The First Lecture in: Phonetics and Phonology for second year students in the English Language Department/College of Arts /Tikrit University

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1.0 Phonetics

Phonetics is the science and general study of the characteristics of speech and speech sounds focusing on the description of speech sounds according to their production, transference and distinctive features. The speech sounds are considered the essential unit. Phonetics provides methods for speech sounds description, classification and transcription. Kumar and Sreehari further declare that *phonetics* is derived from the Greek word *phone* that means sound or voice and refers to the systematic study of speech sounds of any language and their articulation, audition and perception .Linguistic sounds are articulated by pushing air from the lungs out through the mouth, sometimes by way of the nasal cavity. The movement of the air can then be modified by the anatomy of the mouth and throat to produce different sounds.As a system of describing and recording the sounds of language objectively, phonetics provides an important approach of opening our ears to aspects of language which we tempted to recognize by reference to their written rather than their actual spoken forms. There are three branches of phonetics:

1.1 Articulatory Phonetics

Articulatory Phonetics "is the study of the way speech sounds are made (articulated) by the vocal organs"(Crystal, 2008).He adds that the work in phonetics can be divided into two broad kinds :(a) general studies of the production, acoustics or cognition of speech. (b) Studies of the phonetic characteristics of specific languages which show that there is additional criterion required for studying how the sounds of a language are used within the system of pronunciation. This functional approach to Phonetics is a part of phonology.Robins indicates that from the point of view of the study of language and as a part of general linguistics, there are good reasons for prime attention being paid to articulatory phonetics. Anatomically the main parts of the body that are in charge of the production and distinction of speech sounds, the organs of speech, can be reachable easily by visual observation, either directly or by means of

different sets or systems such as laryngoscopes and X-ray photography. Most of them can be described to the extent that deals with the role that they play in the process of speaking by the use of fair terms of comprehension to the non-specialist to make the speaker have an ability to control his speaking. Furthermore, all of us have some kinaesthesis of the processes of speaking.That means the internal process which enables the speakers to be aware of the movement and positions of their vocal organs during their speech. People feel tension or movement of their muscles, joints as well as tendons. They use their knowledge to monitor their process of speaking unconsciously. With time, this kinaesthesis can be developed by interest, practice and training .The ability to recognize and discriminate different speech sounds will be increased in articulation. Bauman-Waengler states that articulatory phonetics deals with how various speech sounds are generated. The description and classification of these speech sounds will be in terms of parameters of their actual articulation. One major kind of classification is derived from the specific structures which are used for articulating the different speech sounds. The articulators (anatomical structures) that generate speech sounds are: the lips, alveolar ridge, lower jaw (mandible), teeth, hard palate, and velum; therefore, a classification of speech sounds is made depending on these articulators. Initial /m/ in 'moon' is produced when the two lips are closed completely. /m/ will be classified as a bilabial sound. Speech sounds are also divided into vowels and consonants that are general groups according to another categorization related to this kind of phonetics. We will explain that later. In this sense, Odden confirms that the speech sounds will be analyzed according to the arrangement of articulators which are required to articulate a particular speech sound. He interprets that by appropriate positioning of articulators, the shape of the vocal tract can be changed, and consequently the sound which emerges from the vocal tract can be changed (much as different sized bottles produce different tones when you blow across the top). For the purpose of studying the production of speech, the most important articulators are the lips, teeth, tongue, palate, velum, pharynx and larynx.

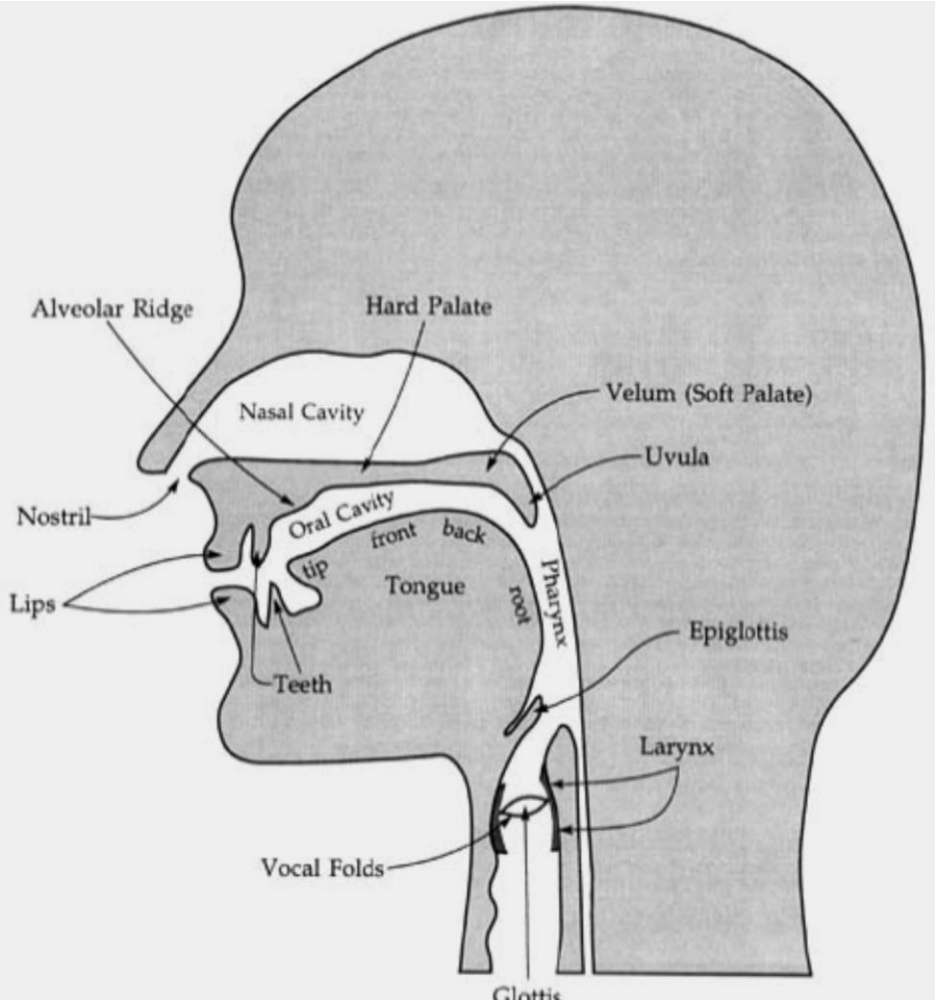

Figure (1): The vocal organs anatomy

Note that figure (1) illustrates the anatomical parameters which are most important for the production of speech studies. The interference of the airflow plays a very important role in the speech sounds articulation. This is system is the respiratory system. The speech sounds production begins with the lungs which push the air to come out of the mouth. Air is forced out of the lungs through the vocal folds, that represent a valve which goes through a repeated cycle of blocking and allowing air to pass from the lungs to the vocal tract. A waveform is made by this repeated movement of air. Airflow through glottis is illustrated by the following figure that shows this movement in the production of voiced sounds.

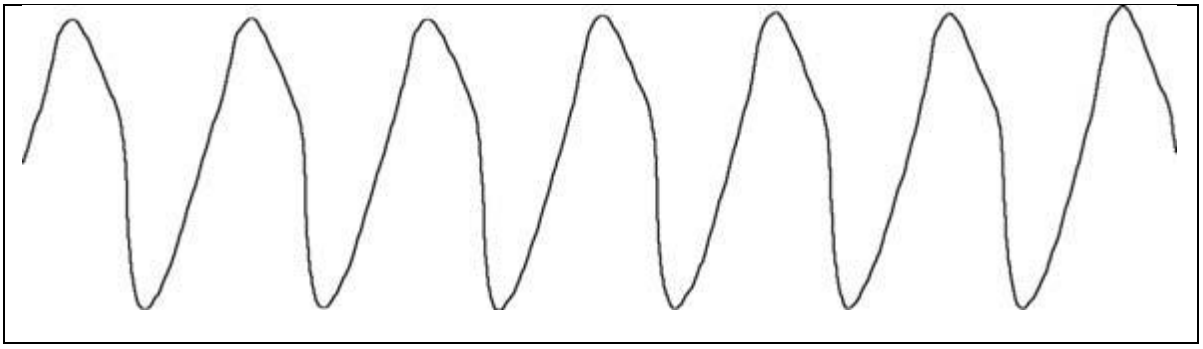

Figure (2): Airflow through glottis

Delahunty and Garvey explain that to produce speech sounds, air has to flow from the lungs through the vocal tract, that includes the vocal folds (popularly called the vocal cords, though they are more like thick elastic bands than strings), the nose or nasal cavity, and the mouth or oral cavity (See Figure 1). The vocal folds vibrate for some sounds but not for others. Air flows through the nose for certain sounds. But the major creator of speech sounds is the mouth.

1.2 Acoustic and Auditory Phonetics

Acoustic phonetics is concerned with the physical properties of speech as sound waves in the air transmitted between mouth and ear. It is concerned with measuring and analyzing the physical properties of the sound waves we produce when we speak. Both approaches are indispensable to an understanding of speech. Fasold and Connor-Linton considers what happens inside the mouth and how the speech sounds are produced, the only part of the process. We have to understand how the articulators turn air movements into sound, what happens to sound after it passes through the lips, how it moves through the air, and how it affects on the ears and brain(sometimes the microphones , recorders, and computers)of the listeners so as to understand how people use sound to communicate.

Auditory phonetics is the study of speech sounds from the point of view of the listener, concerned with the way the ears and brain process and perceive the speech. It is the branch of phonetics that is concerned with the perceptual response to speech sounds, sponsored by ear, auditory nerve and brain. It is not studied well since there are difficulties faced as soon as one tries to identify and measure psychological and neurological

responses to speech sounds. There are well anatomical and physiological studies of the ear[3] as techniques for measurement of hearing, but a little pure research is comparatively done into the attributes of speech-sound sensation, observed as a phonetic system, and the relationship between such phonetic analyses and phonological studies remains obscure. The subject is closely related to studies of auditory perception within psycholinguistics.