

SPEECH DEFICIENCIES IN PRIMARY SCHOOLERS WITH DOWN SYNDROME

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ABSTRACT

A comparative study of primary schoolers with Down syndrome in Sweden, Finland and New Zealand revealed syntactic skills more advanced than speech skills. The intelligibility of the childrens' speech was very low. The speech difficulties are complex and characterized by variability, asymmetry and overshoot of movements. Even the task to imitate some simple non-verbal movements of the tongue and the lips were very hard for the children.

In 1993 teachers in Sweden, Finland and New Zealand were asked to answer some questions about their pupils with Down syndrome. To the opinions of their teachers about 5% of the primary schoolers with Down syndrome in Sweden, Finland and New Zealand used pre-symbolic communication. 17% of the children in Sweden and Finland but 45% of the children in New Zealand were considered to use one-word utterances. The vast majority of the Swedish and the Finnish children and 50% of the children in New Zealand were considered to express themselves in sentences. Of them only 36% of the Swedish children, 43% of the Finnish children and 21% of the children in New Zealand had started to use hierarchical sentences and morphology.

This is a different description of syntactic development in children with Down syndrome than earlier reports on the subject. E.g. Schlanger (1) and Schlanger & Gottsleben (2) wrote that many of the children with Down syndrome never acquired their mother-tongue and that the

majority of them learned to talk in short one- or two-word sentences at best. Those who acquired spoken language had severe speech disorders. The articulation of vowels and consonants was described as indistinct, nasalized and the quality of the voices was described as aberrant.

The teachers in Sweden, Finland and New Zealand were asked to evaluate speech intelligibility of their pupils as well. To the opinions of their teachers the speech of the vast majority of primary schoolers with Down syndrome in the three countries is impossible or very hard to understand. Only 20% of the children in Sweden and New Zealand and 36% of the Finnish children were considered to articulate well enough for strangers to understand their speech. However, there were even some children who did not use speech at all - 8% of the Swedish children and 5% of the children in Finland and New Zealand. 3% of the Swedish non-speaking children "talked" in signed sentences.

The low level of intelligibility may partly be explained by language deficiencies - above all phonological disorders. However, there are neuromotor and neurosensory as well as cognitive deficiencies which may have contributed to the prominent oral motor problems.

In another experiment 30 children with Down syndrome (8 years) and 30 children with normal development (8 year) in Sweden were asked to imitate some movements of the tongue and of the lips. The children were allowed to watch the model and to try several times.

In comparison to children with normal development at the same age, the children with Down syndrome did not succeed very well in imitating the movements of the tongue or the lips. It was especially hard for them to imitate movements they could not watch e.g. to follow the palate with the tongue-tip from the velar region to the teeth, repeated movements e.g. to move the tongue repeatedly from the left to the right corner of the mouth, and asymmetrical movements e.g. to raise only the left corner of the lips.

There are typical deficiencies in the speech production skills of the vast majority of a group of observed children with Down syndrome (N<100), producing the low degree of acceptability and intelligibility to their speech. There are e.g. a strong tendency to shorten the duration of the vowels and to approximate the vowel sounds to a centralized, semi-rounded vowel quality. Front vowels was retracted and back vowels was fronted, narrow vowels was opened and wide vowels was made more narrow. Spread vowels was made non-spread and rounded vowels were unrounded. [i] was as difficult to articulate as [y].

Also, the observed children had problems to find the adequate places of consonant articulation no matter what are the articulation manners. The children rarely used the dento-alveolar place of articulation. The speech of many of the children revealed a preponderance of velar, pharyngeal and glottal articulations.

Articulations at fronted places are interfered by the fact that the relation between the size of the mouth cavity and that of the tongue is different than normal (3). The oral cavity is defined by the reduced mandibular angle, the reduced caudal development of maxilla and a high, arched hard palate (4). The tongue is protruded and it fills the greater part of

the front part of the oral cavity. Tongue protrusion in Down syndrome may be a symptom of an airway restriction by enlarged tonsils and/or adenoids.

The manner of articulation was often deviant as well. The stop production was characterized by a very prolonged and variable duration of the occlusion phase, the explosion phase was indistinct and sometimes not released and there was a lack of aspiration. The prolonged occlusion phases of the stops were followed by shortened vowels durations and the temporal structure of the syllable was deteriorated. Sometimes the opposition between a stop and a nasal was cancelled due to a low velar resistance associated with velo-pharyngeal inadequacy. This is particularly true when the stop is prenasalized - a feature sometimes used in our observed children.

The children managed the production of a non-specific fricative sound very well. However, it was very hard for them to create adequate relationships between area-functions and attributes of the airstream to produce different fricatives. Laterals sounds were often fricativized. A tremulant or retroflex sound was not observed at all.

The human tongue is an extremely flexible structure. The shape of the tongue (e.g. the degree of concaveness and convexness or the width of groove) and the position of the tongue (e.g. the degree of retraction, extension or retroflexion) is due to the tongue's internal composition, to the external muscles and to the support of the hard palate stabilizing the production of certain tongue shapes (5). In children with Down syndrome lingual diastasis is common (6) and there is a strong evidence for hypotonia of the tongue muscles in Down syndrome (7).

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