

What is phonetics?

Phonetics is a scientific study of the ***production, transmission*** and ***reception*** of ***speech sound***. Phonetics is divided into three major subfields:

- ↪ ***Articulatory Phonetics***: It is concerned with how sounds are produced and what are the different organs of speech that intervene to produce these sounds. Fundamental concepts of phonetics are defined in this subfield, such as articulation, the classification of speech sounds, and phonetic transcription.
- ↪ ***Acoustic Phonetics***: It is concerned with what happens to the sound after producing it or how the sound travels in the air. Here phoneticians have to deal with physics of the sound which are:
 - a) ***Frequency***: It means the number of time the vocal cords vibrate to produce a given sound (the rate of vibration), it is measured by "Hertz".
 - b) ***Intensity***: It is the amount of energy used in the production of a given sound (low or high) it is measured by "Decibel".
 - c) ***Time***: It is the time taken to produce a given sound.
- ↪ ***Auditory Phonetics***: It is concerned with the reception of speech sounds through the ear, and begins with the anatomy of this organ in a similar way to articulatory phonetics.

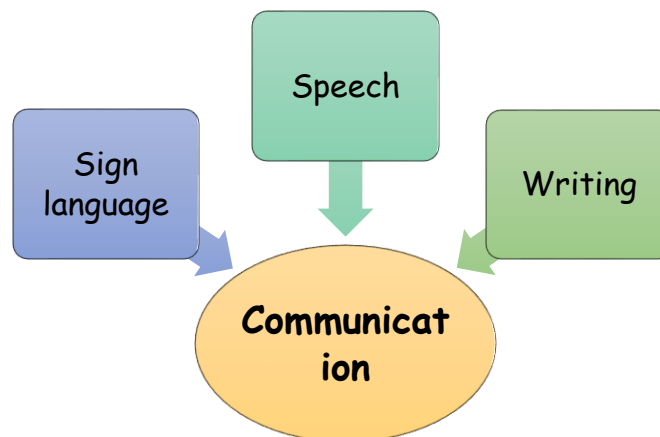
The Speech Chain

The speech chain describes the stages in speech communication when a message moves between the mind of the speaker and the mind of the listener. Through the idea of the speech chain we see that information which is communicated linguistically to achieve some goal is encoded by the speaker into a sequence of articulatory gestures which generate sound, that sound is communicated to the listener, processed by the hearing mechanism into a neural code that is decoded to extract the meaning of the utterance and the intention of the communicative act.

Why is speech important?

- One reason is that the development human culture is made possible- to a great extent-by our ability to share experiences, to exchange ideas and to transmit knowledge from one generation to another; in other words, our ability to communicate with others. The study of speech is also important for the development of human communication with machines. like the computers used so extensively in our society; their operation increasingly relies on frequent, fast, and convenient exchanges of information with users. In designing communication systems or "languages" to link user and machine, it should prove worthwhile to have a firm understanding of speech, that system of person-to-person communication whose development is based on the experience of many generations.

We can communicate in many ways



Human society relies heavily on the free and easy interchange of ideas among its members and, for many reasons, we have found **speech** to be our most convenient form of communication. In reality, speech is a far more complex process, involving many more levels of human activity, not just movements of lips and tongue or transmission of sound waves.

Speech communication consists of a chain of events linking the speaker's brain with the listener's brain

Speaker's Brain

• The first thing you have to do is arrange your thoughts, decide what you want to say and then put what you want to say into linguistic form. The message is put into linguistic form by selecting the right words and phrases to express its meaning, and by placing these words in the order required by the grammatical rules of the language. Then it is from the brain that appropriate instructions, in the form of impulses along the motor nerves, are sent to the muscles that activate the vocal organs.

speaker's vocal tract

• A stream of air emerges from the lungs, passes through the vocal cords where a phonation type (e.g. normal voicing, whispering, aspiration, creaky voice, or no shaping whatsoever) is developed, and receives its final shape in the vocal tract before emerging from the mouth and the nose.

Transmission

• Speech sound wave travels through the air between speaker and listener.

listener's Ear

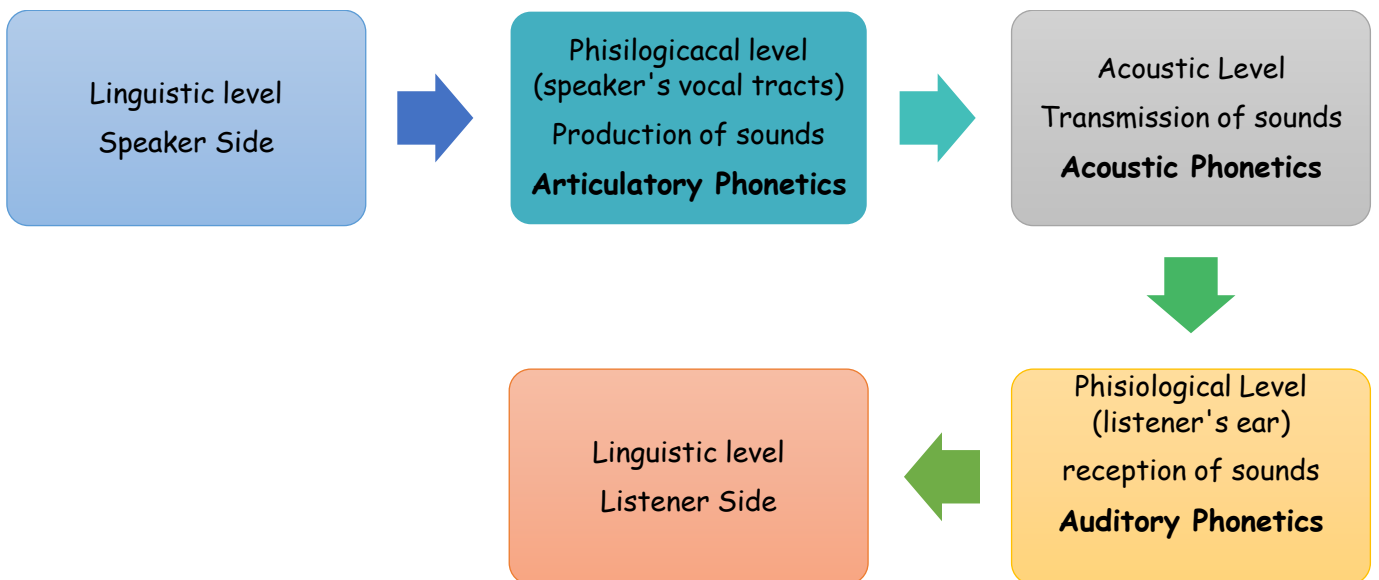
• The sound is analyzed by the ear and the auditory nerves

Listener's brain

• The speech is perceived as a sequence of linguistic units and understood in terms of the ideas being communicated)

In sum:

- The message to be conveyed by speech goes through five levels of representation between the speaker and the listener, namely:
 - The *linguistic level* (where the basic sounds of the communication are chosen to express some thought or idea)
 - The *physiological level* (where the vocal tract components produce the sounds associated with the linguistic units of the utterance)
 - The *acoustic level* (where sound is released from the lips and nostrils and transmitted to both the speaker (sound feedback) and to the listener)
 - The *physiological level* (where the sound is analyzed by the ear and the auditory nerves), and finally
 - The *linguistic level* (where the speech is perceived as a sequence of linguistic units and understood in terms of the ideas being communicated)



As well as the audio channel between speaker and hearer, also demonstrates other channels of information flow, in particular:

- **Auditory feedback** from the speaker's mouth to the speaker's ear. This flow of information is crucial when we are learning to speak, since it provides us with knowledge of how different articulations create different sounds. Children who are born deaf find it much more difficult to learn how to speak than hearing children. Auditory feedback also provides a means to monitor the quality and intelligibility of your speech production. The speech of adults that lose their hearing can become impaired as they lose the ability to monitor their own articulation well enough.
- **Visual information of the speaker's mouth movements** can be useful to the listener, particularly in poor listening environments. We are all skilled lip-readers, and find it easier to understand speech in noisy settings when we can see the speaker.

