

Trying to Make Sense of Developmental Language Disorders

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A few years ago, Margaret Lahey (1990) wrote an article entitled, “Who Should Be Called Language Disordered?” She felt the need to write this article because of the variability in the criteria and procedures used to identify children with developmental language disorders and the confusion this variability causes among clients, students, clinicians, and parents.

Lahey made some specific suggestions for reducing some of the confusion, such as using chronological age rather than mental age or IQ as a reference point for

comparing language abilities. Lahey’s article sparked an interest among a number of researchers in child language disorders to better define the population of children with language disorders. A central issue has been to understand and explain the inconsistency between the clinical and research populations of children with language disorders. Like many clinically oriented researchers in child language, I have been grappling with this issue for years. This article represents my attempt to share some of my struggles and thoughts regarding what children with language disorders should be called, how language disorders should be defined, how they should be classified, and the continuing inconsistency between clinical and research constructs of language disorders.

ABSTRACT: In this article, I share my thoughts concerning what children with developmental language disorders should be called, how they should be defined, and how we might differentiate children with specific language impairment (SLI) from other children with developmental language disorders. Among other things, I attempt to show why a lack of congruence between clinical and research constructs should be expected.

Researchers and clinicians use different identification criterion and procedures because clinical and educational objectives are different from research objectives. While recognizing these differences, I suggest several possible ways to differentiate a subgroup of children with SLI from the general population of children with developmental language disorders without using nonverbal IQ. Even if researchers are able to identify this unique group of children, clinicians may never embrace the SLI construct.

In the best of all possible worlds, clinicians would be familiar with how researchers define SLI and appreciate the value of research that attempts to identify distinct subgroups of children with developmental language disorders. Researchers, in this ideal world, would recognize and acknowledge the lack of congruence between the research populations of SLI and the larger clinical population of children with developmental language disorders.

KEY WORDS: language, disorders, child

WHAT SHOULD CHILDREN WITH LANGUAGE DISORDERS BE CALLED?

In order to talk about who should be called language disordered, one is immediately faced with a decision regarding what to call these children. In light of all the terms that have been used to describe children with language disorders, I think it is unrealistic to expect that the diverse group of individuals involved with these children will ever use consistent terminology. The sheer number of terms and euphemisms are simply too rich for one term to achieve universal usage. It is not unreasonable, however, for researchers, clinicians, parents, and educators to have some understanding of the different meanings associated with particular terms and the factors that influence one’s use of a particular term. The discussion below attempts to achieve this more modest goal.

Many professionals in speech-language pathology prefer the term “language disordered” over alternative terms such as language impaired, language delayed, or language disabled. Lahey (1990) justified her use of the term “language disordered” with a footnote (p. 613) noting that “we in the field of speech-language pathology usually refer

to the various areas of our field as disorders.” She admitted that some of the other terms may be more appropriate, but discussion regarding the appropriateness of terms was not the purpose of her article.

What we call a child who is having difficulty learning language says a lot, however, about how we define and classify children with language disorders. Consider, for example, the widespread use in recent years of the term “specific language impairment” (SLI) in the research literature. The term SLI refers to children who have difficulty learning language in the absence of mental deficiency, sensory and physical deficits, severe emotional disturbances, environmental factors, and brain damage.

Interest in this group of children has a long history in our field, going back more than 30 years to the Stanford Conference on Childhood Aphasia in 1960. Over the years, these children have been referred to as developmentally aphasic, dysphasic, language impaired/disordered/delayed/disabled, and language-learning disabled. The plethora of different terms to label these children has contributed to the confusion in the field concerning who is language disordered and what these children should be called.

In the 1980s, for example, most researchers were using the terms “language impaired” or “language disordered” to describe the group of children with SLI. These were the same terms being used by clinicians to describe many of the children on their caseloads who had language learning problems. In some cases, clinicians did use other terms (e.g., language delay, auditory processing disorder), but the subgroups of children associated with these terms were not ones that were identified in research.

One of the difficulties with terms such as SLI and language delay is that they have literal interpretations that are not consistent with what we know about children with these problems. For example, the term SLI implies that the impairment is specific to language and does not affect other cognitive or mental activities, when in fact, most children with SLI have problems that are not specific to language. In the case of the term language delay, a delay implies that children with this problem will eventually catch up, or that the problem is less severe than a language disorder or impairment. This term is used by many clinicians, however, for children who continue to have language learning problems. It is not used to differentiate those children who outgrow their language impairment from those who do not. A complicating factor is that many children with preschool language learning problems will experience problems learning to read or write. Because a language learning problem often affects both spoken and written language, some authors (e.g., Wallach & Butler, 1994) prefer the term language learning disability.

Terms are important not only because they are inextricably linked with definitional and classification issues, but also because the actual words in the terms have their own independent (lexical) meanings that are often different from the professional interpretations. Even when there are accepted definitions of professional terms, such as disorder, impairment, delay, and disability, these terms may have different meanings for parents, clients, educators, and other individuals. Disorder and impairment have more negative

connotations than delay. This is why it is rare for parents to refer to their children as language disordered or language impaired even though these terms are used synonymously with language delay by many professionals.

Professionals contribute to the confusion because they may use different terms depending on who they are talking to (e.g., colleague, other professional, parent/client) and the different roles they may play (e.g., parent, clinician, educator). For example, in my professional role, I have no difficulty using the term “phonological disorder” to talk about children with speech delays. However, when my younger daughter had a phonological disorder and needed to be in therapy for 2 years, I never thought of her as a phonologically disordered child. Person-first language was not prevalent in the late 1980s, but my problem was not affected by where in the label the word “child” occurred, but with the term phonological disorder. When the subject of Franne’s speech came up, I said things like, “she has a little speech problem” or “she has difficulty learning to talk.” My choice of terms was due in part to the unfamiliarity most people have with the term “phonological.” More disturbing to me, however, was the negative connotation of the term “disorder.” Even though I am very comfortable talking about disorders in my professional role, like other parents, I had difficulty referring to my child as disordered. The term was too stigmatizing for an otherwise normally developing child.

It is interesting that some disorders also are less stigmatizing than others. In our society, it is preferable to have dyslexia than other related disorders (i.e., learning disability, language disorder, reading disability). Attention deficit disorder (ADD) is also more accepted and less stigmatizing than the various learning disabilities. Developmental apraxia sounds much better than a severe phonological disorder. The preferred terms all have medical orientations rather than educational orientations. Dyslexia and ADD have the additional appeal of being found in very intelligent and successful individuals. Some speech-language pathologists who prefer the term SLI believe that it is less stigmatizing than the more commonly used terms (language disorder/impairment).

I began this section by noting that it is probably unrealistic to expect that consistent terminology will ever be used by the diverse group of individuals who study or treat children with language disorders. There are very compelling reasons for the variability in terms used by different professionals, educators, parents, and clients. Indeed, one could argue that it would be more surprising if everyone used the same term to describe children with language disorders, given the heterogeneity and overlap of the various disorder types and the diverse group of individuals involved with these children. But, just because different terms may be used to describe children with language disorders does not mean that there should not be some logic to the inconsistency. In other words, it may be appropriate for professionals to use different terms when talking with colleagues, parents, or other professionals, but there should be some consistency in the terms used with these different groups. Unfortunately, there is too much variability in the terms used by professionals. This variability is caused in large part by the way in

which language disorders have traditionally been defined and classified.

DEFINITIONAL ISSUES

Defining a language disorder at first seems rather easy to do. Consider, for example, the relatively simple definition proposed by Leonard back in 1982: “Children have a language disorder whenever their language abilities are below those expected for their age and their level of functioning” (1982/1990, p. 177). Leonard noted that a broad-based definition such as this one makes it possible to consider children with differing etiological histories as language disordered. But, the broadness of this definition, which is its main advantage, is also its main disadvantage because it does not specify the criterion used to determine when a language disorder exists. More detailed definitions have the same problem, as should be evident with the 1980 American Speech-Language-Hearing Association (ASHA) definition given below:

A language disorder is the abnormal acquisition, comprehension or expression of spoken or written language. The disorder may involve all, one, or some of the phonologic, morphologic, semantic, syntactic, or pragmatic components of the linguistic system. Individuals with language disorders frequently have problems in sentence processing or in abstracting information meaningfully for storage and retrieval from short- and long-term memory. (pp. 317–318)

The ASHA definition says a lot about what a language disorder is and the problems that are associated with it, but like Leonard’s simpler definition, it does not provide a criterion to determine who might have such a disorder. One might conclude that definitions without identification criteria are not very useful either to researchers or clinicians. Definitions do have an important function, however, because they identify the scope of the problem. For example, early definitions of a language disorder focused primarily on syntactic and semantic problems. Problems with phonology, pragmatics, and, most recently, written language, were not considered to be within the scope of a language disorder.

Defining the scope of a disorder is not a trivial matter, and some of the confusion in the field regarding who is language disordered can probably be attributed to differences in how one defines a language disorder. But, definitions are not a substitute for identification criteria and procedures, and it is the variability in these criteria and procedures among researchers and clinicians that accounts for much of the confusion in the field regarding who is language disordered.

Much has been written concerning the different criteria and procedures used to identify children with language disorders (e.g., Aram, Morris, & Hall, 1993; Dunn, Flax, Sliwinski, & Aram, 1996; Lahey, 1990). An underlying assumption in these articles is that variability is bad, and that researchers and clinicians should be using the same criteria and procedures to identify children with language disorders. I think this assumption needs to be questioned.

Clinicians and researchers should use different identification criteria and procedures because clinical and educational objectives are different from research objectives. The primary clinical objective is to identify children who need speech-language services and determine eligibility for services. Research objectives are less straightforward because they can vary according to specific questions addressed in a study. In many cases, however, reliability and validity issues may have more of an influence on subject selection criteria and procedures than the research question addressed. In the sections below, I discuss the criteria researchers use to identify children with SLI and contrast these criteria with the ones used by clinicians to identify children with language disorders.

Exclusionary and Inclusionary Criteria for Children With SLI

As I indicated earlier, interest in children with SLI has a long history in our field. This interest has clinical as well as theoretical roots. Back in the 1960s and 1970s, when research with this population first began, speech and hearing clinics around the country began to treat children with developmental language disorders. The researchers who eventually studied children with developmental language disorders often had their first exposure to these children during their graduate programs and subsequent work experience as speech-language pathologists. Clinical interest in these children developed naturally into research interest. Theoretically, this group of children with language disorders was of interest because the cause of the language learning problem was not readily explained by sensory, cognitive, or emotional deficits. Researchers are still debating whether cognitive or linguistic explanations best account for the language learning problem (e.g., Bishop, 1992; Kamhi, 1996).

In research, findings need to be replicable (reliability) and generalizable (external validity). In order to ensure reliability and validity, the criteria and procedures used to identify children with developmental language disorders need to be reasonably consistent. The use of different criteria and procedures to identify these children would lead to a very heterogeneous population of children, making it difficult to replicate and generalize findings.

Although there may be some variability in the actual assessment procedures used, children with SLI (as they have come to be called) are always defined by a combination of exclusionary, inclusionary, and discrepancy criteria. The exclusionary criteria involve ruling out mental deficiency, hearing loss, severe emotional disturbance, oral/motor dysfunction, and frank neurological deficits as the primary cause of the language impairment. Some researchers also have attempted to exclude children whose language deficits were the result of sociocultural or environmental factors, but determining the relative impact of environmental and child-based factors has proven difficult.

Although there is a general consensus regarding the exclusionary criteria for SLI, the operational definitions of these criteria may vary. For example, rather than simply

excluding children with mental deficiencies, many researchers require that children defined as SLI perform within one standard deviation of the mean on a measure of nonverbal intelligence (i.e., nonverbal IQ must be above 85). This criteria is sometimes referred to as an “inclusionary” criteria. Other researchers may use 80 or 75 as the cutoff point.

The measures of nonverbal intelligence typically given by researchers are the Leiter International Performance Scale (Arthur, 1952), the Columbia Mental Maturity Scale (Burgemeister, Blum, & Lorge, 1972), the Test of Nonverbal Intelligence (Brown, Sherbenou, & Johnsen, 1988), or the performance part of the Wechsler Preschool and Primary Scale of Intelligence (WPPSI, Wechsler, 1967) or Wechsler Intelligence Scale for Children–Revised (WISC–R, Wechsler, 1974). Nonverbal intelligence tests are used rather than full-scale intelligence tests because children with SLI perform below age limits on the verbally oriented subtests.

Children with phonological impairments also are typically excluded from the SLI group. The criteria used to exclude phonological impairments is somewhat variable, however. For example, Stark and Tallal (1981) excluded children whose phonological impairment was more severe than their language impairment. Aram and her colleagues (e.g., Dunn et al., 1996) required a minimum of 25 intelligible utterances. Researchers who are interested in grammatical morphology, such as Leonard (1995), required children with SLI to score above 80% on a test of word-final [s], [z], [t], and [d] in monomorphemic contexts (e.g., nose, bed).

The exclusionary and inclusionary criteria for SLI discussed in this section are not typically used by clinicians to identify a language disorder or determine eligibility for services. Because the primary clinical objective involves identification and eligibility decisions, clinicians do not need to use exclusionary criteria or measures of nonverbal intelligence to identify and qualify children for services. A clinical identification of a language disorder does not require the child to perform within normal limits on a measure of nonverbal intelligence (cf. Tomblin, Records, & Zhang, 1996). An etiological classification is also not required to qualify for services. Clinicians do not necessarily ignore etiological factors, but these factors are more likely to be considered if they impact directly on service delivery. For example, if a clinician suspects that a child has a pervasive developmental delay, a psychological evaluation would be recommended.

In most cases, clinicians only need to demonstrate that a child’s language abilities are deficient. Clinicians usually do this with the use of some type of discrepancy-based criteria that may be similar to the discrepancy criteria used by researchers. The different types of discrepancy criteria are discussed in the next section.

Discrepancy-Based Criteria

Although much has been written concerning the problems with the use of discrepancy-based criteria (cf. Aram et al., 1993; ASHA, 1989), many researchers and clinicians still use some type of discrepancy formula to determine acceptability for research and eligibility for clinical services. For example, Stark and Tallal (1981) attempted to

devise a standard approach to identify children with SLI. In addition to the exclusionary criteria discussed above, a child’s overall language age had to be at least 12 months lower than chronological age (CA) or nonverbal mental age (MA), whichever was lower. In recent years, most researchers have used either nonverbal MA or CA as the reference point to identify children with SLI. In addition to the problems involved in reducing a complex, multifaceted behavior like language to one number, there are also problems using nonverbal MA or CA as a reference point.

The problems involved in using a cognitive reference such as nonverbal MA to determine eligibility for services have been well documented (Casby, 1992; Cole, Dale, & Mills, 1990; Cole, Schwartz, Notari, Dale, & Mills, 1995; Fey, 1996; Fey, Long, & Cleave, 1994). Perhaps the most serious problem is that children whose language abilities are not sufficiently discrepant from their nonverbal MA can be denied services based on these criteria. By denying services to children who do not meet this kind of discrepancy criteria, one is embracing the view that cognitive abilities determine language abilities. Research has shown, however, that cognitive prerequisites are neither sufficient, nor even necessary, for language to emerge or develop. The data are correlational, suggesting interactive, rather than one-way, unidirectional relationships (cf. Bates, Benigni, Bretherton, Camaioni, & Volterra, 1977; Casby, 1992). In support of this research, other studies have shown that children with below average nonverbal IQs benefited just as much from therapy as did children with average nonverbal IQs (Cole, Dale, & Mills, 1992; Fey et al., 1994).

In another line of research, Cole et al. (1992) found that 70% to 90% of a group of young children (ages 3 to 7 years old) changed from eligible to noneligible during an 8-month period, whereas another 13% changed from noneligible to eligible depending on the tests used to make the comparisons. Children also changed categories between SLI (MA-LA discrepancy) and developmental lag language impaired (no MA-LA discrepancy), indicating that the relationship between language and nonverbal IQ changed between assessments (Cole, 1996).

Based on findings such as these, it is generally agreed that any version of cognitive referencing as a clinical method for determining eligibility for speech and language intervention is insupportable and inappropriate (Cole, 1996; Fey, 1996). Because of the problems with cognitive referencing, CA referencing is usually used for clinical identification (Fey, 1996; Lahey, 1990). Reflecting this view, Fey wrote that all children whose age-referenced delays in language create or enable a speech-language pathologist to predict complications in some areas of life functioning should be identified as having language impairments and be considered as candidates for intervention.

The use of CA-referencing has definite advantages over cognitive referencing (Lahey, 1990). Its most important advantage is that it allows all children with poor language skills to be considered for services regardless of cognitive level. There are a number of disadvantages, however, in the use of CA as a standard of reference. Among the dangers pointed out by Lahey (1990), for example, is that standardized language tests typically use normative samples.

Assuming that the normative population is made up of only “normal” children, then performing 1 to 2 standard deviations below the mean is the low normal range. It is unclear how poorly a child must perform in order to be considered disordered. McFadden (1996) presented an excellent discussion of the pitfalls of normative sampling in her recent article. Another problem with CA referencing is that it is difficult to identify disorders in areas where development is not linear and continuous. Once one gets through the early language learning period, with the exception of vocabulary, much of language learning is not captured well by discrete, continuous measures.

Because of the problems with discrepancy-based criteria, some clinicians prefer to use nonstandardized, observational and descriptive assessments to identify children with language disorders. Children with pragmatic-based disorders may be identified in this way. Clinicians may not always have the flexibility to make eligibility decisions using nonstandardized measures. Researchers, however, never have this flexibility; they must use specific exclusionary, inclusionary, and discrepancy criteria to ensure that findings are reliable and valid.

Because research criteria are more stringent and rigid than clinical criteria, the number of children who meet research criteria is necessarily much smaller than the number of children who meet clinical criteria. These differences have been documented by Aram et al. (1993), who found that the congruence between clinically and research-defined SLI ranged from 20% to 71%, depending on the discrepancy criteria used. In a subsequent study, Aram and her colleagues (Dunn et al., 1996) found that a combination of mean length of utterance (MLU), percent structural errors, and CA was the optimal set of variables for predicting a clinical diagnosis of SLI.

The lack of congruence between the clinical and research constructs of SLI led Aram et al. (1993) to suggest that the term SLI “may be a nonuseful superordinate that ultimately cannot be defined by any of the current procedures.... the term [is] both academically illusive and spurious” (p. 589). The lack of congruence is expected, however, given that the criteria used to identify SLI children for research are more stringent than the criteria used to identify children for clinical services. Moreover, the usefulness of the term SLI should not be based on the degree of congruence between research and clinical constructs of SLI. Few would suggest that dyslexia is a nonuseful superordinate even though it is just as elusive if not more so than SLI.

The usefulness of a term depends on the meaning it has for those who use it. SLI is a useful term for many researchers because it defines a specific subgroup of children with language disorders. Most clinicians see no compelling reason to use the term SLI because the more general terms “language disordered/impaired” better reflect the heterogeneity of the population of children with developmental language disorders. Clinicians might embrace the SLI term/construct if they were convinced that the diagnosis of SLI had some impact on treatment or prognosis. The broader issue here involves the clinical utility of subgroups and the classification of children with developmental language disorders.

Classification and Subtyping Issues

Interest in subtypes of children with language disorders has a long history in our field (cf. Aram & Nation, 1982). Despite this interest, researchers have not been very successful in developing valid and clinically useful subgroups of children with language disorders. Should all of these children be called SLI? Should we differentiate children based on nonverbal IQ, severity of the language disorder, nature of the language disorder (e.g., receptive vs. expressive), causal factors, or whether they meet some type of discrepancy criteria?

One possibility is to use the term SLI as a superordinate or cover term for all of the children with developmental language disorders who do not fit into the other major etiological subgroups. Any child with a language impairment who is not hearing impaired, mentally retarded, emotionally disturbed, or brain damaged would be considered SLI. Defined in this way, the population of SLI children would be very heterogeneous. Nonverbal intelligence could range from below normal (70–84) to well above normal (115–130). Children may come from disadvantaged environments as well as from advantaged ones. The delays and learning problems these children have will also be quite diverse. In many cases, the impairments will not be specific to language or language-related behaviors. Performance on basic processing tasks (e.g., perception, short-term memory) may also vary considerably.

Despite the heterogeneity of this broad category of SLI, the children in this group would have some things in common. For example, Fey and his colleagues (Fey, Long, & Cleave, 1994) found that children with above-average nonverbal IQ and children with below-average IQ showed similar patterns of language deficits. Both groups of children also made significant gains in therapy. Nonverbal IQ may impact on other aspects of learning and behavior, but in this preliminary study, it was not associated with a particular pattern of language deficit or therapy progress. This is an important finding, but not a surprising one. Similar patterns of language deficits have been found in children with mental retardation and those with SLI (e.g., Kamhi & Johnston, 1982). Of course, differences in language have also been found. The broader implication of these findings is that there is not a simple linear relationship between general IQ or nonverbal IQ and particular aspects of language.

There are some advantages in using SLI as a cover term for all of the children with language disorders who do not fit into the other etiological categories. As discussed earlier, the term SLI appears to be less ambiguous and less stigmatizing than the more commonly used terms (language disorder/impairment). The term sounds somewhat esoteric and invites questions concerning the underlying nature of the impairment. SLI also seems to be more “media friendly” and, as a result, is more likely to be associated with the other popular learning problems, namely, dyslexia and ADD. These factors may make SLI a more attractive label for affected children, parents, and other professionals. Widespread acceptance of the term SLI would also benefit speech-language pathologists who have had an uphill battle

making the general public aware of their expertise in treating language learning problems. Public familiarity with SLI would lead to more recognition of speech-language pathologists as the professional group that treats children with this language learning problem.

The major problem with the broad-based use of SLI is that it inaccurately describes children whose learning problems are not restricted to language. The assumption of specificity is a critical component of the SLI construct. Specificity means that the learning problems in children with SLI are specific to language and language-related functions. Without the assumption of specificity, one might as well drop the “S” from SLI or use a general term like “developmental language disorder.” Researchers have grappled with the specificity issue and the more general question of what is special or unique about children with SLI. There has been a growing disenchantment with the circular reasoning involved in using nonverbal IQ to define children with SLI and then saying that these children are unique because of their normal nonverbal IQ.

Defining SLI with the usual exclusionary criteria and normal nonverbal IQ does not identify a unique, homogeneous group of children with developmental language impairments. Consider, for example, the data from Tomblin’s (1996) large-scale epidemiologic study of SLI. In order to be classified as SLI, a child had to perform 1.25 standard deviations (*SD*) below the mean on at least two of five composite measures of language. Children also had to meet other exclusionary criteria and perform within normal age limits on a measure of nonverbal intelligence. Using these criteria, 7.4% (534/7218) of the kindergarten children who were tested were identified as SLI.

Tomblin used two different methods to identify subgroups of SLI, using a cutoff score and using a cutoff plus discrepancy criteria. In the cutoff method, performance on a composite measure of expressive or receptive language had to be at least 1.25 *SD* below the mean. Using this method, Tomblin found that 35% of the children had expressive problems, 28% had receptive problems, and 35% had both expressive and receptive problems. When discrepancy criteria were added to the cutoff criteria, Tomblin found that the majority of children (80.6%) did not have a discrepancy between expressive and receptive language. Only 10.7% were categorized as SLI-E (expressive < receptive) and 6.5% as SLI-R (receptive < expressive). These data indicate that children with SLI, as currently defined, are a heterogeneous group of children with varying degrees of expressive and receptive language problems. As such, some of these children’s problems are probably not limited to language and many will have language problems that are very similar to children who have lower nonverbal IQs.

Importantly, the specificity assumption does not require that children with SLI have problems restricted to language. As Johnston (1988) pointed out years ago, a language impairment must impact on certain cognitive abilities. It is possible, however, to restrict the kinds of cognitive problems children with SLI have to a well-defined “problem space,” to use Johnston’s metaphor. The affected problem space has been fairly well defined in the studies that have been conducted over the last 25 years and can

continue to be further defined in the upcoming years. Broadly speaking, it involves language and language-related tasks that place demands on these children’s limited processing capacity—often by taxing phonological working memory (cf. Gathercole & Baddeley, 1990; Kamhi, 1996; Leonard, 1995).

Leonard, for example, found that 10 young children with SLI (aged 3:8 [years:months] to 5:7) had more difficulty than MLU-controls with producing grammatical elements associated with three functional categories (determiner, inflection, and complementizer). A number of studies have shown that children with SLI perform more poorly than age peers on various reasoning tasks when processing/memory demands are high (see Bishop, 1992; Kamhi, 1996, for reviews). Gathercole and Baddeley (1990) have shown that children with SLI have specific limitations in phonological working memory—the memory involved in processing information that is phonologically coded.

Specifying the nature of the language and language-related strengths and weaknesses of children with SLI will eliminate the need to use nonverbal IQ as a cutoff or in some discrepancy formula as a criteria for group membership. A child who has a nonverbal IQ above 85 (even if discrepancy criteria are met) will not be SLI unless specific linguistic and cognitive characteristics are demonstrated. Some researchers are already relying less on nonverbal IQ to identify children with SLI. The Child Language Center at the University of Arizona, for example, uses a nonverbal IQ of 75 as the cutoff and requires that children’s morphosyntactic usage be different from those expected for the child’s age level (cf. Kiernan, Snow, Swisher, & Vance, 1997).

Possible Ways to Define SLI

I think researchers should continue to move away from defining SLI based primarily on normal nonverbal IQ and broad-based norm-referenced measures of language performance, such as the Test of Language Development–Primary (TOLD-P:3, Newcomer & Hammill, 1997). As noted earlier, several studies (e.g., Cole, 1996; Cole et al., 1992; Fey et al., 1994) have not found differences in treatment outcomes for children with normal and below normal nonverbal IQ. Measures of intelligence have also not proven to be useful in differentiating children with reading disabilities. Children with and without an IQ-achievement discrepancy showed similar patterns of deficits on measures of word recognition and phonological processing (Stanovich & Siegel, 1994). Differences that were found occurred on memory tasks and in academic domains other than reading. Based on these findings, Stanovich and Siegel concluded that if there is a special group of children with reading problems who are behaviorally, cognitively, genetically, or neurologically different, it is unlikely that they can be easily identified by using an IQ-achievement discrepancy. I think the same conclusion will hold true for children with developmental language disorders: If there is a special group of children with developmental language disorders (i.e., SLI) who are behaviorally, cognitively, genetically, or linguistically different, it is unlikely that they will be identified using

nonverbal IQ as a criteria for group membership. The question, then, is that if there is truly a group of children with SLI, how can they be identified?

I can think of at least three possible ways to differentiate children with SLI from other children with developmental language impairments without using nonverbal IQ. The first way is to use expressive-receptive language profiles. Another is to use performance on a basic processing measure, such as Tallal's repetition task (Tallal & Piercy, 1973) or a measure of working memory (e.g., nonword repetition). It may also be possible to identify SLI based on measures of treatment outcome or developmental course of the disorder. Each of these possibilities will be considered below.

Expressive-receptive language profiles. There are several possible ways to use expressive-receptive language profiles to identify children with SLI. One is to restrict SLI to the group of children whose expressive language abilities are significantly lower than their receptive language abilities. Children who do not have a sufficient gap between receptive and expressive language would be considered to have a nonspecific or developmental language impairment.

A slight variation on this first possibility is again to require a discrepancy between expressive and receptive language abilities, but also require that children with SLI have age-appropriate receptive language abilities on at least one composite measure (e.g., TOLD-P:3, Peabody Picture Vocabulary Test-III [PPVT], Dunn & Dunn, 1997). In this case, fewer children would be SLI because of the more stringent receptive language criteria. A third possibility, and the least exclusive one, is to define children with SLI as children whose expressive language delays are worse than their receptive language delays. No discrepancy criteria would have to be met, and receptive language can be below age limits. Children whose receptive language abilities were worse than their expressive language abilities would be considered to have a nonspecific developmental language disorder.

To my knowledge, none of these possible ways to differentiate SLI from nonspecific developmental language disorders has been explored in the literature. Several researchers, such as Tomblin and Craig and her colleagues, have used these criteria to identify SLI children or subgroups of SLI, but in each case, nonverbal IQ had to be within normal limits (i.e., above 85). Tomblin's (1996) research, which was discussed earlier, determined the prevalence of various subgroups of SLI. Craig and her colleagues (Craig & Evans, 1989; Craig & Evans, 1993; Craig & Washington, 1993) not only identified subgroups of SLI, but also compared these subgroups on a variety of discourse measures. Cutoff and discrepancy criteria were used to differentiate an expressive SLI group (SLI-E) from an expressive-receptive SLI group (SLI-ER). The SLI-E group performed within normal age limits on the receptive portion of the Clinical Evaluation of Language Fundamental-3 (CELF-3, Semel, Wiig, & Secord, 1995), but had expressive language scores that were at least 10 standard points lower. In contrast, the SLI-ER group performed below age limits on the receptive subtests and had less than a 10-point difference in expressive skills. Interestingly, the average composite expressive scores were lower for the

SLI-ER group than for the SLI-E group, which was suggestive of a more global language production problem (Craig & Evans, 1993, p. 779).

In these studies, the SLI-E group performed more like children with normal language when interrupting turns or attempting interactive access than the SLI-ER group. These findings suggest that meaningful subgroup differences can be found when receptive language abilities are used to differentiate children with SLI. It remains to be seen whether these same differences will be found when receptive language abilities rather than nonverbal IQ are used to identify children with SLI.

Basic-processing deficit. Another way to identify a unique subgroup of children with SLI is to use performance on a measure of basic processing in addition to the standard criteria of performing below age limits of various measures of language. Tallal's repetition task and a measure of working memory would be two popular choices given the recent interest in both of these areas (Gathercole & Baddeley, 1990; Merzenich et al., 1996; Tallal et al., 1996). In order to be considered SLI, children would have to demonstrate a temporal processing deficit as measured by Tallal's repetition task or deficient working memory capacity as measured by a nonword repetition task or another measure of working memory.

Attempting to use a basic processing deficiency to define SLI might help to distinguish children with intrinsic language disorders from those whose language impairments are caused primarily by extrinsic environmental factors. One would expect that such a distinction would also impact on treatment. For example, children whose language problems are caused at least in part by a temporal processing or working memory limitation might benefit most from the treatment program using acoustically modified speech that was developed recently by Tallal and her colleagues (Tallal et al., 1996). How children respond to this treatment program or others could be used to confirm whether the children were in fact specifically language impaired.

Developmental course of SLI. In addition to the possibility of identifying SLI children based on how they respond to treatment, it is also possible to define SLI based on the developmental course of the disorder. For example, if SLI is defined primarily as an expressive language impairment, then children with SLI would probably be less likely to have subsequent reading and learning problems than would children with nonspecific developmental language disorders. If SLI is defined with the exclusionary and inclusionary criteria used by most researchers, its developmental course would be more difficult to predict because of the heterogeneity of the population. For example, Catts (1993) found that not all children with preschool language impairments experience difficulty learning to read, but those who do show many of the same characteristics of children with specific reading disabilities (i.e., dyslexia). In other words, not all children with reading problems have a history of spoken language impairments, and not all children with language learning difficulties have problems learning to read.

It may be that the only way to identify SLI based on its developmental course is to emphasize the continued

difficulty with syntax and morphology that children with SLI have throughout development. Importantly, these language problems can occur with or without a specific reading disability, which means that SLI and dyslexia are two distinct disorders with their own defining characteristics and underlying causes. The frequent co-occurrence of SLI and dyslexia may have given the false impression that there is one basic developmental language disorder with different manifestations at particular points in development (cf. Kamhi & Catts, 1989). The characteristics that define SLI have been discussed throughout this article. An increasingly popular definition of dyslexia is that it is a specific language-based disorder of constitutional origin that is characterized by difficulties in single word decoding, usually reflecting insufficient phonological processing abilities (Lyon, 1995).

CONCLUSION

In the previous section, I suggested three general ways to differentiate the subgroup of children with SLI from the general group of children with developmental language disorders without using nonverbal IQ. The next step is to perform comparative studies using each of these ways to determine whether SLI is associated with unique behavioral, cognitive, genetic, and linguistic characteristics that have impact on treatment and prognosis. In these studies, children with SLI will be compared with children with nonspecific developmental language disorders (DLD).

The general group of children with DLD would be defined as having nonverbal IQ scores above 70 (or perhaps 75, to account for measurement error) and composite language scores at least 1 *SD* below the mean on a norm-referenced language test (e.g., TOLD-P:3, CELF-3). These children would also have to pass a hearing as well as oral-motor function screening and not show signs of frank neurological dysfunction or severe emotional disturbance.

To be considered SLI, a child would need to show evidence of morphosyntactic delays (e.g., omissions or inconsistent use of grammatical morphemes, pronoun errors, difficulty with question formation, use of determiners and complementizers). Different expressive-receptive language profiles and processing variables would be used to further restrict inclusion in the SLI group. The children with SLI would also have to score above 80% on a test of word-final [s], [z], and [d] in nonmorphemic contexts (e.g., nose, bed) (cf. Leonard, 1995). Children with DLD may have more severe speech delays, but the speech delays should not be more severe than the language delay.

I suspect that if there is a unique group of children with SLI, it will be a relatively small group—no more than 20% of the children with DLD. If differences are found between children with SLI and DLD, it will be important to consider whether these differences are a matter of degree or kind. In other words, does a quantitative difference in processing capacity characterize children with SLI (e.g., Leonard, 1994), or do these children have a qualitative difference in their underlying grammar (e.g., Rice, 1994)?

The processing view is consistent with a multidimensional continuum model. The SLI end of the continuum would be associated with a localized processing deficit that affects a circumscribed linguistic and cognitive problem space. As one moves toward the DLD end of the continuum, the processing deficit becomes less localized, leading to more widely distributed linguistic and cognitive deficits. A deficit in the underlying grammar suggests that SLI and DLD are distributed in clusters rather than on a multidimensional continuum. Children in the SLI cluster would be characterized by a deficit in underlying grammar, whereas children in the DLD cluster would not have such a deficit. The continuum model seems to have more support at this point (Leonard, 1995), although there is also some support for the cluster model (Rice, 1994).

As I come to the end of this article, I find myself wondering whether there is any hope in eliminating the confusion that Lahey (1990) wrote about 7 years ago. At times, I found myself adding to the confusion that I set out to eliminate. Writing this article has been a continuous struggle of trying to mediate between my split personality as researcher and clinician. My research side wants to believe that a group of children with SLI exists, and it is only a matter of finding the right way to differentiate these children from other children with developmental language impairments and identifying the characteristics that make these children unique. My clinical side, however, has seen the heterogeneity of children with developmental language disorders and questions the utility of continued attempts by researchers to identify meaningful subgroups and the seemingly endless debate over which terms best describe these subgroups. Clinicians have assessed and treated these children for years without using a measure of nonverbal IQ to distinguish children with SLI. Differential diagnosis and the use of general terms with various modifiers (e.g., moderate expressive language disorder) have served clinicians quite well. Why should clinicians use the SLI construct when researchers cannot even agree what it is?

It is difficult to make a compelling argument that would convince clinicians to embrace and begin using the SLI construct. Even if researchers are successful in discovering the characteristics that differentiate children with SLI from the general group of children with DLD, only a small proportion of children might merit the label SLI. I doubt that the uniqueness of this group would cause most clinicians to embrace the SLI construct, unless various states adopt a classification system that includes an SLI group. In the best of all possible worlds, clinicians would be familiar with how researchers define SLI and appreciate the value of research that attempts to identify distinct subgroups of children with developmental language disorders. Researchers, in this ideal world, would recognize and acknowledge the lack of congruence between the research populations of SLI and the larger clinical population of children with developmental language disorders. Although this article may not have eliminated the confusion that exists regarding developmental language disorders, I hope that it has illuminated and clarified some of the central issues that contribute to this confusion.

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