
SOME ASPECTS OF SPEECH OF DEAF CHILDREN

BERNARD TH. TERVOORT

Applied phonetics and phoniatics have been interested in the speech of the deaf and the severely hard of hearing from their first decades of development. The pathology of the deaf child's speech is different from all other speech pathology insofar as the speech apparatus is normal if no multiple handicap is present, but the normal feedback control is absent due to the absence of the specific regulating and controlling auditory organ. A deaf child has to learn to speak at a later age, by kinaesthetic motor control, by visual perception of speech movements, and by accompanying vibratory or residual hearing perception. New techniques are dealing with speech teaching at a very early age, with the improved training of the combined kinaesthetic and vibratory feedback controls, and with better amplifying equipment. I shall not deal with all those here, but like to mention them by way of introduction.

I have spent the last 8 years on a diachronic study of the language development of 48 prelingually profoundly deaf children of normal intelligence and socio-economic background, 24 in the U.S.A. and 24 in the Benelux. They ranged from age 7 to 12 in 1959 and from 12 to 17 in 1965, the final year of observation. The statistics consist of 3 analyses of variance carried out on the vocabulary, 6 analyses of variance carried out on the syntax, and numerous simple computations; all of the statistics are based upon an age span of 7 to 17. The subjects were filmed on 16 mm. film with telescopic lenses, for 10 minutes each year for 6 years, in age pairs, and while engaged in private, esoteric communication. The study was sponsored by the Vocational Rehabilitation Administration of the Department of Health, Education, and Welfare, Washington, D.C., U.S.A., and by the Netherlands Organization for the Advancement of Pure Research (Z.W.O.), The Hague, The Netherlands. Although its final report's major conclusions are of a linguistic nature, some of the observations made in its 433 pages might be of interest to phonetics too.

The total vocabulary comprises some 72,000 items. These items were not all spoken words, but were executed through: 1. speech only, 2. fingerspelling only, 3. speech with simultaneous fingerspelling, 4. speech with simultaneous signs, 5. signs only. One of the reliable measuring devices of vocabulary to be found in the literature is the ratio between the number of different words and the total number of words in a language sample, termed type token ratio (TTR): it registers the richness of a subject's vocabulary and the efficiency with which he uses it. As its applicability is limited

to samples with an equal number of tokens, and as my aim was to obtain spontaneous free samples, a new measuring device was developed mathematically, termed type token ratio value (TTRV), which could be applied to samples of unequal size.

One of the conclusions with regard to the execution of the vocabulary was, that deaf children among themselves do not use speech-only very effectively when they are young and that the ratio of this usage goes down to near zero when they grow older. On the contrary: fingerspelling is a skill that—once it is mastered—increases, while signing has a very high ratio at age 7 already. Both fingerspelling and signing, if combined with speech, raise the latter's ratio to an average to high level. Speech is not in itself a skill that cannot be mastered: it can be used effectively if it gets support from the hands and the fingers.

This is understandable if one keeps in mind that a deaf child's communication is mainly visual vs. ours which is mainly auditory: this implies that our speech is based upon oppositions serving a distinctive audibility. The deaf child's need for distinctive visibility is served much better by the movements of the hands than by the movements of the lips, but he needs to incorporate the latter because of the demands of his hearing environment and the richness of its language.

If deaf children use speech among themselves, their speech may sound different not only because of the consequences of lack of auditory feedback but more so because of the different purpose to be served. They often speak voiceless as sound is not functional for the deaf partner; they moreover speak in visual oppositions, making relevant some features which are not relevant in normal speech. The visual phoneme has been termed kineme; some phonemes which are different speech sounds, when seen are identical kinemes, termed homophenes. This goes e.g. for all phonemes executed at the same place with about the same visible movements, such as voiced vs. unvoiced consonants, or groups like $P \perp B \perp M \perp$, $K \perp G \perp X$, $T \perp L \perp R$. It is easy to see why e.g. English speaking deaf children would try to make *me-pea-bee* look different from each other by distorting the initial phonemes into different kinemes. It is also easy to see how spelling or signing clarifies the issue even better.

One final remark on the oral activity of the subjects seems to be relevant here. The voice giving or the movements of the speech apparatus could not always be termed speech: the sounds or the movements were sometimes too indistinct for that. Speech often deteriorated to some rhythmical syllabic movements of the mouth. Further research will be interested in this oral motoric activity, and might establish whether this is an intermediate stage between non-speaking and speaking in the growth toward incorporating the spoken word into the private interchange, or between speaking and non-speaking in the loss of skills, learned during school age.*

* This paper is based upon: Tervoort, Bernard T. *Final Report on Project Number RD-476-64-65 of the Vocational Rehabilitation Administration of the Department of Health, Education, and Welfare, Washington, D.C., U.S.A., titled: Analysis of Communicative Structure Patterns in Deaf Children.* etc., Groningen, The Netherlands, 1967.