

MAIN ASPECTS OF FUNCTIONAL PHONETICS

§ 1. Phoneme: definition and functions

A speech sound is the unit of practical phonetics, which is studied from articulatory, acoustic and auditory aspects. A phoneme is the unit of functional phonetics, which serves communicative purposes.

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.

The truly materialistic view of the phoneme was first proposed by an outstanding linguist L.V. Shcherba and supported by V.A. Vassilyev and other phoneticians. According to it 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.

E.g., *sleep*er — *sleep*y;

*bat*h — *pat*h, *li*ght — *li*ke;

He was heard badly — *He was hurt badly*.

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.

E.g., *cap* [k^hæp^h] / [k^hæp]

— 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.

This materialistic conception of the phoneme is regarded as the most suitable for the purpose of language teaching in modern linguistics.

§ 2. Phonemes, allophones, phones: difference and relationships

The sounds of language should be described and classified from the point of view of their functional significance. The same sounds can have different interpretations in different phonetic contexts.

For example, the sound [t] may be opposed to [d] in words like *ten—den*, *seat—seed*. But in the expressions *let us* — *let them* [t] remains the realization of one and the same sound though having certain pronunciation peculiarities.

In order to tell the difference linguists use two separate terms: phoneme and allophone. The term 'phoneme' means sounds of speech used in their contrastive sense whereas the term 'allophone' is used for non-contrastive sounds representing variants of a definite phoneme.

It's been stated before that the **phoneme** is a minimal abstract linguistic unit opposed to other phonemes in order to distinguish the meaning of morphemes and words.

As a unit of language any phoneme possesses a bundle of distinctive features that makes it functionally different from all other phonemes and forms the invariant of the phoneme. The articulatory features characteristic

of the invariant are called **distinctive (relevant)**. They can be extracted when opposing to each other in the same phonetic context phonemes with a difference in one articulatory feature which brings changes in meaning.

For example, all the allophones of the phoneme [d] are occlusive, forelingual and lenis, but when occlusive articulation is changed for constrictive one, [d] is replaced by [z] (*breed* — *breeze*, *deal* — *zeal*). In words *port* — *court*, both phonemes [p] and [k] have the same features of occlusive, fortis consonants, but labial [p] is opposed to lingual [k].

The articulatory features which do not serve to distinguish meaning are called **non-distinctive (irrelevant)**. They are observed within the allophones of a certain phoneme. For example, the opposition of an aspirated [k^h] to a non-aspirated one in the same phonetic context does not distinguish meaning (*back*).

There are two types of non-distinctive features:

- incidental (redundant) features (aspiration of voiceless plosives, presence of voice in voiced consonants, length of vowels, etc.);
- indispensable (concomitant) features (tenseness of long monophthongs, checked character of stressed short vowels, lip rounding of back vowels, etc.).

Allophones are the possible variants of the same phoneme, which never occur in similar phonetic contexts. They are not used to differentiate meaning and largely depend on the phonetic context, in which neighbouring phonemes predict the use of this or that allophone.

There are two types of allophones: principal and subsidiary. If an allophone retains the typical articulatory characteristics of the phoneme, it is called a principal allophone. But when certain changes happen in the articulation of an allophone under the influence of the phonetic environment, an allophone is called subsidiary.

For example, an English phoneme [d] presents a principal variant when it is taken in isolation or in words like *door*, *darn*, *down*, and retains its typical characteristics of an occlusive, forelingual, apical, alveolar, lenis consonant. But the same phoneme [d] may undergo changes under the influence of other phonemes, and thus present subsidiary variants. It may be:

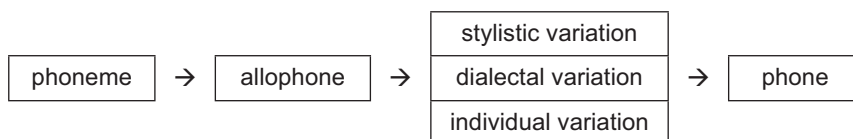
- slightly palatalized before front vowels and sonorant [j] (*deal*, *day*, *dew*);

- pronounced without any plosion before another stop (*bedtime, good dog*);
- pronounced with nasal plosion before [n], [m] (*sudden, admit*) or lateral plosion before [l] (*idle*);
- post-alveolar followed by [r] (*dry, dream*);
- dental followed by [θ], [ð] (*good thing, lead the way*);
- labialized followed by [w] (*dweller*).

Still all the allophones retain the invariant of phoneme [d] and possess its three basic articulatory features: they are forelingual lenis stops.

The actual realization of allophones in the speech chain is exercised through **phones**. These units are not predicted by phonetic context but modified by phonostylistic, dialectal and individual variations. That's why no speech sounds are absolutely alike.

The relationships between the phoneme as an ideal combination of articulatory features, the allophone as its variant and the phone as a concrete speech sound may be illustrated in the following scheme:



§ 3. Meaning of phonemes and allophones in teaching practice

Speaking about phonemes and allophones from the point of view of language teaching it should be mentioned that allophonic differences of the same phoneme are not observed by native speakers whereas allophonic modifications of different phonemes completely change the meaning of morphemes, words and sentences.

Anyone who studies a foreign language naturally makes mistakes in the articulation of sounds. Pronunciation errors are classified into phonological and phonetic.

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. [bit].

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:

[p^hit] / [pit].

Language teachers should guide the students in order not to admit phonological mistakes. Phonetic mistakes are possible; nevertheless language learners are advised not to make them, because in this case the degree of foreign accent may be an obstacle to listener's perception.

Transcription also plays a very important role in teaching and learning a foreign language. According to the International Phonetic Association there exists an accepted inventory of symbols to represent speech sounds separately from their orthographic notation. For example, the symbol [g] represents a lenis back lingual plosive consonant in words like *gate* and it does not coincide with the orthographic sign 'g' of the word *gin*, which is pronounced as [dʒ].

Transcription is the system of phonetic notation organized as a set of symbols representing speech sounds. There are two types of transcription:

- the first is broad (phonemic) transcription, which provides special symbols for all the phonemes of a language;
- the second is narrow (allophonic) transcription, which suggests special symbols adding some information about the articulatory activity of particular allophonic features.

For example, the words *Kate*, *take*, *hill* may get two types of notation:

- a usual broad transcription, like [keɪt], [teɪk], [hɪl];
- a narrow transcription, indicating additional articulatory parameters, like aspiration [k^heɪt], loss of plosion [teɪk^o], the dark shade of the sonorant [ɪ] [hɪɫ].

The broad type of transcription may be used not only in words but in word combinations as well. For instance, it's possible to note:

- linking [r] in the expression *car owner* [karəunə];
- reciprocal influence of sounds [n] and [ð] in the expression *in the yard* [ɪn↔ðə ja:d].

The broad transcription is mainly used for practical experience while the narrow one serves the purposes of research work. In practical teaching the most important variants of allophones should be mentioned to teach the students correct pronunciation.

§ 4. Main views of the nature of phoneme

The phoneme is a basic linguistic unit and this fact is acknowledged by all linguists. But not all of them describe it in the same way. 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, the Russian linguist of Polish origin I.A. Baudouin de Courtenay and shared by E.D. Sapir, Alf. Sommerfelt, M. Tatham. But the American linguist L. Bloomfield, the English phonetician D. Jones and Soviet linguists 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. This view is shared by the linguists of Prague Linguistic Circle N.S. Trubetzkoy, R. Jakobson, L. 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 archi-

phonemes representing types of units completely independent of any phonetic properties which are higher than the phoneme. This approach was originated by the Swiss linguist F. de Saussure and advocated by the Danish linguist L. Hjelmslev and his followers in Copenhagen Linguistic Circle H.J. Uldall, and K. Togby.

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 D. Jones and shared by B. Bloch and G. 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 L.V. Shcherba, the founder of Leningrad phonological school, 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 meaning. This theory was developed by V.A. Vassilyev, who regarded 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 L.R. Zinder, M.I. Matusevich, V.A. Vassilyev, M.A. Sokolova and others.

§ 5. Methods 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 of both unknown languages and languages already described can be fulfilled within two steps.

The first step which is especially important when investigating an unknown language 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.

There are two main methods of phonological investigation: the distributional method and the semantic method, but they get different interpretation in modern phonology.

I. 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.

Numerous examples seem to qualify this approach.

Thus in the opposition *let* — *pet* — *bet* all initial sounds are different phonemes, because they occur in the same initial position before a vowel. At the same time [t^h] and [t^o] in *take* and *let* present allophonic variants of the same phoneme: [t^h] never occurs in the final word position and never follows [s], while [t^o] never occurs initially before stressed vowels.

Still linguists find some lacks in this approach.

First, there are cases when two sounds are in complementary distribution, but are not referred to the same phonemes. For example, [h] occurs only initially or before a vowel (*heat*) while [ŋ] occurs only medially or finally after a vowel and never occurs initially (*sing*).

Then there is one more possibility of distribution besides contrastive and complementary ones. These are free variants of a single phoneme when both sounds occur in a language but native speakers are inconsistent in the way they use them (*калоши-галоши*).

Thus the distributional method doesn't get a wide acknowledgement in our home linguistics, because the distinctive function of the phoneme is underestimated.

II. The **semantic method** is based on the functional rule that phonemes can distinguish words and morphemes when opposed to one an-

other. 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.

For example, *pin* can be successively substituted for *bin*, *sin*, *din*, *tin*, *win*, and each minimal opposition will present different meanings. But the substitution of [p^h] for [p] in *pin* doesn't bring about any change in meaning, though it's wrong from the point of view of English pronunciation norm. So it's possible to conclude that [p], [b], [s], [d], [t], [w] are different phonemes whereas [p^h] and [p] are allophones of the same phoneme.

Any phoneme of a language is opposed to another phoneme at least in one minimal oppositional pair thus performing the distinctive function. The phonemic structure of a language is established according to the system of oppositions, which include minimal pairs of word-initial, word-medial and word-final positions.

N.S. 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 features (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).

The semantic method is widely used in Russian and foreign linguistics, as it attaches great significance to meaning and concerns both articulatory and functional characteristics of phonemes.

A thorough investigation of the problems of phonemes, allophones and phones and different methods of phonological analysis is given in the book by M.A. Sokolova "Theoretical phonetics of the English language" [19].

Seminar 2

1. What is the phoneme? Give the definition.
2. Explain the essence of the materialistic conception of the phoneme.
3. Discuss the aspects that the phoneme includes. Why none of them can be ignored?
4. Give examples of the distinctive, constitutive and recognitive functions of the phoneme.
5. What is the difference between phonemes and allophones? Which of these notions serves as the representation of distinctive features of a speech sound? What is the representation of non-distinctive features?
6. What types of non-distinctive features of the phoneme do you know? Give examples.
7. Is it important to differentiate between the principal and subsidiary allophones of the phoneme? Why?
8. What units represent the realization of allophones in actual speech? Explain the connection between phonemes and phones.
9. Comment on the difference between phonological and phonetic mistakes. State whether it is useful in teaching practice.
10. What types of transcription do you know? Which one would you prefer in teaching pronunciation? Why?
11. Speak about the main phonological schools. Discuss the ideas represented in: