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# SOME PERCEPTIONAL CUES OF CZECH CONSONANTS

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My task is to relate the second part of our listening test results. The results and the conclusions from the evaluation of vowels, the first part of our test results, has already been explained by my colleague Mrs Borovičková.

The perceptual regions of relevancy for Czech consonants are not as unambiguously determined as for vowels, for which the relevancy is concentrated in the changes of frequency dimension of the speech spectra. This is caused by the fact that consonant spectra are formed by the changes of all three dimensions of the acoustic signal. Therefore the relevancy of consonants is formed also in a more complex manner. From the speech production view we may consider consonants, according to our hypothesis, as certain accurately defined distortions of the vowel sequence articulation. Even when our test was carried out mainly for the determination of relevant regions in the frequency dimension, we can determine even the relevancy of the other two dimensions.

According to our results we divided Czech consonants into three main groups. The criteria of selection were: first, those consonants which have common or similar relevant regions, second, those consonants which are most often interchanged with one another.

The first group is formed by fricatives, affricates and the consonant /ʃ/. In the second group are stops and in the third are nazals, liquids and /j/.

The characteristic feature for the first group is the noise part of the spectrum. Single consonants are differentiated by the relevancy region in the frequency dimension. The affricates are differentiated also by the duration of the sound; the pause of phonation is not very important for recognition. Voicedness is not formed by the periodical part of the spectrum alone. At high frequencies the voicedness is evidently replaced by the noise modulation in the rhythm of the pulses of the vocal cords. The relevancy of low frequencies for the recognition of voiceless fricatives is very striking. Recognition in the middle frequency bands is perhaps caused by the transient of the second formant of a following vowel.

The common trait of the second consonant group, the stops, is the great importance of pause before explosion. As the counterpart to the previous consonant group the periodical part of the spectrum has a great relevancy for the recognition of stops. The relevancy of the explosion spectrum is not equal for all members of the group. The relevancy rises in the stops sequence (p, t, t̚, k). Similarly the relevancy of the

transient of the second formant of a neighbouring vowel is not constant. According to our findings from the listening test the following vowel has greater influence on recognition of stops than the preceding vowel. This finding is in agreement with e.g. MacNeilage.

The last group, nazals, liquids and the consonant /j/ has the common feature the step change of the formant structure. The formant structure of a single member of the group is different for different sounds.

The results, on the whole, of the first and the second part of our listening test (both vowels and consonants) confirm our attitude towards the minimal unit of the acoustic speech signal. This unit is the consonant vowel combination. We do not even believe in the existence of the phoneme as a minimal unit of the acoustic speech signal.