/
should	/ʃʊd/	/ʃəd/
would	/wʊd/	/wəd/
must	/mʌst/	/məst/ /məs/
do	/du:/	/du/ (before vowels)
		/də/ (before consonants)
does	/dʌz/	/dəz/
be	/bi:/	/bi/
been	/bi:n/	/bin/
am	/æm/	/əm/
are	/ɑ:/	/ə/
is	/ɪz/	/ɪz/
		/z/ /s/ (in contracted forms)
was	/wɒz/	/wəz/
were	/wɜ:/	/wə/

Strong forms of function words are rare, however, they may appear if the speaker intentionally emphasises the function words. The following environments usually require the use of strong forms:

- when in isolation, as in: *Who?* /hu:/;
- when being quoted, as in: *he said "of", not "off"* /ov/;
- at the end of a phrase or sentence, as in: *What are you looking for?* /fɔ:/;
- as the first of two consecutive auxiliary verbs without a full verb, as in: *would have liked* /wʊd/;
- in coordinations, as in: *he travels to and from London* /tu:/, /frɒm/;
- in contrasts, as in: *a message from John, not for John* /frɒm/, /fɔ:/;
- when used to emphasise a particular aspect of the message, as in: *Paris is the love city* /ði:/.

Further reading options: Roach (2009: 89-96), Collins and Mees (2003: 239-241).

Terminology check:
content word, function word, strong form, weak form, reduced form, reduction, qualitative reduction, quantitative reduction, elision

Study questions:

1. What words are typically stressed in a sentence?
2. How are function words realised under the stress influence?
3. What environments may determine the use of strong forms of the function words?

Exercises:

1. Choose 15 function words and write short sentences for their realisation in strong and weak forms:

Function word	Strong form	Weak form
.		
.		

2. Stress and transcribe the following sentences:

After about an hour, I managed to catch a bus.
Could you keep the secret until we get to our homes?
Don't lose your temper if Ann forgets to come.
I want a pound of sugar for making jam.
Look at the shop windows on the corner of the street.

Say that over and over again to make me feel better and better.
The airplanes are landing every two minutes, making a terrible noise.
There were a lot of people in the room who wanted to stay.
There is nothing better for a cold than a cup of hot tea with honey and lemon.

A LIST OF ABBREVIATIONS

EFL	English as a Foreign Language
SE	Standard English
RP	Received Pronunciation
EE	Estuary English
BBC	The British Broadcasting Corporation
IPA	International Phonetic Alphabet
IPA	International Phonetic Association

A GLOSSARY WITH LITHUANIAN EQUIVALENTS

Below is provided a glossary that uses Lithuanian equivalents as described by Bacevičiūtė (2008), Aprijaskytė and Pažūsis (1994), to help explain the key terms and complex anatomy concepts.

accent	tartis, akcentas arba kirtis
acoustic	akustinis
active organ of speech	aktyvus kalbos padargas
affricate	afrikata, priebalsinis dvigarsis
allophone	alofonas, fonemos variantas
alveolar ridge	alveolės, dantenos
apical (apico)	apikalinis, liežuvio galiuko kliūtinis
apico-alveolar	liežuvio priešakinis alveolinis
apico-dental	liežuvio priešakinis dantinis
apico-post alveolar	liežuvio pirešakinis užalveolinis
archiphoneme	tarpinis garsas
articulatory	artikuliacinis
articulatory settings	artikuliacinė bazė
arytenoid cartilage	vedeginė kremzlė
back vowel	užpakalinės eilės balsis
bilabial	abilūpinis
blade of the tongue	priešakinė liežuvio dalis
central vowels	vidurinės eilės balsiai
clipping	trumpinimas
coda	skiemens pabaigos garsas

consonant	priebalsis
constrictive	ankštumos
cricoid cartilage	žiedinė kremzlė, gerklų pagrindas
diacritics	diakritikas, žymėjimas
dialect	dialektas
diphthong	dvibalsis
distribution	distribucija, galimų pozicijų visuma
dorsum of the tongue	liežuvio nugarėlė
egressive	sudaromas iškvėpimo metu
expiration	iškvėpimas
flaps of muscle	raumenų audinių lopai
fortis	stiprusis
fricative	pučiamasis
front vowel	priešakinės eilės balsis
glide	slankas, antrasis dėmuo
glottal	glotalinis, ryklinis
glottalisation	ryklinis garso tarimas
glottis	balsaskylė, tarpas tarp balso stygų
hard palate	kietasis gomurys
high vowel	aukštutinio pakilimo balsis
homorganic	homorganinis, tariamas toje pačioje vietoje
initiation	iniciacija, garso sudarymo pradžia
inspiration	įkvėpimas
labio-dental	lūpinis dantinis
laminal (lamino)	liežuvio priešakinis
lamino-alveolar	liežuvio priešakinis alveolinis
lamino-palatal	liežuvio priešakinis gomurinis
larynx	gerklos

lateral	liežuvio šoninis
lenis	silpnasis
low vowel	vidutinio pakilimo balsis
lower jaw	apatinis žandikaulis
lungs	plaučiai
medial	liežuvio vidurinis
mid-open vowel	žemutinio pakilimo balsis
monophthong	vienbalsis
monosyllabic	vienskiemenis
nasal cavity	nosies ertmė
nasality	nosinimas, tarimas nosies ertmėje
nostrils	šnervės
nucleus	branduolys, pagrindinis elementas
obstruction	kliūtis
obstruent	kliūtinis garsas
occlusive	uždarumos
occlusive-constrictive	uždarumos-ankštumos
onset	skiemens pradžios garsas
oral cavity	burnos ertmė
oronasal	procesas burnos ir nosies ertmėje
palatalisation	minkštinimas
passive organ of speech	pasyvus kalbos padargas
pharynx	ryklė
phonation	fonacija, garso susidarymas
phone	kalbos garsas
phoneme	fonema
plates of vocal folds	balso stygų klostės
plosive	sprogstamasis

polysyllabic	daugiaskiemenis
primary stress	pagrindinis kirtis
qualitative reduction	kokybinė redukcija
quantitative reduction	kiekybinė redukcija
resonator	rezonatorius, ertmė, kurioje formuojasi garsas
respiratory	respiracinis, kvėpuojamasis
rims of the tongue	liežuvio šonai
root of the tongue	liežuvio šaknis
rounded vowel	lūpinis balsis
secondary stress	šalutinis kirtis
shifting stress	nepastovus kirtis
soft palate	minkštasis gomurys
sonorant	sonantas, pusbalsis
sonority	balsingumas
syllabic	skiemeninis
syllabification	skiemenavimas
syllable nucleus	skiemens centras
thyroid cartilage	skydinė kremzlė
tip of the tongue	liežuvio galiukas
tongue	liežuvis
trachea	trachėja, kvėpavimo aparato organas
transcription	transkripcija, tikslus garsų tarimo užrašymas
triphthong	tribalsis
unrounded vowel	nelūpinis balsis
uvula	liežuvėlis
velar	veliarinis, minkštojo gomurio
velum	minkštasis gomurys
vocal folds	balso stygos

vocal ligament	balsinis raištis, balso stygos
vocalisation	vokalizacija, balsinimas
voiced	skardus
voiceless	duslus
vowel	balsis

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Giedrė Balčytytė-Kurtinienė

A COURSE IN ENGLISH PHONETICS FOR EFL UNIVERSITY STUDENTS

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Computer-assisted Programme for the Teaching of the English Syllable in RP Allophonic Pronunciation

Rasim Tayeh Jehjooh
M.A.
College of Languages

1. Introduction :

Native speakers of English from different parts of the world have different accents,but the differences of accents are mainly the result of differences in the sound of vowels and consonants . The actual use of all these sounds in combination leads the speaker to produce a number of segments which only appear on the production level and realized on the perceptual one . RP pronunciation represents the teachable variety in all Iraqi universities because it is the most acceptable and understandable accent all over the world and not only in South East London ..The structure of the English syllable in RP pronunciation is influenced by the appearance of certain allophones especially aspiration and glottalization which change the form of CV in RP pronunciation.

This study is a new experiment to show how chapter 8 & 9 (the English Syllables)in Roach's book Phonetics & Phonology (2002) have been taught to the second stage ,department of English ,College of Languages through a computer programme and how certain allophones have changed the form of CV system in the structure of the English "syllable" in RP through the use of narrow transcription .

2. Definitions

The term 'syllable', in its broadest sense, is studied from the phonetic and phonological point of view since it represents one of the basic components in phonetics and phonology. However, the syllable theories are based on evidence taken from different fields of knowledge such as psycholinguistics which involves the study of child language acquisition and language universals(Fallows ,1980:76).

Roach (2002:66) states that the syllable is a fundamentally important unit in both phonetics and phonology.

Crystal (1989: 164) defines the syllable as " an element of speech that acts as a unit of rhythm, consisting of a vowel, a syllabic consonant or vowel / + consonant combination ". On the other hand, Hancock (2003: 50) beliefs that a syllable is often described as a group of one or more sounds with a peak or nucleus.

Phonetically speaking, the air pressure is most noticeable in the nucleus. The hearer may distinguish the central part of a syllable because it has more prominence than the surrounding sounds, but people often have difficulty in hearing when one syllable ends and another begins, for example, the word "bitter"[b'ɪtə] may be heard as (bi-tter, bit-ter or bitt-er).

Phonologically speaking, a syllable is defined as the way in which vowels and consonants combine to form various sequences (the study of the location of sounds in sequence is called phonotactics) . Vowels can form a syllable on their own or they can be the " centre or nucleus " of a syllable , e.g. [e] in bed [b ˈed],I [aɪ].

In addition, some consonants like / m, n, ŋ , l / are called syllabic consonants since they function as syllables in final position and also we have what is called " minimum syllable ", as in [ˈm] to show agreement and [ˈʃ] to keep someone quiet and these are consonant sounds, but they have meaning. (Roach, 2002: 76).

Roach (ibid: 66) divides a syllable into two parts onset plus rhyme (hence nucleus & coda). For example, sit consists onset[s]+nucleus[ɪ]+coda[?t]]; therefore [ɪ] + [?t] represent the rhyme part of the syllable as in fig ure 1

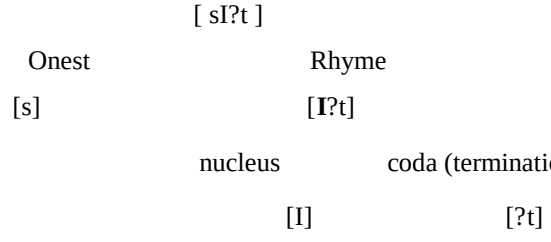

Figure (1)

The proposed definitions of the term "syllable" can be divided into three types: phonetic, phonological and phonotactic.

Phonetically, a syllable is usually described as consisting of a centre which has little or no obstruction to the flow of air out of the mouth and which sounds comparatively loud and before and after this centre. (Abrecrombie, 1989:39; Roach, 2002:67).

Phonologically speaking, a syllable is defined by Laver (1994:39) as "a complex unit made up of nucleus and marginal elements". Nucleus elements are the vowels or syllabic consonants. In the 'one word syllable' try [trˈaɪ] the diphthong /aɪ/ is the nucleus element; while the initial consonant cluster which consists of [t] and [r]are the marginal elements.

A number of scholars suggest that the term "syllable "should not be used in either a phonetic or a phonological sense, but it should refer to a linguistic unit composed of phonemes that are arranged according to certain phonotactic criteria. McCarthy (1978:107)

3. Significance of the Syllable

For Crystal (2003:447) "The syllable is important in phonology in relation to prosody, and cross-linguistic studies of rhythm .In the distinctive features theory of phonology 'syllable' is used to replace the syllabic nucleus".

Likewise, Bolinger (1975:56) emphasizes that the syllable obtains much of its obviousness because of the role it plays in rhythm, i.e., when people segment the stream of speech and give it a rhythm of strong and weak beats, as in music. In addition, the best justification for ending the structure of sound–units at the level of the syllable is that anything higher is almost necessarily related to the meaning and the structure of the language.

It is necessary to mention that the significance of syllable has increased especially in models of non–linear phonology in relation to derivation .In addition, a syllable plays a role in prosodic morphology as being "a level above the 'mora' and below the 'foot'- the unit of rhythm in languages" (ibid.).

Finch (2000:68); and the Free Encyclopedia (2005:Int.) state that syllables serve in carrying the stressed patterns of English which are essential to the way in which speech is organized.

O'Connor (1973:201) explains the importance of the syllable when he affirms that "the syllable is useful as the largest unit one needs to consider in explaining how phonemes are permitted to combine together in a language".Moreover, Smith and Wilson (1980:141) also refer to the importance of the syllable in the need for something larger than a phoneme and smaller than a word.

4. The Syllable : Various Theories

A number of studies have been made to explain theories of syllable. Phonetically speaking, one of the most important theories is "the chest pulse theory" which tackles the syllables in the context of muscular activities and lung movements in the process of speech. Experiments which have shown that the number of chest pulses, accompanied by the increase of air pressure, can determine the number of syllables produced, thus, allowing associate with the number of chest pulses. (ibid.56)

This theory, however, can not account for cases when two vowels occur one after another, for example, in words like being [b'i:ɪŋ] the second chest pulse must be almost irrelevant and thus leads erroneously to the conclusion that such English words consist of one syllable only. (Roach, 2004:1)

Another well-known theory is 'the prominence theory', which tackles the syllable from a phonological point of view and depends on auditory judgements, i.e., the number of syllables in a word is determined by the number of peaks of prominence. In the word beautiful,[bj'u:?tɪfʊl], for example, the peaks of prominence are represented by the vowel phonemes /u: , ɪ ,ʊ/, respectively. However, this theory does not help much in the problem of division of the syllable (Gimson, 1989:52).

Another theory is the “Sonority theory” in which “the pulses of pulmonic air stream in speech correspond to peaks in sonority”. The sonority of speech of a sound is seen as its relative loudness compared to other sounds. Each syllable corresponds to a peak in the flow rate of pulmonic air. Thus, the nucleus elements or syllabic segments are described as intrinsically more sonorant than marginal or non-syllabic segments.Speech sounds can be ranked in terms of their intrinsic sonority according to sonority scale as in figure(2) (Rogers,2000:268).

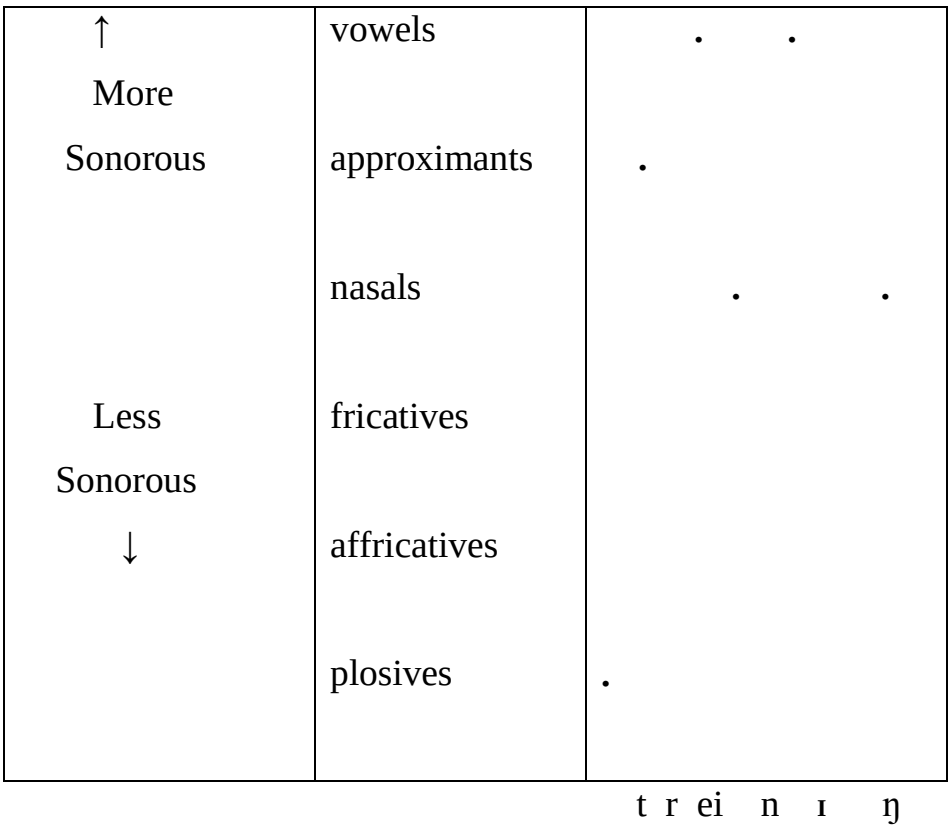

Figure (2): The Sonority Scale of the Word Training [tr'eɪnɪŋ]

(after Roach 2004:2).

In the above figure two peaks of sonority can be seen in the linear sequence of phonemes **/tr-eɪ-n-ɪ- ŋ/**i.e., the diphthong /**eɪ** /and the pure vowel / **ɪ** /.Thus, the number of syllables is two (ibid).

5 . English syllable: Nature of Structure of patterns .

O’Connor, (1973:201) states that the nature of a syllable structure varies from one language to

another since there is no universal phonological syllable. The phonological view of the syllable requires a separate definition for each language. However, Malmberg (1963:1), among other phoneticians, believes that a syllable consisting of a consonant plus a vowel is the only one which is general for all languages.

There are two types of English syllable structures which can be classified into two types: a phonetic syllable structure and a phonological one.

5.1 Phonetic Syllable Structure :

The phonetic syllable structure consists of three phonetic parts: the onset, the peak and the coda (Hyman, 1975:188). Sequences of segments within a phonetic syllable depend upon an inherent hierarchical scale of sonority. The most sonorous segment occupies the nucleus and farther from the nucleus on either margin the least sonorous, the sounds will be optional consonants (Hawkins, 1984:66). On the other hand, the phonological syllable structure displays the following pattern of arrangements: 0, 1, 2, 3 consonants +V + 0, 1, 2, 3, 4 consonants. This pattern means that a syllable consists of a vowel(V)which is preceded by zero, one, two, three, consonants and followed by zero, one, two, three, four consonants as in[ˈaɪ] [t^h ˈi:],[tr ˈaɪ],[str ˈi:t],[ɪn], [i:ʔt],[g ˈa:dn] ….etc. (O'Connor, 1973:229).

5.2 Phonological Syllable Structure :

Moreover, as for phonological theories of syllable, they are mostly concerned with the internal structure of syllables .In this respect, phonologists have adduced every possible configuration for the internal structure of syllables. For instance, the main concern of CVC syllables is whether the vowel is grouped with the prior consonant (called the onset) or with the posterior consonant (called the Coda) or with neither.

More recently, some phonologists have claimed that the components of the syllable are units of weight called 'Moras' (Hyman, 1982:9) .

Two parts can be found in the internal structure of the syllable. These parts are onset and rhyme; with the rhyme, nucleus and coda are found .It is important to point out that not all syllables have these parts; the smallest possible syllable

contains a nucleus only .Simply, onset means the beginning sound(s)of the syllable which precede the nucleus and coda means the sounds at the end of the syllable which follow the nucleus. These are always consonants in English (Roca and Johnson, 2000:239). Vowels and consonants do not act alone, but there are very few words-like which consist of only one sound, for instance, (I, eye, oh, m (to show agreement), or, are….etc.)(ibid.)

Accordingly, there are four patterns of syllables.They are: (ØVØ), (CVØ), (ØVC) and (CVC). In this case, a syllable may be a vowel only, viz. the pattern (ØVØ), as in or ['ɔ:], this kind of syllable is known as a 'minimum syllable'. The syllable which is not closed by consonant, viz. the pattern (CVØ) as in be [b'i:] is called an "open syllable".

Phonetically speaking, syllables consist of a centre, which has little or no obstruction to air flow and before and after this centre, there may be greater obstruction as in eye ['aɪ], in ['ɪn]. more [m'ɔ:]. But phonologically, consonants always occupy the margins of the syllable structure, and it happens that a consonant occupies the nucleus of the syllable as in syllabic consonant' (Gimson, 1989: 54).

6. English Syllables: Major Types

6.1 Simple Vs Complex Syllables

English syllables are classified into simple and complex according to their structure.. The simple syllable consists of a nucleus only or a nucleus with one consonant preceding it and /or another consonant following it. Consequently, the simple syllable has the structures: V, CV, VC and CVC as in "I" ['aɪ] , 'knee' [n'i:] , 'if'['ɪf] and dog[d'ɒg]. Other types of syllables are complex, i.e., they have cluster(s) of consonants before and /or after the vowel (ibid.).

Concerning the longest complex monosyllable English words, the following is a list of some of the nine- letter English words which have (7) sounds that each consists of a single complex syllable:

Table 1

Nine – letter Monosyllabic words in English

The word	narrow Trans.	syllable structure
scratched	[skr'æ?ʧ t]	CCCVCCC
straights	[str'eɪ?ts]	CCCVCCC
stretched	[str'e?ʧt]	CCCVCCC
scrounged	[skr'aʊndʒd]	CCCVCCC
scrunched	[skr'ʌn ʧt]	CCCVCCC
strengths	[str'eŋθs]	CCCVCCC

6.2 Open vs. Closed Syllables

Syllables are divided into open and closed according to the ending of the syllable. Open (free) syllables are those that end with a vowel or diphthong, i.e., they end with ‘nuclei’. Closed syllables (also called complete or blocked) are those that have at least one consonant following the vowel, i.e., they end with 'coda'. (Hartman and Stork, 1976:228)

Thus, closed syllables are those that have a branching rhyme while open syllables have a non-branching rhyme (Roach et al., 2004:Int.).The most common closed syllable has the structure CVC as in ‘died’ [d'aɪd]. This type of syllables, that has the CVC structure, is thought to be a subsequent innovation of the open syllable CV (Brosnahan and Malmberg, 1970:210). On the other hand, the most common open syllable has the structure CV, as in ‘we’ [w'i:] , the CV (a consonant followed by a vowel) structure, which is not closed by another consonant, is regarded as a basic phonological unit in all languages since relatively all languages

have it in their structures and may be the first systematic utterances of children are expected to be of this form (Hogg and McCully, 1989:36).

Cox et al., (2004:Int.) show the different structures of each type in English monosyllabic words as illustrated below:

Table (2)

Open and closed Syllables

(A). Closed syllables		
VC	is	['iz]
VCC	end	['end]
VCCC	ants	['ænts]
CCVCCCC	prompts	[prompts]
CVC	moon	[m'u:n]
CVCC	jump	[ʤ ʌ mp]
CVCCC	hands	[h'ændz]
CVCCCC	sixths	[s'Iksθs]
CCVCCC	plants	[pl'ænts]
CCVCCC	twelfths	[twelf θ]
CCCVC	strong	[str'ɒŋ]
CCCVCC	springs	[spr'Iŋz]
CCCVCCC	splints	[spl'Ints]
(B.) Open syllables		
V	or	['ɔ:]
CV	sea	[s'i:]
CCV	through	[θr'u:]
CCCV	screw	[skr'u:]

6.3 Strong Vs Weak Syllables

Phoneticians have found that it is useful to make a distinction between syllables that have more prominent nucleus and less prominent nucleus .In this respect they divided syllables into strong and weak syllables.

Smith (1982:10) refers to strong syllables using the terms “heavy” and “long”, and to weak syllables using the terms “light” and ‘short”. These two types of syllables can be described in part in terms of stress since they are closely associated with this aspect. Also, in a polysyllabic word there is always a syllable with primary stress; this syllable is called a “strong syllable”. Syllables that have no stress are known as “weak syllables” (Singh and Singh 1979:170).

Crystal (2003:493) states that syllables can be metrically “heavy” or “light”:- a light syllable is one whose rhyme comprises a short vowel nucleus alone or followed by a coda of no more than one short consonant, thus it has the structure CV or CVC.

In fact, English puts certain restrictions on the structures of strong syllables .They can be open only if they contain a long vowel or a diphthong and only a closed strong syllable may have a short vowel. In other words, long vowels and diphthongs can occur in both open as in ‘sue’ [s'u:], ‘bay’[b'eI] and closed as in ‘bean’[b'i:n]and ‘eight’['eI?t]which constitute strong syllables, whereas short vowels occur only in closed ones as in ‘cat’ *[*k^{h}'æ?t*]* and ‘ill’ *[*'ɪl*]*(Roach et al., 2004:Int).

Generally, strong syllables can have in its centre any long vowel, like the first syllable of the word ‘father’ [f'a:ðə] or diphthong as the first syllable of the word ‘daily’ [d'eɪlɪ] except the vowel [ə], whereas weak syllables can only have the following types of nucleus (Roach, 1999:76):

A. Short Schwa

Schwa is symbolized as /ə/, which is the most common unstressed vowel in English. This vowel occurs initially e.g. ‘alive’ [əl'aɪv], medially e.g. ‘forget’ [fəg'e?t] and finally as in ‘cinema’ [s'ɪnəmə]. Many English words have one stressed vowel and a schwa in their unstressed syllables as in ‘purpose [p'ə:pəs],

‘elephant’ ['elɪfənt] and ‘tremendous’ [trəm'endəs] (Kreidler, 2003:80). Actually in English, there are words that have two forms in pronunciation: one with short schwa (the weak form) and the other with some other vowels like / ɪ /, / æ / and / ɒ/ instead of this schwa. For example, ‘of’ has the weak form [əv] and the strong form ['ɒv] (Wells and Colson, 1981:24).

B. The [i, u] vowels

Roach (1999: 77-8) illustrates that the weak syllable can have one of two other vowels as its centre. The first is a vowel that occurs in the general area between /i:/ and /ɪ/ while the second one lies in the region between /u:/ and /u/. Here, unlike the case with strong syllables, there is no clear borderline between the long and short forms of each vowel in weak syllables, i.e., no one can tell which vowel one realizes in words like ‘easy’ or ‘busy’. Wells and Colson (1981:22) argue that these vowels are more like the long forms when they come before another vowel and they tend to be shorter when they precede a consonant or pause. Thus, a different (or a third) vowel is introduced symbolized as [i] in the first example and [u] in the second one. As a result, the words ‘busy’,‘easy’ and influence are transcribed as [b'ɪzi] ,['i:zi] and ['ɪnfluəns] respectively. Some other examples are the [i] in ‘happy’ /hæpi/; ‘valley’ [væli] and [u] thank you [θæŋkju] and ‘coffee’ [kɒfi] (ibid.).

C. Syllabic Consonants:

Laver,(1994:114) pointed out that “the syllable must have a compulsory constituent in its structure, i.e., the nucleus, which consists of a vowel (pure or diphthong”). The exception to this rule is syllabic consonants. Those are the lateral sound [l̩] and the nasals [m̩], [n̩], [ŋ̩] in which each consonant can form a syllable. The English syllabic consonants in RP symbolized by vertical dash[ˌ],

written under the sound as in ‘bottle’ [b'ɒt$_{|}$l]; ‘bottom’ [b'ɒt$_{|}$m]; ‘garden’/g'a:d$_{|}$n/and ‘thicken', [θ'ɪk$_{|}$ŋ]but /θ'ɪk$_{|}$n/, is also possible)(Jones,1984:55) .

7.1 Syllabication

Pulgram (1970:40) defines syllabication as a phonotactic operation which is performed in conformity with the distributional criteria of the language under analysis (CF.Hans, 1981:257). Although it is possible that one can specify the number of syllables in words, it is very difficult to determine syllable boundary placement. (Ladefoged, 1975:218).

Some phonotactic criteria for syllable boundary placement are suggested by a number of phoneticians.

Pulgram (1970:47-51) proposes the following principles:

1. A principle of maximal open syllabicity.
2. A principle of minimal coda and maximal onset.
3. A principle of irregular coda.

As far as the first principle is concerned, a syllable boundary is inserted after every vowel of a word. Thus, words such as rooster and master are syllabified as [r$^{|}$ʊ.stə] and [m$^{|}$æ.stə] so as to make the first syllable open. A problem arises; however, in the form (mæ . stə) since the principle of maximal open syllabicity creates a sequence which violates a sequential constraint in English by which the short vowel /ɪ, e, æ, ɒ, ʊ / are disallowed in word-final position. Since [m$^{|}$ æ. stə] contains the vowel / æ/, which doesn’t occur in word finally, it must be resyllabified by the next principle to yield [m$^{|}$æs.tə]. A similar motivated readjustment must occur in a second set of circumstances.

Pulgram (1970:40) explains this by stating that:

If the syllable can not be kept open because the consonant or consonants that would form the onset of the next syllable do not occur in word- initial position, then many consonants, as necessary –but not more –to reduce the onset to a

permissible word-initial shape, must be detached from it and transferred to the preceding syllable as coda, to close the syllable.

Hence, while employ [ɪmpl'oɪ] would be syllabified [ɪ .mpl'oɪ] by the principle of maximal open syllabicity, this would create a syllable- initial /mpl/ sequence which can not occur in word initially. Hence, the/m/ must be sent back to the first syllable to yield [ɪm.pl'oɪ] where each syllable now meets the syllable structure constraints of English. Pulgram's final principle is stated as follows:

If the necessary transfer from syllable- initial to syllable-final position leads to a group of consonants, then the burden of irregularity must be borne by the coda rather than the following onset.

Pulgram's principle is further expanded by Fallows (1980:78) who suggests two principles of syllabication: stress and ambisyllabicity. The first principle means that a stressed syllable will attract the maximum number of consonants in both initial and final position. The next principle shows the sharing of an inter-vocalic consonant by the neighbouring syllables. So, a word like begin [bɪgˈɪn] is syllabified as [bɪ.gɪn] or [bɪg.ɪn). It seems that the second division of the word begin [bɪg-ɪn] is more acceptable since it is familiar to find English beg and in through the dictionary.

7.2 Rules of syllabification

1- Recognition of certain prefixes and suffixes un-,mis-,dom-,in-.
2- If the first syllable in disyllabic words is a long or a diphthong vowel, it ends the syllable. And the next sound goes to the following syllable.

Example. Writer [r'aɪ . ʔtə] o [r'aɪʔt . ə]

3- The syllable division is marked before the schwa /ə/ in triphthongs.
Example.
chaos $k^{h_{h_w}}$eɪ.əs]

Note: Division of disyllabic and polysyllabic words should not produce unacceptable consonant cluster in both the onset and coda in English language.

4- In **VCV** if one consonant occurs between two vowels and the second vowel is long (stressed or unstressed), the consonant becomes part of the second syllable.

Example.

Return [rɪ ʔt 'ɜː n] VCV

V C V [rɪʔt'ɜː n]

| |

Short long

Vacation [v ə.ʔk 'eɪʃ.n]

| | |

V C V

| |

short long

Delay [dɪl'eɪ] VCV [dɪ.l'eɪ]

Example

Windy [w'ɪn.dɪ]

[w'ɪnd.ɪ]

But not

[wɪ. ndɪ] English words can not begin with (nd-)

5- In (VCV) if one consonant occurs between two short vowels, and the first vowel is stressed the consonant goes with the preceiding vowel.

Example.

[l 'ɪ m ɪ? t] [l'ɪm.ɪʔt]

| |

short short

| |

Stressed unstressed

6- In the intervocalic consonants as in [b] in [h'æbɪʔt] here, the consonant sound [b] is treated as ambisyllabic ,i.e. ,

[b] can be

To the first syllable ← coda and onset → To the second syllable

Therefore , [b] has dual function.

8- The Manipulation of Computer Techniques in Monitoring English Syllables

Studying the English Syllable at the University level practically represents the task of the researcher who does his best to design a comprehensive programme to be used by teachers at the college on one hand and the students themselves on the other hand.

4.3 Procedures for Presenting the Programme

To design the CD programme of this study two steps have followed.

The First step is to select the data which is taught by using computer and the second step is to design the actual CD programme to be a ready-made software for studying the English syllable. As far as the first step is concerned, the data of the present study have taken from chapters "Eight" and "Nine" included in the text-book which is taught at the second year in departments of English under the title Phonetics and Phonology: A Practical Course by Peter Roach: 2002. Some relevant topics have been added to the programme from other books to achieve a comprehensive programme for studying syllables at the university level.

The researcher designed an actual CD programme which presents the content in slides through selective programmes such as Microsoft Word 2003/2007 for writing and power point for making slides and visual Basic 2003 for testing items. Multimedia is also used in this study.

The programme has been designed in three stages which can be summarized as follows:

1- Presentation

After loading the programme into the computer, the content of the programme will appear on the monitor in form of slides. The content is arranged

into presentation, application or practice and testing. A learner can click on the button "introduction" to read the main aims and advantages of the programme. On the presentation stage, the learner can click on any topic from the main menu to study it in all its details. In each slide, a number of buttons appeared to give the learner the freedom to choose whatever he likes to do the next. On the left hand, in the bottom, there is a button of reading the material in the selective slide, whereas on the right hand,there is a button of music which he can use while reading the slide silently.

To attract the learner's attention and make the process of learning more interesting, different pictures and colours are used with soft music which accompanied all the stages of programme.

A learner can repeat the material endlessly until he/she is satisfied with the results.

2- Application

After presenting and explaining the contents in words, the learner can click on an icon of application which transfers what has been written in words to a simple tree diagram to combine between theory and practice on the same screen.

3- Testing

The last stage of the programme is a test for the learner to check himself/herself whether she /he understands the material of each item in the main menu or not. Questions have been designed or prepared according to the nature of each item in the topic and its weight in the text-book itself.

4.4 Programme Mechanism

Our programme entitled "the English syllables" has been designed through the use of VB 2005 which has wide spread capacities on educational and productive scientific levels.At first, the mechanism will be explained, illustrated by some electronic windows with its own demonstration, and then a simplified explanation

about the programming language (VB 2005) will be given. (See Figure.3)

Figure 3: The Main Frame of the Programme

The above (Compiled Window) represents the main frame of the programme which has been designed according to Visual Basic Programme 2005, where two buttons **(Introduction, the End)** activate either to introduce the programme or end it.

The effective use of colours, pictures and orthography has been done according to the productive programme entitled **(Adobe PhotoShop CSME)**.

The following designed[1] window shows the aim of our study and a letter to the users to know why this programme has been designed and its effect on the scientific level of the university students in this branch of knowledge (phonetics and phonology). In this window, there will be a button entitled **(Main Menu)** by which one can see and choose the item he / she wants to study of the English Syllables.

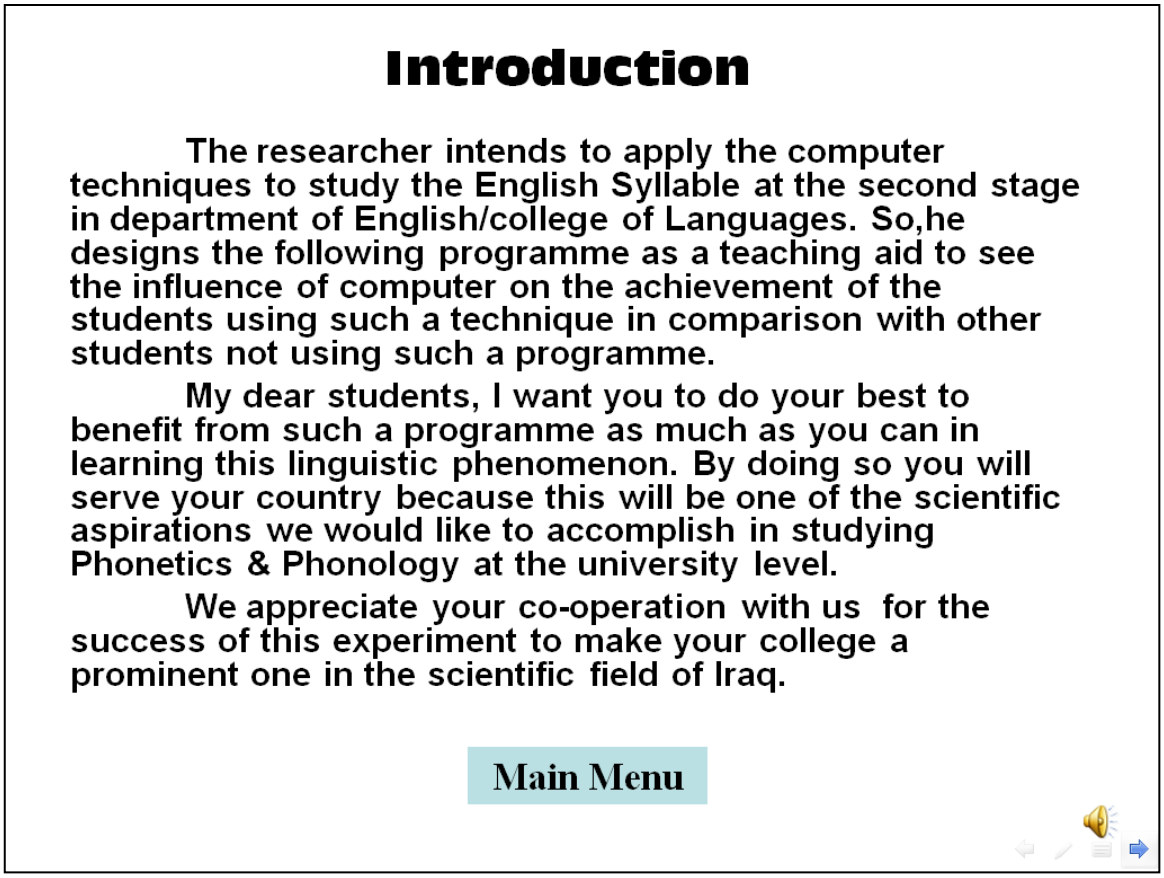

Figure 4: Introduction to the Programme

Figure 5: The Main Menu

The above compiled window **(Figure5)** represents (the main menu) where the eight topics that are included in this study (The English syllable) will be shown. Only one example has been taken, that is the First button (Definition: The English Syllable) with its windows represented in the following pages.

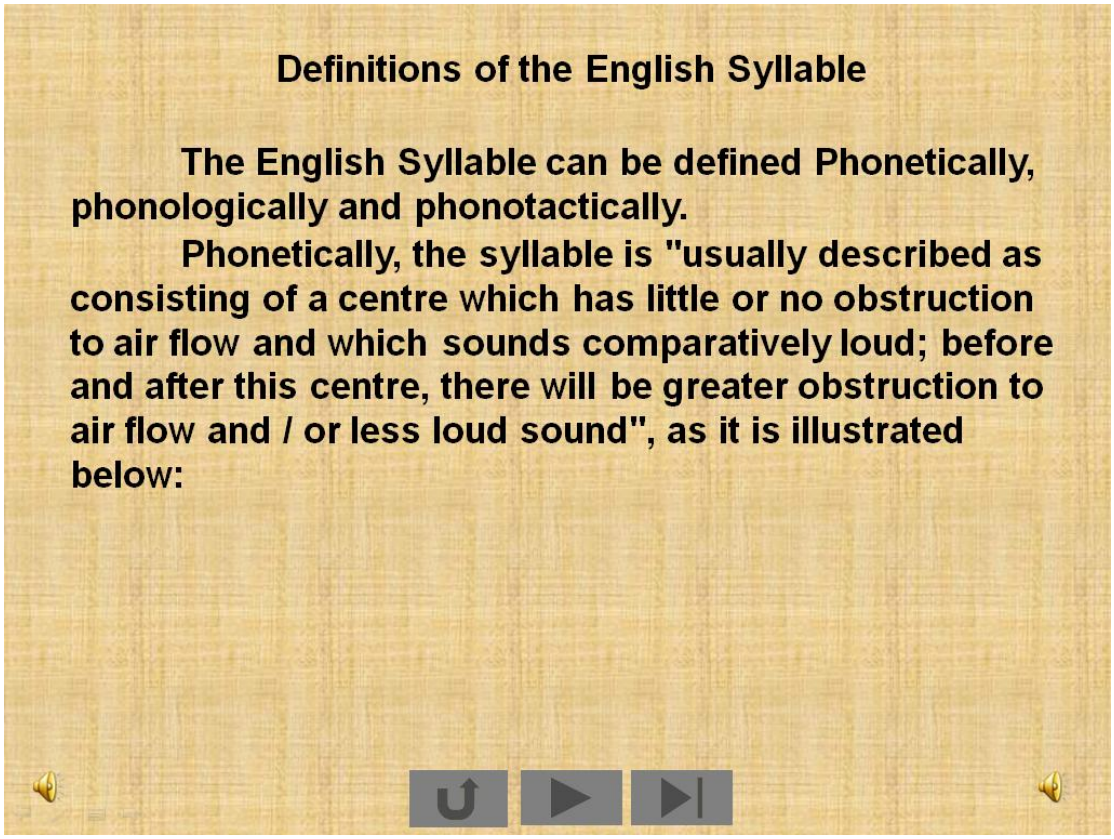

Figure 6: The Electronic Slide of the Definition of the English Syllable

The above frame (Figure 6) represents the electronic slide of the first topic in the main menu where one can see a number of buttons to control sound or another to show the next electronic window that leads to presenting questions about the topic itself.

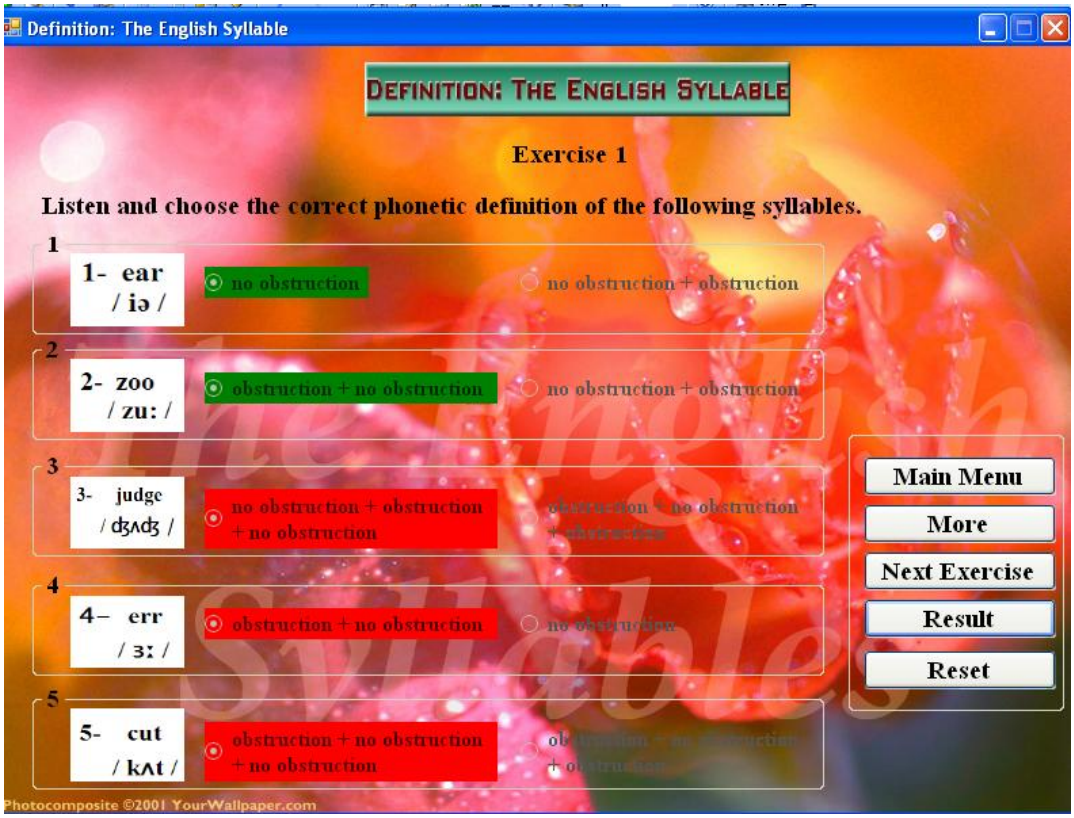

Figure 7: Exercise on Definition: The English Syllable

This window represents as in its full form the first two questions of the first topic where it contains some important buttons repeated in other windows of other topics as follows:

1- (Main Menu): This button leads us to the eight – button window.

2- (More): This button shows us successive choices of the same question.

3- (Next Exercise): This button transfers to the window of the following question of the same topic.

4- (Results): This button examines the results of responses of all the choices of the present question where the green colour shows the correct responses and the red color states the wrong answer

9. Conclusions:

In the light of the empirical evidence revealed in this study and according to the researcher's own observation, the following conclusions are drawn on the theoretical and practical level of this study :

1- Some allophones in RP pronunciation change the form of CV system of the English syllable by using narrow transcription as in put [p^{h}ʊ?t] becomes CCVCC but not CVC; text [t^{h}è?kst] becomes CCVCCCC but not CVCCC (Roach, 2009) in a letter to the researcher on Thursday, April 16, 2009, 5: 36 P.M.

Roach says: "It would be true to say those counting phonetic segments in narrow transcription would result in a different number of segments from the number resulting from counting phonemes".

2- Whenever we deal with a particular accent, for example (BBC/RP) narrow transcription must be used to distinguish this accent from other varieties of EngliAccording to the sonority theory of the English syllable, the place of stress must be put above the peak and not on the preceding consonant in the stressed syllables.

whereas, on the practical level, this study shows that: First, the achievement of the experimental group is higher than that of the control group and that is attributed to the application of computer techniques. Secondly, there is an improvement in the level of knowledge of the experimental group between pre- and post test.

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