SPEECH INTELLIGIBILITY OF THE DEAF AND HARD OF HEARING PERSONS

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The aim of the reported study was to determine the social effectiveness of the speech in deafness of various degree and duration and to demonstrate the teachers at the Czechoslovak schools for the deaf—where usually much attention is still paid to articulation drill—the extent to which speech intelligibility of the deaf depends upon the accuracy of articulation and upon the musical factors of speech.

Speech intelligibility was investigated in 24 speakers with various hearing losses. Two speakers with normal hearing served as controls. All were 16—19 years old and their I. Q.s revealed normal intelligence. 180 adults, not familiar with the speech of the deaf, served as auditors. In every speaker, recordings of reading 20 sentences, 30 P.B. words and 50 P.B. syllables were made and later scored by 6 male and 6 female auditors.

Fig. 1 shows the results of sentence intelligibility for all groups of speakers both with congenital and acquired hearing losses.

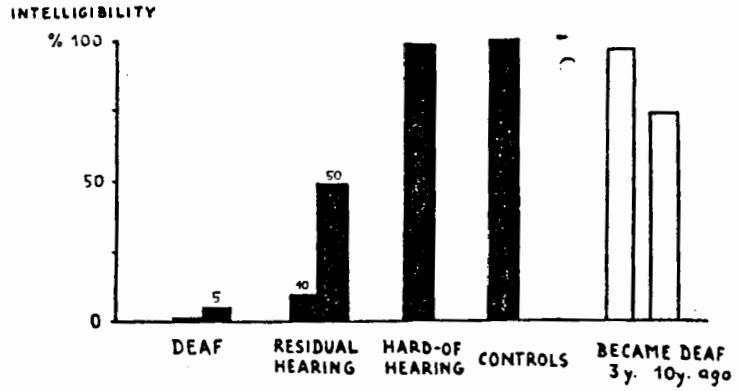

Fig. 1.

Fig. 2 gives the principal result of our investigation. It is the finding that speech intelligibility of the deaf reveals inverse correlations when compared with normal speakers. This can be demonstrated in 3 selected speakers with congenital hearing losses of various degree: The speech intelligibility of a hard of hearing person who could hear loud speech only at a 30 cm distance showed nearly normal results—his

sentence intelligibility being the best = 100 %, word intelligibility slightly worse = = 90 % and syllable intelligibility being the worst = 55 %.

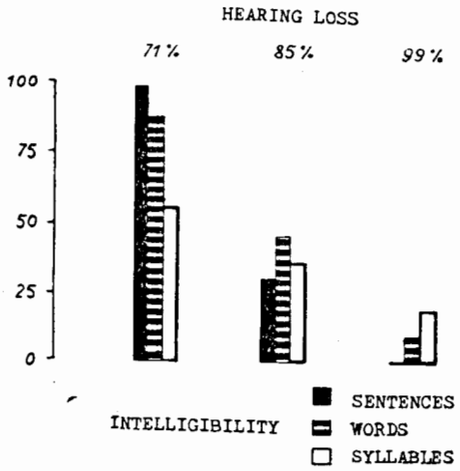

Fig. 2.

Completely reverse results were found with the speech of a congenitally totally deaf—the best intelligibility was found not for sentences but for syllables = 18 %, word intel. was worse = 8 % and the lowest intel. was for sentences (almost zero).

Between these two cases was the third subject with residual hearing who could only distinguish isolated vowels pronounced closely at the ear; his sentence, word and syllable intelligibility all kept within 30—40 %.

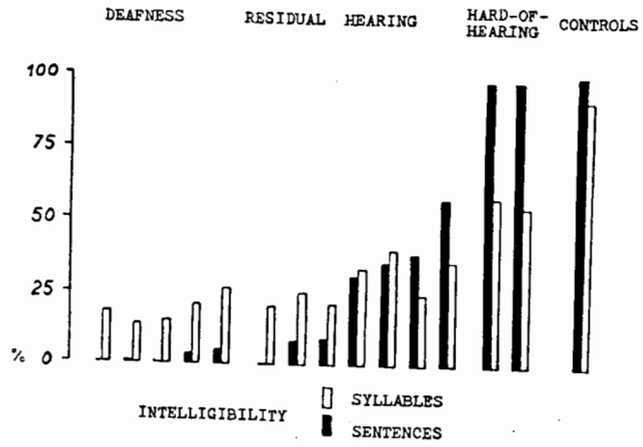

Fig. 3.

Fig. 3 gives the results in all our subjects with congenital hearing losses. Syllable intelligibility equalled 20—50 % in all except the controls. Sentence intelligibility,

on the contrary, manifested extreme differences from 0 % in the totally deaf to 100 % in the hard of hearing persons.

These results show that speech intelligibility of the deaf is relatively best where it mainly depends on articulation, i.e. in isolated syllables. When musical factors play an increasing role in pronouncing word and especially in whole sentences the intelligibility of the deaf speaker rapidly decreases.

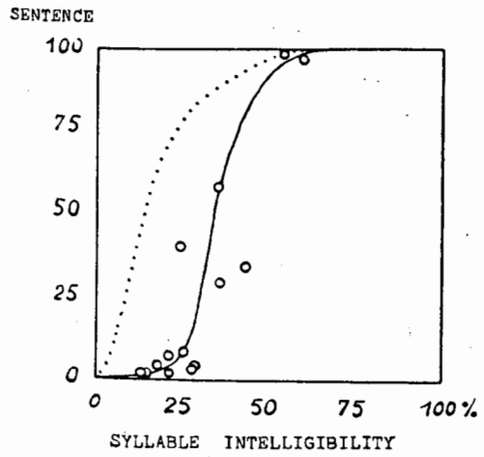

Fig. 4.

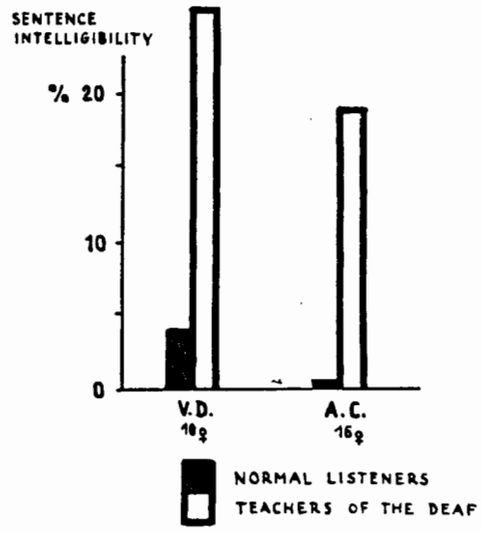

Fig. 5.

In similar foreign investigations as e.g. of Clarke, the listeners were asked to score separately the single musical qualities of the speech. We prefered to use another way of a statistical proof asking the listeners to answer a single and quite a natural question which was very similar to normal situations in communication, that is whether they did or did not understand the deaf speaker. The predominant role of musical factors for the intelligibility of speech was then evident from a simple comparison of the scores for whole sentences, for words and for single syllables.

This relation of syllable and sentence intelligibility is shown in Fig. 4. The full line represents our findings. Compared with the dotted line standing for normal speech it is shifted by approximately 30 % to the side of syllable intelligibility. This means that e.g. a deaf speaker with 20 % syllable intelligibility has 0 or 10 % sentence intelligibility as contrasted with 80 % sentence intelligibility of a normal speaker under identical conditions.

Finally we want to mention similar investigations of foreign authors who usually obtained much better results of speech intelligibility. Since these authors used teachers of the deaf as listeners we repeated such an experiment just to demonstrate the difference between scores obtained from untrained and specialist auditors; it

was great, e.g. 1 versus 20 %. It is obvious that specialist auditors cannot give a true picture of the social effectiveness of the speech of the deaf in daily life situations.

Concluding we may say that all the reported results strongly support the necessity of a very early diagnosis and auditory training in all deaf infants since the musical factors are one of the first acquired in every speech development.