Teaching Listening Comprehension: Bottom-Up Approach

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ABSTRACT
Improving listening comprehension skills is one of the urgent contemporary educational problems in the field of second language acquisition. Understanding how L2 listening comprehension works can have a serious influence on language pedagogy. The aim of the paper is to discuss the practical and methodological value of the notion of the perception base of the language. It also highlights the importance of structural features and frequency of linguistic units in helping to determine teaching priorities in English language teaching, specifically, when training listening skills. The leading approaches to the problem of the paper are the psycholinguistic and statistical ones which help to identify practical teaching principles. The paper illustrates these approaches with the findings on the perceptually relevant features and frequency of the English words and sentences and their linguistic features. The findings are discussed in terms of their application in developing bottom-up listening skills and tested in a listening comprehension experiment. The materials of this article may be of use to those who are interested in problems of speech perception and improving the existing listening comprehension teaching techniques.

Introduction

Urgency of the Problem

The role of English as one of the world's international languages results in efforts to find more effective ways of teaching it as a second language. The role of listening comprehension in second language learning was taken for granted for a long time, little research was done and it was given little pedagogical attention. Listening comprehension was not seen as a specific methodological issue (Khaleeva, 1989). However, listening comprehension is one of the most important components of oral speech communication: about 40-50% of

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communication time is spent by adults listening (Gilman and Moody, 1984). R.A. Hunsaker (1990), arguing for the role of listening in the communicative skills, stated that more than three quarters of what children learn at school is achieved through listening. Listening is a leader among all other kinds of speech skills (speaking, reading, and writing) and it provides the basis for their development.

Recently the problems of oral speech perception and listening comprehension learning have attracted much greater interest. Most exams now include a listening component. It is an accepted fact now that programs for teaching listening comprehension cannot be based on the intuition and experience of its authors but should be backed by scientific findings in the fields of speech perception, corpus linguistics, and etc. However, foreign language teachers often do not take into consideration the psycho-physiological and linguistic basis of the process of speech perception, which prevents them from developing purposeful and consistent programs to teach L2 listening comprehension.

Status of the Problem

The issue raised in the paper can be discussed within the following areas of focus: levels and mechanisms of speech perception and comprehension; the level of listening and speech comprehension skills of students; methods to overcome linguistic and extralinguistic difficulties in training listening skills; listening strategies; development and effective use of listening comprehension training programs (Tsarevskaya and Litovchenko, 2015; Lopatina et al., 2015; Grigoryeva et al., 2015; Aponte-de-Hanna, 2012).

The speech perception process is not open for direct observation; or, more precisely, it is the least explicit of the four language skills. It is a complex multi-level process which can be investigated only by modeling the mechanisms of speech perception. In the framework of second language teaching it is necessary to model the mechanisms of L2 learners' perception and compare them with the perception mechanisms of native speakers. More than that, it should be noted that a person who has just started to learn a foreign language has to rely on perception mechanisms in his native language which leads to perception interference. There is only scarce research in this field which gives data on how, for example, Russian learners perceive English, what their typical mistakes are, what is the most challenging for them in interpretation of an aural speech input.

L. Vandergrift (2009) argues that, when listening, people draw on the following knowledge sources: linguistic knowledge, pragmatic knowledge, and prior (experiential) knowledge. They consider the linguistic source to be the fundamental one. It is represented by semantic, phonological and syntactic knowledge of the target language which helps the listener to assign meaning to the sound stream of the connected speech.

Most researchers support L.V. Shcherba's (1974) idea that only a professional who is well aware of the linguistic basis of speech activity can be efficient in teaching a language. However, in practice the main principle employed in second language teaching is still the principle of "self-learning ability of the perceptive system" (Ventsov and Kasevich, 1994). The listening activities used in teaching in most cases only test learners how well they can listen without actually teaching them how to listen. This tendency to test rather

than teach listening continues in many classrooms to this day (Vandergrift and Goh, 2012).

Major psycholinguistic approaches to foreign language learning agree that a learner needs to be exposed to input, however, there is no agreement on the type of input needed and how such input is processed in order to become acquired (Karimvand, 2011). The main criteria which are taken into consideration when designing listening aids are contextual, personal, criterion of authenticity, socio-linguistic, the linguistic form of the speech signal, the instructional goal, etc (Fedotova, 2015; Howard and Major, 2004). Undoubtedly, the linguistic form of the materials used for teaching listening comprehension is of great importance, but it is usually only said that the linguistic form should not be too difficult for the students to process, it should correspond to their language proficiency level without explaining how the linguistic form of a speech signal can influence the process of listening or what the students should know about it to increase their awareness of what they learn to do D. Mendelsohn (1998) highlights a gap between the interests of listening researchers and classroom teachers, stating that classroom materials do very little to develop metacognitive knowledge by means of raising learners' consciousness of the listening process. Thus, it is of primary importance to know the laws of the speech perception process, to teach how to listen, to explain the basic laws of the listening strategies.

Methodological Framework

Speech Perception Mechanisms

Understanding the process of speech perception is important because it gives clues concerning what listeners do when they are faced with deciphering aural information. Researchers usually describe speech perception as a multi-level process involving a number of skills which allow a listener to recognize a speech signal, and to pass from its acoustic image to its meaning. V.B. Kasevich (2010) describes three main levels in speech perception: psychoacoustic (perception of physical characteristics of a speech signal), linguistic (phonetic, lexical, syntactical, and semantical representation of a speech signal) and cognitive (making information hypothesis about the structure of a speech sound). So listening requires the use of non-linguistic as well as linguistic knowledge. The use of linguistic cues in perception mechanisms is referred to as bottom-up processing whereas the use of contextual clues and world knowledge is referred to as top-down processing. Such mechanisms as memory (working memory, long-term memory) and probabilistic forecasting also play an important part in speech perception.

It is a disputable question what can be considered a universal unit of perception. St. Petersburg linguistic school developed the statistical descriptive model of speech perception by essential linguistic features (Zinder and Shtern, 1972; Shtern, 1992; Chugaeva, 2007). The model helps to identify the so called "anchor" features in the perception of the structure of a linguistic unit which help to identify the linguistic unit as a whole in connected speech. This model allows to identify essential features of linguistic units at different linguistic levels (syllable, word, sentence). The set of essential linguistic features can be identified in experiments and lies in the basis of the perception types of linguistic units. This model investigates only perception of the linguistic (surface) form of a speech signal it does not deal with semantic processing.

As P. N. Karimvand (2011) noted the storage of linguistic structures and functions in the mind, i.e. knowledge, is directly linked to comprehension. Thus, the listening comprehension problem can also be treated in terms of the model of the perception base of a language which was worked out by Z. N. Dzhaparidze (1985). The perception base is defined as a hierarchic system of models of speech units and correlation rules which are kept in the memory of an individual. Z. N. Dzhaparidze (1985) described the models of only phonetic phenomena (speech sounds, syllables, rhythmic structures, etc). However, experiments (Abramov, 2004; Krause, 2002; Shtern, 1992; Chugaeva, 2007; Porchesku 2013; Masalimova, Porchesku & Liakhnovitch, 2016; Gutman et al., 2014) show that listeners store in the perception base models of units of other language levels, such as words, sentences, and texts. T. N. Chugaeva (2009) defines the perception base as a hierarchic statistically distributed system of multidimensional matrices of language units, united by numerous crisscrossing perceptually relevant linguistic features including perception models of words and sentences. The notion of the perception base can have a significant practical value for teaching listening.

In the process of learning a second language a student forms the perception base of a foreign language which is developed in the process of learning. In this case three mechanisms can be singled out: a native language mechanism of perception, an authentic mechanism of perception in a foreign language and a forming mechanism of perception in a foreign (second) language. The last one is greatly influenced by the native language mechanism but tries to approximate oneself to the authentic one (Shtern, 1992). The stages and peculiarities of development of the perception base of a foreign language can be described by means of experimental research. There are a few works which describe language interference in the field of listening comprehension and formation of the L2 perception base. They try to reveal linguistic features which are mostly exposed to interference in the listening process, e.g. features which are more difficult for learners of a particular language to perceive.

Listening in a foreign language is a complex task, which ranges from perception to comprehension and requires the interaction between top-down and bottom-up cognitive processes partly mediated by attention and memory mechanisms (Delvaux et al, 2015). The surface form of the linguistic unit is "invisible" for native speakers (Ventsov & Kasevich, 1994; Frumkina, 1990), but for L2 learners it becomes of importance. Consequently, listening comprehension training programs should include enough exercises aimed at training the students to listen at the level of the surface form of the linguistic unit, especially, at lower levels of language proficiency, i.e. there should be enough exercises helping to form bottom-up processing skills.

Frequency of Linguistic Units

An important mechanism of speech perception is probabilistic forecasting. G.A. Miller and J.A. Selfridge (1950) explains the work of this mechanism in the following way: «The listener begins with the assumption of a signal at the input. On the basis of this assumption he generates an internal signal to be compared with the perceived one». In the process of developing the mechanism of probabilistic forecasting in L2 the notion of frequency of linguistic units seems to be of great use.

Speech perception experiments and research show that speech units are organized in the speech mechanisms hierarchically in accordance with their frequency of use in speech. Words are said to be processed linearly, i.e. one after another, and frequent words are recognized more easily and faster. As for grammar, Leech believes that differences between spoken and written grammar show up most markedly in frequency (Leech, 2001). Frequency is understood as a property of a linguistic unit showing how often it is used in texts created in a particular language. The frequency feature turns out to be essential for perception of all linguistic units, especially if speech is perceived under not ideal conditions (noise, lack of linguistic knowledge). Spoken language makes greater use of high-frequency words of the language, so frequency data is of primary importance when we teach a language, either native or foreign one. Knowledge of frequent words or structures of L2 supports the work of probabilistic forecasting.

Frequency information, in the fields of both grammar and lexis, can bring a realistic reappraisal of what English language content should be taught to different kinds and levels of learners in the interests of their communicative needs (Leech, 2001). Revealing frequency characteristics of words and syntactical patterns of the perception base seems to be quite promising for practical teaching. Linguostatistical analysis (content analysis) of the essential linguistic features of linguistic units or the data provided by different corpora giving information on frequency characteristics of language units can be regarded as a way to describe the perceptive models of linguistic units. These methods give information about the frequency characteristics of linguistic units and their perception image based on linguistic behavior of native speakers.

Thus, among other requirements which are usually applied in respect of listening comprehension teaching materials there should be a requirement to take into consideration the frequency ratio of the linguistic units used in the teaching materials as well as typical interference mistakes made by learners of a particular language. This can help to prevent listening comprehension mistakes caused by cross-language interference and improve the existing listening comprehension teaching techniques and programs.

Results

Perception Peculiarities of the English Words and Sentences

When forming bottom-up strategies of speech perception, it is necessary to have the information about essential features of English words and sentences which are essential for their successful recognition.

The essential linguistic features of the English words are *accented vowel*, *initial sound*, *part of speech*, *length in morphemes* and *length in phonemes*, *accented structure*, *consonant index* (Chugaeva, 2009; Baiburova, 2008). A*ccented vowel* and *frequency* characteristics are essential in perception of 'short' words (one- and two-syllable words), *accented structure* feature becomes significant in perception of a 'long' word. The findings of the linguostatistical analysis of two frequency strata of the British National Corpus present the peculiarities of the sound image of English high frequency words. About 90 % of the two high frequency strata words are one-syllable words, in comparison with Russian they are two-syllable words (50.2 %) and three-syllable words (22.3 %). The consonant index of the English word is higher than that of the Russian one

(2.43 *vs* 1.4). The typical consonant type of the English word is CVC while in Russian it is two syllable CVCV type. Most two-syllable words (76.6 %) have their first syllable stressed, three-syllable words have their stress on the first (48.2 %) and second (49.3 %) syllable while Russian words are characterized by equal use of different placement of the stress. A typical frequent English word is non-affixal, while in Russian many frequent word types contain suffixes or prefixes. Most accented vowels of the high frequency English word strata are represented by short front vowels (Chugaeva, 2007).

The English spoken sentence as any other unit of perception has its form which plays center stage in the process of speech perception of an L2 sentence. Sentence perception can be influenced by the following linguistic features of the sentence: *extended sentence – unextended sentence*; *affirmative sentence – question*; *tense of the verb-predicate*; *active – passive*; *structure pattern*; *positive sentence – negative sentence, structural type of the sentence, length in words*, and *frequency* of the linguistic features of the sentence. The features which are essential i.e. tend to be perceived intact by native speakers when listening in noise are *structural type of the sentence; tense of the verb-predicate; positive sentence – negative sentence*; *active – passive.*

The linguostatistical analysis of a corpus of spoken texts was also carried out to reveal the frequency of linguistic features of the English sentence (Porchesku, 2013). Some of the findings of the frequency characteristics are correlated with the data of *Longman Grammar of Spoken and Written English* (Biber et al., 2004). The high frequency stratum of the English sentences is characterized by the following peculiarities: the most frequent sentence types are a simple sentence of *SPO* or *SbeC* structure pattern, and a compound sentence having two clauses; the next frequent type is a semi-composite sentence which contains a verbal (infinitive – 55.6 % or gerund – 19.1 %), and the last is a composite sentence consisting of three clauses. Clauses in composite sentences are most often connected by means of the following conjunctions: *that, and, what, because, which, but.* The average length of the English aural sentence is 13.16 words (simple sentence – 5.8; semi-composite sentence – 11.7; composite sentence – 22). The predicate in such sentence is, in most cases, in the form of the Present Simple Active Tense (59 %) and Past Simple Active (10.5 %). The most frequent verbal is the infinitive (55.6 %) and the most frequent patterns with the verbals are *V+Inf, N+Inf, Adj+Inf* (Porchesku, 2013).

The findings of the research done within the framework of the statistical descriptive model of speech perception have also helped to identify the main problems Russian learners of the English language tend to face in the sphere of listening comprehension.

The experimental data show that Russian learners (students of language departments) demonstrate that their level of listening skills and perception mechanisms differ significantly from those of native speakers. The average rate of successful identification of separate words recorded in white noise is twice as low as that of native speakers (Chugaeva, 2007). As to the sentence, it is even lower; the Russian speakers demonstrate only 31 % of successful perception of sentences in comparison with 77 % of native speakers (Porchesku, 2013).

Russian learners of English and native speakers rely on different linguistic features in the process of speech perception. For example, in the process of perception of long (four-syllable) English words the following features turn out

to be relevant: *accented vowel, consonant index, word frequency, length in morphemes*. However, Russian learners tend to rely on *length in phonemes*, as for *consonant index,* it becomes irrelevant for them (Chugaeva, 2009).

Speaking about the English sentence, the mechanisms of perception of English speakers and Russian L2 speakers rely on the same relevant features (*sentence pattern, tense of the verb-predicate, modality*), i.e. they tend to reproduce them when they hear a sentence recorded in noise), but at the same time bottom-up strategies at lower levels of perception prevail: listeners tend to reproduce individual words, syllables and sounds without recognizing the sentence as a whole and making mistakes in recognition of its linguistic features. The Russian learners have difficulties in identifying the structural pattern of the English sentence, make mistakes in hearing the tense of the verb-predicate, and do not differentiate between affirmative and negative or active and passive sentences. The kinds of substitutions they make demonstrate the fact that they employ bottom-up strategies of sentence perception but they appear to understand separate words without identifying their place in the sentence structure. So the bottom-up strategies are more or less well utilized only at the word level. The learners' inability to recognize the linguistic features of the English sentence prevents them from identifying the sentence as an integral unity and, consequently, prevents them from understanding the meaning of the sentence which is the ultimate aim of listening comprehension.

Listening Comprehension Experiment

The role of speech perception and linguistic knowledge in facilitating listening comprehension prompts the current methodological principle of providing learners with a certain amount of exercises training them to discriminate the aural input on its surface level (the sound form of words and the structure of sentences).

So the findings of the research on the essential linguistic features and frequency of the English words and sentences were used as a basis to work out a program of exercises to train the perception mechanisms of the Russian learners of English. The program was tested in a training experiment with two groups of pre-intermediate learners: the experimental (8 people) and control (9 people) ones. They studied English at one of the linguistic centers of Kirov. The experiment lasted a month during which the groups had two classes each week about 90 min each. The same textbook was used to teach the groups but in the experimental group sometime of every lesson was devoted to extra listening comprehension training (10-15 min each class). Besides, the learners were given a CD and photocopies of the same exercises to train out of class. After each lesson they were also given a listening task.

The exercises of the program concentrated on training the bottom-up mechanisms of speech perception at the levels of words and sentences. The exercises contained only separate words and separate sentences. The level of the text was not included into the program. Some of the exercises used in the program were taken from the Listening Challenge manual (Chugaeva et al., 2005), mostly, they are word-level exercises. The exercises were organized according to principles of frequency of words and sentence types used in them. We used only the words presented in the first two frequency strata of the British

National Corpus and the most common types of sentences according to the frequency analysis by G.V. Porchesku (2013). Besides, the data about the perception problems of Russian learners in recognizing the linguistic features of the English words and sentences was taken into account. Thus, in balancing the material, such poorly recognized linguistic features of the words were trained as: the stressed vowel, long-short vowels, groups of diphthongs, words of different accented structures (with their stress on the first, second and third syllable).

Examples of the exercises:

Read, listen to and repeat the words containing short vowel sounds: [i] think, simple, million; [u] could, stood, should [e] red, help, health.

Listen to and write down the words containing short vowel sounds: [i] bit, …. ; [u] book … ; [e] well, … .

Listen to the sentences, underline the word you hear: That butter is bitter/better. This cap/cup is too expensive for me.

I should be noted that such exercises help to create sound–script connection because learners are often not able to segment the sounds of the word from surrounding words or, in some cases, they do not recognize the word because of their own inaccurate or different pronunciation of it. They also help in building up the L2 vocabulary what is also important in training listening skills as recent studies demonstrate that up to 50 percent of success in listening ability could be explained by vocabulary knowledge (Vandergrift and Goh, 2012).

As to sentences, there were two main types of exercises used: listening to sentences made of the same words but presenting different structural patterns and repeating them: *She reads a book. She is reading a book. She has read a book. She doesn't read a book. She isn't reading a book. She hasn't read a book.* … . And a similar exercise but the sentences were composed of different words: *You run your own business. They don't understand you. Do you watch the news?* The structural patterns covered only the grammar material taken at the pre-intermediate level taking into consideration their frequency. Thus, structures which are more frequent were given more attention and place in the program.

The program also tried to take into consideration the advantages of speech-in-noise perception (Slater and Kraus, 2015) so most of the exercises were recorded in noise.

The students were explained the basics of the work of the perception mechanism and the perception peculiarities of the sound image of the English words and sentences, so they were aware of the fact what is trained during the listening comprehension part of the lesson. Most of the students reported at the end of the experiment they also trained their listening skills with the help of the program out of class two or three times a week.

The learners of both groups were given a listening comprehension test at the beginning and the end of the experimental period consisting of two parts: listening to separate words and listening to a text both recorded in white noise. In the second task successful recognition of both separate words and sentences were analyzed. The results of the listening comprehension test are shown in Table 1 (p % of the average mean of correct recognition).

Table 1. Recognition of words and sentences in the listening comprehension test

	Material	Control Group	Experimental Group
At the beginning of the experimental period	Words	19, 6 %	19, 8 %
	text (words)	23,3 %	23, 9 %
	text (sentences)	14,7 %	14, 8 %
At the end of the experimental period	Words	23 %	29,6 %
	text (words)	23,6 %	33 %
	text (sentences)	16,7 %	30,8 %

It is seen from the table that at the beginning of the experimental period both groups demonstrated nearly equal percentage of recognition. The results demonstrated positive changes in recognition of separate words, and words and sentences in the text in both groups but in the experimental group there was a more notable improvement.

It should be noted that the experiment took quite a short period of time but it was enough to show the positive influence of the described approach. The set of exercises is quite limited in the experiment but there are some works which can provide teachers with a wide range of tasks and exercises aimed at training bottom-up processing (Vandergrift and Goh, 2012; Richards, 2008; Fedotova, 2015).

Discussions

Aural speech comprehension system suggests interaction of highly complex processes. People do not rely on only one knowledge source to understand speech, but they use various resources available to them, using both bottom-up and top-down approaches, to arrive at the meaning of the input messages.

The research provides evidence for importance of the consistent approach to teaching listening comprehension based on psycholinguistic findings. One of the approaches is the so called bottom-up approach. The bottom-up approach involves listening exercises which develop bottom-up processing helping learners to recognize individual words, sentences, and clause divisions, recognize key linguistic features of the words and sentences. Such approach is effective when the L2 perception skills are not developed enough. S.V. Govorun (2015) found out that when learners are given a choice what strategy to use, at lower levels of L2 proficiency they prefer bottom-up strategies to arrive at the meaning of an aural input.

The listening comprehension exercises balanced according to the linguistic units and their essential linguistic features allow to form the new perception base of an L2 learner at all linguistic levels. Training of the surface level of aural perception may facilitate the process of teaching in many ways: it reduces the anxiety of learners; it helps to create "perception automatisms" (Zalevskaya, 1988), thus, helping to have additional attention and memory resource to process speech at other cognitive levels of speech perception (Sekerina, 2006). So training the formal (surface) level of speech perception contributes to the development of the upper (semantic) level of perception.

The experiment carried out with a group of pre-intermediate learners concentrated only on perception of separate words or sentences and their

linguistic features. But it can be said that improving perception mechanism at the bottom levels of speech perception results in notable improvement of listening comprehension skills as a whole. By the end of the experimental period the control group demonstrated higher confidence in doing listening tasks, they asked to replay the recording more seldom in comparison with the control group and seemed to be more eager to be engaged in listening activities.

L2 learners usually say that listening is the most difficult skill (Graham, 2006), when it is coupled with classroom practice that often associates listening with evaluation (Mendelsohn, 1994) it contributes to a high degree of anxiety and stress among learners that can interfere with comprehension especially at the beginning levels of language competency. In our discussions of the teaching process and the experiment the learners showed greater levels of motivation and reported less anxiety.

The exercises used to train bottom-up processing also contribute to not only spoken L2 comprehension but to its acquisition. Consciousness of features of the input can serve as a trigger which activates the first stage in the process of incorporating new linguistic features into one's language competence (Richards, 2008).

Finally, frequency information which is available now from quite many sources helps in choosing the material for training exercises and can provide the learner with the basis for successful speech processing in every-day communication interaction. Knowledge of frequent words and syntactic structures helps them anticipate potential occurrence of certain words and syntactic models in the stream of speech improving probabilistic forecasting skills.

Conclusion

The article reviews some of the psycholinguistic factors which influence L2 listening comprehension strategies and should be taken into consideration when developing programs aimed at teaching listening skills. Listening comprehension processes rely on the following information: linguistic input, contextual information, and the learner's linguistic and other general knowledge of the world, including semantic and pragmatic knowledge. Comprehension can be largely determined by the linguistic form of the speech input, especially at the lower levels of language proficiency. The use of linguistic cues in speech comprehension mechanisms is referred to as bottom-up processing.

Teaching of L2 listening has attracted a lot of interest in recent years. There are many publications nowadays which claim listening to be the most important skill of the foreign language communication competence. However, taking the current textbooks used in teaching English we can see that many language programs still lack curricular support for developing listening skills. Most listening tasks are aimed at evaluating what a learner understands but they do not teach learners to listen.

English learners, especially those with lower proficiency language levels, consider listening to be the most difficult of all the skill areas of English for them. One of the reasons for this is that the spoken language seems to them like "a wave of sounds without borderlines" (Hulstijn, 2003). To improve students' listening skills, teachers should base their teaching on theoretical principles. L2 learners do not possess an innate understanding of how effective listening is

carried out; therefore, it is the responsibility of teachers to share that knowledge with them. An effective way to teach foreign language listening skills is to develop scientifically based programs. Understanding the importance of the linguistic knowledge for the speech perception process and awareness of the laws of speech perception provide a good foundation for developing programs for teaching foreign language listening skills. The formation of L2 perception base and "perception automatisms' can help listeners to distinguish the spoken input and its parts as they can recognize it only if the corresponding models of them are kept in their long-term memory. The formation of L2 perception base should become one of the priorities in the process of teaching listening comprehension at the initial stage of L2 acquisition.

The data of the research can also contribute to the task component of the metacognitive knowledge important for teaching a foreign language, e.g. the purpose, demands, and nature of learning tasks, types of spoken texts, discourse structures, grammatical forms, and phonological features of words and phrases as they appear in connected speech; as well as to the strategy component: knowing about effective strategies for listening tasks (Vandergrift and Goh, 2012). It provides information about the listening processes and mechanisms taking into account the typological peculiarities of English as a second language and the influence of native language listening mechanisms.

A typical task sequence in current teaching materials usually consists of three components: pre-listening, while-listening and post-listening activities. In our view, at the beginning level the pre-listening activities as well as post listening ones should make a greater use of bottom-up processing, which later will become a good basis for top-down speech processing. Bottom-up processing is surely insufficient for speech comprehension but it can help achieve greater success in comprehension at the beginning level of language proficiency.

Recommendations

The bottom-up approach to teaching listening comprehension is proved to be effective in developing listening strategies and it is supported by psycholinguistic findings and experiments.

Current research on foreign language listening comprehension has revealed the importance of linguistic knowledge in the bottom-up process of speech perception. Effective L2 materials teaching listening skills should provide L2 learners with guided listening practice in accordance with their proficiency level. The psycholinguistic approach to the problem of teaching listening comprehension helps to get relevant information about the perception image of linguistic units of the language taught. The findings described in the article can be of use in developing listening tasks and exercise aimed at developing bottom-up listening strategies.

Another application area of the approach described in the paper is developing and improving listening comprehension testing programs which can be based on the perception of the linguistic features of speech units and show the stage of development of the perception base of an L2 learner in comparison with a native speaker.

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