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## MODELING THE PROCESS OF AUDITORY PERCEPTION AND THE DEVELOPMENT OF LISTENING INSTRUCTION TECHNOLOGY

*In connection with the orientation of the school learning process on the practical knowledge of a foreign language, the problem of understanding speech by ear is of great importance. It is known that in teaching practice the methodology of teaching listening is least developed. One of the main reasons for the lack of attention to listening from methodologists and teachers is the fact that, until recently, listening was considered an easy skill. There was a point of view that if, when teaching oral speech, the teacher concentrates all efforts on speaking and ensures mastery of this ability, then students will learn to understand speech spontaneously, without special purposeful training. The failure of this point of view was proved both by theory and practice. Although speaking and listening skills are in a certain relationship, their uniform development can only be achieved if a specially designed system of exercises is used to develop an understanding of just oral speech in natural conditions of communication. According to some studies, even people who are fluent enough in a foreign language have difficulty listening to the natural speech of native speakers. Psychology data also indicate that the perception and understanding of sounding speech is a very complex mental activity.*

*The essence of auditory perception, according to a number of scientists, consists in two-level speech recognition.*

*In recent decades, almost all significant discoveries and new directions have arisen at the intersection of various sciences, for example, physics and chemistry, physics and biology, biology and chemistry. Obviously, the teaching methodology also cannot do without involving related sciences. To justify the proposed method of listening, we will use some theoretical principles and practical achievements of audiopedagogy, typhlopedagogy and psychology.*

*Thus, listening is one of the most difficult types of speech activity and, according to many methodologists, should be developed better than other skills. One of the practical tasks in the field of listening is to teach students the perception of foreign language in conditions that are close to real.*

**Key words:** *speech activity, auditing, communication, listening, foreign language.*

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## МОДЕЛЮВАННЯ ПРОЦЕСУ АУДИТОРСЬКОГО СПРИЙНЯТТЯ ТА РОЗВИТКУ СЛУХОВОЇ ІНСТРУКЦІЙНОЇ ТЕХНОЛОГІЇ

*У зв'язку з орієнтацією шкільного процесу навчання на практичні знання іноземної мови велике значення має проблема розуміння мови на слух. Відомо, що в педагогічній практиці методика навчання аудіювання є найменш розробленою. Однією з головних причин недостатньої уваги до слухання з боку методистів та вчителів є той факт, що донедавна слухання вважалося легкою майстерністю. Існував погляд, що якщо під час навчання усного мовлення вчитель концентрує всі зусилля на мовленні та забезпечує оволодіння цією здатністю, то учні навчаться розуміти мовлення спонтанно, без спеціальної цілеспрямованої підготовки. Провал цього погляду був доведений і теорією, і практикою. Хоча навички говоріння та слухання перебувають у певних стосунках, їх рівномірного розвитку можна досягти лише за умови використання спеціально розробленої системи вправ для розвитку розуміння справедливого усного мовлення в природних умовах спілкування. За даними деяких досліджень, навіть людям, які досить добре володіють іноземною мовою, важко слухати природне мовлення носіїв мови. Дані психології також свідчать про те, що сприйняття та розуміння звучання мови є дуже складною розумовою діяльністю. Суть слухового сприйняття, на думку ряду вчених, полягає у дворівневому розпізнаванні мовлення. В останні десятиліття майже всі значні відкриття та нові напрями виникли на перетині різних наук, наприклад, фізики та хімії, фізики та біології, біології та хімії. Очевидно, що методика викладання також не може обійтися без залучення суміжних наук. Для обґрунтування запропонованого способу прослуховування ми використаємо деякі теоретичні принципи та практичні досягнення аудіопедагогії, тифлопедагогії та психології. Таким чином, аудіювання є одним із найскладніших видів мовленнєвої діяльності і, на думку багатьох методистів, має розвиватися краще, ніж інші навички. Одне з практичних завдань у галузі аудіювання – навчити учнів сприйняття іноземної мови в умовах, близьких до реальних.*

**Ключові слова:** *мовленнєва діяльність, аудит, спілкування, аудіювання, іноземна мова.*

**Introduction.** In this article, we consider the process of auditory perception as a physiological phenomenon, so some special terms must be introduced. “Analyzer” according to A.B. Ermakova is “A functional system by which the analysis of phenomena occurring in the environment and within the body itself” is carried out. (Ермаков, Якунин, 2000а: 29).

The analyzer consists of the peripheral section (receptor), the conductor and the central (brain) departments. The peripheral sections of analyzers are sensory organs: eye, ear, organs of taste, smell, touch, (Ермаков, Якунин, 2000b: 29–30). The activity of analyzers is most successful in their interaction. The interconnection of analyzers is ensured by the functions of all links and levels of the central nervous system (Ермаков, Якунин, 2000с:32).

The auditory analyzer is one of the main sensory systems in humans. The peripheral part of the auditory sensory system of a person consists of the outer, inner and middle ear (Ермаков, Якунин, 2000d:59). We will use the terms: auditory analyzer and visual analyzer. The main difference between auditory and visual modality is that “the existence of a sound object without a temporal characteristic is impossible” (Носуленко, 1988:24). When considering the physical model of visual perception, the time parameter can be neglected, while the physical model of sound exposure implies a time parameter as one of the most significant. In other words, the process of auditory perception is happening here and now. The relationship between auditory and visual perception will be shown in more detail later in this paper.

**Discussion.** In recent decades, almost all significant discoveries and new directions have arisen at the intersection of various sciences, for example, physics and chemistry, physics and biology, biology and chemistry. Obviously, the teaching methodology also cannot do without involving related sciences. To justify the proposed method of listening, we will use some theoretical principles and practical achievements of audiopedagogy, typhlopedagogy and psychology.

Pedagogy deals with the problem of teaching deaf and children with loss of hearing. Why do we turn to this science? This question can be answered by presenting the learning process of listening as a kind of model. Let us compare the auditory perception of a student who has never before heard foreign language speech, with the auditory perception of a newborn child, perceiving the speech of parents and adults surrounding him.

At what age does the child begin to recognize speech? L.S. Vygotsky believes that only in the 3rd

week of life a child does have the first reactions to the human voice, the first response, i.e. social reaction, appears on the 2nd month (Выготский, 1999). Conditional reactions to auditory stimuli appear in a child only in the fifth month of life (Кольцова, 1967).

From that moment on, the speech of the parents and adults surrounding it is perceived by the child as a set of sounds, a noise in which he/she cannot distinguish a single word, because he/she does not yet know the words. However, the melody and rhythm of the mother tongue, as well as the intonation that conveys the speaker’s emotional state, he/she captures. V. P. Ermakov gives the following picture of the auditory perception of young children: “At the earliest stage in the development of speech, the child perceives the words as a single, undivided sound complex with a certain rhythmic and melodic structure. The next stage is characterized by the gradual development of the ability to distinguish phonemes that make up the words” (Ермаков, Якунин, 2000е: 127). Before the child speaks, it takes almost a year, during which he/she is in the language environment. This situation is modeled by the oral method described above. Naturally, the time allotted for language adaptation in this case is much less.

So, in the simulated learning process of listening, the student goes through the first stage of adaptation to a foreign language, comparable to the period of adaptation to the mother tongue of a newborn child and goes to the second stage, where his perception of foreign speech can already be compared with the perception of native speech by a child with hearing impairment. Such a comparison suggests itself. Speech difficulties are very similar. The student hears foreign language speech, but experiences significant difficulties in recognizing individual words in the speech flow and in understanding the message as integral information. A child with hearing impairment experiences the same difficulties, but for physiological reasons.

The essence of auditory perception, according to a number of scientists, consists in two-level speech recognition. At the first level, a series of phonemes is recognized, at the second, a series of phonemes is translated into a sentence as a language unit. The success of listening to speech depends on the level of speech development, context and situation, the complexity of speech structures, as well as on the volume of sounding audio material. For children with hearing impairment, the success of perception also depends on the state of hearing.

Obviously, the higher the level of speech development and the student’s vocabulary is, the more successful the perception of speech by ear becomes.

According to M. V. Lyakhovitsky hearing is divided into phonemic and speech. Phonemic hearing is the ability to distinguish speech sounds and correlate them with the corresponding phonemes. The object of speech hearing is mainly the semantic components of speech and intonation contours (Ляховицкий, 1981: 54). The process of recognizing voice messages is very complex and is the subject of study by large teams of scientists – physiologists, acoustics, linguists, psychologists, both in our country and abroad. A. I. Soloviev believes that perception is associated with solving problems of coordinating the physical, physiological, psychophysical, and linguistic factors of speech hearing. (СОЛОВЬЕВ, 1972). But, despite the difficulty of recognizing a speech message, the situation is not hopeless, since listening to speech is amenable to training, development and improvement both in children with hearing loss and, of course, among students studying listening to foreign languages. The teacher's task is to select such hearing-developing exercises that will be most suitable for this group of students, i.e. will correspond to their level of audio training, interests, emotional mood.

L. P. Nazarova talks about eleven features of auditory perception of speech. Since we are comparing the second stage of the model of the process of learning to listen with the process of auditory perception of children with hearing impairment, we can take some of these features into account when teaching listening to foreign speech (Назарова, 2001a).

1. A large amount of audio information is difficult to digest. An attempt to increase the amount of information leads to a decrease in its perception. A.C. Lurie cites data that with long loading of the auditory channel, when listening to phonograms lasting more than 20 minutes, the listeners become tired more quickly and their attention weakens accordingly (Lurie, 1991). This feature must be taken into account when planning a lesson and selecting audio material. N. L. Mironova: "Students should not be presented phrases that exceed the amount of short-term memory, and audio texts – the amount of attention" (Миронова, 1982: 82). Short-term memory holds once presented information in the amount of 5 to 9 words, numbers, figures, etc. for about 20 seconds (Столяренко, 2003:161).

2. Not only volume is important, but also the speed of presentation of information. For people with normal hearing, an interval of 4 seconds is sufficient for perceiving information. An increase in speed leads to perception errors. We can adjust this parameter when we ourselves read the text or transmit an oral message.

However, in most cases, we use ready-made audio materials that offer a variety of study guides published abroad. In this case, it is hoped that these materials are recorded in accordance with the physiological characteristics of the average student.

3. The thresholds of legibility in people are different. The threshold of legibility is an individual feature of a person. It depends on physiological reasons, in particular on hearing acuity, which, in turn, is determined by the structure of the hearing organs. The threshold of legibility also depends on the sound environment in which the person is located. For example, if at home a child hears quiet, calm speech all the time, his/her hearing aid does not overload and his hearing perception is quite wide enough. On the contrary, if a child is constantly surrounded by loud voices, loud sounds, the threshold of legibility of his/her hearing aid rises, and he can no longer hear quiet sounds. Unfortunately, we cannot control this parameter either. However, we can take it into account through an individual approach to students.

4. Low-frequency noise influences the legibility threshold. In order for speech to be heard by listening to noise, its sounds must exceed noise by approximately 6 dB. In the training environment, we are faced with the problem of the quality of film recording and the quality of reproducing equipment. It is the poor quality of the films and tape recorders that creates the background noise. You can deal with it by increasing the sound volume, however, background noise interferes with sound reception, creates discomfort, causes irritation, and thereby reduces the effectiveness of learning.

5. Each person has the individual ability to "select" speech information. The listener involuntarily selects the information received and passes it through his/her consciousness. Perceiving spoken language even in the mother tongue, a person cannot learn 100% of the information received. The percentage of perceived information is approximately 70%, the rest is filled with conjecture. It is very interesting to observe these individual characteristics in practical listening exercises – some students catch verbs, i.e. action, others, pay more attention to nouns and adjectives. We cannot correct these individual characteristics of students, but we can significantly increase attention and, thereby, perception efficiency by selecting audio material that meets the interests of each individual group of students.

Interference for the perception of speech, according to L. P. Nazarova, is a reverb, i.e. distortion of sound vibrations arising from the reflection of sounds from objects, walls, floors, ceilings. If the reverberation time is 2 seconds, then about 10%

of the spoken language is lost, with an increase in the reverberation time to 8 seconds, it is lost up to 50%. We can take this parameter into account only when planning and equipping classrooms designed for listening lessons.

In addition to these features, there are some common features of the perception of speech by ear by children and students who perceive foreign language speech. In children with normal hearing, according to L. P. Nazarova, auditory representations are of an involuntary nature and arise on the basis of repeated perception by the auditory analyzer of speech and environmental sounds. One of the conditions for the formation of auditory representations in children with hearing loss is “the formation of a close connection between auditory representations and motor components, i.e. each word perceived by ear must necessarily be pronounced. On the basis of auditory perception with pronouncing, auditory-pronouncing ideas arise” (Назарова, 2001b: 60). In our case of learning to listen to foreign speech, speaking to ourselves the information perceived by ear leads to an increase in the rate of internal speech and, accordingly, in the form of feedback, to an improvement in auditory perception. “Internal speech refers to speech about

and for oneself. Words of internal speech are based on the movement of peripheral organs of loud speech. Thinking, memory, perception are closely related to internal speech” (Ермаков, Якунин, 2000f:126). A.A. Leontev believes that “inner speech is a speech action transferred “inward” (Леонтьев, 1969: 158).

The study of internal speech as a process of higher nervous activity cannot be carried out by direct observation. According to N. I. Zhinkin, the section of internal speech is the most impregnable for studying in the chain of language communication (Жинкин, 1998: 85). However, scientists such as B. G. Ananyev, T. N. Ushakova, L. S. Vygotsky, they tried to investigate inner speech by indirect observation.

**Conclusions.** The main conclusion that can be drawn based on the above authors is that inner speech is a kind of minimized replacement of external speech, a stage that precedes the formation of external speech. We know that a person’s memory stores visual and auditory images obtained respectively through the visual and auditory canals. Comparison of images in memory with new images is an internal process of thinking. It can be said that in the process of internal speech a person operates with visual and auditory images, almost the same as in the process of external speech he/she operates with a word.

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