Socioemotional and Academic Adjustment Among Children with Learning Disorders:

The Mediational Role of Attachment-Based Factors

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This study examined the role of attachment-based factors (children's attachment style, children's appraisal of teacher as a secure base, and teacher's feelings of closeness to child) in explaining differences in Israeli children's socioemotional adjustment (self-rated sense of coherence, loneliness) and academic functioning (teacher-rated). The sample comprised 98 children with learning disorders from general education classes in four public elementary schools and 107 typically developing children from the same classes. Significant intergroup differences emerged in socioemotional and academic adjustment as well as attachment-based factors. Moreover, attachment-based factors were significantly correlated with adjustment measures and significantly mediated the association between learning disorders and socioemotional adjustment. The findings are discussed in terms of the theoretical and practical implications rendered by children's experiences in close relationships on socioemotional adjustment among school-age children with learning disorders.

The results of a large number of studies suggest that children with learning disorders are more likely to experience adjustment problems than are their typically developing peers (e.g., Morrison & Cosden, 1997; Wenz-Gross & Siperstein, 1998). Studies have indicated that in addition to their learning difficulties, these children evidence a high level of peer rejection and loneliness, a deficit in their sense of coherence, and multiple emotional problems (e.g., Culbertson, 1998; Margalit & Levin-Al-Yagon, 1994; Morrison & Cosden, 1997). On this basis, research on children with learning disorders should focus on identifying vulnerability factors that increase maladjustment, as well as protective factors that enhance positive adjustment (Morrison & Cosden, 1997).

Vulnerability and Protective Factors Among Children with LD

In analyzing the factors that contribute to the socioemotional adjustment of children with development problems, Luthar and Cicchetti (2000) described vulnerability factors and protective factors at the individual, family, and community levels. Most studies of children with learning disorders have emphasized the effect of children's individual characteristics on socioemotional maladjustment (see Culbertson, 1998, for a review). These internal factors include alterations in central nervous system functioning (i.e., information-processing disorder), impulsivity, performance and production deficits, emotional reactivity, low self-esteem, and denial of the disorder. Personal factors that protect children with learning disorders from maladjustment outcomes are high verbal skills, high self-esteem, and a delineated understanding of the nature and course of the disorder (Morrison & Cosden, 1997).

At the family level, studies of children with learning disorders have demonstrated the contribution of vulnerability and protective factors, such as the mother's sense of coherence, parental disappointment, family rigidity or disorganization, and family cohesion (e.g., Al-Yagon, 2003; Margalit, Al-Yagon, & Neuberger, 1996). At the community level, studies on school-age children have highlighted the contribution of school policy (e.g., the school's readiness to accommodate itself to the child's special needs) and social support from adults in the school, especially in the form of supportive relationships with teachers (Luthar & Cicchetti, 2000; Morrison & Cosden, 1997; Wenz-Gross & Siperstein, 1998).

The rare studies existing on the interrelations between different vulnerability and protective variables have pinpointed the importance of close relationships for students with learning disorders. Although many studies have emphasized the importance of social and close relationships to adjustment throughout life (e.g., Howes, Matheson, & Hamilton, 1994; Mikulincer & Florian, 2001; Shaver & Hazan, 1993), only a few researchers have investigated school-age children with learning disorders. In one longitudinal study, Werner (1993)

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showed that the temperament of individuals with learning disorders affected the interpersonal support they received from their community, which in turn affected the development of their autonomy and adjustment. More recently, Murray and Greenberg (2001) reported that student–teacher relationships and school bonding were significantly correlated with adjustment at school. These findings emerged for children both with and without learning disabilities.

In the current study, we followed this line of research and examined the interrelationships between children's learning disorders and their experiences in close relationships, with a focus on attachment-based factors (i.e., measures designed to capture processes identified as important in attachment theory; Kerns, Aspelmeier, Gentzler, & Grabill, 2001). Over the last decade, Bowlby's (1982/1969, 1973) attachment theory has been considered a highly relevant framework for explaining individual variations in adjustment among populations who are at risk for developing adjustment problems. Furthermore, growing awareness has emerged regarding the important contribution of attachment-based factors to socioemotional adjustment across the life span (Mikulincer & Florian, 2001; Shaver & Hazan, 1993). For school-age children, close relationships extend beyond the home and the family; therefore, our study focused on two attachment-based factors—children's global attachment to others and children's specific relationships with teachers. We explored the contribution of these factors to the adjustment of children with learning disorders.

Attachment Theory: Secure Base and Attachment Style

Bowlby's attachment theory (1982, 1973, 1988) highlights the role that interactions with significant others play in personality and socioemotional development. Over the course of their first year of life, infants develop a specific and enduring relationship with their primary caretakers (Ainsworth & Wittig, 1969). According to Bowlby (1982), infants' strong tendency to seek proximity to caregivers is the overt manifestation of the attachment behavioral system—an inborn system that is designed to restore or maintain proximity to supportive others in times of need. Bowlby (1982, 1973) labeled these supportive others as "attachment figures" and argued that the proximity to an available and responsive caregiver provides the infant with a sense of "secure base," which refers to a set of expectations about others' availability and responsiveness in times of stress.

Thus, secure attachment represents a balance between proximity and exploration across both ordinary and emergency situations and refers both to skillful use of the support received from attachment figures and to confidence in the availability and responsiveness of these figures in times of need (Bowlby, 1988; Waters & Cummings, 2000). Conversely, interactions with unavailable caretakers lead to a sense of mistrust in the world, serious doubts about self-worth, chronic distress, and insecure patterns of attachment.

Bowlby (1973) also proposed that infants internalize their interactions with attachment figures into "working models of attachment," which are mental representations of significant others and the self. These result in unique attachment styles, that is, stable patterns of cognitions and behaviors that are manifested in other close relationships and social interactions. Most measures of attachment style use Ainsworth's observations of infants in the "strange situation" (Ainsworth, Blehar, Waters, & Wall, 1978) and her classification of attachment style into one secure style and two insecure styles (avoidant and anxious). Individuals with the secure style hold positive working models of the self and others and have a history of satisfactory interactions with supportive attachment figures, whereas individuals with avoidant and anxious styles have negative working models and a history of frustrating and painful interactions with unavailable and unresponsive attachment figures. Moreover, each of the two insecure styles represents a different strategy for regulating the pain resulting from the lack of a sense of secure base. Avoidant individuals attempt to deactivate the attachment system, deny their attachment needs, and distance themselves from attachment figures and close relationships. Anxious individuals attempt to hyperactivate the attachment system, and they develop a hypervigilant, clinging, and overdependent attitude to attachment figures and close relationships. Main and Solomon (1986) later added a third insecure pattern, the disorganized style, reflecting a random mixture of the avoidant and anxious styles.

Many studies have examined attachment-style differences in socioemotional adjustment and functioning. In low-risk child and adult samples, securely attached individuals clearly revealed better mental health and functioning, higher levels of psychological well-being, and more optimal signs of social and emotional adjustment than did individuals with an avoidant or anxious style (e.g., Erikson, Sroufe, & Egeland, 1985; Mikulincer & Florian, 2001; Sroufe, 1983). In high-risk samples of children, studies have emphasized the role of insecure attachment styles as a vulnerability factor in increasing maladjustment in the social, emotional, and cognitive domains (e.g., Lyons-Ruth, Alpern, & Repacholi, 1993; Moss, Parent, Gosselin, Rousseau, & St-Laurent, 1996; Speltz, Greenberg, & Deklyen, 1990).

Most of the research that has explored at-risk and clinical samples has focused on abused children, premature infants, children from disadvantaged environments, and children with psychiatric problems or physical illnesses. Studies examining the association between attachment style and socioemotional adjustment among children with developmental disabilities are few and have mainly focused on children and adults with autism and Down syndrome (Atkinson et al., 1999; Berry, Gunn, & Andrews, 1986; Blacher & Meyers, 1983; Ganiban, Barnett, & Cicchetti, 2000; Hoppes & Harris, 1990; Smith & McCarthy, 1996). In fact, only Smith and McCarthy examined

learning disabilities, but they studied adults, reporting a lower incidence of secure attachment style in this group than in a control group. In light of the relevance of attachment style for explaining variations in socioemotional adjustment among at-risk individuals and the paucity of research on children with learning disorders in this domain, the current study investigated the role of attachment style in explaining the adjustment of school-age children with learning disorders.

An Attachment Perspective of the Student–Teacher Relationship

As mentioned previously, Bowlby (1988) emphasized that once a child's security needs are met and the parental figure becomes a source of secure base, the child can direct his or her attention and energy toward exploring the environment and engaging in social interactions with other persons. These explorative activities and social interactions may result in the formation of new attachment-like relationships with different partners, including siblings and other relatives, peers, nonfamilial caregivers, and teachers (Owens et al., 1995; Weiss, 1998). These different relationships can serve as contexts for important attachment experiences, and the various relationship partners can also act as attachment figures, providing care and support in times of need and becoming a source of secure base for further exploration and new skill learning.

The relationship that the child forms with teachers may be affected by early interactions with parental figures and may be of crucial importance for providing a sense of secure base in the specific school context. Several studies have already reported that the quality of the mother–child relationship affects the quality of the relationship that a child forms with teachers (e.g., Howes, Matheson, & Hamilton, 1994; Motti, 1986; Pianta, 1999; Toth & Cicchetti, 1996). Motti, for example, revealed that teachers differed in the anger and tolerance they felt toward avoidant and anxious children. Toth and Cicchetti found that teachers reported lower levels of fondness for insecurely attached children and evaluated them as less adjusted, in comparison to securely attached children. These findings are consistent with Bowlby's (1973) assumption that a child's "working models of attachment"—a set of internal guides for interacting with adults—generalize to new relationships and affect the child's cognitions and behaviors in these relationships.

Moreover, studies that have explored the impact of child–teacher relationship quality on school-related functioning have revealed its meaningful contribution to children's social competence (Howes et al., 1994), academic achievements (Birch & Ladd, 1996; Pianta, Steinberg, & Rollins, 1995), and motivation and engagement in school (Connell & Wellborn, 1991). Studies of the child–teacher relationship in children with disabilities are scarce. However, they also highlight the important role of the quality of this relationship in explaining students' socioemotional adjustment (Murray & Greenberg, 2001; Pianta et al., 1995; Wenz-Gross & Siperstein, 1998). For example, Pianta and colleagues revealed that warm relationships with teachers act as a protective factor for children with disabilities, reducing the referral rate to special education settings. Likewise, Murray and Greenberg demonstrated that a supportive relationship with teachers was positively correlated with social, emotional, and academic adjustment among children with disabilities.

Altogether, these findings raise some important questions calling for additional exploration. Do early experiences with parents form a generalized attachment representation that contributes to the quality of relationships with teachers? Do children with learning disorders differ from their typically developing peers in their relationships with teachers and their perceptions of teachers' functioning as a source of secure base? How, if at all, does the child–teacher relationship contribute uniquely to the socioemotional adjustment of children with learning disorders?

Purpose of the Current Study

The current study aimed to test the relevance and validity of attachment theory for understanding problems in socioemotional adjustment and academic functioning of children with learning disorders. Specifically, we examined the possible role that attachment-based factors play in mediating the association between learning disorders and problems in socioemotional adjustment and academic functioning. In line with researchers' recommendations emphasizing the importance of children's self-reported perceptions of close relationships (Lynch & Cicchetti, 1997), as well as the low reliability of parents' and teachers' reports on children's emotional and overcontrolled problems (e.g., loneliness, anxiety, depression; Achenbach, 1993; Ronen, 1997), the present study examined the children's perceptions of their own socioemotional adjustment and their relationships with teachers.

With this purpose in mind, we sampled a group of Israeli children with learning disorders who attended general education classes and a matched control group of typically developing children from the same classes. We assessed children's socioemotional adjustment (self-rated sense of coherence and loneliness feelings), academic functioning (teacher-rated), and self-rated global attachment style in close relationships, as well as the two measures of their specific relationship with teachers: children's own perceptions of the teacher as a secure base and teachers' ratings of their feelings of closeness to the children. We developed the following hypotheses:

1. Children with learning disorders would exhibit more problems in socioemotional adjustment and academic functioning than would normally developing children.

2. Children with learning disorders would exhibit a less secure attachment style and a less secure relationship with their teacher (lower appraisal of teacher as a secure base, teacher not feeling as close to child) than would their typically developing peers.
3. Both children's global attachment to others and children's specific relationships with teachers would be correlated with adjustment as follows: A more secure attachment style (self-rated) and a more secure relationship with the teacher (self-rated and teacher-rated) would be correlated with better socioemotional adjustment and academic functioning.
4. Attachment-based factors (children's attachment style, children's appraisal of teacher as a secure base, and teacher's ratings of closeness) would mediate the association between learning disorders and problems in socioemotional adjustment and academic functioning, so that the statistical control of attachment-based factors would significantly reduce the strength of this association.

Method

Participants

The children's sample consisted of 205 students: 68 third graders, 74 fourth graders, and 63 fifth graders. Students ranged from 8 to 11 years in age and were sampled from 23 different classrooms. Analyses of variance examining the possible effect of classroom revealed no significant classroom difference in all the assessed variables. In fact, differences among the classrooms accounted for a small percentage of the variance in all the assessed variables (between 9% and 14%).

These 205 students comprised two groups: 98 children with learning disorders who attended general education classes (54 boys and 44 girls) and 107 typically developing children (59 boys and 48 girls) who attended the same classes. The students attended four public elementary schools in central Israel. The children with learning disorders had an average IQ level (ranging from 85 to 115), and they had been previously identified, via psychoeducational evaluation, as demonstrating learning disorders in reading, writing, and/or mathematics. In line with the educational policy of the Israeli Ministry of Education, the diagnostic evaluation was conducted by the regional psychology services agency and by the psychoeducational team of each school. The diagnostic assessments included instruments such as the *Wechsler Intelligence Scale for Children–Third Edition* (Wechsler, 1991), the *Kaufman Assessment Battery for Children* (Kaufman & Kaufman, 1983a, 1983b), the *Bender-Gestalt Test for Young Children* (Koppitz, 1975), the *Rey-Osterrieth Complex Figure Test* (Osterrieth, 1946; Rey, 1941), and the Hebrew adaptation of the *Rey Auditory Verbal Learning Test* (Vakil & Blachstein, 1993). Due to confidentiality directives, group data, rather than specific information regarding individual children's disabilities, were available.

Approximately 10% of the children in each classroom had been diagnosed with learning disorders (a range of 2 to 4 children for each homeroom teacher). According to Israeli educational policy, these children received special assistance from inclusive teachers during school hours. Homeroom teachers evaluated the children with typical development as having normal development and average academic functioning without any remarkable social, behavioral, or emotional problems.

The sample of teachers consisted of 23 homeroom teachers: 7 third-grade teachers, 9 fourth-grade teachers, and 7 fifth-grade teachers. The homeroom teachers spent the majority of the school day with the students and taught them most subjects. All these teachers had graduated from programs for general education teachers.

Instruments

Children's Instruments. We used four self-report measures for the children.

1. *Loneliness and Social Dissatisfaction Questionnaire* (Asher, Parkhurst, Hymel, & Williams, 1990). The Hebrew adaptation (Margalit, 1991) of this children's self-report scale consisted of 16 primary items tapping a child's feelings of loneliness (e.g., "I have nobody to talk to in my class," "I am lonely") and 8 filler items (e.g., "I like school") that covered various activity areas. The scale asked children to read the items and to rate how frequently they experienced the feeling described in an item, on a 5-point scale (1 = *never,* 5 = *always*). Asher et al. (1990) recommended the computation of a single total score tapping the global sense of loneliness. In our sample, the high Cronbach alpha coefficient for the 16 items (α = .87) allowed us to compute a total loneliness score by summing up the 16 items. Higher scores reflected more frequent feelings of loneliness.

2. *Children's Sense of Coherence Scale* (Margalit & Efrati, 1995). This children's self-report scale consisted of 16 items tapping three dimensions of children's sense of confidence in the world:

1. sense of comprehensibility—feeling that one understands one's environment (e.g., "I feel that I don't understand what to do in class"),
2. sense of manageability—feeling in control and confident that positive rewards are available (e.g., "When I want something I'm sure I'll get it"), and
3. sense of meaningfulness—motivation and interest in investing effort in different tasks (e.g., "I'm interested in lots of things").

The scale asked children to read the items and to rate how frequently they experienced the feeling described in an item, on a 4-point scale (1 = *never,* 4 = *always*). Antonovsky (1987) recommended the computation of a single total score tapping the global sense of coherence. In the current sample, the acceptable Cronbach alpha for the 16 items ($\alpha = .79$) allowed us to compute a total coherence score by summing up the 16 items. Higher scores reflected a higher sense of coherence.

3. *Attachment Style Scale* (Finzi, Har-Even, Weizman, Tyano, & Shnit, 1996). This children's self-report scale targeted assessment of attachment-style at the elementary school level. The scale comprised an adaptation of the Hebrew version of the adult attachment style scale (Mikulincer, Florian, & Tolmacz, 1990). The scale consisted of 15 items assessing each of three attachment styles (5 items per style): secure attachment (e.g., "It is easy for me to depend on others, if they are good friends of mine"), avoidant attachment (e.g., "Sometimes others get too friendly and too close to me"), and anxious attachment (e.g., "Sometimes I'm afraid that other kids won't want to be with me"). The scale asked children to read the items and rate the extent to which an item described their feelings in close relationships, on a 5-point scale (1 = *not al all appropriate,* to 5 = *very appropriate*). This scale emerged as highly reliable for measuring attachment style among school-age children (Finzi, Cohen, Sapir, & Weizman, 2000; Finzi, Ram, Har-Even, Shnit, & Weizman, 2001). In the current sample, Cronbach alphas for these three factors ranged from .64 to .73, implying that there was adequate internal consistency. On this basis, we computed three subscale scores by summing up items that corresponded to each attachment style subscale. Higher scores reflected greater endorsement of a secure attachment style, followed by avoidant and then anxious attachment styles. No significant gender differences were found for any of the three attachment subscale scores, $F < 1$.

Beyond computing the three attachment-style subscale scores, children were classified as "securely attached" if their Secure Attachment score surpassed both their Avoidant and Anxious scores. Children were classified as "insecurely attached" if either their Avoidant or Anxious score surpassed their Secure Attachment score. This classification yielded a distribution of secure and insecure styles that resembled previous findings (e.g., Finzi et al., 1996). Fifty-nine percent of the children were classified as securely attached, and the remaining 41% were classified as insecurely attached.

4. *The Children's Appraisal of Teacher as Secure Base Scale* (CATSB; Al-Yagon & Mikulincer, 2004). This children's self-report scale assessed children's appraisal of the teacher as a secure base (see Appendix). The authors constructed this 26-item scale after interviewing teachers, children, and experts in educational psychology and attachment theory, as well as after conducting a large-scale study on a sample of 570 typically developing children (Al-Yagon & Mikulincer, 2003). The CATSB asked children to read each item and rate the extent to which the item described their homeroom teacher, on a 7-point scale (1 = *not at all appropriate,* 7 = *very appropriate*). The items were organized around three subscales of children's appraisal of the teacher as a secure base:

1. Availability: the extent to which the teacher was thought to be available and receptive in times of need (6 items, e.g., "When I need the teacher's help, she is always there");
2. Acceptance: the extent to which the teacher was appraised as a caring figure who accepted the child's needs, feelings, and behaviors (12 items, e.g., "The teacher makes me feel welcome in the class"); and
3. Rejection: the extent to which the teacher was perceived as rejecting the child (8 items, e.g., "The teacher makes me feel that I'm unnecessary in the class").

In their large-scale sample study, Al-Yagon and Mikulincer (2003) conducted a factor analysis of the 26 items, which revealed three main factors that corresponded with these three subscales. In the current sample, Cronbach alphas for the subscales ranged from .72 to .86, implying that there was adequate internal consistency. On this basis, we computed three subscale scores by summing up items that corresponded to each teacher appraisal subscale. Higher scores reflected a higher appraisal of the homeroom teacher as available, accepting, and nonrejecting at times of need.

Teachers' Instruments. We used two teacher-report measures.

1. *Teacher Assessment of Student Academic Functioning* (Margalit, 1995). In order to assess teachers' ratings of their students' academic competence, we used the third part of the Hebrew adaptation of the *Social Skills Rating System* (SSRS; Gresham & Elliott, 1990). For each child, the teacher answered the following item: "Compared to other students in my class, the overall academic performance of this child is . . . ." Teachers rated students on a 5-point Likert scale (1 = *very low functioning,* 5 = *very high functioning*).

2. *Student–Teacher Relationship Scale* (Teacher version; Pianta, 1992). The original English version of this scale assessed the teacher's feelings about his or her relationship with each specific student in terms of closeness, conflict, and dependency. In the current study, we used a Hebrew version of the closeness factor that consisted of 10 items (e.g., "I share an affectionate, warm relationship with this child," "If upset, this child will seek comfort from me"). We used only the closeness factor to promote teachers' cooperation in light of the numerous questionnaires that teachers completed for the study. With this limitation in mind, we selected the closeness factor because of its compatibility with the main goal of the attachment system, which emphasizes proximity maintenance between the child and the attachment figure (i.e., teacher).

In the current study, we asked teachers to complete the scale separately for each of the targeted children in their homerooms. The teachers rated the extent to which items described

their relationship with each specific child, on a 5-point scale (1 = *definitely does not apply,* 5 = *definitely applies*). In the current sample, the high Cronbach alpha coefficient for the 10 items ($\alpha = .89$) allowed us to compute a total closeness score for each targeted child by summing up the teacher's answers to the 10 items in reference to that child. Higher scores reflected greater feelings of closeness to the child.

Procedure

After obtaining parental consent and approval from the Israeli Ministry of Education, two members of our research team (graduate students in special education programs) entered each classroom. At the start of the session, the team members distributed the four questionnaires listed previously to each student. Each scale was printed on a different color of paper, and the order of the scales was randomized across participants. Before asking students to complete the questionnaire packet, one of the team members read aloud sample items for each of the four scales, to ensure that children understood. During the session, as children individually completed the scales, the team members provided additional help to students when needed, paying particular attention to students with special needs.

One team member introduced the research instrument and procedure to the teachers on an individual basis. Teachers first completed the *Student–Teacher Relationship Scale* for each of their students with a learning disorder. We then asked teachers to match a control group of students of average academic functioning who did not have any remarkable social, behavioral, or emotional problems (identical in gender distribution to the group of children with disabilities) and to complete the *Student–Teacher Relationship Scale* for each of these typically developing children. Finally, we asked the teachers to complete the *Teacher Assessment of Student Academic Functioning* for each child in their class.

Results

In examining the role that attachment-based factors may play in mediating the association between learning disorders and problems in socioemotional and academic adjustment, we adopted the analytical steps suggested by Baron and Kenny (1986). These steps examined

1. whether learning disorders are significantly associated with children's socioemotional and academic adjustment,
2. whether learning disorders are significantly associated with the hypothesized mediating factors (children's' attachment style, their appraisal of teacher as a secure base, and teacher's feelings of closeness to a child),
3. whether these attachment-based mediating factors are significantly associated with children's socioemotional and academic adjustment, and
4. whether individual variations in attachment-based factors can explain the link between learning disorders and socioemotional and academic adjustment.

Step 1: The Association Between Children's Learning Disorders and Adjustment. We examined the association between learning disorders and measures of socioemotional and academic adjustment using two-way ANOVAs (Gender × Group) with sense of coherence, loneliness, and academic functioning scores as the dependent variables.

The MANOVA yielded a significant main effect for study group, $F(3, 196) = 96.02$, $p < .01$. The main effect for gender and the interaction between study group and gender were not statistically significant. Univariate ANOVAs revealed significant main effects for study group regarding sense of coherence, loneliness, and academic functioning scores (see F scores in Table 1). As expected, an examination of group means indicated that students with learning disorders scored higher in loneliness and lower in sense of coherence and academic functioning than did typically developing students (see Table 1).

Step 2: The Association Between Children's Learning Disorders and Attachment-Based Factors. We examined the association between learning disorders and the hypothesized mediating factors (attachment-based variables) using two statistical analyses. First, we conducted two-way ANOVAs (Gender × Group) with the three CATSB scores and the teacher's feelings of closeness to a child as the dependent variables. Second, we conducted a chi-square test to examine the association between study group and the distribution of children's attachment style classification (secure or insecure).

The MANOVA yielded a significant main effect for study group, $F(4, 193) = 15.62$, $p < .01$. The main effect for gender and the interaction between study group and gender were not statistically significant. Univariate ANOVAs revealed significant main effects for study group regarding CATSB acceptance and rejection scores as well as teacher's closeness score. In line with our predictions, an examination of group means indicated that students with learning disorders appraised their teachers as more rejecting and less accepting than did typically developing students. Moreover, teachers reported feeling less close to students with learning disorders than to typically developing children (see Table 1). Neither the main effect for gender nor the interaction between gender and study group showed significant effects on any of the four attachment-based variables.

A chi-square test yielded a significant association between study group and attachment, $\chi^2(1) = 16.24$, $p < .01$. Whereas 73% ($n = 77$) of typically developing students were classified as having a secure attachment style, only 45% ($n = 44$) of students with learning disorders were classified as securely attached. A similar significant association was found when analyzing the continuous attachment style scores: $t(203) =$

TABLE 1. Means and Standard Deviations of Adjustment Measures and Attachment-Related Factors by Study Group

Variable	Children with learning disorders		Typically developing children		*F*
	M	*SD*	*M*	*SD*	(3, 203)
Adjustment measures					
Sense of coherence	47.38	6.43	52.22	5.68	31.60**
Loneliness	35.37	12.58	26.46	9.20	30.42**
Academic functioning	2.06	0.91	4.35	0.84	337.75**
Attachment-based factors					
Teacher's closeness	39.11	7.59	41.93	6.17	8.36**
CATSB availability	30.09	7.38	31.91	7.12	3.61
CATSB acceptance	64.90	12.14	73.28	10.09	29.05**
CATSB rejection	20.02	10.26	12.35	6.75	40.97**

Note. Significance levels for univariate ANOVAs were corrected according to Bonferroni technique. CATSB = *The Children's Appraisal of Teacher as a Secure Base Scale* (Al-Yagon & Mikulincer, 2003).
**$p < .01$.

TABLE 2. Correlation Matrix for the Assessed Variables

Variable	1	2	3	4	5	6	7	8	9	10
1. Teacher closeness	—									
2. Acceptance	.24**	—								
3. Availability	.16*	.71**	—							
4. Rejection	−.14*	−.46**	−.29**	—						
5. Secure classification	.02	.18*	.09	−.31**	—					
6. Security	.12	.39**	.35**	−.32**	.68**	—				
7. Avoidance	−.05	−.08	−.04	.33**	−.55**	−.40**	—			
8. Anxiety	.03	−.12	−.05	.30**	−.67**	−.50**	.48**	—		
9. Coherence	.24**	.56**	.46**	−.47**	.35**	.51**	−.33**	−.40**	—	
10. Loneliness	−.08	−.50**	−.36**	.54**	−.42**	−.52**	.38**	.39**	−.60**	—
11. Academic functioning	.25**	.29*	.03	−.33**	.27**	.28**	−.24**	−.20**	.26**	−.30**

*$p < .05$. **$p < .01$.

4.77, $p < .01$, for security; $t(203) = -3.93$, $p < .01$, for avoidance; $t(203) = -3.12$, $p < .01$, for anxiety. The findings consistently showed that students with learning disorders reported less security and more avoidance and anxiety in their close relationships than did their typically developing peers (M = 17.61 vs. M = 19.80, for security; M = 14.75 vs. M = 12.45, for avoidance; M = 14.80 vs. M = 12.65, for anxiety).

Step 3: The Association Between Attachment Factors and Socioemotional and Academic Adjustment. Before testing the contribution of attachment-based factors to adjustment measures, we examined the associations between the various attachment-based factors. Significant Pearson correlations emerged between teacher's feelings of closeness to a child and the child's appraisal of teacher's availability, acceptance, and rejection (see Table 2). Higher closeness felt by the teacher toward a child correlated with that child's appraisal of the teacher as less rejecting, more available, and more accepting. It is important to note that this finding strengthened the construct validity of our CATSB scale as a measure of perception of teacher as a secure base. Additional Pearson correlations indicated that attachment style was significantly associated with the CATSB scores of acceptance and rejection, but not with the CATSB availability score or with a teacher's feelings of closeness to a child (see Table 2). Secure children appraised their teacher as more accepting and less rejecting than did insecure children. When using the continuous scores of attachment style, Pearson correlations showed that attachment security was significantly correlated with the three CATSB scores, whereas scores of attachment avoidance and anxiety were significantly correlated with only the CATSB rejection score (see Table 2).

In examining the contribution of attachment-related factors to socioemotional and academic adjustment, we per-

formed multiple regression analyses for each adjustment score, with the following predictors: teacher's feelings of closeness to a child; child's appraisal of teacher's availability, acceptance, and rejection; and child's secure attachment classification (a dummy variable contrasting secure style with insecure style). The multiple regression for sense of coherence revealed a significant contribution of attachment-based factors, $F(5, 192) = 29.66$, $p < .01$, which explained 44% of the variance. Pearson correlations (see Table 2) revealed significant associations between all the attachment-based factors and sense of coherence. Similarly, the standardized regression coefficients revealed significant contributions for all of the attachment-based factors: teacher's feelings of closeness to a child ($\beta = .12$, $p < .05$); child's appraisal of teacher acceptance ($\beta = .27$, $p < .01$), availability ($\beta = .17$, $p < .05$), and rejection ($\beta = -.22$, $p < .01$); and child's secure attachment classification ($\beta = .20$, $p < .01$). The child's higher sense of coherence was explained by the teacher's higher feelings of closeness to the child, as well as by the child's higher appraisal of teacher acceptance and availability, lower appraisal of teacher rejection, and more secure attachment style in close relationships.

With regard to child's sense of loneliness, the set of attachment-based factors contributed significantly, explaining 46% of the variance, $F(5, 192) = 32.14$, $p < .01$. Pearson correlations (see Table 2) revealed significant associations between loneliness and most of the attachment-based factors, with the exception of teacher's feelings of closeness. The regression analysis revealed a significant unique contribution only for child's appraisal of teacher acceptance ($\beta = -.28$, $p < .01$) and rejection ($\beta = .33$, $p < .01$) and child's secure attachment style ($\beta = -25$, $p < .01$). The child's lower sense of loneliness was explained by the child's higher appraisal of teacher acceptance and availability, lower appraisal of teacher rejection, and more secure attachment style in close relationships.

Child's academic functioning was significantly predicted by the set of attachment-based factors, $F(5, 193) = 12.40$, $p < .01$, which explained 25% of the variance. Pearson correlations (see Table 2) revealed significant associations between academic functioning and most of the attachment-based factors, with the exception of child's appraisal of teacher availability. Similarly, the standardized regression coefficients revealed significant contributions for teacher's feelings of closeness to a child ($\beta = .19$, $p < .05$), child's appraisals of teacher acceptance ($\beta = .35$, $p < .01$) and rejection ($\beta = -.19$, $p < .05$), and child's secure attachment style ($\beta = .17$, $p < .05$). The child's higher academic functioning was explained by the teacher's higher feelings of closeness to the child as well as by the child's higher appraisal of teacher acceptance, lower appraisal of teacher rejection, and more secure attachment style in close relationships.

Step 4: The Mediating Role of Attachment-Based Factors. In examining this hypothesis, we adopted Baron and Kenny's (1986) analytical strategy. According to their terms, a variable functions as a mediator under any of the following circumstances:

1. Variations in the independent variable account for variations in the mediators (Path A).
2. Variations in the mediator significantly account for variations in the dependent variable (Path B).
3. When Paths A and B are controlled, a previously significant relationship between independent and dependent variables is no longer significant.

In applying these criteria to our data, we could analyze the mediating role of attachment-based factors vis-à-vis the significant association between learning disorders and child's sense of coherence, sense of loneliness, and academic functioning. Both child's learning disorders and child's attachment-based factors significantly contributed to these scores. Moreover, a significant association emerged between child's learning disorders and attachment-based factors.

Technically, we conducted a hierarchical regression for each of the three adjustment scores (sense of coherence, sense of loneliness, and academic functioning). In Step 1, we introduced learning disorders (a dummy variable contrasting children with learning disorders to typically developing children) as a predictor of adjustment. In Step 2, we included the set of attachment-based factors (teacher's feelings of closeness, CATSB scores, and child's secure attachment style) as additional predictors. Then, we compared the beta of the learning disorders in Step 1 to the beta of the learning disorders in Step 2 (after controlling for the hypothesized mediators), using Sobel's (1982) test for mediation. Table 3 presents relevant data (betas and *t* tests) for these hierarchical regressions.

The findings indicated that the set of attachment-based factors significantly mediated the contribution of learning disorders to the child's sense of coherence and sense of loneliness. With regard to these two socioemotional adjustment factors, the original significant contribution of learning disorders at Step 1 was no longer significant at Step 2 after controlling for variation in attachment-based factors. In fact, Sobel's (1982) test for mediation revealed a significant difference in the betas of the learning disorders (see Table 3) before and after the statistical control for attachment-based factors ($Z = 3.32$, $p < .01$, for sense of coherence; $Z = 3.86$, $p < .01$, for sense of loneliness). Table 3 also shows that child's appraisal of teacher acceptance and rejection and child's secure attachment style significantly contributed to the adjustment scores and acted as significant mediators of the contribution of the learning disorders to the child's sense of coherence and sense of loneliness. This finding was in line with our hypothesis about the mediating role of attachment-based factors.

With regard to academic functioning, the findings indicated that the set of attachment-based factors did not significantly mediate the contribution of the learning disorders. In this case, the original significant contribution of the learning disorders at Step 1 was still significant at Step 2 after controlling for variation in attachment-based factors. In fact, Sobel's (1982) test for mediation revealed no significant dif-

TABLE 3. Hierarchical Regression Testing the Mediational Role of Attachment-Based Factors

Predictor	Sense of coherence			Loneliness			Academic functioning		
	Standard β	*T*	R^2	Standard β	*T*	R^2	Standard β	*T*	R^2
Step 1			.13**			.14**			.63**
Learning disorders	–.36	–5.48**		.38	5.74**		–.79	–18.20**	
Step 2			.44**			.46**			.65**
Learning disorders	.09	–.48		.09	1.51		–.74	–14.90**	
Teacher–child closeness	.10	1.90		.05	1.00		.10	2.33**	
Acceptance	.24	2.81**		–.25	–3.00**		.12	1.74	
Rejection	–.20	–3.06**		.30	4.85**		.01	0.15	
Availability	–.09	–1.11		–.08	–1.11		–.16	–2.61**	
Secure classification	.18	3.25**		–.24	–4.22**		.06	1.29	

**$p < .01$.

ference in the betas of the learning disorders (see Table 3) before and after the statistical control for attachment-based factors, $Z = 0.73$.

Discussion

The current findings supported our hypotheses concerning the important role that attachment-based factors play in mediating the detrimental effects of learning disorders on children's socioemotional adjustment. With regard to academic functioning, the findings were at odds with our hypotheses, indicating that attachment-based factors did not play a significant role in mediating problems in academic functioning of children with learning disorders. Beyond delineating the mediational role of attachment-based factors, the findings also provided important information about the association and unique effects of two different attachment-based factors—children's global attachment style and the perception of the teacher as an attachment figure. Despite these two factors' significant interrelations, they nevertheless evidenced unique contributions to children's socioemotional adjustment. Overall, the findings highlighted the relevance and validity of attachment theory for explaining the socioemotional problems of children with learning disorders, while delineating the unique importance of child–teacher relationships for understanding the possible antecedents of these problems.

The current findings clearly indicate that children with learning disorders suffer from problems in socioemotional adjustment and academic functioning at school. Specifically, in line with previous research, children with learning disorders reported a greater sense of loneliness and lower sense of coherence than did their typically developing peers (e.g., Asher et al., 1990; Margalit & Levin-Al-Yagon, 1994; Pavri & Monda-Amaya, 2000). As expected, the current outcomes also revealed that teachers evaluated children with learning disorders as demonstrating a lower level of academic functioning than did children with typical development. This finding resembles those reported by Culbertson (1998), underscoring that children with learning disorders are more likely to experience maladjustment than are their typically developing peers. It is important to note that no gender differences emerged for socioemotional adjustment or academic functioning. In addition, gender did not considerably moderate the significant effects of learning disorders on sense of coherence, loneliness, and academic functioning.

Beyond documenting the effects of child's learning disorders on socioemotional adjustment and academic functioning, the current findings revealed a significant effect of learning disorders on attachment-based factors. This is an important finding because if attachment-based factors are indeed a mediator of socioemotional and learning problems for children with learning disorders, they should be associated with learning disorders. Moreover, as mentioned earlier, despite growing awareness regarding the importance of the contribution of attachment-based factors to children's adjustment, few attachment studies have been conducted on school-age children with learning disorders. In addition, the existing studies have not systematically documented differences in attachment-based factors between children with learning disorders and their typically developing peers. Due to the paucity of such research, the current findings showing a significant association between learning disorders and attachment-based factors make an important contribution to the understanding of the interpersonal consequences of learning disorders and the nature of the socioemotional problems related to learning disorders.

The findings indicate that children with learning disorders differ from their typically developing peers in terms of the attachment-based factors studied. With respect to children's global attachment orientation toward others, children with learning disorders reported lower attachment security and more attachment avoidance and anxiety in their close relationships than did their typically developing peers. These in-

tergroup differences support prior outcomes for adults with learning disorders (Smith & McCarthy, 1996) and for high-risk samples of abused, premature, disadvantaged, or ill children (e.g., Lyons-Ruth et al., 1993; Moss et al., 1996; Speltz et al., 1990). Thus, the current findings offer unique information regarding documenting the attachment patterns of children with learning disorders who attend general education schools. Conceptually similar effects of children's learning disorders emerged on both measures of the specific child–teacher relationship. First, children with learning disorders viewed their teachers as more rejecting, less available, and less accepting than did typically developing children. These outcomes support Murray and Greenberg's (2001) findings that children with learning disorders reported greater dissatisfaction with their teachers. Second, our teachers reported lower levels of emotional closeness to children with learning disorders than to the typically developing students in their classrooms, supporting recent findings (Cook, Tankersley, Cook, & Landrum, 2000) that children with learning disorders were significantly overrepresented in teachers' rejection nominations.

These results regarding both global and specific aspects of attachment highlight the role of children's learning disorders as a vulnerability factor that impairs the quality of the child–teacher relationship. It seems that teachers avoid closeness to children with learning disorders, who in turn perceive their teachers as unavailable in times of need and as rejecting and nonaccepting figures. Consequently, children do not perceive these teachers as a source of safe haven and a secure base—the basic functions of an attachment figure—and thus may form an insecure attachment relationship with them. It must be noted that all of these teachers had graduated from programs for general education teachers. Their lack of specific training and preparation may be implicated by these teachers' difficulties in establishing optimal relationships with these children. Similar to previous studies that have examined such teacher characteristics as tolerance toward maladaptive behaviors, expectations, and teaching efficacy (Gersten, Walker, & Darch, 1988; Hocutt, 1996; Landrum & Kauffman, 1992), the current results call for additional exploration of the contribution of teachers' characterstics to the process of inclusion.

In line with our hypotheses, this study revealed that attachment-based factors had an impact on socioemotional and academic adjustment. First, children's more secure attachment style in close relationships made a unique, significant contribution to their higher sense of coherence and lower feelings of loneliness, and to the teacher's higher evaluation of their academic functioning. These findings corresponded with the growing literature showing the beneficial effects of attachment security and the detrimental effects of insecure attachment patterns on the individual's adjustment and functioning (e.g., Van Ijzendoorn, Goldberg, Kroonenberg, & Frenkel, 1992). Second, a teacher's stronger feelings of closeness to a child also made a significant, unique contribution to that child's higher sense of coherence and academic functioning, but not to the child's lower feelings of loneliness. Past research has emphasized the influence of the child–teacher relationship on children's social competence (Howes et al., 1994) and academic achievements (Birch & Ladd, 1996; Pianta et al., 1995). Third, a child's perception of a teacher as a source of secure base, as a more available and accepting and less rejecting figure, also contributed significantly and uniquely to his or her higher sense of coherence, lower feelings of loneliness, and higher academic functioning. Overall, more secure attachment patterns in close relationships with teachers rendered beneficial effects on children's socioemotional and academic adjustment.

Perhaps the most valuable contribution of the current study is its examination of the role that attachment-based factors play in the association between learning disorders and socioemotional adjustment. Thus, the current findings suggest the merit of adding attachment-based explanations to the well-documented association between learning disorders and socioemotional maladjustment (e.g., Margalit & Levin-Al-Yagon, 1994; Morrison & Cosden, 1997; Wenz-Gross & Siperstein, 1998). Specifically, the results highlight two additional explanatory factors involving the functioning of the attachment system for children with learning disorders: (a) their relatively high incidence of insecure patterns of attachment in close relationships and (b) their relatively low tendency to appraise the teacher as providing an opportunity to develop a secure base. These conclusions correspond with Al-Yagon's (2003) findings, which emphasized the role of secure attachment as a protective factor in explaining emotional adjustment in at-risk kindergartners with mild developmental delays.

In light of the predominant empirical trend to exclusively investigate a single perspective of the child–teacher relationship, that of either the teacher or the child (e.g., Murray & Greenberg, 2001; Pianta, 1992; Pianta et al., 1995), the current study focused on both the child and the teacher concurrently. Indeed, we found a significant association between these two perspectives. The child's appraisal of the teacher as a secure base (i.e., available, accepting, and nonrejecting) correlated with the teacher's stronger feelings of closeness to that child.

It is interesting to note that an examination of the particular associations between the children's global attachment style in close relationships and the children's perspective of the specific child–teacher relationship (perception of the teacher as a secure base) suggests that the two are not overlapping constructs. The correlations found between children's higher global attachment security in close relationships and children's higher appraisal of the teacher (as available, accepting, and nonrejecting) show that securely attached children tend to form secure relationships with their teachers. However, these variables showed only moderate correlations (between .32 and .39). In addition, attachment security in close relationships was not significantly associated with a teacher's feelings of closeness to a child. Also, despite the significant association between the children's global attachment style and

specific appraisal of the teacher as a secure base, the two sets of variables made significant, unique contributions to socioemotional adjustment. Thus, it seems possible for insecurely attached children to develop secure patterns of attachment with a teacher and for these patterns to stem from the specific relationship with the teacher, rather than from the child's global attachment style. These results underscore the important role that the quality of teachers' care can play in forming secure and supportive child–teacher relationships. The key qualities of these relationships appear to be related to the teacher's ability to become a secure base for the child, which, according to Pianta (1999), consists of reading the child's unique needs, responding contingently to these needs, conveying acceptance and emotional warmth, offering assistance as necessary, and offering a model for the child's behavior. Future studies should examine whether and how teachers' attitudes and behaviors contribute to secure and insecure relationships between children and their teachers.

These results, emphasizing the importance of both children's global attachment style and children's specific relationships with teachers to their socioemotional adjustment, are congruent with those of Bowlby's (1988) study. Bowlby assumed that although attachment style is formed during early interactions with primary caregivers, every meaningful interaction with significant others throughout life may affect the individual's beliefs about others' availability and supportiveness. Thus, although attachment style may be quite general, it is also common for individuals to develop relationship-specific beliefs organized around actual experiences with a specific partner.

The results of this study have theoretical and practical implications. The theoretical contribution focuses on the relevance and validity of attachment theory for explaining socioemotional problems of children with learning disorders. The practical implications concern the possible implementation of attachment theory for developing effective interventions among children with learning disorders. These interventions can consist of two major components:

1. early interventions conducted with mothers of children with learning disorders in order to improve the quality of their relationship with their children and then to facilitate the formation of a secure attachment style in these children and
2. interventions conducted with teachers of children who have learning disorders in order to facilitate the perception of the teacher as a secure base.

Further studies attempting to develop such intervention programs should examine their effectiveness in buffering the socioemotional problems of children with learning disorders.

Several limitations of this study call for further research. First, because the close relationships among school-age children extend beyond the home and the family, the present study focused on interrelations between children's learning disorders and their experiences in close relationships with extrafamilial figures, rather than attachment with parental figures. Future research should investigate the interrelations between intrafamilial and extrafamilial attachment-based factors. Further study could also elaborate on the quality of children's relationships not only with parents and teachers but also with siblings and peers and other extrafamilial figures. Moreover, future research should investigate the longevity of such perceptions over time and use qualitative interview methods to elaborate on these children's structured self-reports.

Second, the present sample size did not allow us to explore the multiple personal and interpersonal factors that may contribute to the development of insecure attachment patterns, specifically by children with learning disorders. In this context, future studies should focus on the individual characteristics of children with learning disorders (i.e., verbal skills, temperament, attention-deficit/hyperactivity disorder), parenting style, and teachers' representations of and attitudes toward learning disorders.

Finally, the current descriptive study provided cross-sectional data. Future research should adopt longitudinal designs that follow up with at-risk children from early ages, to improve our understanding of the formation of insecure attachment and socioemotional problems in this population.

AUTHORS' NOTE

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Appendix

The Children's Appraisal of Teacher as Secure Base Scale (CATSB)

My Teacher and I—A Student Questionnaire

1. My teacher makes me feel wanted in the class.
2. My teacher makes me feel that what I do is important.
3. My teacher is always there to help me when I need her.
4. My teacher always gives me a lot of attention.
5. My teacher tends to complain about me to other adults (for instance: parents, teachers, principal).
6. My teacher makes me feel superfluous in the class.
7. My teacher makes me feel unwanted.
8. My teacher trusts me.
9. My teacher is aware of my good qualities.
10. When I am worried or sad, my teacher helps me feel better.
11. My teacher believes in my abilities.
12. My teacher is ashamed that I am her student.
13. My teacher is pleased with my behavior.
14. My teacher praises my abilities in front of other people.
15. My teacher would prefer me to be someone else.
16. My teacher makes me feel I am an asset to my class.
17. My teacher believes that I mean to make an effort.
18. My teacher makes me feel as though I do not exist.
19. My teacher does not appreciate what I do.
20. My teacher keeps me at a distance.
21. My teacher expresses her appreciation of me even when I try but fail.
22. My teacher is never around when I need her.
23. My teacher praises me when she is pleased with me.
24. I feel free to talk with my teacher.
25. My teacher praises me when I do a good job.
26. My teacher tries to get me to be closer to her.

Thank you for your cooperation and help.

Note. The CATSB provided a 7-point scale for responses. Participants circled the appropriate number along the following scale: *applies very much* (7), *applies* (6), *applies somewhat* (5), *applies to a medium degree* (4), *does not apply much* (3), *does not apply* (2), *does not apply at all* (1).