The Functional Aspect of Speech Sounds.

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1. The Phoneme.
1.1. The definition of the phoneme.
   The **phoneme** is a minimal abstract linguistic unit realized in speech in the form of speech sounds opposable to other phonemes of the same language in order to distinguish the meaning of morphemes and words.
1.2. The phoneme as a unity of three aspects.
   The phoneme is a dialectal unity of three aspects: 1) material, real and objective, 2) abstractional and generalized and 3) functional, which determine one another and are thus interdependent. They can be separated from one another only for purposes of analysis and description.
   The phoneme is a *material*, *real* and *objective* unit because it really exists in actual speech in the material form of speech sounds which have definite articulatory and acoustic features, independent of the will of individual members of a given language community.
   The phoneme is a *functional* unit because in speech it serves to perform three functions: constitutive, recognitive and distinctive, as sounds constitute, help to recognize and distinguish morphemes, words and sentences.
   The phoneme is an *abstractional* and *generalized* unit as it is an abstraction from and a generalization of a number of speech sounds, which are its variants. This abstraction and generalization has been unconsciously made by and unconsciously exists in the mind of each member of a language community. No matter how different the articulation of variants may be, they function as the same linguistic unit.

2. Phonological and phonetic mistakes in pronunciation.

If an allophone is replaced by an allophone of a different phoneme the mistake is called **phonological**, because it affects the meaning of words. For example, the change of a vowel phoneme of the word *beat* into a more open, more advanced and not diphthongized one creates another word *bit*: [bi:t] vs. [bɪt].

If an allophone of the phoneme is replaced by another allophone of the same phoneme the mistake is called **phonetic**, because the meaning of the word does not change. For instance, the absence of aspiration in the word *pit* does not create any meaningful variations: [pʰɪt] / [pɪt].

3. Main Trends in the Phoneme Theory.

There are several schools of phonology, which express different views of the nature of phoneme.

I. The psychological view regards *the phoneme* as *an ideal 'mental image'* that the speaker bears in mind when pronouncing allophonic variants. The speech realization of a target phoneme deviates from the ideal because of the individual peculiarities of the speaker's articulating organs and the influence of neighbouring sounds.

This view was originated by the founder of the phoneme theory Ivan Olexandrovych Baudauin de Courtenay and shared by an American anthropologist-linguist Edward Sapir /səˈpɪər/, a Norwegian linguist Alf Sommerfelt, a British linguist Mark Tatham. But the American linguist Leonard Bloomfield and the English phonetician Daniel Jones rejected this view on the basis that it's impossible to establish ideal sounds which don't exist in reality.

II. The functional view doesn't take into consideration the actually pronounced speech sounds and regards *the phoneme as the minimal sound unit by which meanings can be differentiated*. According to it only distinctive features of the phoneme make sense, while non-distinctive ones should be extracted. For example, the words *ladder* and *latter* are said to differ only in one feature of the third sound: lenis or fortis characteristics [d – t].

This view is shared by the linguists of Prague Linguistic Circle Nikolai Sergeyevich Trubetzkoy, Roman Osipovich Jacobson, Leonard Bloomfield, and others.

III. The abstract view regards *phonemes as units which are independent of speech sounds*. The acoustic and physiological properties are associated with purely abstract phonemes. It is stated that there exist archiphonemes representing types of units completely independent of any phonetic properties which are higher than the phoneme.

This approach was originated by the Swiss linguist Ferdinand de Saussure [soʊˈsjʊər] and advocated by the Danish linguist Louis Hjelmslev [ˈluːi ˈjɛlmslev] and his follower in Copenhagen Linguistic Circle Hans Jorgen Uldall [ʻhans ʻjogən ʻuldæl].

The second and third views are rejected as purely idealistic conceptions which do not take into consideration the real human speech.

IV. The physical view regards *the phoneme as a family of related sounds* that have phonetic similarity and do not occur in the same phonetic context.

This conception was proposed by Daniel Jones and shared by American linguists Bernard Bloch and George Trager.

The lack of this approach is that it studies the phoneme from the point of view of its articulatory characteristics only without any regard to its functional aspects.

V. According to **the materialistic view,** originated by Lev Volodymyrovych Shcherba, *the phoneme is defined as a real, independent distinctive unit which has its material manifestation in the form of allophones*. The number of allophones is much greater than the number of phonemes proper and they are incapable of differentiating the phoneme as a dialectical unity of functional, material and abstract aspects, which performs constitutive, distinctive and recognitive functions.

This view is widely recognized in modern phonology, its followers are Leo Zinder, Margaret Matusevich, Maria Sokolova and others.

4. Methods of Phonological Analysis.

4.1. The aim of phonological analysis.

The aim of phonological (phonemic) analysis is to determine phonemic (functional) and non-phonemic (articulatory) differences of speech sounds and to identify the inventory of language phonemes.

The phonological analysis can be fulfilled within two steps.

The first step is to identify the minimal segments of speech continuum and record them graphically by means of allophonic transcription.

The second step is to arrange the sounds into functionally similar groups in order to find contrastive phoneme sounds and allophones of the same sounds.

4.2. Distributional method of phonological analysis.

According to the **distributional method** phonemes of any language are discovered by rigid classification of all the sounds pronounced by native speakers according to the following *laws of phonemic and allophonic distribution*:

— allophones of different phonemes occur in the same phonetic context and their distribution is contrastive;

— allophones of the same phoneme(s) never occur in the same phonetic context, their distribution is complementary and the choice depends on phonetic environment.

4.3. Semantically distributional method of phonological analysis.

The semantic method is based on the functional rule that phonemes can distinguish words and morphemes when opposed to one another. It consists in the systemic substitution of one sound for another in the same phonetic context in order to find cases in which such a replacement leads to the change of meaning. This procedure is called *the commutation test* and it helps to establish minimal oppositional pairs of words and word-forms presenting different meaning.

4.4. Methods of establishing the phonemic status of speech sounds in weak positions. Morphonology.

Morphonology (or morphophonemics) is the branch of linguistics that studies the interaction between morphological and phonological or phonetic processes. Its chief focus is the sound changes that take place in morphemes (minimal meaningful units) when they combine to form words.

To establish the phonemic status of speech sounds we should consider the cases when the sounds are in the **weak position,** or the position of **neutralization.** In this position some of the distinctive features are neutralized. For vowels it is the position in the unstressed syllables. Consonants are in their strong position before vowels and in the intervocalic position, they are in the weak position when they are word-final or precede other consonants.

This problem is tackled by *morphonology or morphophonemics*, which studies the relationship between phonemes and morphemes. According to Sokolova M., morphonology is concerned with the way in which sounds can alternate as different realization of one and the same morpheme. A morpheme is a minimal unit of meaning.

For ex.: consider the words "*windy", "dusty", "sunny"*. Evidently they have two morphemes. The meaning of "wind", "dust", "sun" is obvious. But what function does the morpheme *"-y"* perform? It appears that the function of *"-y"* is to convert a noun into an adjective. This morpheme has a grammatical meaning. Now then what is meant by the identification of alternated sounds? The following pairs of words exemplify a sound alternation in one and the same morpheme of two different parts of speech (nouns and adjectives): malice |ˈmælɪs| - malicious |məˈlɪʃəs|; active |ˈæktɪv| - activity |akˈtɪvɪti|.

5. Aspects of speech sounds. Speech sounds as articulatory units and the problem of their classification.

There are four aspects of speech sounds: **1) articulatory 2) acoustic 3) auditory 4) functional** (linguistic, social).

The **articulatory/sound production** aspect: from the articulatory point of view every speech sound is a complex of definite coordinated and differentiated movements and positions of speech organs. The movements and positions necessary for the production of a speech sound constitute its **articulation.**

The **acoustic** aspect: every speech sound is a complex of acoustic effects and has its physical properties - it is a physical phenomenon, a kind of moving matter and energy. The physical (acoustic) properties of speech sounds consist of:

1) *frequency,* 2) *spectrum,* 3) *intensity,* 4) *duration.*

The **auditory/sound-perception** aspect involves the mechanism of hearing. It is a kind of psychological mechanism which (1) reacts to the physical properties of speech sounds, (2) selecting from a great amount of information only the one which is linguistically relevant

The **functional/linguistic/social** aspect is called so because of the role the sounds of language play in its functioning as medium of human communication.

Grouping speech sounds according to their major articulatory features is called an **articulatory classification**.

According to the specific character of the work of the speech organs, sounds in practically all the languages are subdivided into two major subtypes: VOWELS (V) and CONSONANTS (C).

There are 1) articulatory, 2) acoustic and 3) functional differences between V and C.

1) The most substantial **articulatory difference** between vowels and consonants is that in the articulation of V the air passes freely through the mouth cavity, while in making C an obstruction is formed in the mouth cavity and the airflow exhaled from the lungs meets a narrowing or a complete obstruction formed by the speech organs.

Consonants' articulations are relatively easy to feel, and as a result are most conveniently described in terms of **PLACE** and **MANNER** of articulation.

Vowels have no place of obstruction, the whole of speech apparatus takes place in their formation, while the articulation of consonants can be localized, an obstruction or narrowing for each C is made in a definite place of the speech apparatus.

The particular quality of Vs depends on the volume and shape of the mouth resonator, as well as on the shape and the size of the resonator opening. The mouth resonator is changed by the movements of the tongue and the lips.

The particular quality of Cs depends on the kind of noise that results when the tongue or the lips obstruct the air passage. The kind of noise produced depends in its turn on the type of obstruction, on the shape and the type of the narrowing. The vocal cords also determine the quality of consonants.

2. From **the acoustic point of view**, vowels are called the sounds of voice, they have high acoustic energy, and consonants are the sounds of noise which have low acoustic energy.

3. **Functional differences** between Vs and Cs are defined by their role in syllable formation: Vs are syllable forming elements, Cs are units which function at the margins of syllables, either singly or in clusters.

These differences make it logical to consider each class of sounds independently.

As it follows from the above given considerations, the sounds of a language can be classified in different ways. *Heinz Giegerich* (a Scottish linguist of German origin, Хайнц Йоахим Гигерих) [1992], *Martha Carswell Pennington* [1996] use a set of basic binary (two-way) distinctions in terms of:

1) phonation (the behavior of the vocal cords in the glottis during the production of the sound);

2) oro-nasal process (the modification of that flow of air in the vocal track, from the glottis to the lips and nose);

3) manner of articulation (the configuration and interaction of the articulators (speech organs such as the tongue, lips, and palate) when making a speech sound).

1) Phonation	2) Oro-nasal process	3) Manner of articulation
Sonorants: sounds whose phonetic content is predominantly made up by the sound waves produced by their voicing.	*Oral*: sounds in the production of which the air escapes through the mouth.	*Stops*: sounds made with a complete obstruction or stoppage of the airflow coming up from the lungs. They are also termed *plosives*.
Obstruents | ˈɒbstrʊənt/ *(noise consonants)*: sounds produced as a result of obstruent articulation involving an obstruction of the air stream that produces a phonetic effect independent of voicing. They can typically occur in voiced and voiceless variants.	*Nasal:* sounds in the production of which the soft palate is lowered, and the air escapes through the mouth.	*Continuants:* sounds, in which the obstruction of the airflow is only partial, so that the sound can be prolonged, for a period of time. *Vowels* are one type of continuants and there are *three consonant types of continuants*: *fricatives*: whose phonetic content includes a hissing noise, produced by turbulence, in the air stream as, it is forced through the narrow

		gap between the articulators; *affricates:* complex sounds which consist of two components which correspond to two phases of articulation - an oral-stop phase followed with a short friction phase; *approximants*: sounds m the production of which one articulator moves close to another, though not so close as to cause a turbulent as to produce friction; [r, w, j] are termed *central approximants* because air passes through the oral tract along the center of the opening; [1] is called a *lateral approximant* because air passes out along the side/s of the articulation; [h] is a *glottal approximant.* In some phonological systems approximants are treated as *semi-consonants* [1, r] or *semi-vowels* [w, j].

Articulatory classification organizes English consonants into certain groups according to distinctive changes in *the degree of noise, the manner of articulation, the place of articulation, the presence of voice and the position of the soft palate*.

A minimum vowel system of any language is likely to take the form of a triangle with the sounds [i, u, a] at the tops. They form boundaries of the vowel system as acoustically stable and articulatory different from each other.

[a]

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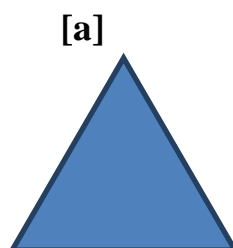
[i]   **[u]**

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Sounds [e, o] may be added to them to mark the medium degree of unlikeness in the acoustic and articulatory characteristics. Thus we get **the most common vowel system with 5 vowels.**

<div align="center">

[a]

[e]   **[o]**

[i]   **[u]**

</div>
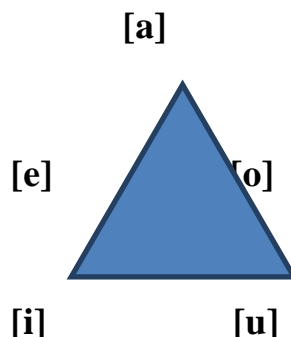
The British linguist *D. Jones* tried to establish a broader classification of vowels for all languages. He devised **the system of eight Cardinal Vowels** on the physiological basis with the help of X-ray photography of the tongue positions. This system is recognized by most foreign linguists and serves the basis of the International Phonetic Alphabet (IPA).

Articulatory classification of English vowels describes distinctive changes in *the stability of articulation, the tongue position, the lip position, the vowel length, the vowel tenseness and the character of the vowel end*.

6. Three functions of the phoneme. The system of oppositions. Vowel and consonant adjustments in connected speech: coarticulatory phenomena.

The phoneme is viewed as a functional, material and abstract unit, which performs *three functions*: *distinctive, constitutive and recognitive*.

1. The phoneme as a functional unit performs **the distinctive function**. It distinguishes different sounds in a contrastive sense and serves as the smallest language unit that discriminates between larger language units. Thus, the opposition of phonemes in the same phonetic environment differentiates the meaning of morphemes, words and even sentences.

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E.g., sleep**er** — sleep**y**;

bath — **p**ath, ligh**t** — li**k**e;

He was hear**d** badly — He was hur**t** badly.

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2. The phoneme is a material, real and objective unit that performs **the constitutive function**. The phoneme is realized in speech in the form of its variants or allophones, which do not make meaningful distinctions and serve to constitute the material form of morphemes.

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E.g., *cap* [kʰæ**pʰ**] / [kʰæ**p**]

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– the loss of plosion in the final phoneme [p] doesn't bring any change of meaning.

3. The phoneme is also an abstract and generalized unit, which performs the recognitive function. The phoneme serves to distinguish and understand the meaning, because the use of the right allophone in the certain phonetic context helps the listener to understand the message and thus facilitates normal recognition.

E.g., *take it — tape it*

– the difference in two phrases is understood by two different phonemes.

Nikolai Sergeyevich Trubetzkoy has worked out **the classification of phonological oppositions** *which is based on the number of distinctive features*. It concerns only relevant (distinctive) features of phonemes. The non-distinctive features are not taken into consideration.

1. *A single phonological opposition* is established on the basis of a single difference in the articulation of two speech sounds.

For example, the opposed phonemes in the minimal pair '*pen — ben*' possess some common features (occlusive, labial) and one differentiating feature (fortis vs. lenis).

2. *A double phonological opposition* marks two differences in the articulation and presents a sum of two single oppositions.

For instance, the minimal pair '*pen — den*' presents one common feature (occlusive) and two differentiating feature (labial vs. lingual, voiceless-fortis vs. voiced-lenis).

3. *A triple phonological opposition* has three articulatory differences, presenting a sum of three single oppositions. For example, there are three differentiating features in the minimal pair '*pen — then*' (occlusive vs. constrictive, labial vs. dental, voiceless-fortis vs. voiced-lenis).

Sound adjustments in connected speech can be summarized as follows:

	Types of adjustments	Kinds of adjustments
1	Adjustments related to C-C linking	1. **Assimilations** = modifications of a C under the influence of a neighboring C, for ex.: *ten mice* [te**m m**ais]
2	Adjustments related to V-V, C-V, V-C linking	1. **Liaison** = connecting of the final sound of one word or syllable to the initial sound of the next, for ex.: a phrase such us *far away, far out* is usually pronounced with [fa:**r**]. 2. **Accommodation (adaptation)** = modifications of C under the influence of the adjacent V or vice versa: e.g. two = labialized [t] under the influence of the

		rounded [u]; let = more open [e] after [l]. 3. **Glottal stop / hard attack,** symbolized [**?**], is a plosive made at the glottis by the vocal folds. For ex.: *atmospheric* [,ætməs'ferik] – [,æ?məs-].
3	Adjustments related to sound deletion / insertion	**1. Elisions (elipsis or omission)** = deletion of a sound in rapid or careless speech. For ex.: a phrase, such as *next thing, next question,* is often pronounced with elision of the [t] in [neks]. 2. **Epenthesis** = inserting of a V or C segment within an existing string of segments. For ex.: in RP, however, as in other non-rhotic accents (some of New England accents and in New York City) speakers tend to add an intrusive [r] to V+V sequence even when there is no [r] in the spelling of the preceding word, e.g. comma ['kɔmər], ['ka:mər]. In isolation, the RP form is ['kɔmə]. But in a phrase such *put a comma in*, it is often pronounced ['kɔmər]. In GenAm it is always ['ka:mər], whatever the environment. 3. **Smoothing** = a diphthong optionally loses its second element before another vowel, or it is monophthongized: E.g.: fire ['faiə -'faə - 'fa:].
4	Adjustments on the syllable level	**Compression** when two syllables, usually both weak, optionally become one. Applies only to [i], [u], syllabic consonants: [i] becomes like [j], e.g. lenient ['li:niənt] - ['li:njənt], etc.
5	Weakening	**Weakforms** are alternate forms of words so reduced in their articulation that they consist of a different set of phonemes. Weakforms differ from strongforms by containing a weak vowel resultant from reduction or by elision of one or more of its phonemes, e.g. can [kən], [kn]