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Child Language Disorders

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Terminology and Definition

Children with language disorders have been variously referred to as language disordered, language impaired, language delayed, or as having a specific language impairment. Clinicians tend to use the first three terms; specific language impairment is the preferred term in research publications. A language disorder can be defined as a significant delay in the use and/or understanding of spoken or written language. The disorder may involve the form of language (phonology, syntax, and morphology), its content or meaning (semantics), or its use (pragmatics), in any combination (American Speech-Language-Hearing Association 1993). Phonology is the aspect of language concerned with the rules that govern the structure, distribution, and sequencing of speech sounds. Syntax is the rule system that governs how words are combined into larger meaningful units of phrases, clauses, and sentences. Morphology is the aspect of a language that governs word structure and includes grammatical word inflections that carry tense. Semantics is the aspect of language that governs the meaning of words and word combinations. Pragmatics is concerned with the social use of language. Difficulties with any aspect of language must be in a person's first language in order for language disorder to be considered.

Interest in children with language disorders has a long history in speech-language pathology going back to the Stanford Conference on Childhood Aphasia in the 1960s. The children with language disorders that initially intrigued theorists were those that had difficulty learning language in the absence of mental deficiencies, sensory and physical deficits, severe emotional disturbances, environmental factors, or brain damage. These children intrigued researchers because there was no obvious cause of the language impairment. More than 40 years of research has found that these children, now referred to as children with specific language impairment (SLI), have cognitive weaknesses that may explain at least some of the language learning difficulties these children experience.

Classification and Characteristics

Language disorders can be classified according to the aspect of language that is impaired (phonology, syntax, morphology, semantics, and/or pragmatics), its severity (mild, moderate, or severe), and whether it affects comprehension (receptive language), production (expressive language), or both (Bishop 1997). The expressive – receptive distinction is used by the *Diagnostic and Statistical Manual of Mental Disorders-IV* (DSM-IV, American Psychiatric Association, 1994) and the *International Classification of Functioning, Disability, and Health*.

According to the DSM-IV, an expressive language disorder is characterized by language production skills that are below an age-appropriate level. Deficits in expressive language

are apparent in both the formation and production of language and include weak vocabulary skills, word finding difficulties, word omissions, poor narrative skills (i.e., story telling), difficulty providing information, and grammatical errors. Expressive language disorder can affect both oral and written language. Children with expressive language disorder demonstrate age-inappropriate comprehension of language. Deficits in receptive language are apparent when children do not understand language at an age-appropriate level and include difficulties following directions, understanding words and sentences, and answering questions. Comprehension of both oral and written language can be affected. Mixed receptive – expressive language disorder is characterized by difficulties with both the production and comprehension of language.

Subgroups of children with language disorders have been identified according to the expressive – receptive distinction. In a group of kindergarten children, 35% had expressive problems, 28% had receptive problems, and 35% both expressive and receptive problems (Tomblin et al., 1996). Others have identified additional subtypes of language impairment and shown that almost half of children moved from one subtype to another over only a year as their specific strengths and weaknesses changed (Conti-Ramsden et al., 1997, Conti-Ramsden and Botting 1999).

Another way to classify children with language disorders is to differentiate children with SLI from children with non-specific language impairments (NLI). Children with NLI do not perform within normal age-limits on measures of nonverbal intelligence. Research comparing SLI and NLI has found children with NLI are just as responsive to therapy as children with SLI (Fey et al., 1994). More recent research has found that the risk for later reading disabilities is higher for children with NLI (nonverbal and language deficits) than for those with SLI (language deficits only, Catts et al., 2002).

Causes and Consequences

All developmental disorders have a strong genetic component, and SLI is no exception. Studies have shown that between 20% and 40% of children with language impairments have an affected family member (Stromswold, 1998). Twin studies confirm that these numbers reflect genetic factors rather than the shared environment of the family members (Bishop, 2002). The idea of a gene for language received considered attention in the 1990s with discovery of the KE family in London. Sixteen members of this three-generational family were diagnosed with a language disorder (Gopnik and Crago, 1991). All of the affected individuals had a mutation of a gene on chromosome 7 referred to as FOXP2. The initial excitement of the discovery of the language gene was muted by subsequent research showing that the gene regulated the activity of other genes and affected the development of many organs, including brain systems involved in speech and language learning (Fisher, 2005). It also turned out that most individuals with SLI have an intact FOXP2 gene. This finding does not reduce the impact genetics has on language disorders; it just means that language disorders like other developmental disabilities are caused by several genes as well as environmental factors.

Some researchers believe that more fruitful avenues of causal research look for the specific cognitive and linguistic deficiencies that explain the language learning problems experienced by individuals with SLI. This research is reviewed in the sections below.

Language Knowledge Deficit Accounts

Linguistic accounts typically focus on the difficulty children with SLI have in learning grammatical morphology. The most popular linguistic account, extended optional infinitive (EOI), was proposed by Wexler (1994). Wexler found developmental evidence that English-speaking children progress through a stage of language acquisition in which the marking of tense in main clauses is not obligatory. Inconsistent marking of tense is thus a typical stage in the English acquisition process. The problem for children with SLI is that they do not move through the optional infinitive stage as quickly as typically developing children. Evidence for this account comes from studies that have shown that English-speaking children with SLI use morphemes that are unrelated to tense (e.g., regular plural *–s*, *-ing*) with much higher accuracy than morphemes that are related to tense (e.g., third person singular *–s*, Rice and Wexler, 1996).

Other language knowledge accounts of SLI include the inability to develop implicit grammatical rules (Gopnik, 1990), the missing agreement account (Clahsen, 1991), and the computational grammatical complexity account (CGC, Marshall and van der Lely, 2007). The CGC account proposes that some children demonstrate a specific form of SLI called grammatical-SLI. For these children, SLI is caused by deficits in the phonological system, and this affects their ability to produce some grammatical forms.

Processing Accounts

Processing explanations range from claims about general processing deficiencies in speed or capacity to specific processing limitations involving auditory information. A deficit in overall processing capacity would tax conceptual domains that require high levels of processing resources (Johnston, 1994). Language and non-language skills would thus show different levels of function based on their overall processing demands. Slower processing speed will also affect performance on a variety of tasks. Studies have shown that children with SLI demonstrate slower response times than chronological-age peers in various linguistic and non-linguistic tasks (Leonard et al., 2007; Miller et al., 2001; Windsor and Hwang, 1999). General processing limitations can also explain the absence or reduction in the use of morphosyntax by children with SLI (Leonard et al., 1997). Surface features of languages, such as the physical properties of grammatical morphemes in English, make some aspects of language more difficult to acquire, particularly if they must be perceived and processed quickly in the context of running speech.

Specific processing accounts have focused on deficits in auditory temporal processing (Tallal, 1976) and phonological working memory (Montgomery, 2000, Montgomery and Windsor, 2007). Although Tallal et al. (1981) now believe that temporal processing problems are not specific to auditory information, some researchers hold on to the belief that children with SLI have particular difficulty processing auditory information (Chermak, 2002).

Consequences

Although understanding the possible causes of a language disorder is important for early identification and prevention efforts, equally important is information about the possible consequences of a language disorder. The primary risk for young children with language disorders is subsequent reading and academic learning difficulties (Aram et al., 1984, Bishop and Adams, 1990). Research has shown that at least half of kindergarten children with language disorders have identifiable reading and learning difficulties in later primary grades (Catts et al., 2002) and continue to demonstrate decreased reading achievement compared to typical language peers through at least Grade 10 (Catts et al., 2008).

Assessment

There are at least four purposes of assessment: (a) to determine whether a child has a language learning problem, (b) to identify the specific areas of deficit, (c) to formulate hypotheses about the possible causes of the problem, and (d) to identify specific goals to target in a general management plan. Determining whether a child has a language disorder is usually based on standardized assessment instruments. To qualify for services, children typically have to perform at least one standard deviation below the mean on a standardized measure of language. Some standardized measures of language are better than others in identifying children with language disorders. Plante (1998) provides an excellent discussion of the sensitivity and specificity of norm-referenced language tests.

Standardized tests are not the best way to determine specific areas of deficits because they focus primarily on syntactic-semantic aspects of language rather than on discourse, pragmatic, and prosodic aspects that can only be assessed through conversational and narrative sampling procedures (cf. Paul, 2007). Standardized assessments should also not be used to plan intervention targets. Dynamic assessment procedures are particularly useful to determine goals and intervention procedures (Olswang and Bain, 1991).

Assessments may vary based on the age of the child. For preschool children, observing play behaviors and interactions with parents and siblings provides important information about the child's social, cognitive, and interactive development. Emergent literacy skills should also be assessed (e.g., conventions of print, letter names). Narrative abilities can be assessed by having young children retell a story using a wordless picture book. For school-age children, language should be assessed not just with a clinician, but also with peers and in the classroom. A variety of discourse genres should be evaluated with spoken and written samples of language (cf. Paul, 2007). Figurative aspects of language should also be evaluated (Nippold, 2007).

Intervention and Prognosis

The progress children make in response to intervention is affected by many factors. All things being equal, the prognosis is better for children with less severe language impairments and expressive-only language disorders. Children who have more severe disorders that affect receptive language and cognitive abilities have poorer prognoses. Early identification and positive family support help to improve long-term outcomes.

Children who normalize language by early school age are less likely to have subsequent reading and academic problems than those whose language disorders persist into the school years (Catts et al., 2002).

There are many intervention procedures that have been found to be effective in improving language-learning abilities. There are recent meta-analyses of the effectiveness of intervention on children with language impairments (Cirran and Gillam, 2008; Law et al., 2004). Law et al. found 36 studies of preschool language intervention that met their inclusion criteria. Significant positive effects of intervention were found for children with phonological and expressive vocabulary difficulties. The findings were mixed for children with expressive syntactic difficulties. There were not enough studies involving children with receptive language problems to reach any conclusions about intervention efficacy. Clinicians and parents trained in the interventions were found to be equally effective in delivering interventions.

A more recent systematic review of language interventions for school-age children with spoken language disorders (Cirrin and Gillam, 2008) concluded that clinicians can have some confidence in the specific language intervention practices examined in the 21 studies they found. Strategies of imitation, modeling, and evoked production produced moderately large to large effects in children with expressive syntactic difficulties. Improvements in semantic processing and vocabulary were seen with clinician-teacher collaboration, slowed presentation rate, interactive conversational reading, and direct instruction in analogical thinking. Phonological awareness interventions to improve rhyming, sound identification, phoneme segmentation, and sound-letter correspondence yielded moderately large to large effects. In the area of pragmatics and discourse, direct instruction on topic initiation and group entry behaviors also yielded moderately large to large effects. Because there is relatively little evidence concerning the language intervention practices used with school-age children, Cirrin and Gillam (2008) conclude that "until the research base expands and confirms the efficacy and effectiveness of specific intervention practices for older students with language problems, clinicians working in school settings will need to select intervention approaches carefully, monitor students' progress on a regular and frequent basis, and validate the effectiveness of specific interventions for each student to whom they are applied" (S130).

The Cochrane Collaboration (www.cochrane.org) database provides up-to-date information about the latest intervention research. Professional organizations such as the American Speech-Language-Hearing Association (www.asha.org), the Canadian Association for Speech-Language Pathologists and Audiologists (www.caslpa.ca), the Royal College of Speech and Language Therapists in the United Kingdom (www.rcslt.org), and the Speech Pathology Association of Australia (www.speechpathologyaustralia.org.au) also provide continual updates about the latest intervention research.

Summary

A language disorder is a significant delay in the use and/or understanding of spoken or written language. The disorder may involve the form of language (phonology, syntax,

and morphology), its content or meaning (semantics), or its use (pragmatics), in any combination A significant delay is usually defined by performing at least one standard deviation below the mean on a norm-referenced measure of language. Language disorders can be classified according to the aspect of language that is impaired (phonology, syntax, morphology, semantics, and/or pragmatics); its severity (mild, moderate, or severe); whether it affects comprehension (receptive language), production (expressive language), or both; and whether deficits are specific to language or not (SLI vs. NLI). There are many potential causes of language disorders because language is a complex behavior influenced by genetic, biological, perceptual, cognitive, linguistic, and environmental factors. Deficits in each of these areas have been linked to difficulties learning language (Leonard, 1998). The primary risk for young children with language disorders is subsequent reading and academic learning difficulties.

A comprehensive evaluation of a child with a potential language disorder that uses norm-referenced instruments and dynamic assessment procedures to assess language use in a variety of contexts will help identify appropriate targets for intervention. The long-term goal of language therapy is for the child to communicate and use language at an age-appropriate level. Long-term outcomes depend on the type and severity of the language disorder. Children who normalize language by early school age are less likely to have subsequent reading and academic problems than those whose language disorders persist into the school years. Early identification and treatment are crucial for all children with language disorders.

References

Aram DM, Ekelman BL, Nation JE. 1984. Preschoolers with language disorders: 10 years later. Journal of Speech and Hearing Research, 27(2):232-244.

American Psychiatric Association. 1994. Diagnostic and statistical manual of mental disorders. 4th ed. Washington (DC): American Psychiatric Press.

American Speech-Language-Hearing Association. 1993. Definitions of communication disorders and variations. [Internet]. [cited 2009 Jan 7]. Available from: http://www.asha.org/docs/pdf/RP1993-00208.pdf

Bishop DVM. 1997. Uncommon understanding: Development and disorders of language comprehension in children. East Sussex (UK): Psychology Press Limited.

Bishop, DVM. 2002. The role of genes in the etiology of specific language impairment. Journal of Communication Disorders, 35(4):311-328.

Bishop DVM, Adams C. 1990. A prospective study of the relationship between specific language impairment, phonological disorders and reading retardation. Journal of Child Psychology and Psychiatry and Allied Disciplines, 31(7):1027-1050.

Catts HW, Bridges MS, Little TD, Tomblin JB. 2008. Reading achievement growth in children with language impairments. Journal of Speech, Language, and Hearing Research, 51(6):1569-1579.

Catts HW, Fey ME, Zhang X, Tomblin JB. 2002. A longitudinal investigation of reading outcomes in children with language impairments. Journal of Speech, Language, and Hearing Research, 45(6):1142-1157.

Chermak GD. 2002. Deciphering auditory processing disorders in children. Otolaryngologic Clinics of North America, 35(4):733-749.

Cirrin FM, Gillam RB. 2008. Language intervention practices for school-age children with spoken language disorders: A systematic review. Language, Speech, and Hearing Services in Schools, 39(1):S110-S137.

Clahsen H. 1991. Child language and developmental dysphasia. Philadelphia (PA): John Benjamins.

Conti-Ramsden G, Crutchley A, Botting N. 1997. The extent to which psychometric tests differentiate subgroups of children with SLI. Journal of Speech, Language, and Hearing Research, 40(4):765-777.

Conti-Ramsden G, Botting N. 1999. Classification of children with specific language impairment: Longitudinal considerations. Journal of Speech, Language, and Hearing Research, 42(5):1195-1204.

Fey ME, Long SH, Cleave PL. 1994. Reconsideration of IQ criteria in the definition of specific language impairment. In: Watkins RV, Rice ML, editors. Specific language impairments in children. Baltimore (MD): Paul H. Brookes. p. 161-178.

Fisher SE. 2005. Dissection of molecular mechanisms underlying speech and language disorders. Applied Psycholinguistics, 26(1):111-128.

Gillam R, Cowan N, Day L. 1995. Sequential memory in children with and without language impairment. Journal of Speech and Hearing Research, 38(2):393-402.

Gopnik M. 1990. Feature-blind grammar and dysphasia. Nature, 344(19 April):715.

Gopnik M, Crago MB. 1991. Familial aggregation of a developmental language disorder. Cognition, 39(1):1-50.

International Classification of Functioning, Disability, and Health [Internet]. Geneva (Switzerland): World Health Organization. [cited 2009 Jan 7]. Available from: http://www.who.int/classifications/icfbrowser/

Johnston JR. 1994. Cognitive abilities of children with language impairment. In: Watkins RV, Rice ML, editors. Specific language impairments in children. Baltimore (MD): Paul H. Brookes. p. 107-121.

Law J, Garrett Z, Nye C. 2004. The efficacy of treatment for children with developmental speech and language delay/disorder: A meta-analysis. Journal of Speech, Language, and Hearing Research, 47(4):924-943.

Leonard L. 1998. Children with specific language impairment. Cambridge (MA): Massachusetts Institute of Technology.

Leonard L, Ellis Weismer S, Miller C, Francis D, Tomblin J, Kail R. 2007. Speed of processing, working memory, and language impairment in children. Journal of Speech, Language, and Hearing Research, 50(2):408-428.

Leonard L, Eyer J, Bedore L, Grela B. 1997. Three accounts of the grammatical morpheme difficulties of English-speaking children with specific language impairment. Journal of Speech and Hearing Research, 40(4):741-753.

Marshal C, van der Lely H. 2007. The impact of phonological complexity on past tense inflection in children with grammatical-SLI. Advances in Speech Language Pathology, 9(3):191-203.

Miller C, Kail R, Leonard L, Tomblin B. 2001. Speed of processing in children with specific language impairment. Journal of Speech, Language, and Hearing Research, 44(2):416-433.

Montgomery J. 2000. Verbal working memory and sentence comprehension in children with specific language impairment. Journal of Speech, Language, and Hearing Research, 43(2):293-308.

Montgomery J, Windsor J. 2007. Examining the language performance of children with and without specific language impairment: Contributions of phonological short-term memory and speed of processing. Journal of Speech, Language, and Hearing Research, 50(3):778-797.

Nippold M. 2007. Later language development: School-age children, adolescents, and young adults. 3rd ed. Austin (TX): Pro-Ed.

Olswang LB, Bain BA. 1991. When to recommend intervention. Language, Speech, and Hearing Services in Schools, 22(4):255-263.

Paul R. 2007. Language disorders from infancy through adolescence: Assessment and intervention. 3rd ed. St. Louis (MO): Mosby-Year Book.

Plante E. 1998. Criteria for SLI: The Stark and Tallal legacy and beyond. Journal of Speech, Language, and Hearing Research, 41(4):951-957.

Rice ML, Wexler K. 1996. Toward tense as a clinical marker of specific language impairment in English-speaking children. Journal of Speech and Hearing Research, 39(6):1239-1257.

Stromswold K. 1998. Genetics of spoken language disorders. Human Biology, 70(2):297-324.

Tallal P. 1976. Rapid auditory processing in normal and disordered language development. Journal of Speech and Hearing Research, 19(3):561-571.

Tallal P, Stark R, Kallman C, Mellits D. 1981. A reexamination of some nonverbal perceptual abilities of language-impaired and normal children as a function of age and sensory modality. Journal of Speech and Hearing Research, 24(3):351-357.

Tomblin JB, Records N, Zhang X. 1996. A system for the diagnosis of specific language impairment in kindergarten children. Journal of Speech and Hearing Research, 39(6):1284-1294.

Wexler, K. 1994. Optional infinitives, head movement, and the economy of derivations. In: Lightfoot D, Hornstein N, editors. Verb movement. Cambridge (MA): Cambridge University Press. p. 305-350.

Windsor J, Hwang M. 1999. Testing the generalized slowing hypothesis in specific language impairment. Journal of Speech, Language, and Hearing Research, 42(5):1205-1218.