LINGUISTIC FACTORS IN SPEECH PERCEPTION

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ABSTRACT

The hypothesis tested in this research is that certain linguistic characteristics have a material influence on speech perception. A statistical model is based on analysis of variance in perceptual data as proposed, where significant factors are found to be the perception cues and their levels to be decision making units. The investigations of the model have enabled us to elucidate a number of psycholinguistic features of the speech perception process, the typological properties of a given language as well as some characteristic of perceptive ability development in both native language acquisition and second-language learning.

HYPOTHESIS, KINSHIP, MATERIAL

In the present study we consider the perception of a complex, phonetic signal, i.e., a syllable, word, sentence, or text. The tests we have used are based on the hypothesis that speech perception is a mental process which may be controlled by linguistic characteristics. We have analyzed speech perception in the context of various linguistic features, such as stress, voice, and intonation. The results indicate that certain linguistic features have a significant influence on speech perception.

I. THE PSYCHOLINGUISTIC FACTORS IN SPEECH PERCEPTION

A. Isomorphism of Models for Speech Unit Perception

The hypothesis tested in this research is that certain linguistic characteristics have a material influence on speech perception. A statistical model is based on analysis of variance in perceptual data as proposed, where significant factors are found to be the perception cues and their levels to be decision making units. The investigations of the model have enabled us to elucidate a number of psycholinguistic features of the speech perception process, the typological properties of a given language as well as some characteristic of perceptive ability development in both native language acquisition and second-language learning.

B. Similarity in Mechanisms of Perception

In the present work we consider the perception of a complex, phonetic signal, i.e., a syllable, word, sentence, or text. The tests we have used are based on the hypothesis that speech perception is a mental process which may be controlled by linguistic characteristics. We have analyzed speech perception in the context of various linguistic features, such as stress, voice, and intonation. The results indicate that certain linguistic features have a significant influence on speech perception.

C. Differences in the Perception of Isolated Word vs. Word in Context

When the type of distortion is constant but the degree is altered not only common but specific factors as well are revealed. For example, the factors of stress and accent are important factors in poor reception conditions and to decrease the reception conditions improve. The factor Parts of Speech is insignificant under poor reception conditions. For most cases, the direct object is superior to the indirect object in the perception process. In other cases, the direct object is superior to the indirect object in the perception process. Thus, it can be said that the analysis revealed both common and specific factors.

D. Differences in the Perception of Isolated Word vs. Word in Context

Comparison of sets of significant factors found in a text indicates that some of them are present in both test conditions. For most factors, however, a decrease in significance in the context is observed. Thus, the mechanisms of perception are different for isolated words and words in context.
Some factors are related to elements into which units can be subdivided (e.g. stressed vowels), whereas the others determine the unit as an active recipient of speech. Our experiments have confirmed the significance of certain factors. An additional experiment has shown, however, that this mechanism is closely related to the frequency distribution in a sample, i.e. when frequencies of elements correspond to their linguistic probabilities this dependence is the lowest. Conversely, when the elements are equally distributed the direct dependence is higher. When the distribution is reverse, i.e., when elements with high probabilities occur rarely and vice versa, the dependence is also higher but the correlation will have an opposite sign (**). The probabilility elements are harder to recognize than low probability ones. Thus, the active character of perceptual processes is revealed in an interplay of the listener's sociolinguistic experience and the current analysis of frequency distributions in a given sample. The listener's activity is also revealed in series of choices he has to make: of a perceptual (phonetic) base from those he has at his disposal; of a morpheme from a corresponding morphemic class; of a word from a set of similar words, etc. All this applies only to speech in silence. A different result is presented in isolation. In a text, however, the role of the past considerable decreases. On the other hand, a key word prediction factor emerges, whose activity is linked with the work of association mechanisms.

III. THE PSYCHOLINGUISTIC TYPOLOGY OF LANGUAGES.

Comparison of significant factors for a number of languages, namely, Russian, German, English and French enabled us to obtain both universal and language specific factors. A number of examples of different levels were used with regard to the pronunciation and word order. The former is non-existent in French while the latter is quite significant in Russian. Moreover, the word-length factor may serve as another example. In Russian, the word-length factor is quite significant whereas word length in morphemes (the syllabic level) is less. In German the situation is the reverse: word-length in syllables has absolutely insignificant and word length in morphemes is in the forefront of significant factors. This latter fact is evidently connected with the greater syntacticality of the German word. A project analysis of other languages will help to establish a typology of languages at the perceptual level.