

error pattern, and course of normalization? Pursuit of this question generated many methodological needs, including the need for new measures and a sufficient database.

The following pages are a condensed progress report to acquaint readers with my past, present, and future research. I first discuss conceptual frameworks and then applied issues in assessment and treatment. Crystal ball gazing and wish listing are interleaved within these contexts. Literature citations are used liberally to point the interested reader to places for more detail.

THEORETICAL PERSPECTIVES

Three Populations of Childhood Speech Disorders

Figure 5-1 is an overview of the current scope of practice in childhood speech disorders. This scope of practice stands in stunning contrast to clinical responsibilities of 20 years ago. Contemporary practitioners and service providers must meet the needs of three populations of children. The primary variable differentiating the three groups is the degree to which they have medical, educational, psychosocial, or sociolinguistic needs in addition to their speech needs. It is useful to introduce the three populations in the chronological order in which they have been studied, both by the discipline and in our research activities.

Residual Errors

The population with childhood speech disorders that we first studied consisted of children with what we term *residual errors* (Shriberg, 1980a; Shriberg, Austin, Lewis, McSweeney, & Wilson, in press b). The concept of residual errors follows from the sociobiological perspective of a developmental period for speech-sound acquisition that normally terminates at approximately 9 years of age (Locke, 1994; Shriberg, Gruber, & Kwiatkowski, 1994). At the end of this period, some children retain certain speech-sound errors, typically speech-sound distortions of English fricatives/affricates and/or liquids. Such errors may be regarded as the "residuals" of the period in which one developmental task is to acquire full allophonic mastery of all consonants and vowels/diphthongs of the ambient language.

From a scope-of-practice perspective, it is important to underscore what has happened to children with only residual distortion errors during the past several decades. Two decades ago, the assumption was that all articulation errors were potentially handicapping to speakers. That is, even one speech-sound distortion might distract listeners from the speaker's message—much as a minor orofacial or cosmetic difference might be a visual distraction. Accordingly, services for speech-sound distortions were routinely provided to children in public school settings, and considerable research resources were focused on procedures to assess and treat children with these articulation errors. We, too, found it challenging to find ways

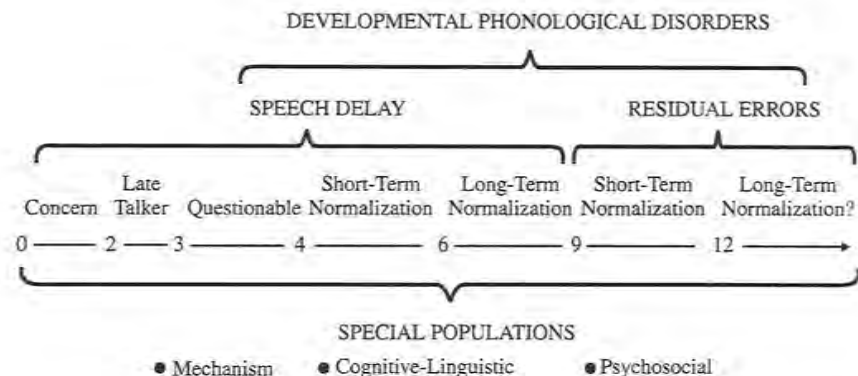


Figure 5-1 The Three Populations of Childhood Speech Disorders

to try to help speech-language pathologists evoke correct /r/ and /ʒ/ sounds from older children with persisting distortions. In one study of 65 children, we described an eight-step response evocation procedure that evoked correct /ʒ/ from 70% of children within 6 minutes; another approximately 10% of children emitted correct /ʒ/s in subsequent sessions that trained program step failures (Shriberg, 1975b). In a later study, we described a "ventriloquist stick" technique to evoke correct /ʒ/ from children with persistent /ʒ/ and /r/ distortions (Shriberg, 1980b).

More recently, three factors have militated against this type of research and the routine provision of public school speech services for children with only distortion errors. First is the issue of the importance of such errors in a child's development of speech and language. Unlike phoneme deletions and phoneme substitutions, phoneme distortions have not been associated with deficits in the phonological skills underlying reading, writing, and other verbal skills. Second is the issue of the sociolinguistic consequences of distortions such as dentalized and lateralized lisps and derhotacized consonant and vowel sounds. Their consequences have not been associated with intelligibility deficits, and in the current pluralistic culture, they may not be associated with unfavorable stereotypes. In fact, close listening to the speech of broadcasters and celebrities suggests that at least some types of speech distortions may be favored for their distinctive quality.

Third, even if distortion errors may be attested as handicapping, they are viewed as lower priority needs at a time when special educational resources are severely taxed. Thus, although included in the scope of practice in Figure 5-1, speech services for children with residual errors may increasingly be more difficult to fund from public sources. For children with residual errors that do not normalize by 12 years of age (*short-term* normalization), alternative services in the private sector

are increasingly the only option, and for an undocumented percentage of adults not experiencing *long-term* normalization, speech-sound distortions may persist unchanged for a lifetime.

Interestingly, it is the theoretical significance of residual errors that is of contemporary interest, rather than their importance as a public health concern. Later we will have more to say about possible etiologic origins of residual errors. Here we will just underscore the theoretical puzzle posed by residual errors: Why might a child correctly acquire everything else about the ambient language but fail to learn how to articulate one or two sounds?

Speech Delay

The second population with childhood speech disorders, also subsumed by the term *developmental phonological disorders* in Figure 5-1, consists of children who have what we term *speech delay* (Shriberg, 1980a). This classificatory label, too, is referenced to the developmental period for speech acquisition. Children meeting criteria for speech delay have persisting deletion and substitution errors not observed in typically speaking children of the same chronological age. As suggested above, if there were one core developmental phonological disorder, speech delay and residual errors might just represent different levels of severity of expression of the disorder. Unlike children with residual errors, however, a significant percentage of children with speech delay appear to have associated cognitive-linguistic, learning, and other special educational needs. It was the significance of these needs, also recognized in the Education of All Handicapped Children Act of 1975 (see U.S. Education Department, 1992), that motivated the considerable research effort over the past 20 years to describe and treat speech delay.

Ingram's (1976) influential synthesis and conceptual frameworks by others provided developmental ties among cognitive-linguistic processes. Speech delay can be referenced to several subperiods, phases, or stages within the period of development from birth to approximately 9 years. Again, because children with speech delay typically, but not invariably, have some other developmental involvements—most often language delays or later reading or other learning delays—delayed speech is a public health concern throughout the developmental period. Let us look briefly at each age period.

As indicated in Figure 5-1, there is concern about any notable delay from the landmarks of speech development from 0 to 2 years of age, as addressed in earlier chapters in this volume. Of signal interest are Oller's emerging data indicating that children who are late canonical babblers are at risk for later verbal development (Oller, Eilers, Steffens, Lynch, & Urbano, 1994). The second period of concern about speech delay occurs from 2 to 3 years, with a significant percentage of children termed *late talkers* later having clinically notable speech-language delays (Paul, 1993). The third period is from 3 to 4 years, a period of large individual

differences in speech development. As shown in Figure 5-1, we find it appropriate to describe children at the low end of the normal distribution during this period as having *questionable speech delay*. Fourth is the period from 4 to 9 years, when children may fall into two groups: *speech delay* or *questionable residual errors* (not shown in Figure 5-1). Finally, as described later, subtypes of residual errors describe the error types and error histories of persons who have retained speech errors past 9 years of age.

The course of normalization of a disorder can provide important information for purposes of classification, as well as for clinical-prognostic purposes. In several follow-up studies, we have found that approximately 75% of children with speech delay normalize their speech errors by 6 years of age (termed *short-term normalization*; Shriberg, 1994; Shriberg, Gruber, & Kwiatkowski, 1994; Shriberg, Kwiatkowski, & Gruber, 1994). Of the remaining 25% of children, most normalize by 9 years of age (*long-term normalization*), but some continue to manifest one of the three types of residual error patterns described below. Children in the latter two groups especially may have other special educational needs throughout early and later primary grades (Shriberg & Kwiatkowski, 1988).

Special Populations

The third category of childhood speech disorders in Figure 5-1 is termed *special populations* (see Bernthal and Bankson's, 1994, use of this term to organize an edited text on this topic). In contrast to children with speech-language delay as their primary need, the primary needs of children in special populations are typically in other health or educational areas (e.g., tracheostomy, traumatic brain injury, behavioral disorders). We have found it useful to subgroup children in these populations by etiology in three domains: speech-hearing mechanism, cognitive-linguistic processes, and psychosocial processes (Shriberg & Kwiatkowski, 1982, 1994; Shriberg, Kwiatkowski, Best, Hengst, & Terselic-Weber, 1986). Speech-language pathologists working with these children need to be well trained to understand relevant aspects of their primary needs, as well as to meet speech needs. As illustrated in Figure 5-1, the speech involvements in these special populations may originate and persist over varying age ranges within the birth to 9-year period for normal speech acquisition, as well as in any time period beyond 9 years.

In the context of emerging trends in health care, the needs of special populations have redefined the clinical landscape. Speech-language pathologists must be able to apply their knowledge of phonological and speech-motor development to an ever-widening array of clinical responsibilities. It is for these reasons that we currently prefer the term *childhood speech disorders*—in contrast to terms such as *articulation disorders*, *phonological disorders*, or *articulation/phonological disorders*—as the most useful cover term for the three populations of children studied and served by the discipline of communicative disorders.