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Contact author: Laurence B. Leonard, Audiology and Speech Sciences, Heavilon Hall, Purdue University, West Lafayette, IN 47907

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Speech-Language Pathology: Moving Toward the 21st Century

Developmental Phonological Disorders: Moving Toward the 21st Century—Forwards, Backwards, or Endlessly Sideways?

Lawrence D. Shriberg
University of Wisconsin–Madison

Although there is considerable research activity in developmental phonological disorders, basic questions about their origin and nature remain unanswered. I believe that the central need in research and clinical practice toward answering these questions is a shared classification system. I'll try to support this perspective with some clinical examples and some findings from one classification approach.

Progress in Developmental Phonological Disorders

Consider three recent referrals to our university Phonology Clinic. Case A is a preschool child referred for an intelligibility problem of unknown origin and a language production deficit. Her mother reports that the child has experienced early, recurrent otitis media with effusion. Case B is a school-age child who has made only limited progress after 2 years of speech therapy. His public school clinician suspects an underlying oral motor disorder. Case C is a doctoral student in a natural science program on campus who called

me to see if there was something he could do about his protrusional lisp. His wife is pregnant and he wants to be a good speech model for his child. These three examples seem to sample the range of what are called *developmental phonological disorders*.

One way to evaluate progress in developmental phonological disorders is to look at what our field has to offer cases A, B, and C in five areas: description, explanation, prediction, intervention, and prevention. Is progress defined by the level of activity of research in each area, such as might be determined by a count of the number of symposia, articles, or funded research projects? Or, relative to cases A, B, and C, is real progress defined by *what we know* about the nature of their problems for purposes of description, explanation, and prediction, and *what we can do* about these problems for purposes of intervention and prevention?

I suggest that we have made only limited progress in these five areas of concern. Beginning with *description*, it is likely that these three cases would not have had similar descriptive assessment protocols if they had gone to more than one clinical center for evaluation. Second, although we were directly asked in each case, we could not tell A or B's parents or C the cause of or *explanation* for the speech problem. Third, in none of these cases were we able to *predict*, within a useful confidence interval, the expected time course for normalization of the phonological disorder. Fourth, we could not say which *intervention* approach would be clearly superior to all others, even for Case C. Fifth, although we could suggest forms of secondary and tertiary *prevention* for A and B, we had little to offer the parents in relation to primary prevention of the disorder in their other children; nor could we state the likelihood of Case C's child also having a lisp or what could be done to prevent it.

It seems to me that progress in a discipline is demonstrable by three characteristics. First,

there is *emerging consensus on theory and practice*, with a small number of alternative theories and practices vying for the title “most highly valued.” Consensus on a descriptive-explanatory framework certainly does not exist in contemporary research in child phonology. What has happened since the paradigm shift from articulation to phonological disorders well over a decade ago might be characterized as a revolving door of phonological theories, with no one theory currently considered the most highly valued.

A second characteristic of significant progress in a discipline is *systematic and reliable measures*. Researchers and speech-language pathologists currently employ a formidable array of linguistic procedures to describe and, presumed, to account for speech differences. A problem with these sampling procedures and complex analyses is that interpretation of findings is heavily dependent on the philosophy and skills of the examiner. Traditional validity and reliability concerns are not always well documented. Have we lost ground in terms of the psychometric rigor we currently demand of assessment procedures and the clinical decisions they generate?

The third characteristic of progress in a discipline is a *shared classification system*, which, as reviewed next, may be crucial to “forward” progress in developmental phonological disorders.

Classification of Developmental Phonological Disorders

Classification systems in a clinical discipline arise from two sources: research projects that attempt to describe and validate one or more putative subgroups, and intradisciplinary and interdisciplinary projects that develop systems for health care delivery needs. The most widely recognized example of the second source is the *Diagnostic and Statistical Manual of Mental Disorders-IV* (American Psychiatric Association, 1987). I think that the multiaxial DSM-IV provides the appropriate model for the classification needs of researchers and practitioners in developmental phonological disorders. DSM-IV classifications are based on presenting symptoms and descriptive data rather than on etiology. Specifically, for each disorder, the DSM-IV provides current knowledge in the following areas: diagnostic features, associated features, age at onset, course, subtypes, gender, prevalence, familial pattern, and differential diagnosis.

Some colleagues and I are currently working with a classification system based on

the DSM model. The system includes five subgroups of children with developmental phonological disorders. The first classification category is *Speech Delay* (SD) without associated involvement. The second through fourth categories are conditions in which Speech Delay is associated with other components: *Speech Delay + Otitis Media with Effusion* (SD+OME), *Speech Delay + Developmental Apraxia of Speech* (SD+DAS), and *Speech Delay + Developmental Psychosocial Involvement* (SD+DPI). The fifth category, *Residual Errors* (RE), is for two types of individuals—those whose speech-sound distortions are residuals from a speech delay (RE_A) and those whose residual distortions from the developmental period are not associated with earlier speech delay (RE_B).

We are currently assembling speech and nonspeech research findings for each of the five subtypes. Prevalence estimates for each classification type are obtained by examining proportions in our clinical samples and other research samples in relation to the national, unconditional estimate of 2.5% occurrence of developmental phonological disorders in preschool children. We estimate that approximately 60% of the preschool children identified in our local populations have speech delay without associated involvements. Using the 2.5% national prevalence figure, this translates to a population estimate of 1–2 children per hundred with a form of the developmental phonological disorder termed speech delay. Approximately 30% of our clinical samples have SD+OME, which translates to less than 1 child per hundred or 7–8 children per thousand. SD+DAS is estimated at 3–5% of cases or 1–2 children per thousand, and SD+DPI at 5–7% or 1–2 children per thousand. National survey data indicate that residual errors (i.e., both RE_A and RE_B) occur in five children out of a hundred; there is great need for lifespan epidemiologic data.

For gender findings, which also have implications for genetic and other causal-explanatory models, the estimated proportion for speech delay is 75% boys. The picture is unclear in SD+OME, with only possibly somewhat more boys; 80–90% boys for SD+DAS; 75% boys for SD+DPI; and probably equal gender proportions for residual errors, with possibly more girls for some types of residual distortions. Again, if substantiated, the presence of gender differences among classification categories has implications for the five areas of concern identified earlier in this paper.

Family aggregation data—information on the percentage of children with family mem-

bers who have or have ever had a speech problem—increasingly play a fundamental role in explanatory research. To date, the percentages reported by several research groups range from 24% to 46%. Familial aggregation is strongly suggested in SD+DAS, but the limited subject descriptions to date do not allow percentage estimates. As such data become available for each of the categories—especially the two forms of residual errors—studies will directly test the hypothesis that some, but not all, types of speech disorders may be inherited.

At present there are only limited data on language involvement in each of the five classifications. Language comprehension deficits may be present in 10–40% of children with speech delay, with estimates for language production deficits ranging from 50–75%, depending on age and measures used. Clearly, there is a sharp contrast between the involved language status of children with speech delay and the purportedly normal language status of children and adults with the RE_B form of residual errors.

Finally, normalization histories reported from a variety of intervention studies also suggest some provoking differences, with data not yet available for some categories. In speech delay, approximately 75% of preschool children have short-term normalization defined as normalized speech by 6 years of age; the remaining 25% normalize developmentally inappropriate errors sometime after six years. A cardinal sign of SD+DAS, of course, is that virtually 0% have short-term normalization, with histories (such as that for our Case B discussed earlier) indicating that normalization occurs only much later. Finally, by definition, 100% of residual errors have long-term normalization, with some persons (such as case C) retaining a single speech difference perhaps over a lifetime.

Summary

I have argued that notwithstanding considerable research activity in developmental phonological disorders, the basic questions remain unanswered. I have proposed that a central problem with the research culture in child phonology is that it includes too little cross-laboratory collaboration of the type seen when significant breakthroughs are reported in other biological and social sciences. Finally, I have suggested the need for a shared classification system for developmental phonological disorders—to promote cross-laboratory research, as well as to strengthen the efforts of individual clinical research groups. As stressed by one of my teachers, Ralph Shelton, collaboration is a cornerstone of scholarship. I am optimistic that our discipline will evolve toward a productive 21st century marked by vital, collaborative scholarship.

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Contact author: Lawrence D. Shriberg, PhD, Department of Communicative Disorders, The Waisman Center, 1500 Highland Avenue, University of Wisconsin-Madison, Madison, WI 53705

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Lawrence D. Shriberg
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