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Special Article

Psychiatric Implications of Language Disorders and Learning Disabilities: Risks and Management

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ABSTRACT

This article reviews the relationship between different learning disabilities, language disorders, and the psychiatric disorders that are commonly associated with learning disabilities and language disorder: attention-deficit hyperactivity disorder (ADHD), anxiety disorders, depression, and conduct or antisocial personality disorder. The complex associations between language disorders and specific learning disabilities—dyslexia, nonverbal learning disorder, dyscalculia—and the various psychiatric disorders are discussed. Clinical vignettes are presented to highlight the impact of these disorders on a child's social and psychological development and the importance of early recognition and treatment. (*J Child Neurol* 2004;19:814-826).

Learning disabilities occur in 5 to 10% of the population.¹ They include reading disorder (dyslexia), developmental arithmetic disorder (dyscalculia), disorders of written expression (dysgraphia), and nonverbal learning disorders. Although not considered a learning disability in the classic sense, language disorder is often a precursor of dyslexia, can be associated with dyslexia in older children and adults, and can be a component of the other learning disorders. Dyslexia is the most common, constituting about half of all learning disabilities.¹ There is an extensive literature regarding the relationship of language disorders to dyslexia and to psychiatric disorders.²⁻²⁷ There is much less information about nonverbal learning disability, a much rarer disorder. Estimates of the prevalence of nonverbal learning disabilities within learning disability clinics range from 1 to 10%,^{28,29} with an estimated population prevalence of 1% or less. Relatively few studies deal with the relationship of nonverbal learning disability and psychiatric disorders, and very few relate to developmental arithmetic disorder or disorder of written expression. Therefore, the major emphasis here is on the relationship of language disorders and dyslexia to comorbid psychiatric conditions.

RELATIONSHIP BETWEEN LANGUAGE DISORDERS AND PSYCHIATRIC DISORDERS

Despite different methodologic approaches (varying samples and sample size, statistical power, criteria for psychopathology, eg, "emotional" and "behavioral" vs stricter criteria based on the *Diagnostic and Statistical Manual of Mental Disorders, Third Edition (DSM-III)*),³⁰ and different measurement strategies (eg, checklist vs clinical evaluation), the data have pointed with remarkable consistency to some core concepts: (1) certain types of speech and language impairment are more likely to be associated with psychiatric disorders^{2-5,9,11-13,15,31-33}; (2) some specific psychiatric disorders occur with greater frequency in children with speech and language disorders^{18-20,22-24,26,34}; (3) certain psychiatric disorders are more apparent at different developmental stages^{32,35}; (4) these associations are not explained by low IQ, marked hearing loss, brain damage, socioeconomic status, marital status of parents, or maternal education^{3-5,9,22}; (5) at least with the type of speech and language interventions offered in the 1980s (compared with the potential promise of current interventions), little impact was made on the severity of either speech-language disorders or psychiatric outcome^{12,32}; and (6) early language-based interventions when the child is in preschool or kindergarten hold the greatest promise for improving socioemotional and academic outcome.

General Epidemiology of Speech-Language and Psychiatric Disorders

Delays in language acquisition are more prevalent than emotional or behavioral problems in young children, and both tend to increase with increasing age. In a study of over 1000 subjects, the prevalence of expressive language delays in 18- to 23-month-old children was 13.5% and at 30 to 36 months was 17.5%.²³ This is considerably higher than the prevalence of socioemotional and behavioral problems in 1- to 2-year-old children,³⁶ suggesting that impaired social competence, rather than behavior problems, could be the early manifestation of impaired expressive language.

In a study involving 1655 5-year-old children in kindergarten, the overall prevalence of speech and language disorders was 19%, and there was little difference between boys and girls in speech impairment alone (boys, 6.58%; girls, 6.68%) or language impairment alone (boys, 8.17%; girls, 8.37%).⁸ However, more girls than boys manifested combined speech-language impairment (boys, 3.31%; girls, 7.06%).

Based on two recent epidemiologic studies in the United States, the overall prevalence of psychiatric disorders in children and adolescents is approximately 20.3% in children aged 9 to 11 years old and 30% in 18 to 24 years old, with nearly 50% reporting at least one lifetime disorder.^{37,38}

Speech-Language Disorders Associated With Psychiatric Disorders

Even at a very early age, children with language disorders manifest hard-to-manage behaviors and evidence of emotional distress. Irwin and colleagues examined 14 toddlers with delays in expressive language but not in receptive language (mean age 26.9 months, range 21-31 months) and 14 age-matched controls.³⁹ The children with delayed expressive language were rated higher in depression or withdrawal and lower in social relatedness, pretend play or imitation, and compliance than the control group. Mothers of the late-talkers endorsed higher levels of parent-child dysfunction. However, at this age, no differences were found in externalizing behaviors or peer relationships. Horwitz et al reported that by age 30 months, subjects with expressive language delay were four times as likely to have externalizing behavior problems by parental report.²³ In an epidemiologic study of 705 3-year-old children in a London suburb, Stevenson and Richman found that 59% of the children with delayed language also had behavioral problems, in contrast to 14% of the total sample.⁴⁰

In a study of 34 children ranging in age from 24 to 32 months with identified expressive language delay and a comparison group of normally developing children, Caulfield and colleagues identified a significantly increased rate of shyness or fearfulness in new situations and problems with bedtime (going to sleep, sleeping through the night, or remaining in own bed through the night—potentially anxiety-related issues).⁴¹ Benasich and colleagues observed that girls with language impairment were more socially withdrawn than control girls. Expressive language impairment at age 4 years significantly predicted social withdrawal behavior at age 8 years. Words descriptive of the girls included "secretive, won't talk, shy, withdrawn, likes to be alone, timid." In comparison, on some hyperactivity rating scales, language-impaired boys were significantly more hyperactive than controls.³³ Consistent

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with these findings, in addition to an association between language disorders and attention-deficit hyperactivity disorder (ADHD), Beitchman and colleagues also noted an increased rate of anxiety disorders in children evaluated at age 5 years.³¹

Tallal et al re-examined the relationship between language impairment and behavior problems in a group of 81 carefully evaluated children with language disorder compared with 60 normally developing children.³⁴ The psychiatric symptomatology was based on parent report using the Child Behavior Checklist.⁴² The investigators noted that only "immaturity" significantly differentiated language-impaired boys from normal boys, and aggressivity approached significance. The language-impaired girls had significantly increased rates of social withdrawal compared with normal girls. The investigators suggested that some of the behaviors resulted from the language disorder itself ("won't talk"), whereas others were related to attention problems and clumsiness. They suggested that both the language and psychiatric problems could have resulted from underlying neurodevelopmental delay.

Attention-Deficit Hyperactivity Disorder

ADHD is the most common child psychiatric disorder. It is therefore not surprising that it is a frequent comorbidity of a language disorder. Love and Thompson evaluated 200 children ranging in age from 2.8 to 7.7 years who were referred for psychiatric services.⁴³ Sixteen percent of the children had speech and language disorders alone, 25% of the children had ADHD alone (based on *DSM-III* criteria), and 48.3% had both speech and language disorders and ADHD. Twenty-eight percent of the children who had both receptive and expressive impairment had ADHD. ADHD was less frequent in children who had receptive language impairment (7.8%), expressive impairment (6.9%), or articulation disorder (6.0%). On a chart review study detailing clinical characteristics of inattentive type and combined types of ADHD in 276 children, Weiss and colleagues reported that individuals with inattentive-type ADHD were two to five times more likely to have a referral for speech and language problems and were at risk of academic underachievement.⁴⁴ Waxmonsky reviewed treatment interventions in children with ADHD, noting that children with comorbid learning disabilities and ADHD respond well to stimulants.⁴⁵ Similarly, Tannock and colleagues noted that medication improved certain aspects of language disorder.⁴⁶

Psychiatric Disorders Associated With Language Disorders

When carefully assessed for the presence of language disorders, a surprisingly large proportion of children who are diagnosed with psychiatric disorders were found also to have language disorders. Jenkins and colleagues conducted a longitudinal study of behavior problems in all ($N = 418$) preschool children in a geographic area of north London, evaluating them at ages 6 weeks, 6 months, 1 year, 18 months, 2 years, 3 years, and 4.5 years, and noted an association between delayed speech-language and behavior problems.²⁴ Although very young children were not identified as having language problems per se, their mothers expressed concern about their behavior. Twice as many children in the group with atypical language development manifested behavior problems compared with those without language disorder.

Language disorders are easily overlooked, particularly in children with behavioral disorders. Cohen and colleagues evaluated 399 children, aged 4 to 12 years (mean age 8.82 years, $SD \pm 2.3$ years) in a psychiatric outpatient clinic.²⁰ Of the 399 children, 111 had been previously found to be language impaired. However, 99 other children (34.4%) were found, on further evaluation, to have an unsuspected and somewhat more subtle language disorder.

In a study of children with mild to moderate behavior disorders, Camarata et al reported that 37 of 38 (97%) fell at least 1 SD below the mean on one or more of subtests of the Test of Language Development—Intermediate.^{18,47} The authors recommended that other areas of language, such as phonology and pragmatic skills, should also be evaluated. Cohen and colleagues noted a strong co-occurrence of language disorders and symptoms of ADHD.²⁰ Those children who had been referred psychiatrically who had not been suspected of having language impairments and were subsequently diagnosed with a language disorder had more severe externalizing behavior problems. In the study by Baker and Cantwell involving 600 children with speech-language disorders, 50% received a *DSM-III* axis I psychiatric diagnosis.³ Diagnoses included ADHD, conduct disorder, oppositional disorder, anxiety disorders, affective disorders, and adjustment disorders. They observed that psychiatrically ill children showed significantly more disorders involving language, as well as delays in articulation, expressive language, and/or language comprehension skills. In a review of 40 consecutive admissions to a child psychiatry inpatient service, Gualtieri and colleagues reported that over 50% had moderate to severe developmental language disorders.²² *DSM-III* psychiatric diagnoses included attention-deficit disorder with hyperactivity, conduct disorder, schizoid disorders, adjustment reaction, and schizophrenia.

Other Factors Contributing to the Risk of Speech-Language Disorder

In their study, Baker and Cantwell evaluated a number of factors that might explain the strong link between language and psychiatric disorders—low IQ, marked hearing loss, and brain damage—noting that they were found in only a small percentage of their sample, and could not account for the association.³ Beitchman and colleagues specifically investigated family demographic variables—socioeconomic status, marital status, and maternal education—that might affect the relationship between speech and language impairment and psychiatric disorders.⁹ Although these variables distinguished disturbed from normal children in the normal language group, they did not distinguish normal children from children with psychiatric illness in the language-impaired group. However, in the study reported by Horwitz and colleagues, children with language problems tended to come from homes characterized by low education, low expressiveness, poverty, high levels of parenting stress, and parents who reported worrying about their children's language problems.²³

Longitudinal Studies

A number of longitudinal studies examining the emerging relationship between language disorder and behavior problems have been carried out. In addition to the early age at appearance of behavior problems in children with language disorder, it is also apparent that the psychiatric symptomatology does not improve with age.

Horwitz and colleagues noted a pattern of impaired social competence as early as 18 to 23 months of age, which persisted at the 24- to 29-month age range.²³ In the young child, poor social competence rather than behavior problems appeared to be more strongly related to impaired expressive language, but by age 30 months, a correlation between behavior problems and expressive language delays was apparent. Children with language delay were four times more likely to have externalizing behavior problems on parental report compared with controls. Stevenson and colleagues re-examined the children they had initially studied at age 3 years and found that behavior problems persisted at age 8 years.⁴⁸

In a longitudinal study of approximately 1000 children, assessed at ages 3, 5, 7, 9, and 11 years, Stark and colleagues noted depressed IQ and slower progress in reading in the language-impaired groups compared with controls.²⁷ Receptive and receptive or expressive language delay (but not expressive language delay at age 3 years) was predictive of behavioral problems at ages 7, 9, and 11 years.

Baker and Cantwell examined the psychiatric, linguistic, and educational status of 300 communication-impaired children 4 to 5 years after the initial evaluation.³ Forty-four percent of the children were diagnosed with a *DSM-III* axis I psychiatric diagnosis. In a subsequent study, Baker and Cantwell reported that only one fourth of the children studied had no remaining speech or language disorders at follow-up (most of the children who recovered had speech problems, not language problems).³ The majority of their subjects continued to manifest both speech and language problems. Expressive language and language comprehension did not show significant improvement over time.

Beitchman and colleagues noted that psychiatric disorder, at age 12.5 years in individuals who had originally been identified at age 5 years with speech and language disorders, was more likely to occur in individuals with language disorders than with speech disorders, even if speech and language improved.¹² Pervasive speech-language impairment at age 5 years was associated with continued increased risk of poor linguistic and academic outcome at age 12.5 years, with 72% of children with language impairment at age 5 years continuing to experience language impairment at 12.5 years. They also noted that about one third of these children went on to develop a psychiatric illness by age 12.5 years. Thirty-one percent of language-impaired boys had a diagnosis of ADHD, an incidence that was approximately the same as at age 5 years.

When 244 subjects in this group were re-evaluated at age 19 years, significant stability in language performance and academic achievement was noted, with the greatest difficulties with success occurring in the language-impaired group.^{35,49} Language impairment at age 5 years is associated with an increased risk of psychiatric disorder at age 19 years.³² Beitchman and colleagues noted significantly higher rates of anxiety disorders (15.8% for the speech-only group, 26.7% for the language-impaired group, and 8.1% for controls).³² The most common anxiety disorder identified was social phobia. Individuals with language impairment had higher overall rates of psychiatric disorder: 21.6% for individuals with speech-only impairment, 40% for the language-impaired group, and 21% for controls. Antisocial personality disorder rates were 13.2% in the speech-impaired group, 19.5% in the language-impaired group, and 7.8% for controls. In male participants, the risk of overall psychiatric

disorder, anxiety disorder, and antisocial personality disorder rates was related to speech-language status, with the language-impaired group having the highest rates. However, the speech-impaired group was not significantly different from the control group. In the small group of female subjects in this study, there were no psychiatric disorders that separated based on speech-language disorder status. Very few participants suffered from bipolar disorder, panic disorder, or generalized anxiety disorder. No participants met the diagnostic criteria for schizophrenia. Two participants had an eating disorder. The authors observed that it is not surprising that many children with language problems develop psychopathology associated with speaking to others, public speaking, and social interaction. Interestingly, substance abuse disorders occurred only slightly more frequently than in the controls. The authors hypothesized that because some young adults with speech-language disorders were less socially successful, the social opportunities and pressures were less, decreasing the tendency to use illicit substances.³²

Pure articulatory disorders, without other language problems, carried a much better prognosis than language disorders, with or without articulatory impairment.^{3,50}

Does Speech-Language Therapy Modify Psychiatric Outcome?

Longitudinal studies indicate that children with speech impairments only appear to improve in terms of academic performance and psychiatric diagnosis. The developmental trajectory for children with impaired language is much more concerning. Interventions offered in the past have not appeared to significantly impact the language, academic, or emotional success of these children.^{3,9,12,20,27,31-33,35,49,51,52} Hopefully, more contemporary interventions for language and reading disorders, which assess the specific nature of the deficit and focus interventions on phonemic awareness and/or syntax, semantics, and grammar, will not only have a positive impact on language but will also enhance academic success.⁵³ It will be of great interest to see whether this also lends some protection against the development of associated psychiatric disorders. These findings will also clarify the relationship between language and psychiatric disorders (ie, whether one disorder leads to another or whether there are common, underlying neurodevelopmental factors that result in difficulties in both areas).^{6,25,34,54}

Case Vignettes

The following vignettes illustrate the problematic outcomes of children with language and concomitant learning disabilities.

Case 1

Linda had been diagnosed as having an expressive language disorder and dyslexia (her IQ was in the above-average range) and had received learning disability services in a special school since second grade. She developed chronic, disabling vertigo at age 9 years, which resulted in recurrent absences from school. (Her mother also had frequent vertiginous episodes.) By the time she was in seventh grade, she missed 3 weeks of school at a time and in eighth grade missed approximately half of the year. Linda had been evaluated by multiple professionals from various specialties, including neurology, psychiatry, and otolaryngology. She went through surgical procedures related to her vertiginous symptoms, with marginal improvement. Her psychiatrist noted dysphoria and impaired self-esteem. Multiple medications were used, including meclizine, hydrochlorothiazide, triamterene

and hydrochlorothiazide, and selective serotonin reuptake inhibitors, without clear benefit. Linda reported that the medication that helped the best was diazepam.

In the summer before her freshman year, her family relocated to another area of the country, partly in an effort to improve her symptoms. In her new home, she appeared to adjust well and was off to a good start at her new school, one of the local large public high schools, when her symptoms recurred approximately 1 month into the first semester. Linda was evaluated by a new collection of physicians. Her neurologist felt that her presentation was consistent with migrainous vertigo and initiated amitriptyline, and an otolaryngologist felt that this was the likely diagnosis. As part of her treatment, Linda began to see a psychiatrist and underwent a neurocognitive evaluation, which revealed a 20-point standard score discrepancy between a high-average IQ and low-average receptive and expressive language skills. She was noted to have substantial deficits in phonologic awareness, phonologic working memory, rapid naming, word decoding, and spelling with average-range reading comprehension. She was also diagnosed as having the inattentive type of ADHD.

Linda was very strong-willed and defiant at home, and considerable conflict centered on homework owing to her difficulty with reading and writing. She had not posed any behavior problems at school, and school authorities did not raise any questions about her long periods of absence. Linda had rejected receiving accommodations at school because she did not want to feel singled out or different from peers. Predictably, she has been unenthusiastic about medication and reluctant to try new medication targeting attentional issues. Amitriptyline appeared to be effective with the migrainous vertigo and dysphoria and also likely helped with attention. Linda made a unilateral decision to discontinue this medication and has had a gradual re-emergence of her symptoms off medication. Over a period of 6 months, Linda has started to work on what it means to her to have a language-based learning disorder and ADHD. Linda completed intensive phonologic awareness-based reading remediation over the summer. Atomoxetine was prescribed for ADHD, predominantly inattentive type to help with attention and focus issues. She is currently motivated to try to change how she is coping with her learning disabilities.

This vignette illustrates the following issues:

- Linda's self-esteem is problematic and appears to have been negatively impacted by her academic difficulties.
- Although Linda is aware of lowered self-esteem, she has lacked the ability to self-monitor and pace herself. As a result, she has had a consistent cycle, fluctuating from being bedridden to overdoing it and precipitating the next episode of migrainous vertigo; developing better self-regulation skills will be an important part of treatment.
- Although Linda has a legitimate medical diagnosis, her symptoms become exacerbated under periods of academic stress, indicating that somaticization is a component of her coping strategies.
- Linda also has used denial to cope with her difficulties.
- These maladaptive coping strategies are anticipated to interfere with reading remediation strategies and will need to be addressed as part of treatment.
- Treating the comorbid attentional issues more aggressively will likely improve her endurance and success with intensive remediation.
- Linda's desire to minimize accommodations should be supported; the more the individual can be supported to meet the academic standards applied to peers, the greater the opportunity for success in college and as an adult. The greatest success has been seen when individuals with a learning disability can plan for and take the additional time and effort needed to com-

plete their work. This requires a greater reliance on industrious focus and less on denial as a style of coping.

- Children with learning disabilities who are not behavioral concerns do not appear on the "radar" of school districts with the same "at-risk" status as children with externalizing behaviors.
- Gradual focus in therapy on what it means to have a language-based learning disorder has led to some shift in Linda's level of denial. She is beginning to explore alternative coping strategies and is working to address the fundamental language difficulties through intensive phoneme-based interventions.

Case 2

Roger, a 22-year-old man, was referred for psychiatric evaluation by his mother and current psychiatrist. Roger had a childhood diagnosis of dyslexia and as a young adult had been diagnosed with bipolar disorder. Roger's symptoms of mood disorder included mood swings, irritability, and aggressive behavior, all of which improved on carbamazepine. Roger continued to have difficulty with organization and follow-up on projects. Cannabis abuse on an almost daily basis was also an issue. Cannabis abuse did not occur with peers but when Roger was alone in his apartment.

Roger's developmental milestones were, in general, on time, although as a preschooler he was noted to make unusual phonemic sequencing errors. His academic difficulties were first noticed by parents and school in third grade, and by fifth grade, he was engaged in almost daily conflict with peers and teachers. In fifth grade, an evaluation demonstrated auditory and visual processing deficits. Roger entered schools specializing in the treatment of learning disorders. On interview, he acknowledged that he would do almost anything to get out of school, which was for him an excruciatingly painful experience. Behavioral and academic problems remained at the forefront, and he ultimately left school and obtained his general equivalency diploma. Academically, math was always his easiest subject, with reading and writing representing significant challenges. Roger also has significant talent in the visuospatial arena. He is reported to be able to look at complex electrical circuitry plans and quickly assimilate the information.

Neurocognitive testing revealed an about average IQ, coupled with low-average word-decoding skills and average-range reading comprehension, consistent with dyslexia. He had ADHD, with otherwise good executive function and bipolar disorder by history.

This vignette illustrates the following points:

- Roger's behavioral difficulties are typical of some individuals with language and academic difficulties.
- His behavioral difficulties might have been further complicated by childhood-onset bipolar disorder. Maladaptive coping strategies might also have been part of the picture.
- Roger continues to have maladaptive coping strategies, as exemplified by his ongoing cannabis abuse, which interferes with his ability to develop more appropriate and functional skills.

Analysis of Case Vignettes 1 and 2

The self-esteem of each of these young persons was fragile, and there were few areas of their lives in which they felt successful. Linda's coping skills included "flight" into the socially more acceptable role of being sick (and, indeed, somatic complaints often occur in people with dyslexia), whereas Roger coped by turning to "fight"; thus, they effectively removed themselves from the stressful situation of the classroom. Both Roger and Linda come from highly educated families in which academic success is held to a high standard. This standard might have played a role in the specific coping strategies they developed.

The information reviewed in this section would suggest that there is a close relationship between language impairment and psychiatric disorders, which appears very early in childhood. The development of personality and a child's sense of competence in social situations is likely to rest squarely on the development of language.²² Although it is often not possible to make a formal psychiatric diagnosis in the very young child, language disorders evolve into significant psychiatric disorders by the time the child has entered school and persist into adulthood. An early sign of a potential language problem is parent-child conflict.^{23,24,43} Horwitz and colleagues pointed out that the combination of poor expressive language with poor attention and noncompliance in children in the absence of blatant auditory or cognitive impairments suggests that poor expressive language might not be an isolated problem.²³

It is also not clear at this point if specific subtypes of language disorder tend to be closely linked to particular types of behavior problems. Beitchman and colleagues have suggested that early auditory comprehension problems might be a specific risk factor for later aggressive and hyperactive symptoms,¹² but other authors have argued that, at least in 30-month-old children, externalizing behaviors are associated with expressive language delay.²³

Helping parents and teachers understand the effect of a language disorder on a child's social behaviors can have a very positive effect. Cohen and colleagues speculated that adults can have inappropriate expectations and interpretations of the child's behavior and perceive the behaviors of these children as noncompliant or inattentive, leading to frustration with the child and punitive treatment.²⁰ (Certainly, we have encountered children whose parents and teachers feel that they are "stubborn" and "oppositional" when, in reality, they do not always understand what they are being asked to do.) Cohen et al pointed out that when adults understand the underlying language difficulties and the cascading effect on family, peer, and school activities, they are less likely to interpret these behaviors in a negative light, as misbehavior. Teaching parents and teachers how to effectively employ structured, repetitive routines and visual cues, including visual representations of time, such as picture calendars, can make a major difference in the way in which a child manages in the classroom and at home.

Case 3

Cindy, an 8-year-old girl who had been diagnosed with a severe expressive-receptive language disorder and ADHD, attended a classroom for children with specific language impairment. She did not understand time concepts ("after lunch," "tomorrow") and would have intense, prolonged tantrums when asked to shift from one activity to another. She would pester her mother incessantly if she knew that an exciting trip was planned in the future. When driving in the car, she often became agitated if there was a change in the route or in the timing. The staff worked with her mother and teacher to develop a picture schedule and calendar, as well as other visual cues. Her mother expressed amazement when she was able to explain, in the visual format, the afternoon's plans and by simply reviewing the visual schedule with Cindy when she appeared to become distressed or confused was able to abort the usual angry outburst.

Analysis of Case Vignette 3

In addition to disturbed parent-child relationships, early communication difficulties can negatively impact peer relationships owing to impaired ability to participate in symbolic play, make-believe games, group games, and structured social interactions.³ Teasing

can further complicate peer relationships and self-esteem. Children appeared to be more likely to have behavioral difficulties when challenged with increased processing demands and faced with repeated failure.¹² Social anxiety and avoidant behavior can stem from early experiences of peer rejection and fears of embarrassment and humiliation.³² Understanding language impairment and effective interventions might improve behavior and help children resolve at least some of their emotional dilemmas. Failing to identify and treat a language disability at an early age places a child at risk of significant long-term academic and emotional disadvantages.

LEARNING DISABILITIES

Dyslexia

Dyslexia is the most frequently encountered learning disability. In a research study—identified epidemiologic sample, 8.7% of boys and 6.9% of girls in second and third grade were diagnosed as having a reading disability.⁵⁵ Dyslexia is a language disorder characterized by deficits in phonologic awareness and concomitant difficulty in word decoding. However, dyslexia is often associated with the additional manifestations of language disorder discussed in the previous section.¹ Dyslexia is discussed in considerable detail in other articles in this issue of the *Journal of Child Neurology*, and the reader is referred to these articles for detailed information about dyslexia. The focus of this section is on the psychiatric comorbidities of dyslexia.

It has been well established that language disorder is a precursor of dyslexia: early speech and language skills predict individual differences in literacy outcome.^{5,17,26,27,56,57} Gallagher and colleagues studied 63 children identified as genetically at risk of dyslexia compared with 34 children from families reporting no history of reading impairment.⁵⁸ At age 6 years, 57% of the at-risk group were delayed in literacy development compared with 12% of controls. The children in the literacy-delayed group also showed significantly slower speech and language development. Letter knowledge at age 45 months was the strongest predictor of literacy at age 6 years. Scarborough conducted a longitudinal study of preschool children and noted that at 2.5 years of age, children who subsequently were diagnosed as reading disabled manifested deficits in length, syntactic complexity, and pronunciation accuracy.^{56,57} At age 3 years, deficits in receptive vocabulary and object naming appeared, and by 5 years, they had weak letter-sound knowledge, naming, and phonemic awareness. These problems did not appear to be related to environmental causes and were not noted in a comparison group of children who also came from families with dyslexia but who did not have early reading problems.

Although the relative proportion of pure phonologic awareness deficits to underlying language disorders is not clear, it is apparent that many children with dyslexia also have concomitant language disorders. This raises the question as to whether the psychiatric disorders associated with dyslexia are related to a common underlying language disorder that is a precursor of dyslexia or are specifically related to dyslexia. Certainly, any child who performs poorly in school is likely to develop a negative self-concept.^{59,60} It would appear that a learning-disabled child is likely to manifest a pattern of increasing social and academic dysfunction as early as the first three grades.⁶⁰ Conventional special education

services were not noted to remediate the progressive pattern of underachievement even when services were initiated as early as first and second grade. Scarborough suggested that children who become dyslexic have an underlying neurocognitive condition that impedes mastery at each developmental challenge.⁶⁶ Thus, children with dyslexia, even those with relatively mild language disorder, are likely to have persistent but changing learning problems and are at increased risk of psychiatric disorders.¹⁷

Dyslexia and Specific Psychiatric Comorbidity

ADHD is the psychiatric disorder most frequently associated with dyslexia.¹ This is a bidirectional relationship and holds true if one examines children with dyslexia for ADHD⁶¹⁻⁶³ or examines children with ADHD for dyslexia.^{64,65} Smart et al conducted a longitudinal study from infancy to age 6 years.⁶⁶ Grouping the children at age 7 years into four groups—those with reading disability, behavior problems, and both reading and behavior problems and a control group—they noted that there was a different developmental trajectory from infancy onward, with both of the groups with behavior problems bearing a strong resemblance to each other, whereas the reading-disabled children without behavior problems more closely resembled the control group. In this study, boys appeared to be more severely involved than girls.

In a twin study, Willcutt and Pennington examined two groups of twins ranging in age from 8 to 18 years (mean age 10 years)—192 with dyslexia and 209 without.⁶⁷ There was a highly significant difference in the incidence of ADHD in children with dyslexia (boys more than girls) compared with the boys and girls in the group without dyslexia. There was also an elevated rate of oppositional defiant disorder and conduct disorder in boys with dyslexia relative to the girls with dyslexia, who did not differ from the children who did not have reading problems. Thus, the boys with dyslexia in this study were at risk of externalizing behaviors, such as aggression and delinquency; a familial influence was also noted. A further statistical analysis also indicated that the presence of ADHD was the central factor.

Other studies have also noted an association between reading disability, conduct disorder, and later antisocial personality disorders.⁶⁸ In a classic epidemiologic study, Rutter and Yule noted that children with reading disability were almost five times more likely than children without reading problems to exhibit antisocial behavior.⁶⁹ Similar findings were reported in a study of 177 clinic-referred boys with reading disability (based on a discrepancy or regression model) and ADHD and conduct disorder, but as in the twin study reported above, statistical analysis demonstrated that the apparent comorbidity was related to ADHD.⁷⁰

One area of debate has to do with whether the association is primarily related to inattention or to inattention in combination with hyperactivity and impulsivity. In several studies in which the specific subtype of ADHD is identified, the link between the two disorders appears to be related to inattention rather than hyperactivity or impulsivity. For example, Willcutt and Pennington, in a twin study, noted that approximately 95% of the phenotypic covariance between dyslexia and symptoms of inattention was attributable to common genetic influences, whereas there was only 21% of phenotypic overlap between dyslexia and hyperactivity or impulsivity.⁶⁷ A similar observation was made by Maughan and colleagues, who

reported on a study of 1416 boys examined initially in first grade and then re-evaluated in the fourth and seventh grades.⁷¹ Subjects were identified as having low reading achievement (9.1% of the sample) on the basis of two criteria: first, scores at the first screening fell at or below the 6th percentile, and, second, they continued to show reading impairment on subsequent evaluations. Reading difficulties were strongly associated with the predominantly inattentive type of ADHD, as well as conduct disorder and delinquency, but not with hyperactivity or impulsivity. However, controlling for levels of inattentiveness, the low reading achievement–delinquency link was no longer significant. This relationship was not observed by Frick et al.⁷⁰

In a study of 466 children with reading impairment, behavior problems were more common than in controls.⁷² The behavior problems emerged before the reading difficulties came to notice and increased in the early school years. In the study reported by McKinney, 29% of the children were identified with attention deficit and 14.3% with conduct problems, and withdrawn behavior was noted in 11%.⁶⁰

Depression is another frequent comorbidity of dyslexia. Thirty-three percent of adolescents with dyslexia and young adults on an inpatient service were diagnosed as depressed.⁷³ In the study reported by Maughan and colleagues, depressed mood was markedly elevated in the poor readers (23%) compared with those who were not defined as having reading problems (9.6%) in the first and fourth grade samples, but depressed mood dropped substantially in the seventh grade subjects.⁷¹ The investigators further noted that although low reading achievement was linked to depressed mood at all three time points, there was no increased risk of depression beyond the presence of depression at the first evaluation. The investigators explored possible factors that might explain the increased vulnerability to depression, such as a “depressogenic” family environment, the effect of other comorbid disruptive behavior disorders, or the detrimental effect of depression on learning. Although all of these factors had minor effects, the most robust effect remained the association in the first time period between low reading achievement and depression. However, depression in children with dyslexia does not necessarily predict impaired functioning in adulthood. Adults with dyslexia were reported to be functioning at a level comparable to that of controls, although they continued to have reading and spelling problems and ADHD and were more likely to report symptoms of anxiety and depression.⁷⁴

Some children with dyslexia respond with increased anxiety, and this is frequently associated with depression. Girls with dyslexia are much more likely to manifest anxiety and depression than boys with dyslexia.⁶⁷ Somatic complaints were also elevated in this group. This is certainly well substantiated in clinical practice; it is very common for children with dyslexia to develop stomach-aches or other somatic symptoms, which serve to keep them out of school (see, for instance, case 1 in the previous section).

Thus, it is important for parents to be aware of the high prevalence of learning disorders in children with behavioral disorders, and they should not attribute academic underachievement to behavioral problems. Mattison and colleagues studied a group of 8-year-old children attending a classroom for “behavioral disorders” (ADHD, conduct disorder, conduct or oppositional disorders, and depressive disorders).⁷⁵ The children received special education

services and behavioral modification programs in small, structured classrooms. Of the 81 subjects, 52 (64.2%) met the diagnostic criteria for learning disability. Despite the services delivered, 61.7% of the subjects continued to meet the diagnostic criteria for learning disability, that is, their academic achievement scores were essentially unchanged when tested 3 years later at age 11 years, with the exception of written language achievement scores, which had declined. Moreover, the Wechsler Verbal and Full-Scale IQ scores of the learning-disabled children dropped significantly over that 3-year period. The authors noted that clinicians and special educators should not "assume that the academic performance of students with emotional-behavioral disorders is primarily related to their psychopathology and thereby overlook the role of comorbid [learning disability]."

Dyslexia and Social Relationships

Studies examining peer relationships demonstrate that children with dyslexia are often impaired. In a study of 65 third through sixth grade boys with learning disability, Landau and colleagues reported that children perceived their peers with dyslexia in a somewhat different light, depending on the verbal or performance profile.⁷⁶ Although all of the boys were equally deficient relative to controls in leadership and prosocial behaviors, the boys with a Wechsler Verbal IQ equal to Performance IQ had the most negative social reputation. The boys with a Wechsler Performance IQ greater than Verbal IQ were less popular but not significantly rejected by their peers. Boys with a Verbal IQ greater than a Performance IQ did best with peers. It was felt that a relative strength in verbal functioning might mitigate the development of negative social status. One should add to this formulation the fact that many of these children likely had disruptive behavior disorders.

The following two vignettes illustrate how early psychiatric symptoms emerge in children at risk of dyslexia with speech-language problems. These vignettes also demonstrate the promise of current interventions, particularly when initiated at an early age.

Case 4

Matt was a 4.3-year-old Caucasian male with average to above-average intelligence. Language delay was identified around 24 to 30 months of age. Matt was screened for developmental delay through Child Find at 18 months at his parents' request (there was a bilateral family history of dyslexia and an older brother who had both language problems and severe dyslexia), but no delays were apparent at that time, and the assessment team was impressed with his socialization and motor and language development. Development, they felt, was on track. Matt has good fluency but poor articulation and poor phonemic awareness. Examples of language errors include "I -gi-O's" for "GI Joes" and "campfire" for "vampire." He is a high-energy, impulsive youngster who seeks out sensory stimulation especially when tired. At age 30 months, he was climbing to the top of the play structure and leaping off (no other child in the preschool did that). He has poor body awareness, and although he has excellent motor control, he was constantly bumping into objects and people. Hypersensitivity to sound was also an issue. Potty training was achieved around age 48 to 50 months, being delayed by both avoidance of toilets owing to the sound of toilets flushing and a lack of awareness of the necessary physical sensations. At school, Matt sought out physical activities constantly, had some difficulty attending to circle time, was fidgety but attentive in reading time, and had limited interest in fine motor activities, such as drawing, until after 48 months of age. Simultaneous with the achievement of toilet training, there was a significant improvement in impulse control and attentiveness. Drawing and arts and crafts projects became sudden areas of interest.

Matt's play was characterized by involved imaginative games from an early age. Peer interactions were problematic owing to his frequent and well-intentioned "crashing and bumping" social interactions. Good friends in preschool were other very active, impulsive, "crashy" boys. The teachers at the preschool had their hands full. Matt was not a boy who was frequently invited to birthday parties.

Matt did not demonstrate any significant social anxiety, irritability, or depressive symptoms. He clearly met the diagnostic criteria for ADHD.

Matt's self-esteem was an area of concern. He became inconsolably sad and clearly ashamed of himself when he realized that he had hurt someone. When he acted in a socially inappropriate way in public and realized it, he appeared to be embarrassed and humiliated. It was also apparent that he did not know how to deal with these feelings and needed help working through them.

Occupational therapy and speech therapy were sought by Matt's family when he was diagnosed as delayed, and progress was made in all areas. There are still times, however, when Matt needs help with appropriately engaging with peers. His mother related one story in which Matt began to spit at and taunt his older brother, to the point that his sibling was in a rage. Matt gleefully fled into his mother's arms, with his brother in hot pursuit. When his mother was able to calm his brother, she talked to Matt, who apologized to his brother and said that he would not spit at or tease him again. No sooner was Matt out of this mother's arms than the same behavior ensued. Once the situation was calmed again, the mother asked Matt what he wanted; did he want his brother to play with him? He responded, "Yes." His mother suggested a more appropriate invitation to play. Matt repeated these words to his brother, who immediately suggested a game, which they successfully engaged in together.

Matt embarked on a program appropriate for preschoolers to enhance phonological awareness. Interestingly, he responded very positively and made strides in phoneme discrimination, sequencing, and blending. The complexity and fluency of his speech also improved after brief exposure to this program.

Case 5

Scottie was a cuddly, happy baby who was nicknamed "the laughing Buddha" by his day-care providers. However, as he moved from infancy to toddlerhood to preschool, it became apparent that his language was delayed. Behavioral concerns followed language delays but were quite apparent during the early preschool years, with frequent temper tantrums at school. Although temper tantrums at home were less of an issue, his parents and extended family noted a dysphoric quality and significant excessive worry, which verged on obsessionality. Given a maternal family history of ADHD and dyslexia and a paternal family history of hearing impairment, dyslexia, and mood and anxiety disorders, his family had closely watched his developmental progress.

Language and occupational therapy evaluations occurred at 30 months of age, and he was diagnosed with apraxia of speech, some fine motor skill deficits, and sensory-motor integration abnormalities. Although Scottie made significant gains in language fluency, fine motor skills, and sensory modulation, significant difficulties in phonemic awareness, word retrieval, and ability to focus were noted during the kindergarten year. At that very early age, he had already picked up on the fact that letter and sound identification was very difficult for him compared with his peers and described himself as being "dead meat," with profound anxiety, when he received news that he would be moving on to the first grade.

Intensive speech-language therapy was initiated using the Lindamood Phoneme Sequencing program,⁷⁷ an intensive phonemic awareness training program (5 days a week during the summer before first grade). The speech therapist noted poor success initially owing to inattentiveness, fatigue, and emotionality. Although he was not hyperactive, avoidant behaviors were a major problem. Atomoxetine was started. There was an almost immediate improvement in attentiveness from 40 to about 95%, with significant gains made in the therapy. Over a short period of time, his family also noted a substantial decrease in dysphoria, irritability, anxiety, and obsessionality. When Scottie entered the first grade, he was ahead of his peers on reading basics. Although, over the summer, the use of tangible rewards (eg, Yu Gi Oh! cards) was necessary to motivate him to work, by the fall, he began to read for the sake of reading. Most importantly, he had shifted his self-perception

from that of a nonreader to that of a successful reader. Once he felt success with his skills and his self-image improved, he sought out reading opportunities and challenged himself instead of avoiding reading. When Scottie completed first grade in a private school with high academic expectations, he was firmly at the median in reading skills compared with his classmates, according to his reading teacher. He was well liked by his teachers and peers and was described as an earnest, serious learner. Scottie's self-confidence had vastly improved. At the end of first grade, he felt that he was ready and could handle the challenges of the second grade. Emotional outbursts were rare, although still present on occasion. Outbursts most commonly occurred when he was tired and frequently were in response to a misperception of what someone had said to him or a provocation by his younger brother, Matt. Sports have been an area of challenge for Scottie. He has been most successful in individual sports and has set personal goals in karate that he is focused on achieving. As his confidence has improved, he has been more willing to engage in team sports and appears to be less overwhelmed by all that must be tracked in team activities. After the 9-week intensive treatment program during the summer before first grade, followed by twice-a-week work with the reading specialist team, Scottie's reading and comprehension were squarely at grade level and nonword reading was at a third-grade level, and he was an enthusiastic learner.

In addition to his language and reading impairments, Scottie had significant gifts in the visuospatial domain. By age 3.5 years, he appeared to have an internal map of the town in which he lived, with an excellent directional sense. He understood the physical relationship of objects to each other in the town. His drawings were very sophisticated and detailed for his age, and he enjoyed working with clay in three dimensions. He also had well-developed empathic skills for his age. By age 6 years, he had accumulated 200 dollars through hard work, could count it, and understood the value of money. He knows to the penny exactly what is in his money market account (yes, his own money market account) and asks when his statements are coming.

Analysis of Case Vignettes 4 and 5

These clinical vignettes highlight the following issues:

- Each child demonstrated normal social development up to the point that language impairment interfered with communication success.
- When language impairment was apparent, sensory-motor abnormalities were also noted.
- From a very early age, both children had an awareness of areas of impairment and difficulty, although they did not possess the tools to address or correct the problem.
- From a very early age, both children demonstrated impaired self-esteem and behavioral concerns.
- Although the presentation was strikingly different for each child, social and behavioral difficulties followed language and sensory-motor integration impairments.
- When interventions in reading are initiated, often, until a child feels successful at reading, external sources of motivation are necessary.
- Identification and treatment of any comorbid psychiatric issues and involvement of the family in the treatment process are an important part of intervention.
- With learning disabilities, frequently, there are areas of talent. Often for individuals with developmental reading disorders, these talents are in the visuospatial arena and in empathic skills.
- Identifying and developing areas of talent and success are an important ballast for areas of disability.
- Self-esteem improves with tangible gains in skills and with the perception that one is on track compared with one's peers.

- For both of these children, school professionals consistently took a "wait and see" attitude when specifically asked by the parents about diagnostic concerns, such as language evaluation when delays were apparent to the parents, about ADHD, and about specific interventions regarding language delays and early signs of reading difficulty. Frequently, the feedback was that the child was too young for intervention. For instance, at his individual educational plan meeting, his parents were told that there was no need to work on phonemic awareness in 4-year-old Matt. When Scottie was 2.5 years old, his preschool staff told his parents that most children "grow out" of their language delays, so there was no need for a speech and language evaluation. Only persistent, tempered advocacy by the family, along with provision of the necessary documentation of the importance of intensive intervention, led to evaluation and intervention.
- Early intervention appears to have changed the trajectory for Scottie in terms of language, reading skills, and self-esteem.
- The treatment of the emerging psychiatric problems appears to have improved behavioral concerns (although they are still present), with improvement in attentional deficits, anxiety, dysphoria, and obsessiveness.

Nonverbal Learning Disorders and Psychiatric Comorbidity

Nonverbal learning disorders are characterized by a cluster of impairments that are often linked to right hemisphere dysfunction. These include deficits in social or emotional functioning, visuospatial ability, motor function, mathematics learning, and prefrontal executive functioning. Relative strengths are noted in rote verbal skills, phonemic awareness, fluent speech, well-developed vocabularies, and good word-decoding skills. Although individuals with nonverbal learning disorder might initially have problems with graphomotor skills, which are present early in their school career, these usually improve. They are able to perform repetitive academic tasks with relative ease. Except for inattention and motor difficulties, the problems of children with nonverbal learning disability are likely to be minimized until later in their school careers, when they are required to deal with peers and in academic situations and make complex inferences about what they are learning, organizing information into novel conceptualizations. There is often a remarkable verbosity.

Rourke postulated a model that is organized into primary, secondary, and tertiary assets and deficits.²⁸ Primary assets include simple repetitive motoric skills, auditory perception, and mastery of rote or repetitive material. Secondary assets involve selective and sustained attention for simple, repetitive verbal material (especially through the auditory modality). Tertiary assets involve rote verbal memory. Primary deficits include tactile and visual perception, complex psychomotor skills that appear to increase in severity with age, and the ability to process novel situations. The resultant secondary deficits include impaired attention to tactile and visual stimuli (unless the material is coded verbally) and exploratory behavior. Tertiary deficits include impaired tactile and visual memory and deficits in concept formation, problem-solving, and hypothesis-testing skills. There are also problems in understanding the semantic and pragmatic aspects of language.^{78,79} These deficits appear to increase with age. Rourke postulated that nonverbal

learning disorder is related to dysfunction of white-matter tracts that serve to connect associational areas, with particular involvement of the right hemisphere.²⁸

Nonverbal Learning Disability and Psychiatric Comorbidity

ADHD is a well-documented comorbidity of nonverbal learning disability.⁸⁰ In a study of 20 children with nonverbal learning disorder (average age 9.5 years), all 20 children had ADHD, 16 had marked slowness of performance, and 18 were noted to have severe graphomotor problems.⁸¹

Anxiety and mood disorders frequently occur in association with nonverbal learning disability. In a study of four groups of 484 hospitalized inpatient adolescents and young adults (those with a nonverbal learning disability, verbal learning disorder, or general learning disorder or normal psychiatric controls), the incidence of depression was by far the highest in the nonverbal learning disability group (66.3%). In contrast, 33.3% of patients with dyslexia were depressed. Younger patients and female more than male patients were also at risk of depression.⁷³ Rourke and colleagues noted that individuals with nonverbal learning disability are at risk of serious impairment in occupational success, with resultant anxiety, depression, social isolation, and suicide risk.^{82,83} Two of the individuals in the sample carried a diagnosis of schizophrenia.

However, the first author has encountered a number of individuals who had been diagnosed with schizophrenia on the basis of unusual speech patterns, anxiety, and explosive behavior who were more accurately diagnosed as falling into the nonverbal learning disorder-Asperger's syndrome spectrum disorders. They have done well and have not developed psychotic symptoms after being tapered off antipsychotic medication. Treatment was directed at managing depression and anxiety and developing social skills. The use of atypical antipsychotic medications can be helpful for assisting with executive functions, such as impulse control in the face of processing difficulties. Most likely, these individuals benefited from antipsychotic medication for anger management and subsequently received the diagnosis of schizophrenia (Sundheim STPV, unpublished data).

There is some overlap diagnostically between nonverbal learning disorder and Asperger's syndrome. When stringent *International Classification of Diseases-10 (ICD-10)* research criteria were applied to individuals with high-functioning autism and Asperger's syndrome, the neuropsychologic profile of those with Asperger's syndrome, as opposed to autistic disorder, bore a strong resemblance to individuals with nonverbal learning disability on neuropsychologic profile.⁸⁴

In a literature review on the socioemotional functioning of individuals with nonverbal learning disability, Little noted that the literature revealed that people with nonverbal learning disabilities were at increased risk of both internalized and externalized emotional, behavioral, and social problems compared with individuals with other types of learning disability.⁸⁵ In an anonymous on-line survey on the prevalence of peer shunning and victimization of children with Asperger's syndrome and children with nonverbal learning disability, Little reported that 75% of the children had been bullied, 10% had been attacked by a gang, and 15%

were victims of nonsexual genital assaults.⁸⁶ These rates were significantly increased when compared with other Internet studies of victimization.

Given the concerning psychiatric comorbidity of nonverbal learning disability, early identification and specific interventions in areas of weakness should be instituted. Close monitoring of the child's social-emotional functioning is of extreme importance.⁸⁷

Developmental Mathematics Disorder and Disorder of Written Expression

There is an overlap between developmental mathematics disorder and nonverbal learning disability, although not all children with developmental mathematics disorder have nonverbal learning disability. Because mathematics disorder includes difficulty with calculation, one also encounters Gerstmann's syndrome, a disorder in which individuals have poor calculation, left-right confusion, finger agnosia, and poor handwriting (dysgraphia). No literature was available on the psychiatric comorbidity. The authors believe that the psychiatric comorbidities are likely to be similar to those of other learning disorders.

Disorder of written expression is characterized by a difficulty in organizing and presenting information in writing compared with the ability to do so orally. Children with this problem struggle with the mechanics of handwriting to such an extent that they lose track of the thoughts and ideas that they are working to put on paper. There can also be difficulties in translating information from an auditory-oral mode to a visual-written mode.¹ Disorder of written expression is often associated with language disorder, dyslexia, and working memory deficits. ADHD is a common psychiatric comorbidity.

Training Psychiatrists to Recognize Learning Disabilities

Psychiatrists receive extensive training in the diagnosis and treatment of psychiatric disorders, but in many training programs, the significant psychiatric comorbidity of language disorders and learning disabilities receives relatively minimal attention. In a survey of 22 psychiatric educators completed in 1980, only 2 respondents felt that familiarity with communicative disorders was an essential part of residency training.⁸⁸ Gualtieri and colleagues noted that psychiatrists do not seem to recognize speech and language disorders.²² Although the concomitant presence of emotional, behavioral, and language disorders has been well established since the early 1990s, the recognition and treatment of learning and the comorbid disorders still represent an area of relative weakness in the training of most child and adolescent psychiatrists. However, once the constellation of difficulties is recognized in one patient and the issues are worked through as part of treatment, the psychiatrist often understands how a learning disability contributes to the patient's clinical picture.

Helping Parents and Children Cope With a Child's Learning Disability

To help their child, parents need to come to terms cognitively and emotionally with the realities of their child's learning disability and any associated behavioral problems, as well as deal with any learning or behavior problems that they might have themselves. Although

this process might have begun long before they initiate evaluation and treatment, the formal diagnostic process in itself often heightens the need to acknowledge the child's situation from a new perspective. Some parents must confront their own learning problems from a different perspective and deal with their anger, guilt and sadness. They must revisit their own childhood experiences and the helplessness it engendered. For other parents, who do not have a learning disorder, it can be a challenge to comprehend their child's disability and the need for proactive intensive intervention. Convincing parents (even those who have identified the problem and seek help) that this is a very real diagnosis and that effective treatment is available means that the professionals working with them need to help them confront their pain and denial in a compassionate way that facilitates the effective pursuit of treatment.

When they recognize that their child has a learning problem, parents can respond in different ways. Some parents tend to minimize the problem and make the assumption that the child's learning disability will be dealt with by special education services in the school. However, although special education might stabilize academic achievement, it is unlikely that children will receive services that will remediate their skills.^{75,89-92} (See also the articles by Alexander and Slinger-Constant, and Schatschneider and Torgesen in this issue.^{93,94}) Some parents of children with learning problems and significant behavioral problems appear to assume that these problems will diminish with age. The information presented here would suggest that that is not the case. Parents must decide if they have the financial and emotional resources to provide intensive remediation services to their children in addition to what they receive in school.

Some parents respond by becoming extremely protective of their child and demand special interventions and accommodations. They might minimize the child's responsibility and accountability for inappropriate behavior or demand that the child not be required to perform to the standard of peers. Heavy accommodations do not prepare the child for "real life," and they communicate to the child that he or she is, indeed, "different" and is so impaired that special dispensations are required. These kinds of reactions can set in motion lifelong maladaptive behaviors. The former does not help the child develop appropriate behavioral strategies. The latter does not support the child in later success once school is completed. Both can lead simultaneously to a feeling of being damaged and support denial of the problem. Teaching the child how to negotiate the system is a much more successful strategy. Most successful adults do not deny their difficulties; in fact, they are exquisitely aware of their problems and are able to anticipate workloads and schedule adequate time and use other strategies that effectively enable them to perform to the standard of their peers.

Children with language disorders and learning disabilities develop ways of coping with the emotional impact of these disabilities long before entering school. However, once in school, the child rapidly becomes aware of the fact that certain tasks, which seem easy for peers, are extremely difficult. Although children might benefit from being pulled out of the regular classroom for special learning disability services, this is often a painful experience, particularly if the child denies the problem. The children

described in the vignettes simultaneously denied their difficulties, although, at the same time, they appeared to be greatly troubled by the implications of their diagnoses. It also seemed to disturb them that they were singled out for "help." It is possible that the diagnosis was not explained in a way that made sense to them and was experienced as akin to a "social disease." On the other hand, denial is frequently like an onion, and no matter how adequate the initial explanation of the diagnosis, it is necessary to revisit the issue, gradually addressing the layers of denial at a pace appropriate for the individual and family, which includes processing the experience of the individual and other family members, the prognosis, and providing factual information as a necessary part of coming to terms with any diagnosis. It is not helpful to talk about "dyslexia," "dysgraphia," or general concepts such as "learning disability" or ADHD. It is more helpful to the child to openly discuss the specific problem that is the manifestation of the learning disability and realistically emphasize strengths. For example, "I know you are frustrated and angry.... Sounding out words is hard work, and it does take you longer, but look how much you have learned," or "Yes, writing is hard, and I know Jimmy can write faster, but Jimmy isn't as good at math."

SUMMARY

Language disorders and learning disabilities carry a significant risk of comorbid psychiatric disorders that appear in early childhood and can persist into adulthood. These disorders—ADHD, anxiety disorders, depression, and antisocial personality disorder—have been extensively documented in the literature. Serious academic, occupational problems are often associated with learning problems and psychiatric disorders. In some cases, disruptive behavior disorders in childhood lead to delinquency and antisocial personality disorder. It appears that the major risk factor is ADHD and ADHD of the predominantly inattentive type, although this is still a subject of some controversy. In the past, both speech-language interventions and school-based learning disability interventions have not changed the academic or behavioral patterns of concern. Recent phoneme-based language interventions have initiated brain-based changes documented on functional magnetic resonance imaging and appear to be a promising therapeutic approach. However, whether these interventions will have greater success in altering behavioral patterns over the long range has yet to be determined. Finally, it should be emphasized that the early diagnosis and treatment of ADHD in these children can improve some aspects of language and help these children become more effective learners, and research has demonstrated that treatment of ADHD can minimize the risk of developing a psychiatric disorder.⁴⁵

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