1.A. ORAL SPEECH: BASIC PERSPECTIVE

Phonetics as a Science

Phonetics may be loosely defined as the science that studies oral speech. There are verbal and non-verbal ways of communicating meaning. *Verbal meaning* is expressed with the help of words, word combinations, utterances. To construct them, we use *speech sounds* – vowels and consonants, which are 'building material' for syllables, and, consequently, for words, utterances, and discourse. Syllables are the smallest units into which oral speech can be divided because in connected speech, sounds are not pronounced separately.

Non-verbal communication has its own means:

- visualizations (e.g., traffic signs, pictures, charts, tables, graphs, maps, logos, etc.)
- body language (e.g., sign language, facial expression, bodily gesture, deaf-blind language, secret codes, bodily contact and physical distance between people)
- elements of other semiotic systems (e.g., light, numbers, flowers, colours, clothes, jewellery, scent, dance, sounds other than human voice such as drumming, whistle, music, etc.)
- prosody.

Prosody has the following features:

- pitch movement, also called melody, speech melody, or intonation
- loudness
- speech tempo.

Together, they are factors in creating the effect of stress and rhythm. The effect of stress is caused by variations in loudness, pitch movement, and tempo. English

rhythm is created by regular recurrence of stressed syllables in stretches of speech. The other important phenomena related to prosody are pauses and voice timbre.

Phonetics studies the following aspects of human speech: (a) the production, (b) transmission, and (c) reception of speech sounds; it also (d) makes generalizations about the systems of sounds and prosodic features in a language and their role in expressing meaning. Thus phonetics is divided into four main branches:

- ***Articulatory phonetics*** deals with the ways we use speech organs to produce sounds.
- The sphere of ***acoustic phonetics*** is the physical properties of speech sounds as they are transmitted from the speaker to the listener.
- The branch called ***auditory phonetics*** is the study of the ways speech sounds are received by the listener.
- While the above three branches of phonetics study all possible sounds people produce talking to one another, the fourth one – ***phonology*** – deals with the sound systems and prosodic features of a language.

  The sound systems of a language do not comprise the diversity of sounds in connected speech. The sound systems are generalizations about the features of *sound types*, or *phonemes*. Distinctive features of each phoneme are described and systematized. A change of at least one distinctive feature causes change in meaning; e.g., *sit* /sɪt/ – *seat* /siːt/; *sell* /sel/ – *sale* /seɪl/; *back* /bæk/ – *bag* /bæg/; *vine* /vaɪn/ – *wine* /waɪn/. This branch of phonetics is called *segmental phonology*.

  Phonology also deals with prosody, or prosodic features. They are properties of speech units larger than one segment – of syllables, words, utterances, discourse. This branch is called *suprasegmental phonology*. An important thing about prosody is that changing prosodic features, we may change the meaning; e.g., if pronounced with a falling tone, *She is a student* communicates the speaker's confidence, while in the high rising tone in the same utterance expresses incredulity, disbelief.

Thus phonology studies the segmental and suprasegmental features which cause change in meaning.

Aspects of Sound Phenomena

Speech sounds are produced by the human organs of speech, transmitted through the air, and received by the human ear; the information conveyed by the sounds and prosodic features is then sent to the human brain, where its meaning is interpreted. Therefore, speech may be analyzed from different perspectives:

- production, or articulation
- acoustic transmission
- auditory reception
- function.

Articulatory aspect of speech. The act of speech is the effect which results from the coordinated work of different organs: the lungs, the bronchi, the trachea, the larynx, the vocal cords, or vocal folds (in the trachea), the pharynx, the mouth, the lower and the upper lips, the lower jaw, the nasal cavity.

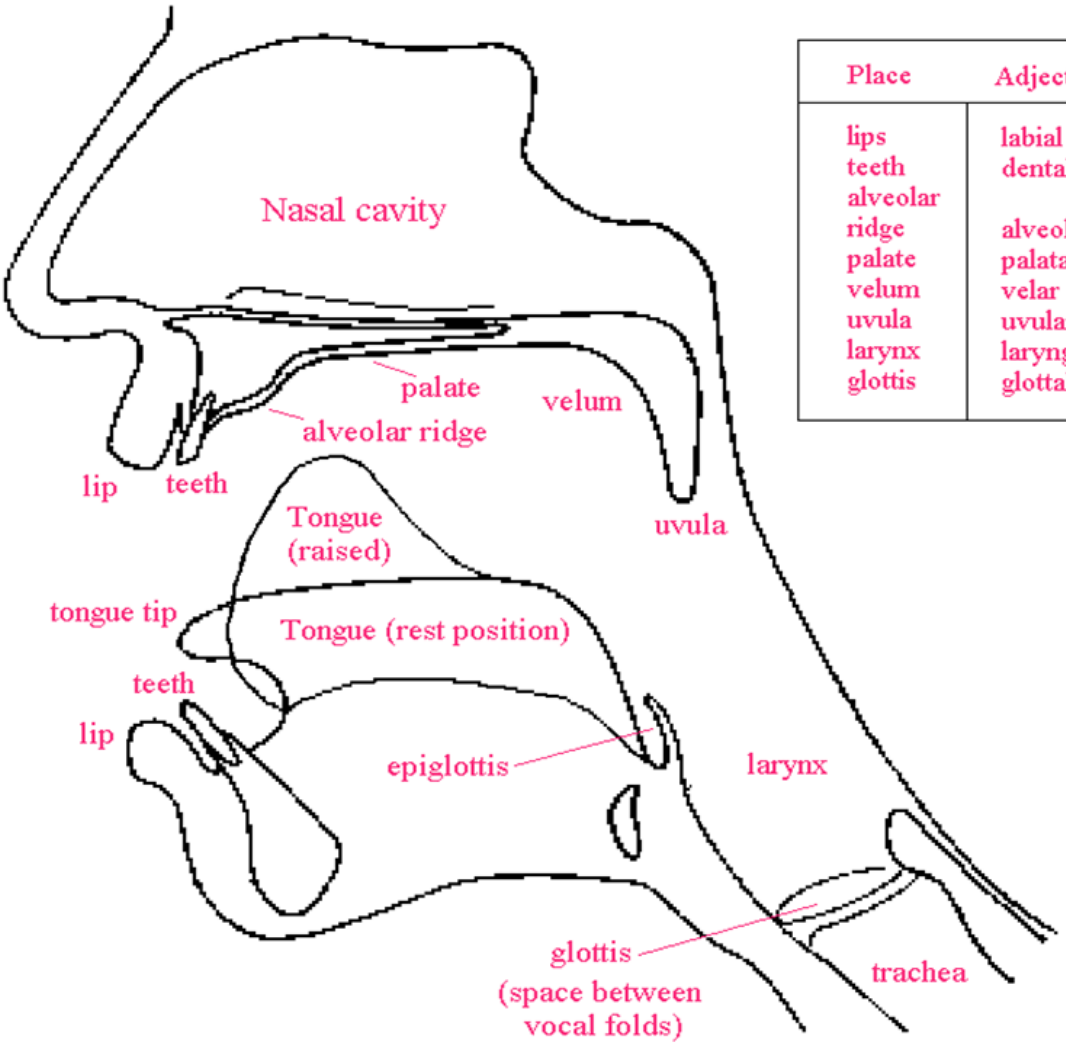
The speech organs in the oral cavity, or the mouth cavity, are the tongue (the tip, the blade, the front, the back of the tongue); the lower and upper teeth, the alveolar ridge, the hard and the soft palate, the uvula.

The stream of air escapes from the lungs and passes along the vocal tract – the larynx, the pharynx, the oral or nasal cavities. The air pressure below the vocal cords make them vibrate. Vibrations are carried by the stream of air, reach the human ear, carried to the brain and perceived as voice. The process of voice production is called *phonation*.

Due to their coordinated movements and particular positions, the human speech organs can produce different sound effects. This process is called *articulation*. For each sound, the position of the speech organs is changed;

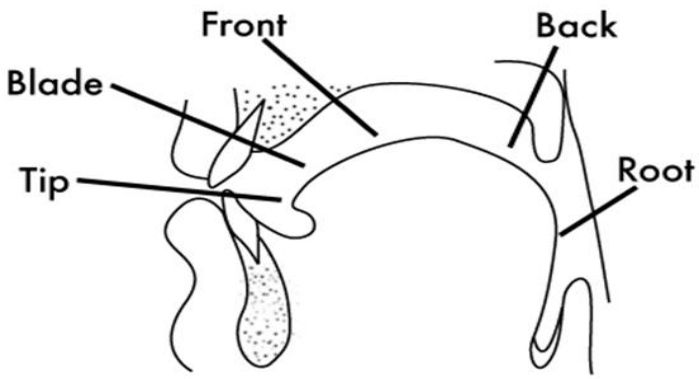
consequently, the shape and the size of the pharynx and the oral cavity are changed; as a result, we pronounce different speech sounds.

HUMAN SPEECH ORGANS



Place	Adjective
lips	labial
teeth	dental
alveolar ridge	alveolar
palate	palatal
velum	velar
uvula	uvular
larynx	laryngeal
glottis	glottal

PARTS OF THE TONGUE



Acoustic aspect of speech. The acoustics of speech is a physical process of transmission of sound. (But the human brain identifies sounds of speech in terms of auditory qualities (physiology and psychology) rather than acoustic properties (physics)).

The acoustics of speech studies the physical properties of air waves produced by movements of the vocal organs, especially vibrations of the vocal folds. These properties are frequency, amplitude, intensify, duration, spectrum. *Frequency* is the number of movements of air particles per second measured in hertz. The basic frequency is called the *fundamental frequency* (Fo). On the auditory level, frequency of a pure tone is perceived as pitch; the higher the frequency of a sound, the higher pitch the human brain perceives. Complex tones are combinations of several tones which result from simultaneous vibrations of different organs. *Amplitude* is the distance between the rest point and the top or bottom point of the air wave. Amplitude affects *intensity* of a sound. The latter is the chief factor in creating the auditory effect of loudness; the other factors are frequency and *duration*. *Spectrum* is the correlation between the frequency and amplitude of a sound. The peaks of amplitude in correlation with particular frequencies are the main points of energy in sound production; they are called *formants*.

Auditory aspect of speech. It has already been said that what we perceive as voice exists in the form of pressure waves made by vibrations of particles of air. A wave passes along the external auditory canal of the human ear and reaches the eardrum. The eardrum turns vibrations into mechanical movements, which are carried to the human brain. The mechanism of sound perception involves complex physiological and psychological processes.

There is a correlation between acoustic properties of speech and auditory qualities perceived by a person: frequency is perceived as *pitch of voice*; intensity, as *loudness*; duration, as the *length* of a sound; spectrum/formants, as specific *quality* of a sound which makes it different from other sounds.

Functional, or linguistic, aspect of speech. Speech sounds and prosody belong the fundamental elements of language; in other words, they are linguistic phenomena. The main function of sounds and suprasegmental (prosodic) features is to *convey meaning*. They enable people to communicate, express their thoughts, feelings, attitudes, for which reason this aspect of speech is also called social.

THE PHONETIC SYSTEM OF ENGLISH

The phonetic system of language comprises the four components:

- the system of segmental units – phonemes
- the syllabic structure of words
- word stress
- prosodic features.

The segmental units, phonemes, are realized in speech as allophones. Allophones are variants of a phoneme; the choice of a variant depends on the position of a phoneme in a word because neighbouring allophones affect each

other's articulation. The system of phonemes and the occurrence of allophones in different positions are studied by **segmental phonetics**.

Suprasegmental phonetics is the study of a complex effect produced by variations in (a) *pitch of voice*, (b) *loudness*, and (c) *tempo*. In speech, they create specific intonation contours, stress patterns, and rhythm.

To study these features, we need a unit larger than segmental ones – a meaningful sequence of sounds. Sequences of sounds, which form suprasegmental units, do not necessarily coincide with words. They may coincide with a syllable, a word, a combination of words, a clause, a simple sentence. *Suprasegmental (prosodic) units* are syllable, rhythmic group, tone group, utterance, discourse.

Syllable a unit larger than a single segment (sound) and smaller than a word. From phonetic perspective, the syllable is the smallest articulatory and perceptible unit in connected speech. E.g., fac·ul·ty; gig·a·byte; won·der·ful.

Pitch, loudness, and tempo can make a specific effect of *prominence* of one or two syllables in a word. Such prominence is usually referred to as **word stress**. A stressed syllable in English is perceived as having a greater length, a greater degree of loudness, and being marked by a higher pitch and quality of sounds compared to other (unstressed) syllables.

In speech, syllables may combine to form larger prosodic units – rhythmic groups. Thus **rhythmic group** is a stressed syllable or a stressed syllable with some unstressed ones grouped around it.

For example,

`*Yes* (one rhythmic group)

One can 'never be `*sure* (two rhythmic groups)

Rh. gr. 1 Rh. gr. 2

She is the 'best 'student in my `year (three rhythmic groups)

Rh. gr. 1 Rh. gr. 2 Rh. gr. 3

Rhythmic groups make up tone groups. **Tone groups** are *sense groups*; in speech continuum, each tone group has a particular tone (specific intonation contour). Tone groups' boundaries are marked by pauses.

For example, *I'll `help you | no 'matter `what ||*

Rh. gr. 1 Rh. gr. 2 Rh. gr. 3

Tone gr. 1 Tone gr. 2

(three rhythmic groups, two tone groups)

If one syllable expresses a complete thought, it can form a tone group alone; e.g., tone groups 1 and 2 in the following dialogue:

A: ˌTea? – **B:** `No | `thank you ||

Tone gr. 1 Tone gr. 2 Tone gr. 3

Roughly speaking, **utterance** is an oral version of sentence, a stretch of speech which is not associated with grammar theory. Utterance may consist of one or more tone groups. Pauses between utterances are longer than pauses between two tone groups within one utterance. Let us return one of the examples given above:

I'll `help you | no 'matter `what ||

(two tone groups, one utterance)

Unlike a sentence (which is supposed to be grammatically correct because its meaning is conveyed through words and syntactic structure), an utterance may lack grammatical correctness: part of its meaning may be conveyed through non-verbal elements – prosody, gestures, body language, facial expression. Besides, the meaning of an utterance depends on situational context. For example,

(1) A. *We are invited to the party.*
B. ***Lovely!*** (pleasure)

(2) C. *They made it clear we are not welcome.*
D. ***Lovely.*** (displeasure, sarcasm)

Discourse is coherent sequence of utterances used by the speaker to express ideas, attitudes, feelings and emotions.

In connected speech, the features of the suprasegmental level – speech melody, stress, and tempo – work together creating specific intonation contours, stress patterns, rhythm. They are *superimposed* on meaningful sequences of allophones (segments) – on syllables, rhythmic groups, tone groups, discourse. That is why these features are called *suprasegmental*.

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