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Perceptions of Parents and Teachers of the Social and Behavior Characteristics of Children with Reading Problems

Tina Smith-Bonahue*
Anne Larmore
Jennifer Harman
Melissa Castillo
University of Florida

Children with learning disorders (LD) are at increased risk for a host of psychosocial problems, including Attention Deficit Hyperactivity Disorder (ADHD) (e.g., Bouffard, Roy, & Vezeau, 2005; Elksnin & Elksnin, 2004; Greenham, 1999; Michaels & Lewandowski, 1990; Sideridis, Morgan, Botsas, Padeliadu & Fuchs, 2006; Weiner & Tardiff, 2004). While the co-morbidity between learning disorders and Attention Deficit Hyperactivity Disorders (ADHD) has been well documented, the nature of the relationship between the disorders and the overlap of manifested symptoms have not been thoroughly examined (Zentall, 2005). This study examines parent and teacher ratings on the Behavior Assessment System for Children for 91 students with learning disorders referred for reading problems, both with and without Attention Deficit Hyperactivity Disorder. Both parent and teacher ratings differed significantly from the mean for all children in the sample for Internalizing and Social Problems. Parent and teacher ratings suggested significantly more difficulties with Externalizing behaviors for children with both ADHD and LD compared to children with LD. Parent ratings suggested that the children with both LD and ADHD had more difficulties with hyperactivity than the children with LD only; teacher ratings suggested more difficulties with attention and learning for the children with both LD and ADHD.

Keywords: Learning disabilities, internalizing behaviors, externalizing behaviors, Attention Deficit Hyperactivity Disorder

Although academic difficulties represent the most central feature of learning disabilities (LD), social-emotional concerns surrounding LD have long been reported, with an extensive body of literature suggesting that students with LD are more likely to experience psychosocial difficulties than their typically developing peers (e.g., Bender & Wall, 1994; Bouffard et al, 2005; Elksnin & Elksnin, 2004; Greenham, 1999; Kistner & Gatlin, 1989; Michaels & Lewandowski, 1990; Sideridis et al., 2006; Weiner & Tardiff, 2004). Evidence of deficits in the emotional, behavioral, and social development of children with LD abounds (Bender & Wall, 1994), including internalizing and externalizing problems and social skills deficits (Greenham, 1999; McConaughy, Mattison, & Peterson, 1994). Attention Deficit Hyperactivity Disorder is particularly common among children with learning disabilities, and its

*Please send correspondence to: Tina Smith-Bonahue, Ph.D., Associate Professor, School of Special Education, School Psychology, and Early Childhood Studies, University of Florida, College of Education, PO Box 117050 Gainesville, FL 32611-7050, (352) 273-4289, Email: tmsmith@coe.ufl.edu.

effects frequently cannot be disentangled from the learning problems themselves. Ultimately, this body of literature suggests that in order to meet the needs of students who struggle academically, their social and emotional health status must be assessed as well. The purpose of this study is to examine the parent and teacher perceptions of the psychosocial functioning of students with learning disorders, both with and without ADHD.

Although researchers generally agree that social-emotional concerns often accompany learning difficulties, discussion regarding the mechanisms relating psychosocial and academic dysfunction continues (Elksnin & Elksnin, 2004; Greenham, 1999). One model suggests that psychosocial difficulties emerge as a secondary symptom from years of academic failure (Bryan, 1981; Greenham, 1999). This model has been described as a cycle of academic failure, subsequent negative feelings of helplessness and poor self-concept, and eventual social and emotional problems (Greenham, 1999). Consistent with this view, behavior problems such as hyperactivity and inattention have also been considered to represent a child's reaction to repeated academic difficulties (Torgeson, 1988). Work by Tomblin and colleagues (2000)—examining the association between reading disability, behavioral disorders, and language impairment—offers support for this hypothesis: these authors report that although the three disorders are correlated, reading mediates the relationship between behavior and language disorders (Tomblin, Zhang, Buckwalter, & Catts, 2000). Also supporting the hypothesis that academic difficulties precede psychosocial ones, researchers in Britain found that difficulty learning to read predicted internalizing behaviors through first grade and externalizing behaviors in later elementary school (Halonen, Aunola, Ahonen, & Nurmi, 2006).

On the other hand, which comes first, academic failure or psychosocial difficulties, is not entirely clear as other studies have found that motivation, metacognition, and psychopathology also predict learning difficulties and risk of learning difficulties. Sideridis and colleagues (2006) used a combination of affective and behavioral indicators and were able to predict whether or not adolescents demonstrated learning disabilities. In fact, using measures of motivation, metacognition, and psychopathology, these researchers yielded more accurate classification rates than have been reported by researchers using cognitive factors.

A second major hypothesis is that neither LD nor psychosocial problems are causative agents. Rather, LD and psychosocial problems co-occur because of common neurobehavioral conditions that manifest both in learning and behavioral problems (Rourke & Fuerst, 1991; Greenham, 1999). Weiner (2004) refers to this as a "single-risk" model in which the social deficits inherent to LD are thought to cause psychosocial difficulties. Cerebral dysfunction underlying both LD and psychosocial problems is supported by neuroimaging data, confirming brain abnormalities both in individuals with LD and those with psychiatric disorders (Greenham, 1999). Complicating the issue further, the relationship among neuroanatomical dysfunction, LD, and psychosocial problems is mediated by common cognitive covariants—e.g., language deficits, Attention Deficit Hyperactivity Disorder, ADHD (Gibbs & Cooper, 1989; Riccio, Gonzalez, & Hynd, 1994), as well as psychosocial covariants such as self-esteem, test anxiety, negative future expectations, and motivation (Bouffard et al., 2005; Lufi & Darliuk, 2005; Sideridis et al., 2006; Zentall, 2005).

An additional model relating LD and psychosocial adjustment has been termed a "multiple-risk" model (Weiner, 2004). According to this theory, children with LD who experience other risk factors, in addition to LD, are more likely to experience more problems socially with internalizing and externalizing behaviors than children with LD who do not experience additional risks (Weiner, 2004). Children with LD who are exposed to risks such as poverty, ADHD, being an English language learner, unaccommodating educational environments, or family difficulties are more likely to exhibit psychosocial maladjustment (Weiner, 2004).

Frequent comorbidity for ADHD and LD is consistently reported in the literature (e.g., Greenham, 1999; Riccio et al, 1994; Spencer, Bierderman, & Wilens, 1999). Both LD and ADHD are generally defined in terms of children's inability to succeed in the academic environment, albeit often in different aspects of their environment (Zentall, 2005). Given that failure to succeed defines both LD and ADHD, regardless of underlying causation, children who display both conditions are likely to experience failure globally, in terms of academic achievement and behavioral conformity. Thus, while in itself, ADHD represents a significant risk-factor for poor social skills and behavior problems (Weiner, 2004; Fussell, Macias, & Saylor, 2005), children with both LD and behaviors characteristic of ADHD (e.g., inattention, hyperactivity) seem to be at even greater risk for peer rejection and psychosocial difficulties than typically developing children and those with LD or ADHD alone (Flicek, 1992; Kistner & Gatlin, 1989; Weiner, 2004; Mayes, Calhoun, & Crowell, 2000).

Social Skills and Relationships

Many students with LD experience more difficulties with interpersonal relationships and exhibit lower levels of social competence than students without LD (Kavale & Forness, 1996; LaGreca & Stone, 1990; Michaels & Lewandowski, 1990). Children and youth with LD tend to have poorer social skills and to be less well accepted by peers than normally achieving students (Haager & Vaughn, 1995). A meta-analysis of 152 studies revealed that an average of approximately 75% of children with LD exhibited deficits in social skills (Kavale & Forness, 1996). Teachers perceived academic incompetence and less social interaction as the major social skill deficits of students with LD; hyperactivity and distractibility were also among teachers' top concerns regarding social difficulties (Kavale & Forness, 1996). Many students with LD are aware of their own social difficulties: 7 out of 10 LD students rated themselves as having social skill deficits, while still viewing their academic difficulties as the most central problem (Kavale & Forness, 1996).

Sociometric studies suggest that children with LD are more likely to be rejected and are less likely to be accepted or popular (e.g., Kavale & Forness, 1996; Vaughn, Elbaum, & Schumm, 1996; Wiener & Harris, 1993). Peer status rankings in the literature indicate that as many as 30% of children with LD experience peer rejection, roughly twice as frequently as non-LD controls (Greenham, 1999; Ochoa & Palmer, 1991). However, some studies have suggested that children with LD experience average levels of acceptance by peers (e.g., in between rejected and popular) at similar percentages as their typically-achieving peers (Ochoa & Palmer, 1991; Greenham, 1999). The relationship among peer status, academic difficulty, and social skills has been found across age and cultural groups: a study of students in Greece revealed

that rejected students are more likely to have learning problems and exhibit fewer pro-social behaviors (Hatzichristou & Hopf, 1996).

The relationship among social functioning and other domains of psychosocial functioning in children with LD has emerged as an area of interest in recent years. While evidence suggests that students with LD are at risk for being rejected by peers, this relationship is complicated by comorbid internalizing and externalizing behaviors, and by the frequent overlap of ADHD and LD (e.g., Riccio et al., 1994). For example, while children with LD who did *not* have ADHD were rated by their peers as similar to typically-developing peers in terms of disruptiveness and aggression, children with ADHD and children with both ADHD and LD were viewed by peers as having higher levels of disruptiveness and aggression (Weiner, 2004). Students with LD and ADHD or ADHD alone possess fewer social perception skills than their non-ADHD peers (Hall, Peterson, Webster, Bolen, &Brown, 1999; Taylor & Tricket, 1989; Vaughan et. al, 1992).

Internalizing Problems

With regard to the emotional development of children and adolescents with LD, Bender and Wall (1994) asserted that "simply put, the majority of students with LD are not happy," (p. 329). Some research suggests that students with LD experience internalizing problems—including symptoms of depression and anxiety, lower self-concepts, and an external locus of control with respect to academic outcomes—at higher rates than their peers without LD (Bender & Wall, 1994; Greenham, 1999). Based on parent and teacher-rating scales and peer nominations, children with LD had significantly higher depression scores than those found in normative samples or in normally achieving controls (McConaughy et al., 1994; Greenham, 1999). Students with LD often (1) make more negative attributions and (2) display feelings of inadequacy and more negative attitudes toward school, and (3) are more likely to perceive academic outcomes as being controlled by others or external forces (e.g., luck), while simultaneously internalizing poor achievement as reflecting lack of intrinsic ability (Bender & Wall, 1999; Martinez & Semrud-Clikeman, 2004). In addition, lower self-esteem, lower motivation for on-task behavior, and more loneliness characterize children and adolescents with LD compared to their peers (Bender & Wall, 1994).

Clearly the risk of internalizing problems is higher among students with learning disabilities. At the same time, the literature is unclear on whether this difference reaches the threshold of clinical significance. Self-report measures have also indicated mild depressive symptoms in adolescents with LD; however, studies with more rigorous designs (e.g., those including a control group) suggest that individuals with LD are not at increased risk for *severe* depression compared to their non-LD peers (Greenham, 1999). Data from both clinic-based and school-based samples suggests that students with LD experience only slightly higher levels of anxiety compared to normative samples (Fisher, Allen, & Kose, 1996; Greenham, 1999; Lufi & Darliuk, 2005).

In general students without LD reported better overall moods, higher self-esteem, and greater satisfaction with life than students with LD or students with LD and ADHD (McNamara, Willoughby, & Chalmers, 2005). Therefore, it appears that comorbid ADHD may exacerbate the internalizing problems of students with

LD, although few studies have addressed this issue directly (Greenham, 1999). In addition, the previous studies did not report whether the sample included students with comorbid ADHD. To further understand the relationship among LD, ADHD, and internalizing problems, we have decided that one purpose of this study is to control for ADHD, while examining these characteristics of students with LD.

Externalizing Problems

Many children with LD also experience significant externalizing problems, exhibiting more behavior problems than normally achieving students (Haager & Vaughn, 1995). Consistent evidence has emerged in the literature that parents and teachers tend to report higher levels of aggressive, disruptive, delinquent, and hyperactive-inattentive behaviors in children with LD than in those without LD (Bender & Wall, 1994; McConaughy et al., 1994; Greenham, 1999). For example, parents rated children with LD as exhibiting more aggressive behavior than normal controls without LD (McConaughy et al., 1994). Impulsivity and lower attentional skills have also been noted as characteristic of children with LD (Bender & Wall, 1994). Meta-analyses indicate that teachers view hyperactive and distractible behaviors as problematic for 80% of students with LD (Kavale & Forness, 1996). Adolescents with LD also may be at increased risk for substance abuse (Greenham, 1999).

As with internalizing problems, few studies examine the externalizing behaviors of students with LD, while controlling for ADHD diagnosis. Considering the large comorbidity of these diagnoses, the findings about the externalizing behaviors of LD students should be interpreted with caution, as few studies offer information about ADHD diagnosis.

Teacher Versus Parent Ratings

In general, the literature indicates a good amount of overlap between teacher and parent ratings of the psychosocial functioning of children with LD. For example, McConaughy and colleagues (1994) examined the correlations among parent and teacher ratings on the CBCL and TRF, respectively. This study found "large" correlations for externalizing subscales (e.g., attention problems, r =.53; delinquent behavior, r =.55; aggressive behavior, r =.52; externalizing composite, r =.55; and total problems, r =.51). Medium correlations were obtained for internalizing dimensions (e.g., withdrawn, r =.38; anxious/depressed, r =.33; social problems, r =.48; thought problems, r =.30), and small correlations for somatic complaints (r =.17). Subsequent studies also using omnibus rating scales have suggested similar although slightly smaller correlations for parent and teacher ratings. Handwerk and Marshall (1998) obtained significant correlations for the total scores (r =.31) and Externalizing scores (r =.44) obtained from parents and teachers on the CBCL and TRF. In addition, Handwerk and Marshall found a rater effect, indicating that teachers gave higher ratings than parents for students classified as LD, SED, or both LD and SED. More recently, Bouffard and colleagues (2005) reported that parent and teacher ratings of underachieving children's temperament were "more similar than not" (p.223).

While there is considerable overlap in the behavioral, social, and emotional characteristics of children with LD reported by parents and teachers, the role of both setting and psychometric properties should be considered. Several factors may impact differences in ratings. For example, parents and teachers may have different motivations and fears when rating a child —e.g., parents may fear consequences of

labeling, while teachers may be motivated for students to receive special education eligibility— (Handwerk & Marshall, 1998). Another explanation is that of setting: students may actually behave differently at home and at school based on task demands and general environment (Handwerk & Marshall, 1998).

Importance of the Study

Considerable empirical evidence suggests that children with LD experience increased risk for psychosocial problems, including high co-morbidity with ADHD. Few studies, however, have compared internalizing, externalizing, and social abilities of these children, and no studies were identified that compared parent and teacher ratings of both populations along these dimensions. The purpose of this study is to add to this literature base in 2 ways. First, we compare parent and teacher perspectives on internalizing, externalizing, and social behavior of students with LD and with and without ADHD. Second, we examine the effects of ADHD on the psychosocial functioning of children with learning difficulties by comparing ratings of internalizing, externalizing and social behaviors of children with LD and with and without ADHD.

Methods

Participants

The 90 participants for this study were recruited from an interdisciplinary clinic at a large southeastern university. The clinic was funded by the state to provide free psychoeducational evaluations and intervention for children with significant school problems. Because the services provided by this clinic were free to families and schools, children from all socioeconomic levels were seen. All children in this study were referred by their schools or parents for evaluation because of significant problems with reading. Prior to evaluation by this team, all participants had previous psychoeducational evaluations and interventions. As children were referred to the clinic, an educational consultant conducted an ecological assessment to determine the appropriateness of interventions provided by the school. If the school was not providing empirically supported, appropriate intervention, the educational consultant worked with school personnel, but the child was not evaluated by the team. Only children who had received but failed to respond to intervention were accepted for assessment by the interdisciplinary team and included in this database. For the purpose of this project, to avoid possible confounds, we applied the following exclusion criteria: (1) full-scale or composite IQ below 75; (2) presence of significant medical conditions (e.g., seizure disorder, cancer); (3) presence of significant psychopathology (e.g., bipolar disorder); and (4) questionnaires completed by someone other than a parent or permanent guardian (e.g., foster parent). Following the application of these criteria, we had complete data for 90 elementary school childrenon all measures of interest. These students were included in the analysis for this project.

All children were between the ages of 5 and 13 years old (mean = 8.9 years, SD = 1.9 years). The mean Full Scale IQ score for the sample was 88.6 (SD = 10.8); the mean score on standardized reading achievement measures was 85.5 (SD = 17.0). Furthermore, 27% percent of the children included on the sample previously received a diagnosis of Attention Deficit Hyperactivity Disorder (ADHD) when they were referred to clinic.

Consistent with the literature on learning disabilities, most (75%) of the sample was male. Fewer than half (43%) of these children were already receiving services through special education under the discrepancy model, yet continued to fail to make gains. However, it is important to note that in all likelihood, had a Response to Intervention model been utilized by the participating schools, all the participants would have qualified for services because of their failure to make progress despite the application of intervention. Services provided by this clinic were offered free of charge to parents, so the socioeconomic status of participants ranged considerably; a total of 28% of the students were attending Title 1 schools.

Materials and Procedures

Extensive family and school questionnaires, addressing comprehensive demographic and educational information, were completed for each child prior to the evaluation. In addition, medical records were reviewed carefully to ensure all diagnoses were recorded.

Each participant's social and emotional functioning and academic achievement was assessed as part of an interdisciplinary evaluation including educational, psychological, language, and medical assessments. The assessment protocol was individualized based upon the reason for referral, individuals' characteristics, and any previous testing completed. ADHD diagnosis was determined by review of the medical record and the team evaluations. All children with ADHD diagnoses were prescribed medication.

Table 1
Demographic Data by Group and for Total Sample

Group	LD Mean (SD) (n = 66)	LD/ADHD Mean (SD) (n = 24)	Total Mean (SD) (n = 90)
Age	9.04 (1.94)	8.77 (1.82)	8.96 (1.90)
IQ	87.7 (9.52)	86.8 (12.3)	87.5 (10.1)
Reading	84.4 (17.7)	85.8 (16.7)	84.8 (17.4)
Math	82.2 (16.3)	81.3 (15.2)	82.0 (15.9)

Instruments. The social and emotional functioning of each participant was assessed using an omnibus measure, the Behavior Assessment System for Children, Second Edition (BASC-2; Reynolds & Kamphaus, 2003). Specifically, Teacher Rating Scales (BASC-TRS) and Parent Rating Scales (BASC-PRS) were used to assess teacher and parent perceptions of the participants' behavior. The BASC-TRS is a norm-referenced rating system that consists of 139 items used to assess a teacher's perceptions of a student's emotional functioning, overall behavior, school functioning, and peer relationships. The BASC-PRS is a norm-referenced rating system that consists of 160 items used to assess a parent's perceptions of a child's emotional functioning, overall behavior, peer relationships, and family functioning. Collectively, these two scales generate 16 behavioral composites that include the following: activities of daily living: adaptability, aggression, anxiety, attention problems, atypicality, conduct problems,

depression, functional communication, hyperactivity, leadership, learning problems, social skills, somatization, study skills, and withdrawal. According to the manual, both the BASC-TRS and the BASC-PRS have excellent internal consistency, including scale reliability (.66 to .91 and .72 to .92, respectively) and composite reliability (.82 to .94 and .84 to .94, respectively). Moreover, specific items on both scales (1) ensure that respondents provide consistent response patterns and (2) assess whether respondents rated the child in an overly negative manner.

Results

Consistency of Parent and Teacher Ratings

Pearson Product Moment correlation analyses indicated significant relationships between parent and teacher ratings for the Internalizing (r =.406, $p <$ .000); Externalizing (r =.589, $p <$.001); and Social (r =.279, $p =$ .004) scales. R-squared values indicate moderate to small effect sizes for parent and teacher ratings, with 17%, 34%, and 8% for Internalizing, Externalizing, and Social scales respectively.

Teacher ratings. BASC-TRF data for group membership by gender are presented in Table 2. One sample t test results indicate that the mean teacher ratings for the entire sample differ significantly from the t score mean of 50 for Internalizing (t = 3.171, df = 90, $p =$ .001) and Social (t = -6.073, df = 90, $p =$ .001), but not for Externalizing (t = 1.307, df = 90, p = .098).

Table 2
Mean BASC-TRF for Students With LD, With and Without ADHD

	Social Mean (SD)	Internalizing Mean (SD)	Externalizing Mean (SD)
LD (n = 66)	44.9 (9.60)	55.5 (14.5)	51.1 (13.0)
Boys (n = 47)	42.0 (7.48)	56.6 (16.1)	52.7 (14.5)
Girls (n = 19)	42.4 (9.56)	52.7 (9.54)	47.2 (7.00)
LD/ADHD (n=24)	41.1 (7.73)	52.0 (9.12)	53.8 (12.3)
Boys (n = 19)	42.0 (7.48)	51.6 (8.10)	53.5 (11.6)
Girls (n = 5)	39.8 (10.6)	53.4 (13.4)	54.8 (16.5)

Parent ratings. Demographic data for group membership by gender are presented in Table 3. One sample t test results indicate that the mean parent ratings for the entire sample differ significantly from the t score mean of 50 for Externalizing (t =2.712, df = 90, p = .004), Internalizing (t =2.843, df =90, $p =$ .003) and Social (t =-6271, df = 90, $p <$ .001).

Table 3
Mean BASC-PRF for Students With LD, With and Without ADHD

	Social Mean (SD)	Internalizing Mean (SD)	Externalizing Mean (SD)
LD (n = 66)	45.1 (9.26)	53.5 (12.2)	52.4 (13.7)
Boys (n = 47)	44.7 (9.27)	53.2 (12.1)	54.0 (14.0)
Girls (n = 19)	46.1 (9.42)	54.5 (12.8)	48.3 (12.4)
LD/ADHD (n=24)	41.8 (6.67)	54.0 (10.8)	57.8 (13.0)
Boys (n = 19)	41.6 (6.21)	52.8 (8.87)	58.4 (14.7)
Girls (n = 5)	42.4 (9.02)	58.8 (16.6)	55.4 (1.52)

Parent versus teacher ratings. To examine differences between parent and teacher ratings by diagnosis, we used a repeated measures design. Because the analysis considers multiple dependent and independent variables, a MANOVA procedure was selected to reduce the likelihood of experiment wise error. Two independent variables, each with two levels, are considered: Diagnosis (LD only and LD/ADHD) and Rater (parent and teacher). Dependent variables examined included two continuous variables: Internalizing score and Externalizing score. A significant main effect was found for diagnosis $F(2/87) = 19.28$, $p < .001$ with a partial eta squared = .307; means analysis suggests that members of the LD/ADHD group tended to have higher Externalizing and lower Internalizing scores, while members of the LD group tended to have higher Internalizing and lower Externalizing scores (see Table 4). No main effects were found within or between subjects by rater (parent versus teacher).

Multivariate analysis of variance was utilized to examine differences between parent and teacher subscale ratings of LD versus LD/ADHD participants; MANOVA was selected to reduce experiment-wise error. The significant between-group differences on the parent scale included Hyperactivity, $F(1,63) = 5.61$, $p = .05$. Two teacher scales, Attention, $F(1,63)=5.82$, $p = .027$, and Learning, $F(1,63)=5.50$, $p = .031$ reached significance.

Discussion

This study contributes to the growing body of literature regarding symptoms of psychosocial dysfunction in children with LD. The unique contribution of our study was examining both parents' and teachers' perceptions of psychosocial functioning in children with LD and with LD and ADHD. Overall, our findings were consistent with previous studies in supporting statistically significant differences in ratings of problem behavior and psychosocial functioning of children with LD when compared to the norming sample mean (e.g., Al-Yagon, 2007; McConaughy et al., 1994). Further, our findings are consistent with that of researchers who found that children with ADHD and LD demonstrate more significant difficulties than children with LD alone (Flicek, 1992; Kistner & Gatlin, 1989; Weiner, 2004).

Internalizing Problems

Increased likelihood of internalizing problems for children with learning disorders has been reported in a number of studies with children with learning disabilities (e.g., Bouffard et al., 2005; Sideridis et al., 2006). Consistent with this literature, both parent and teacher ratings of internalizing behaviors differed

Table 4
Between Subject Effects of Teacher and Parent Ratings on BASC Subscales for Students With LD and With and Without ADHD

	Teacher Ratings			Parent Ratings		
Subscale	Mean(SD)	F	Partial Eta Squared	Mean(SD)	F	Partial Eta Squared
Hyperactivity	52.52(12.00)	2.42	.029	56.23(11.94)	*5.61	. 82
LD	51.18(11.67)			53.56(11.05)		
LD/ADHD	56.09(15.73)			63.30(14.04)		
Aggression	50.32(12.07)	.013	.000	50.92(11.94)	1.18	.014
LD	50.23(13.02)			50.05(11.05)		
LD/ADHD	50.57(9.35)			53.22(14.04)		
Conduct	50.81(13.36)	.571	.017	52.54(13.04)	.579	.007
LD	50.13(13.94)			51.87(13.84)		
LD/ADHD	52.61(11.79)			54.30(10.73)		
Anxiety	54.19(15.17)	.348	.004	53.62(11.40)	.707	.009
LD	54.54(15.17)			54.26(11.42)		
LD/ADHD	53.25(11.34)			51.91(11.39)		
Depression	54.19(15.17)	.118	.001	54.77(12.22)	.252	.003
LD	54.54(16.46)			54.36(13.00)		
LD/ADHD	53.26(11.35)			55.87(10.04)		
Somatization	51.25(13.26)	2.15	.025	50.52(12.57)	.873	.011
LD	52.54(14.58)			49.80(11.10)		
LD/ADHD	47.83(8.22)			52.43(12.57)		
Attention	59.71(10.06)	*5.82	.255	57.10(14.40)	2.53	.030
LD	58.41(10.60)			55.57(13.81)		
LD/ADHD	63.17(7.63)			61.13(15.43)		
Learning	64.00(10.65)	*5.50	.244	55.81(12.03)	.189	.002
LD	63.21(10.25)			55.43(13.54)		
LD/ADHD	66.04(11.63)			56.83(13.10)		
Atypicality	58.02(16.44)	3.82	.044	60.23(8.87)	6.77	.076
LD	56.16(13.30)			58.56(9.82)		
LD/ADHD	62.96(16.44)			64.65(9.90)		
Withdrawn	55.86(13.54)	.175	.002	43.32(10.21)	3.26	.038
LD	55.48(12.73)			44.54(10.68)		
LD/ADHD	56.87(15.75)			40.09(8.20)		

Note. *$p < .05$

significantly from the mean of 50, although the LD/ADHD group demonstrated relatively lower Internalizing and relatively higher Externalizing scores. This is particularly important for practitioners working with children with LD, given that internalizing problems are less likely to be diagnosed in children. Other research suggests that the presence of internalizing problems increases the likelihood of other symptoms as well (Lufi & Darliuk, 2005).

Externalizing Problems

For the total group, parent and teacher ratings for externalizing problems significantly differed from the mean of 50, suggesting that all children with significant learning problems are at elevated risk for externalizing problems. The relationship between LD and externalizing behaviors is well established (e.g., Halonen et al., 2006; Hinshaw, 1992; Richards, Symons, Greene, & Szuszkiewicz, 1995; Werner, 2004). What is less well established is the mediating factor of other co-morbid conditions, such as ADHD. We found that children with both LD and ADHD received higher ratings on the BASC Externalizing scale than children with LD alone; however, the only subscale differences between the groups were for parent ratings of hyperactivity, and teacher ratings of attention and learning. That no differences were found between the groups on the conduct or aggression subscales suggests that the difference in externalizing scores between the groups is best explained by the symptoms of ADHD.

Our findings about attention and hyperactivity are consistent with previous research as other authors have identified attention as a critical consideration in understanding the development of co-morbid learning and behavior problems. Mayes and colleagues (2000) suggest that learning and attention problems exist on a continuum, and children with LD, but no ADHD, likely still demonstrate some degree of attentional difficulty. Attentional difficulties are likely to exacerbate learning problems; Richards et al (1995) reported that attention predicted poor learning outcomes even under intense intervention.

Rater Effects

For the most part, parents and teachers tended to identify externalizing and internalizing behavior problems in children with LD and ADHD at similar rates. The correlations between parent and teacher ratings were surprisingly high compared to figures reported in the BASC manual. This may be due to the extreme nature of the problems presented by students in this study and students in the resulting restricted range. At the same time, important differences among ratings were identified. This pattern is consistent with research examining the discriminant validity of omnibus rating scales for diagnosing ADHD (McBurnett et al., 1999; Tripp, Schaughency, Clarke, 2006; Vaughn et al., 1996) and suggests that for this population, both parent and teach,ratings must be obtained in order to fully understand psychosocial functioning.

Inconsistent with other studies (e.g., Handwerk & Marshall, 1998) which found that only parents identified higher rates of internalizing problems, our study found that both parents and teachers identified higher rates of both internalizing as well as externalizing problems. That so few differences emerged between the two groups and across settings suggests that children like this sample, who struggle academically despite intervention, are universally at risk for psychosocial problems, and consequently, should be evaluated for the need for intervention to address

problems generally associated with ADHD diagnoses. The general pattern of more significant problems among the LD/ADHD group is not surprising given previous research (e.g., Bagwell, Molina, Pelham, & Hoza, 2001; Mayes et al., 2000; Richards et al., 1995) and highlights the need for heightened surveillance of children with LD and co-morbid ADHD.

Another consideration relates to the fact that all of the children with ADHD were prescribed stimulant medication to improve performance and behavior at school. It logically follows that improvements might be associated with medication compliance. Thus, our data may have implications regarding the effectiveness of medication in addressing students' hyperactivity and inattention; further study is necessary to confirm or deny this hypothesis. Despite the suggestion that medication decreases some core symptoms of ADHD, results from this study suggest that medication does not universally improve all of the deficits associated with comorbid ADHD and LD.

Future Directions

Although our study supports findings of some previous research, our findings differed from previous research as well, suggesting the need for additional research and clarification of terminology. Riccio and colleagues (1994) discuss some of the methodological issues that may be associated with differential results across studies concerning psychosocial functioning in children with LD. For example, the conceptualization of LD—that is, a more traditional discrepancy approach versus more progressive "treatment resistor" models—and specific diagnostic criteria differ across states and school districts. In addition, the measures used to obtain information on children's psychosocial functioning differ across studies (e.g., omnibus rating scale measures versus semi-structured interviews). We addressed some of these issues in our study. While we intentionally eliminated cases in which pathology other than ADHD had already been identified, all the subjects in our study had failed to make academic progress despite school-based interventions, and are best described as treatment resistors. This suggests that our sample may be at higher risk for psychopathology than those of other studies.

The current study demonstrates the need for prospective studies to examine causality in understanding the relationship among learning problems and psychosocial functioning. A larger sample size would facilitate the use of statistical methods conducive to determining the relationship of causal factors. Specifically, future studies should explore the role of attention and concentration ability and general memory ability in predictive models of teacher-rated and parent-rated behavior problems in children with LD and in predictive models of teacher-rated and parent-rated behavior problems in children with LD and ADHD. Our findings are consistent with work of Richards and colleagues who identified teacher rated attention as a potential explanation for the relationship between externalizing behaviors and learning disorders (Richards, Symons, Greene, & Szuszkiewicz, 1995).

Like other studies (e.g., Tripp, Schaughency, & Clarke, 2006; Vaughan et al., 1997), while overall diagnostic decisions based on teacher versus parent ratings are likely to have similar outcomes, our findings suggest that the specific behaviors that contribute to diagnoses may differ for parents versus teachers. We found that teachers' ratings of attention differed for the LD versus LD/ADHD groups, while parents'

ratings of hyperactivity differed for the groups. McBurnett and colleagues (1999) found that academic problems aggregated along two types of parent and teacher ratings: inattention and hyperactivity. Our results suggest that teachers may be more sensitive to inattention, while parents may be more likely to note hyperactivity. These findings highlight the importance of the recommendation made by many authors to include multiple raters to understand the psychosocial functioning of children with learning problems. Additionally, future studies should examine the differences in predictive models in various subtypes of learning disabilities (e.g., reading versus mathematics) and in subtypes of ADHD (e.g., predominantly inattentive versus predominantly hyperactive).

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Author Note

Tina Smith-Bonahue, Ph.D., is an associate professor of School Psychology and Early Childhood Studies in the College of Education at the University of Florida. She teaches courses in interventions for children with social, emotional, and academic problems and in development and assessment of young children.

Anne Larmore, M.Ed. is a doctoral candidate in the School Psychology Program at the University of Florida. Her dissertation focuses on anxiety and its impact on academic functioning of middle school students.

Jennifer Harman, Ph.D. is a recent graduate of the School Psychology Program at the University of Florida. She is currently completing a post-doctoral fellowship at the Yale Child Study Center in New Haven Connecticut.

Melissa Castillo, M.Ed. is an advanced doctoral student in the School Psychology Program at the University of Florida.

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