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## SPEECH DELAY IN SEVEN SIBLINGS WITH UNUSUAL SOUND PREFERENCES<sup>1</sup>

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*Summary.*—By the age of 8 years, children who are developing normally show almost adult speech skills. Children with serious phonological disorders, however, may exhibit significant differences in development well beyond the age of 8 years with little or no improvement in speech if therapy is not provided. This is a descriptive study of seven siblings, ranging in age from 6 to 14 years of age who had never attended school or received speech therapy until these ages. All of the children exhibited moderate to severe speech disorder with no evidence of predisposing genetic factors, hearing loss, physical abuse, or prenatal drug exposure. These cases, which would obviously be impossible to duplicate in a controlled study, provide strong support for the efficacy of speech therapy. Children with serious speech delays will not improve appreciably without direct intervention.

Systematic and predictable patterns of sound errors, or phonological processes, characterize the speech of all young children learning to speak (Hodson, 1986; Leonard, 1985; Weiner, 1985). When children are delayed in phonological development, some phonological processes will persist. Further, the error patterns may become quite complex in nature if children show normal development in fluency, speech rate, and vocabulary while their development of the fine speech motor movements required for the production of the sounds of the language continue to lag behind (Hodson, 1986; Smith, Goffman, & Stark, 1995). Children with speech disorders may produce speech characterized by idiosyncratic sound patterns that involve multiple changes of numerous features rather than single feature changes. So, for example, a child attempting to say "Santa Clause" might produce the word as /taen to/, representing a production involving five processes or sound changes, that include *assimilation*, *stridency deletion*, *weak syllable deletion*, and *final singleton consonant omission*.<sup>2</sup>

The purpose of this study is to describe the general nature of these children's speech patterns and the use of two idiosyncratic sound patterns

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<sup>2</sup>*Assimilation*: one sound cancels out another. So, in the example provided, the child substitutes [t] for other sounds he is unable to produce. *Weak syllable deletion*: Omission of the unstressed syllable in a word. *Stridency deletion*: the child substitutes plosives [t, d, p, b, k, g] for sounds such as [ʃ, ʒ, f, v, s, z]. *Final consonant deletion*: as the name suggests is the deletion of the final consonant sound in a word. An example is "bow" for boat."

—[gʌ] and the phrase “it’s like a’ [i aɪ’ka i:]—that occurred in the speech of all seven phonologically impaired siblings. Thus, we add to the literature documenting sound preferences among phonologically impaired children. The unusual sound changes in the children’s speech, combined with a rapid rate of speech, led school officials to conclude that the children had developed a unique language. But careful analyses of speech samples confirmed the existence of phonological disability rather than a unique language. Further, systematic but subtle sound segments common to all seven children were substituted for words of differing semantic content and phonological form. The systematicity of the substitutions were only apparent after careful transcription and lengthy observation of the children.

### *Participants*

Participants were seven malnourished children, ranging in age from 6 to 14 years. The children were all below the Average Expected Heights (AEH) for their chronological ages and below the Average Expected Weights (AEW) for the *actual* heights (Zaichkowsky, Zaichkowsky, & Martinek, 1980). As the reader can see in Table 1, the discrepancies in height and weight were most striking among the five younger children.

TABLE 1  
SUMMARY OF THE HEIGHTS AND WEIGHTS OF SEVEN SIBLINGS  
COMPARED TO AVERAGE EXPECTED HEIGHTS AND WEIGHTS

Child	Sex	Age, yr, mo.	Height, in.	AE Height, in.	Weight, lb.	AE* Weight, lb.
1	F	14, 0	58	63	72	100
2	F	13, 2	53	62	40	66
3	F	11,11	42.5	59	29	39
4	M	10,11	43	59	28	40
5	M	9, 8	39	52	24	34
6	F	9, 1	36	45	20	29
7	M	6, 8	35	36	20	30

\*The average expected weight for Child 1 is expected weight for age. The weight for the other children are expected average weights (50th percentile) for their actual stature and sex rather than expected stature (Zaichowsky, *et al.*, 1980).

No evidence of willful abuse or neglect was substantiated, although there may have been long periods with limited food availability and some evidence of milk intolerance. These African-American children were observed to vomit when given ice cream and other milk-based products at school to increase their caloric intake.

All the children were born in a hospital; however, school officials reported that the mother had received no prenatal care during pregnancy with any of the children. No evidence of drug use or maltreatment of the chil-

dren was found. The family was poor, with two parents and the paternal grandmother residing in the home. The parents chose to keep the children at home rather than send them to school. Officials reported the parents had feared for the children's safety, given their small stature. On the first day that the parents enrolled the children in school, officials referred the children to a university clinic for speech/language evaluations.

#### *Procedure*

Samples of the children's speech were collected during two 2-hr. sessions that occurred three weeks apart during the first month of the children's attendance at school. Speech was sampled in one or more of the following situations: individual language sampling, assessment with a standardized speech test (delayed story imitation) and observations of spontaneous language during free play with siblings. The four older children were assessed with the Goldman Fristoe Test of Articulation (Goldman & Fristoe, 1986). The three older girls scored below the first percentile, with a range of sound errors from 33 to 48. Their ten-year-old brother produced 11 sound errors, equivalent to a percentile of 4. The three younger children would not complete the standardized articulation test.<sup>3</sup> However, all of the children participated in individual storytelling tasks with an adult examiner and a group "party" to elicit spontaneous language samples. The three younger children, as described later in the paper, produced sound errors similar to their older siblings.

All samples were videorecorded, audiotaped, and transcribed initially by the primary investigator for these analyses. Follow-up analysis was completed by a speech-language pathologist not involved in the initial transcription. Intrajudge reliability was 98%, and interjudge reliability was 90% for the conversational transcripts.

Corpus 1 provides some representative samples of the consonant-vowel segment [gʌ], with diacritics for stress [ˈ] and prolongation [ː] to indicate the distinct prosody that distinguished the children's productions during storytelling with a book. Speech rate was normal for age. These were fluent children with significant sound changes in their speech.

#### *Corpus 1*

The cat, I mean the bird, go in the pig house.

[gʌ kæˈ gʌ minˈ gə bʌː go in gʌ pi haˈ]

Ask the woman what the card, girl.

[æˈ gʌ voˈmə wɛˈ gi kaˈ ga]

<sup>3</sup>Other nonverbal instruments and language measures were completed. A discussion of language, speech and cognitive skills will be the focus of other papers.

Roll it with hair rollers.

[wo g<sup>^</sup> wɪ ha': wo']

All the girls got the earrings, girls all.

[ɔl g<sup>^</sup> g<sup>^</sup>l' ga' g<sup>^</sup> ɪə' g<sup>^</sup> ɔ:]

The, a, a, the, a the, a the suppose be a cow?

[g<sup>^</sup> a ga g<sup>^</sup> a g<sup>^</sup> ^ gia' g<sup>^</sup>po': bi' ^ kau]

The second pattern "it's like a" varied in phonological form [i at kəi:], [a' k<sup>^</sup>]. This pattern was observed in the three oldest children. The children used the sequence when making comparisons or when attempting to identify unfamiliar objects. Examples are provided in Corpus 2. In addition to the diacritic markings for stress are arrows to indicate high [↑] and low [↓] pitch changes in intonation patterns.

*Corpus 2*

Like a door.

[a' k<sup>^</sup> do]

↑ ↓

Like a tea cup.

[i at k<sup>^</sup> ti gaɪ]

↓ ↑ ↓

Like a goose got head.

[ak' ei: gu ga hæ]

↑ ↓

Corpus 3. Samples of speech for the three younger children are provided in Corpus 3.

*Corpus 3*

I want some popcorn.

[aɪ ɔ̃ ɪ kŌ]

Stop.

[ga]

Stop that.

[ga kə]

DISCUSSION

The obvious lesson here is that more severe speech disabilities will not improve without direction intervention. We considered the factors that may have contributed to the children's phonological development. Leonard (1985) proposed that children develop phonological schema by modifying adult forms to their own production capacities. As a result of natural limitations in vocalization and perception, children modify the adult phonological system. Malnourishment may have imposed an even greater limitation on the

children's perception and production abilities. However, the influence of malnourishment is not exactly clear. Malnourished children are susceptible to numerous illnesses, infections, and delays in motor development (Lozy, Herrera, Latham, McGandy, McCann, & Stare, 1980). Therefore, the children may have experienced bouts of illness, along with middle ear dysfunction and other health problems of which we are unaware.

Malnourishment, however, can not explain the idiosyncratic sound patterns observed in the speech of the three older children. These patterns are examples of the creativity of children in their attempts to master speech. Conceivably, the older children compensated for their limitations in producing front stops and fricatives by substituting [g]. Limitations in the children's production and perception capacities for certain categories of sound could also account for development of the phrase "it's like a." The older children may have observed the adults in the family using this tag phrase. The features most salient for the older children may have been prosodic features, such as stress and intonation, as well as voicing. The three older children's productions may be the result of duplicating the dominant features of the phrase rather than each discrete phoneme.

Once the older children developed preferred patterns, it is possible that the younger children imitated their older siblings' use of the patterns. Similar errors were found among the older and younger children during a second observation when all the children were allowed to play together and the younger children began to talk. Support for this explanation is found in Wellen (1985) who observed that older siblings significantly affect the interaction of parents with younger children. Moreover, children may interact more frequently in conversation with older siblings than with parents. Thus, the development of idiosyncratic patterns in these children was related primarily to environmental input. The maintenance of the delays in phonological development were supported by the same environment in which the children probably experienced limited and predictable demands for speech production. Parents may have limited their demands for the quality of speech given the children's obvious speech delays.

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