SPEECH-PROSODY CHARACTERISTICS OF YOUNG CHILDREN WITH SPEECH DISORDERS OF UNKNOWN ORIGIN

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This report displays selected phonetic, phonologic, and prosodic findings for 64 children with speech disorders of unknown origin. Descriptive and inferential statistics provide some support for subgrouping, with associated research attempting to characterize the phenotype(s) for genetically-transmitted speech-delay. [Supported by the National Institutes of Health, NIDCD, No. 26246]

The Phonology Project at the University of Wisconsin-Madison has developed and validated a computer-assisted assessment protocol, administered the protocol to samples of children and adults with speech disorders of known and unknown origin, and conducted cross-sectional, longitudinal, and intervention studies posing questions in description, explanation, prediction, and intervention [e.g., 4, 8, 9, 13, 14]. Project studies are organized conceptually by a seven-category classification of the possible origins of developmental speech disorders of heretofore unknown origin [7]. Long term goals of primary, secondary, and tertiary prevention include the identification of the speech phenotypes associated with genetically-transmitted speech delays and the development of a discriminant function for differential diagnosis.

METHOD

Selected findings for this poster session are taken from a sample of 64 3-6 year-old children with moderate to severe speech disorders of unknown origin. All data collection and analyses procedures have been developed and reported in prior work, including procedures for sampling conversational speech [7], accomplishing narrow phonetic transcription by consensus [5, 10], coding and entering transcriptions for computer-aided phonological analysis [3], and procedures for prosodic analysis of conversational speech samples [11]. Averaged interjudge and intrajudge agreement for the two consensus transcription teams scoring the articulation test and conversational speech samples was 65.5% to 81.1% for narrow phonetic transcription and 86.7% to 95.1% for broad phonetic transcription. These figures are consistent with other reports in disordered child phonology [12]; most of the data are based on findings at the level of broad transcription.

The procedures described in Shriberg & Kwiatkowski [6] were used to assign children to five of the seven putative diagnostic classification categories based on all protocol information other than the speech data: (a) hearing (fluctuating hearing loss secondary to early recurrent otitis media with effusion), (b) dysarthria, (c) apraxia, (d) psychosocial, and (e) noninvolved, reflecting clear non-qualification for any of the other six categories (there were no children meeting criteria for a category termed 'structural', i.e., craniofacial). These children were not frankly hearing impaired, dysarthric, apraxic, or emotionally disturbed; rather, their case history data and responses on protocol tasks indicated possibly subtle involvements in these domains. The children were also classified into three language production involvement groups (at expected level, up to one-year behind, greater than one year behind) based on their structural stage development [1, 2].

FINDINGS

1. The sex distribution in this study was 64% boys-36% girls, compared to previous estimates in our work closer to 3:1, which are consistent with sex-linked or sex-influenced polygenic threshold models of genetic transmission. A more recent estimate based on a database of 212 speech-delayed children yielded a ratio of exactly 3:1. Unlike gender findings in the dyslexia and learning disabilities literatures, ascertainment bias is not likely in these data.

2. A graphic representation of the consonant error pattern for the entire group can be divided into a three-part function for child phonology research. Comparison of the function to mastery data for early, middle, and late-occurring sounds in normal development indicates good concordance (see Figure 1). The few discrepant points in the normal-speech data are readily accounted for by differences associated with citation-form sampling and level of phonetic transcription. The similarity in the two profiles is viewed as support for the nosological term delayed speech (as opposed to disordered speech), and the profile will be tested as a potential phenotype for this classification category.

3. When phonetic, phonologic, and prosodic data are plotted by the three language involvement groups, clear differences are observed in both the severity and pattern of involvement in each domain. Such findings have implications for clinical classification issues--the continuing debate on articulatory vs. phonological disorders, methodological issues--the need for

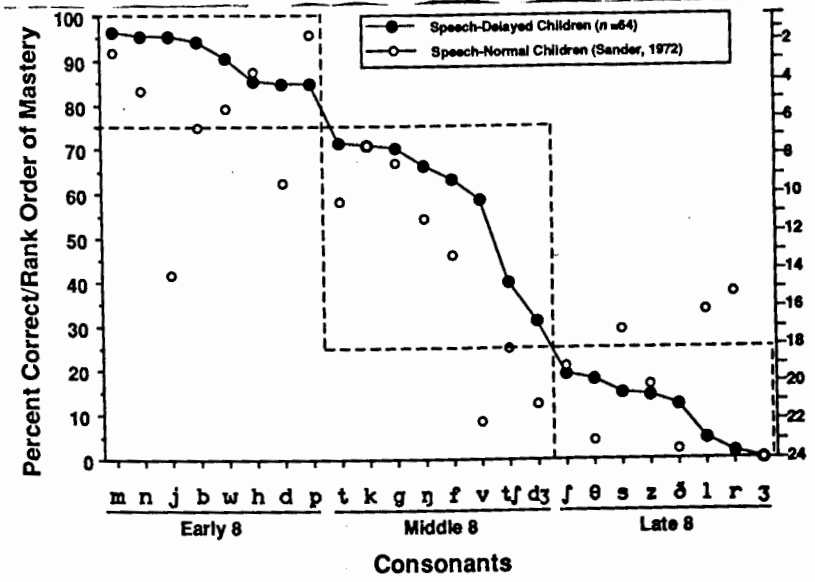

Figure 1. Consonant Acquisition in Speech-Delayed and Speech-Normal Children

comparable subject definitions among child phonology researchers, and clinical issues--the development of instruments for subgrouping, prognosis, and intervention.

4. When divided into the etiological groups on the basis of performance on non-speech measures, most children met inclusionary criteria for more than one category with relatively few 'pure' groups remaining for statistical analysis: hearing, 9 Ss; dysarthria/apraxia, 7 Ss; psychosocial, 7 Ss; no involvement 14 Ss; total n = 37. Phonetic, phonologic, and prosodic profiles for these small groups provide some support for subgroups based on speech-language performance.

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