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Theoretical background

Research in child phonology received its first impetus from the work of Roman Jakobson (1941/1968).

His theory on the orderliness and universality of phonological development provided a fruitful framework within which the rather amorphous data from earlier studies of children's language could be interpreted.

Jakobson explicitly stated that the route of phonological development is in general the same for all children, with a successive unfolding of phonemic contrasts from the most maximal contrast into finer ones.

This has led researchers to concentrate on the order in which children acquire particular contrasts, and their results have provided norms of phonological development, useful for clinical practice.

In the 70's interest turned from universal aspects of phonological development to differences in the phonological development of individual children.

Instead of stating the order in which the child acquires phonemic contrasts, Ferguson (1976), describes different strategies used by different children in developing a phonological system. By means of this type of description researchers try to get a deeper insight into the underlying processes which guide language development.

Another change in focus concerns the linguistic entities which are considered basic and relevant for analysis.

Moskowitz (1971) and Menn (1978) have modified the theory of Jakobson by introducing other and larger entities as fundamental in early phonology.

According to Moskowitz the child develops from a stage where intonation frames form the basic organizational units of phonology, to a syllabic stage characterized by reduplications or single open syllables.

Menn introduces yet another concept, the canonical word form, to characterize the same stage. At the end of the babbling stage the child formalizes certain segmental combinations into recurrent canonical word forms. Two factors are seen to interact in the emergence of new and more complex word forms: the child's increasing control over articulation, and his/her need to use linguistic contrasts in order to be understood.

Not until later, around 2 - 2½ years of age, according to both Moskowitz and Menn, does the child reach a stage where phonemic contrasts are of primary importance.

These new developments in the theory of child phonology have proven very useful for describing the phonology of language disabled children.

Aims of the investigation

The starting point for the investigation reported on here has been clinical practice with language disabled children. In almost all cases of language disability there is a concomitant dysphonology of varying degree and quality.

With some dysphonologic children traditional methods of analysis and treatment have been found insufficient, and thus the question of whether the dysphonology in such children might be qualitatively different from other types of dysphonology arose.

The first problem for the investigation was: Can different subgroups of dysphonologic children be distinguished? The second problem was: Do dysphonologic children develop in similar or different ways compared to normal children?

Subjects and material

Ten South-Swedish children with dysphonologies of various degrees were chosen as subjects (mean age 5,5, range 4,3-7,0 six boys and four girls).

(A preliminary investigation of 32 children preceded the present one.)

Single words were elicited by a picture-naming test and running speech was elicited by asking the children to tell a story about sequences of pictures.

The tapes were transcribed according to narrow phonetic and child-language-modified transcription systems (Bush et al, 1973).

Follow-up studies have been made for all children at $\frac{1}{2}$ -year intervals for 2 to 3 years.

Analysis

Traditional clinical practice analyzes dysphonology in terms of consonant substitution patterns. Among others Lorentz (1976) argues that this approach to dysphonology is insufficient. Other types of simplifications (e.g., harmony restrictions) also have to be taken into account to reach a deeper understanding of dysphonology.

In the present work the following aspects are considered:

a) Distribution of phonemic contrasts, substitution patterns of consonants and vowels and presence of diphthongization.

b) Idiosyncratic vowel and consonant harmony restrictions and other types of phonotactic restrictions on permitted word forms, e.g. deletion of unstressed syllables and reduction of clusters.

c) Some prosodic aspects relevant for early phonological development are also taken into account: development of stress patterns and of word accents.

Results

In discussing the results of the investigation I find it useful to use the dichotomy of paradigmatic versus syntagmatic relations. Two main types of dysphonology are found:

1. Paradigmatic group. This is characterized by paradigmatic substitutions only. 5 children belong to this group, (3 boys, 2 girls, mean age 5,8, range 4,10 - 7,0).

Within this group no syntagmatic restrictions are found except for consonant cluster reductions. The phonological simplifications are exclusively of a substitution type.

Formalized as rules, these could be described as context-free, i.e., the substitutions are clearly predictable irrespective of word context. Productions of specific sound: or

words are fairly consistent.

The substitutions mostly affect consonants. Certain consonant contrasts are cancelled in the child's production.

The most typical simplifications in the paradigmatic group are the following: reduction of consonant clusters, dentalization of velars and stopping of fricatives.

2. Syntagmatic-paradigmatic group. Simplifications both in the syntagmatic and the paradigmatic dimensions are characteristic of this group. The dysphonology in this group is considered more serious than in the first group. 5 children belong to this group (3 boys, 2 girls, mean age 5,4, range 4,3 - 6,7).

Several phonemic contrasts are collapsed in the child's production by substitutions, some of which are similar to those of the paradigmatic groups, e.g. dentalization.

The effect of the substitutions is variable, however, and due among other things to strong harmony conditions or to the use of a restricted number of canonical word forms. Formalized as rules these restrictions could be labelled context-sensitive rules or alternatively as strong surface phonetic constraints, (Shibatani, 1971).

Although the production of individual lexical items often varies segmentally, canonical forms are stable within the same recording.

Two subgroups can be differentiated within the syntagmatic-paradigmatic group:

a) children with the most extreme type of dysphonology show very strict canonical word forms, e.g. reduplications only. A typical prosodic feature is equal stress assignment.

b) children with a less extreme type have strong harmony conditions on vowels or consonants. Most typical is an anticipatory, non-contiguous consonant assimilation. Equal stress is replaced by an overgeneralization of word accent 2 (e.g. "fågel", bird, "springer", runs) in this group, except for words with late stress (e.g., "ba'nän", banana), where the initial syllable is deleted. In general polysyllabic words are strongly reduced.

Discussion

The second type of dysphonology closely resembles the phonology of young children 1 - 2 years of age. (Detailed studies of early phonology are presented by Compton & Streeter, 1977, for example.)

Instead of subdividing the children into two different groups, it might be advantageous to see both types of dysphonology as points on a common line of development, where the more serious type of dysphonology would represent an early stage of phonological development.

For two reasons, however, it seems preferable to view the two groups as distinct from each other.

The follow-up studies show that three of the five children with syntagmatic restrictions retain their syntagmatic dependence, in spite of some development along the paradigmatic dimension. Newly acquired contrasts also become involved in assimilatory processes, and when trying to pronounce 'tongue-twisters' these children easily relapse into earlier patterns of strong word form restrictions.

Another reason to differentiate the two groups is the implications for clinical work. The syntagmatic-paradigmatic group clearly represents a more serious type of dysphonology with a poor prognosis. In all of these cases we find concomitant dysgrammatism. In four of the five syntagmatic-paradigmatic cases we also find symptoms of minimal brain dysfunction which might explain the severity of their language disability.

The present investigation shows that strong syntagmatic restrictions need to be identified as risk-symptoms indicating a poor prognosis, while exclusively paradigmatic simplifications usually disappear in time.

Distinguishing among these two groups demands a revision of current logopedic treatment.

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