

Mediators of the Risk for Problem Behavior in Children with Language Learning Disabilities

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Abstract

A developmental-organizational perspective was employed to explore underlying risk for problem behavior in children with language learning disabilities. The independent and relative influences of social discourse and social skills on problem behavior were examined in 50 children with language learning disabilities (LLD) and 50 control children (children without LLD) aged 8 to 12 years. Hierarchical regression analyses revealed that when examined independently, both impaired social discourse skill and poor social skills accounted for the negative effect of LLD status on children's problem behavior. When social discourse and social skills were examined simultaneously in relation to problem behavior, social discourse no longer retained its predictive value. This result suggests that children's impaired social interactional functioning is central to the development of behavioral symptomatology. However, the importance of social discourse cannot be overlooked, given the significant correlation between social discourse and social skills ratings. Though these results are correlational in nature, it is argued that the impaired communicative competence of some children with LLD may contribute to poor social skills that ultimately manifest themselves as more clinical problem behaviors characterized by internalizing and externalizing symptomatology. Finally, differences were confirmed in social discourse performance, social skills, and problem behaviors between the children with LLD and the control group children. Findings emphasize the importance of the routine assessment and monitoring of broader social discourse skills, in addition to social competence, in children with LLD.

Compelling evidence from two different domains of inquiry has converged to suggest that children with language-based learning disabilities (LLD) are at risk for problem behaviors. Within the learning disability field, a large proportion of children with learning disabilities are rated by teachers and parents as exhibiting problem behaviors characterized by internalizing (e.g., anxiety, depression) and externalizing (e.g., aggression, hyperactivity) symptomatology (Bender & Smith, 1990; Cummings, Vallance, & Brazil, 1992; Margalit, & Levin-Alyagon, 1994; McKinney, 1989; Schachter, Pless, & Bruck, 1991; Wright-Strawderman & Watson, 1992). Concurrently, within the psychiatric literature, several epidemiological studies have revealed that approximately half of the children who present to speech/language clinics have a psy-

chiatric disorder (Beitchman, Nair, Clegg, Ferguson, & Patel, 1986; Cantwell & Baker, 1991; Richman, Stevenson, & Graham, 1982). As well, a similar proportion of children who attend psychiatric outpatient clinics have language impairments (Baltaxe & Simmons, 1990; Cohen, Davine, Horodezky, Lipsett, & Isaacson, 1993; Cohen, Davine, & Meloche-Kelly, 1989; Grinnell, Scott-Hartnett, & Glasier, 1983; Kotsopoulos & Boodoosingh, 1987). Additionally, the co-occurrence of learning disability and language impairment has recently been reported in the literature (Baker & Cantwell, 1987; Gibbs & Cooper, 1989; Sawyer, 1992; Siegel & Ryan, 1984). Furthermore, children who exhibit both a language impairment and a learning disability demonstrate the greatest risk for dysfunctional social and behavioral adjustment (Baker & Cantwell, 1987).

This empirical evidence emphasizes that children with both a language impairment and a learning disability (i.e., children with LLD) are at risk for problem behaviors. Yet, the processes underlying this risk remain unclear. Deficient social discourse (Lapadat, 1991; Mathinos, 1991; McCord & Haynes, 1988; Wiig & Secord, 1989a) and poor social skills (Asher & Dodge, 1986; Cantwell & Baker, 1991; Gresham & Elliott, 1990; Hartup, 1983) have been hypothesized as contributing to problem behaviors in both children with learning disabilities and children without learning disabilities. Past research has tended to examine these variables in isolation, and thus the interplay among the processes has not been explored. The broad objective of this study was to examine the independent and relative influences of social discourse and social skills on problem

behavior in children with LLD and control children (children without LLD).

One way in which language learning disabilities have been thought to contribute to problem behavior is through impairing children's communicative or social discourse skill. Clinical observations reveal that the failure to communicate thoughts and needs, as well as misinterpretations of messages, often lead to confusion, aggression, and social withdrawal in children with language impairments (Prizant et al., 1990). Social discourse is an exemplar of the recent shift in the field of language development toward focusing on the function of language, that is, the integrative, adaptive language skills that are necessary for social communication (Liles, 1993; McTear, 1985; Prizant & Wetherby, 1990; Thomas & Fraser, 1994). In the past, approaches to the study of children's language development have focused exclusively on isolated content and structural components of language (i.e., expressive and receptive phonology, syntax and semantics; Chomsky, 1965; Lahey, 1988). In contrast, social discourse is a domain of development that represents a complex integration of language skills (e.g., syntactic and semantic), cognition, and social processes (e.g., social perception of nonverbal behavior, perspective taking, emotional understanding, and social problem solving; Dennis & Barnes, 1990; McTear, 1985; Prutting & Kirchner, 1987; Roth & Spekman, 1984). The successful coordination of these processes allows for the mutual understanding and exchange of meaning that is necessary for communication. Ultimately, successful communication depends on one's ability to share explicit and implicit intentional states. Research indicates that children with learning disabilities exhibit a range of deficits in the expression and interpretation of social discourse (Dudley-Marling, 1985; Lapadat, 1991; Mathinos, 1991; McCord & Haynes, 1988; Wiig & Secord, 1989a). Most notably, children with LLD ex-

hibit difficulties expressing their understanding of ambiguous sentences (Wiig & Secord, 1989a; Wiig, Semel, & Abele, 1981) and expressing the apparent intentions of others (Chappell, 1985; Liles, 1993), as well as drawing inferences (Liles, 1993; Oakhill, 1984) and understanding the meaning of figurative language (Jones & Stone, 1989; Seidenberg & Bernstein, 1986).

Another way in which language learning disabilities have been thought to contribute to the development of problem behavior is through limiting the development of social skills. Definitions vary, but Gresham and Elliott (1987) defined social skills to include those behaviors exhibited within specific situations that predict a child's standing on important social outcomes. Important social outcomes for school-aged children include acceptance by the peer group, ability to follow the rules of conduct within a classroom setting, and appropriate motivation for achievement (Cicchetti & Howes, 1991; Gresham & Elliott, 1987). Thus, the development of social skills within the school setting is an important stage-salient task for all school-aged children. A plethora of studies indicate that boys and girls with learning disabilities are rated by teachers, parents, and peers as exhibiting behaviors indicative of limited social skills compared to their age-mates (Bender & Wall, 1994; Gresham & Elliott, 1987, 1990; Sabornie, 1994; Tur-Kaspa & Bryan, 1995; Vaughn & Haager, 1994). Specifically, children with learning disabilities tend to display less assertive behavior (e.g., are shy and dependent; Wiener, Harris, & Shirer, 1990; lower rates of sharing, cooperating, helping others, and expressing feelings; and higher rates of poor self-control and impulsivity than their nondisabled peers; Gresham & Reschly, 1986).

The relative effects of social discourse and social skills on the development of problem behavior in children are not known because these variables have tended to be studied in isolation. Some theorists (e.g.,

Cantwell & Baker, 1991) have suggested that poor social skills are more centrally associated with the development of problem behaviors, whereas poor communication skills are more likely to have an indirect effect on children's problem behavior symptomatology. It is argued that among children with LLD, repeated communication breakdowns compromise their interpersonal interactions with peers and adults. Indeed, difficulties with expressing and interpreting social meaning embedded in language is related to poor social competence among children with LLD (Vallance & Gallander, 1997). It is their repeated social failure in dyadic relationships and group settings that ultimately leads to emotional distress, which often presents in children as internalizing and externalizing behavioral symptomatology. Indeed, social discourse is a vehicle for social interaction (Prizant & Wetherby, 1990; Prutting, 1982). Relationships with others are initiated and regulated through communication. Thus, the more immediate effects of communicative incompetence would seem to be one's inability to function effectively interpersonally in a social situation, such as in a school setting. Failure to comprehend the thoughts, emotions, and intentions of others, as well as the inability to effectively communicate one's own state of mind, could impede not only the establishment of friendships but also one's ability to follow the rules of conduct in a school setting. Ultimately, repeated failures in a social setting may contribute to, or exacerbate, teachers' perceptions of secondary clinical symptomatology, such as internalizing and externalizing problem behavior in children. Substantial evidence has demonstrated that poor social skills leave children at an increased risk for the development of additional behavioral and emotional adjustment problems (Asher & Dodge, 1986; Hartup, 1983; Offord, Boyle, & Racine, 1990). Clearly, children with LLD often have difficulty communicating effectively in social set-

tings, as well as achieving social competence. Past research has tended to investigate these processes in isolation; thus, the independent and relative influences of social discourse and social skills on problem behavior in children with LLD have been largely unexplored. The present study was driven by the tenets of the developmental-organizational framework. This framework emphasizes that developmental processes may be studied most meaningfully in concert rather than in isolation (Cicchetti, 1990, 1993; Werner, 1948). This perspective is based on the increasing recognition that domains of development are integrated and exert mutual influences over one another (Cicchetti, 1990, 1993; Wachs, 1993). An analysis of the relations among domains can illuminate the factors critical in influencing developmental outcomes (Cicchetti, 1990). Also consistent with the developmental-organizational perspective is the importance of considering atypical and typical groups of children, as the identification of aberrations in development can enhance our understanding of both normal and abnormal processes (Sroufe, 1990). These features make the developmental-organizational framework particularly conducive to studying processes underlying risk for problem behaviors in children with and without LLD.

To explore the developmental processes underlying risk for problem behavior in children with LLD and children without LLD, the following hypotheses were examined:

1. Children with LLD will exhibit poorer social discourse skills, along with lower ratings of social skills and higher ratings of problem behavior by teachers, compared to control children within a school setting.
2. When social discourse and social skills are examined independently, each will mediate the effects of LLD status on children's problem behavior. A variable functions as a mediator to the extent that it accounts

for the relation between a predictor and an outcome variable. Specifically, if the predictive value of LLD status on problem behavior was no longer significant when social discourse skill or social skills were entered into the regression equation, then social discourse skill and social skills could each be viewed as mediating the effects of LLD status on children's problem behavior.

3. When social discourse and social skills are examined simultaneously in relation to problem behavior, social discourse will no longer retain its predictive value. This result will indicate that poor social skills are more centrally associated with internalizing and externalizing symptomatology. Alternatively, if both social discourse and social skills retain their predictive effect on problem behavior when examined simultaneously, this will suggest that both skills are independently related to the development of teachers' perceptions of children's problem behavior symptomatology.

Method

Participants

A total of 100 children aged 8 to 12 years participated in the study. One group of 50 children (mean age in months = 121; age range in months = 101-145) consisted of a school-based sample of children with LLD, while the second group of 50 children (mean age in months = 125; age range in months = 92-155) consisted of a school-based sample of control children (without LLD). Children were selected from schools in a suburban borough just outside a large, metropolitan Canadian city. The school board, relying on Statistics Canada data of income level for their region, defined the socioeconomic status (SES) of the school population targeted by the present study as being middle class. Group comparisons of child gender, age, race,

nonverbal intelligence, and language skills are discussed in the results section.

Recruitment

Principals of schools participating in a larger study identified the children with LLD. The control children were recruited from the same grades and schools as the children with LLD. Considering that there are only a few children with LLD in any given classroom and only children in Grades 3 to 6 were targeted, it was necessary to recruit several schools for involvement in the study. Thus, children with LLD were collected from a total of 17 schools; on average, one to two classes per school were involved. Children from general education classrooms receiving resource pull-out were used from 10 schools, and children from both general education and partially integrated classrooms were used from 7 schools. Children from general education classrooms receiving resource pull-out were removed from their class for 2 to 10 hours per week to receive specialized instruction in the resource room from a special education teacher. Children in partially integrated classrooms received all academic instruction from a special education teacher in a segregated class, but participated in art, physical education, music, and special events with children of their same grade in general education classes. Control children were collected from six of the LLD schools, but not from the same classes as the children with LLD. Specifically, four schools with two classes from each school and two schools with one class from each school were involved. On average, five control children per class were recruited.

Diagnostic Criteria

Children with LLD. Each child with LLD had to meet the following criteria to be included in the study: (a) an IQ score within the average range of normal intelligence (i.e., Full

Scale IQ score greater than 80 and less than 120 on the short form of the Wechsler Intelligence Scale for Children-Revised [WISR-R; Wechsler, 1974]); (b) English-speaking background, without significant dialectical differences; (c) no hard signs of neurological damage and no diagnosis of autism or pervasive developmental disorder; (d) not currently on medication (e.g., Ritalin for attention-deficit disorder) for educational reasons; (e) a score 1 standard deviation below the normative mean on two of the six Test of Language Development (TOLD-2; Hammill & Newcomer, 1988) subtests, or 2 standard deviations below the mean on one of the TOLD subtests, resulting in a composite score below 85 on the TOLD-2 (cf. Beitchman et al., 1986; Gibbs & Cooper, 1989); and (f) diagnosed as having a learning disability on the basis of definitions put forth by the Canadian Association for Children with LD (CACLD, 1982) and the American Interagency Committee on Learning Disabilities (1987). The operational definition of learning disability specified (a) a discrepancy of at least 1 standard deviation (i.e., 15 points) between the Full Scale IQ score and an academic achievement score in reading, math, or spelling, and (b) evidence of a specific processing deficit (e.g., visual-perceptual, phonological processing, auditory memory, expressive language, receptive language). The children were originally diagnosed through the school board from which they were obtained; however only children who met the above explicit criteria were retained. Regarding the educational placement of the children with LLD, 77% (38 children) were in general education classrooms and received resource pull-out and 23% (12) of the children were in partially integrated classrooms. Children with LLD had been receiving special education services for at least 1 year and not more than 4 years. Analyses of variance on demographic and performance variables revealed no significant differences between the children

with LLD from pull-out and those from partially integrated classrooms in age, gender distribution, ethnicity, performance IQ, language skills, social competence, social discourse, or problem behavior.

Children Without LLD. Each control child had to meet the following criteria to be included in the study: (a) no formal diagnosis of a learning disability, language impairment, or behavior disorder; (b) an English-speaking background, without significant dialectical differences; (c) a full scale short-form IQ score within the average range of normal intelligence (i.e., a score greater than 80 and less than 120); and (d) a composite score above 85 on the TOLD-2, with the maximum of one subtest 1 standard deviation below the normative mean. The children without LLD were obtained from several different classrooms within the same school or same family of schools as the children with LLD. None of the children without LLD were receiving resource pull-out or were in segregated classrooms.

Measures

Intelligence. The short form of the WISC-R (Vocabulary, Similarities, Block Design, Object Assembly) was used to measure IQ. The short form is recommended as a quick and reliable way of obtaining IQ information (Sattler, 1988) and has been shown to correlate significantly with the full scale version of the scale, $r(99) = .87$, $p < .0001$ (Cohen, Gottlieb, Kershner, & Wehrspann, 1985). The standardization, reliability, and validity of the full scale version of the WISC-R are widely known (Sattler, 1988). Only the Performance subscale was used, in order to avoid potential overlap between the Verbal subscale and the language skills measure (TOLD-2).

Language Skills. The Test of Language Development was used to assess children's expressive and receptive syntactic and semantic lan-

guage skills. The standardized test consists of the following six subtests and the accompanying tasks: Sentence Combining—form one complex sentence that is as short as possible from two or more simple sentences read by the examiner; Word Ordering—form a complete correct sentence from a series of randomly ordered words read by the examiner; Generals—describe how three words read by the examiner are alike; Malapropisms—identify words in a sentence that sound like appropriate words but that have strange meanings in the particular context; Vocabulary—requires the child to decide if pairs of words, said aloud by the examiner, have the same meaning, have the opposite meaning, or are totally unrelated; and finally, Grammatical Comprehension—recognize incorrect grammar in spoken sentences. The first three subtests assess expressive language skills, while the last three assess receptive language skills.

According to Hammill and Newcomer (1988), averaged internal consistency coefficients are .95 for composite scores at different age levels and .88 for the subtests. Test-retest reliability coefficients were all above .80. The TOLD-2 is based on the theoretical frameworks of Chomsky (1965) and Bloom and Lahey (1978). The TOLD-2 also has been shown to differentiate between children identified as having language difficulties and children with normal language development (cf. Beitchman et al., 1986; Cohen et al., 1993; Gibbs & Cooper, 1989).

Social Discourse. The standardized Test of Language Competence-Expanded Edition (TLC-E; Wiig & Secord, 1989b) was used to measure children's social discourse skills (age range of 5-0 to 18-11 years). The test is one of only few available standardized social discourse evaluation tools (Dennis & Barnes, 1990). All of the material in each subtest is presented to the child in both spoken and printed form in order to reduce the interference of short-term auditory memory limitations. The domains assessed in

the measure are supported by three cognitive-linguistic models outlined by Chappell (1985) and Wiig and Secord (1989a). The models are based on the assumption that social discourse skill requires the ability to integrate diverse linguistic representational knowledge bases. Specifically, deficits in the areas of representation of mental, semantic, and intentional knowledge, or the failure to integrate these systems, could impair performance in the four domains of social discourse measured by the TLC-E.

The TLC-E comprises the following subtests. The Ambiguous Sentences subtest examines a child's ability to express two different meanings for a single sentence. For example, the child is given the sentence "I saw the girl take his picture" and asked to give two verbal interpretations of the sentence (e.g., take the picture of him or take the picture from him). The subtest Recreating Speech Acts examines children's ability to construct a sentence from two or three words provided in response to a visual social scenario. For example, a picture of two children observing food in a cafeteria would be presented with the words *pie*, *either*, and *have*. The picture suggests that one child is having difficulty deciding what to have for lunch. The participant must provide a sentence that someone might say in this context, using the three words provided. This subtest examines the child's ability to create socially appropriate sentences based on an understanding of individuals' thoughts, feelings, and intentions in a social context.

The Making Inferences subtest examines children's ability to make multiple inferences in response to descriptions of familiar home and school contexts or social scripts. The child is presented with an event such as "Mom went to the bakery to buy a cake," then the outcome of the event sequence is presented: "Later, Mom made pudding for dessert instead." The goal for the participant is to choose, from a set of four available

responses, two possible intervening events that would represent plausible reasons for the outcome. Thus, "Mom could have made pudding because the bakery did not have a cake" would be one reasonable inference, while the inference "Everyone was asleep" would represent an unreasonable inference. The subtest Figurative Language examines the ability to interpret metaphors in language. Correct interpretation is dependent on the social context within which the sentence is used. For the expression "She is easily crushed," said in the context of a boy talking about his girlfriend, the child must first give a spontaneous verbal interpretation of the expression and, second, choose an accurate interpretation from a set of four possible expressions. The correct match would be "She must be handled with care," while an incorrect match would be a literal interpretation, such as "Her bones break easily." The other incorrect matches represent either the opposite meaning of the expression ("She can handle anything") or an unrelated sentence ("She has a crush on me"). The composite score was used as an indicator of children's overall social discourse skill.

According to Wiig and Secord (1989a), internal reliabilities for the TLC-E range from .75 to .92. Interrater reliability for Recreating Speech Acts was 97% and for Figurative Language was 98%. Subtest intercorrelations revealed moderate correlations (between .23 and .57 among subtests). These moderate correlations were expected because the content of each subtest related to overall social discourse competence. High correlations were not expected between any two subtests because each subtest measured social discourse in a different context.

Regarding discriminant validity, Wiig and Secord (1989a) clearly developed their measure as an alternative to assessing the more formal qualities of language development, such as syntax and semantics. Instead, the measure taps the ability to express and interpret a variety of language con-

tent areas across different communicative contexts. However, given that the TLC-E remains a verbally based measure, it was expected to correlate moderately with other measures of language skill, such as the Verbal Intelligence subscale of the WISC (Wiig & Secord, 1989a). Finally, the TLC-E has been used to measure social discourse skills in samples of head-injured children (Dennis & Barnes, 1990).

Social Skills. Social skills in the school setting were measured via the Social Skills Rating Scale (SSRS; Gresham & Elliott, 1990). The 30-item standardized rating scale was completed by the children's classroom teachers. The scale yields a total score and three subscale scores measuring Cooperation, Assertion, and Self-Control. The subscales specifically assess behaviors underlying important social outcomes for school-aged children, including acceptance by the peer group, ability to follow the rules of conduct within a classroom setting, and appropriate motivational orientations for achievement (Cicchetti & Howes, 1991; Gresham & Elliott, 1987). For example, the Cooperation subscale assesses behaviors such as helping others, sharing materials, and complying with rules and directions. The Assertion subscale measures initiating behaviors, such as asking others for information, introducing oneself, and responding to the actions of others. The Self-Control subscale involves behaviors that emerge in conflict situations, such as responding appropriately to teasing, and in nonconflictual situations that require taking turns and compromising. For the present study, only the composite score was used.

According to Gresham and Elliott (1990), coefficients for internal reliability for the SSRS range from .83 to .94. Substantial evidence for test-retest reliability was shown for the teacher ratings, with correlations of .85. High content, construct, and criterion validity have been well established regarding this scale. The SSRS was

designed for children between the ages of 5 and 12 years. Item development for the SSRS was based on a broad survey of the empirical literature on the assessment and training of social skills in children and adolescents with learning disabilities. The SSRS correlates highly with Harter's Teacher Rating Scale ($r = .70$) and the Walker-McConnell Scale of Social Competence and School Adjustment ($r = .75$; Gresham & Elliott, 1990).

Problem Behaviors. Teachers measured problem behaviors in the school setting using the 13-item standardized Problem Behavior subscale of the SSRS (Gresham & Elliott, 1990). The subscale yields a total score and an Externalizing score, an Internalizing score, and a Hyperactivity score. Externalizing problems are inappropriate behaviors involving verbal or physical aggression toward others, poor control of temper, and arguing. Internalizing problems are behaviors indicating anxiety, sadness, loneliness, and poor self-esteem. Hyperactivity behaviors involve excessive movement, fidgeting, and impulsive reactions.

Coefficients for internal reliability ranged from .78 to .88. Substantial evidence for test-retest reliability was shown for the teacher ratings, with correlations of .84. The Problem Behavior subscale has also been found to be highly correlated with the Child Behaviour Checklist ($r = .81$; Achenbach & Edelbrock, 1983).

Procedure

The intelligence, language skill, and social discourse measures were administered individually to both the children with LLD and the control children in a quiet area in their school. Interviews lasted for approximately 1½ hours and were conducted with a graduate student in clinical psychology. The student was under the supervision of a registered psychologist with expertise in psychoeducational assessment; the student had also completed two supervised clinical

practicums in psychoeducational assessment. Teachers of all children (i.e., control, pull-out, and partially integrated) were asked to complete the Social Skills Rating Scale and compare the behaviors of the target child with the behaviors of "typical children" of the same age and grade level. Thus, the teachers were not to base their ratings on relative levels of social skills as seen among their students. They were told that the purpose of the study was to identify factors related to social risk in children with learning disabilities, and were not aware of the research interests in language per se.

Results

Prior to analysis, data distributions were examined for skewness and kurtosis and to identify outliers. In all cases, data were normally distributed.

Initially, group differences were investigated for child characteristics, social discourse skill, social skills, and problem behaviors to confirm that the groups were different, as the literature suggests. Next, hierarchical regression analyses were conducted to examine the independent and relative effects of social discourse and social skills on problem behavior in children with LLD and control children.

Group Differences

Chi-square analyses and analyses of variance were used to assess group differences in gender, race, age, intelligence, language skills, social discourse, social skills, and problem behaviors. These results can be found in Vallance and Gallander (1997) but are summarized below for convenience. The groups did not differ significantly with respect to gender, race, or age distribution. Of the non-Caucasian children with LLD, 1 was East Indian, 1 was West Indian, 2 were Native Indian, and 2 were Black. Of the non-Caucasian control children, 4 were East Indian, 1 was West Indian, 1 was Asian, and 1 was Black. The

group with LLD consisted of 19 girls and 31 boys, whereas the group without LLD consisted of 25 girls and 25 boys. The approximate 2:1 ratio of boys to girls with LLD is consistent with the cited prevalence rates of referred children with LD (Finucci & Childs, 1981).

There was a significant group effect for nonverbal intelligence scores. Children with LLD had significantly lower performance IQ scores than children without LLD. Lower verbal and nonverbal IQ scores (albeit still within the average range) in children with language impairments have been consistently documented (Benasich, Curtiss, & Tallal, 1993; Cohen et al., 1993; Tallal, Sainburg, & Jernigon, 1991). As a result of this group difference in intelligence, performance IQ was covaried in all subsequent analyses. The Performance subscale of the WISC-R was used as a covariate instead of the Full Scale score, which includes both the Performance and Verbal subscales. The Verbal subscale of the WISC-R and the language skills measure (TOLD-2) overlap, as they both measure language skills. Because the language skills measure was used initially to differentiate the groups, the use of the Verbal subscale of the WISC-R as a covariate could potentially eliminate any real differences associated with language impairments between the groups. In contrast, the Performance subscale is less related to language skills (Sattler, 1988); therefore, it is a relatively better measure of general intelligence for children with LLD.

With regard to language skills, as expected based on the definition of the groups, the children with LLD displayed significantly more impaired language skills, in both expressive and receptive language, than the control children. There also were differences in social discourse skill and social competence ratings by teachers between the two groups. Children with LLD exhibited poorer social discourse skills and received lower ratings of social competence from teachers compared with control children.

To examine differences in problem behaviors, a one-way analysis of covariance (ANCOVA) with group as the independent variable and Performance IQ as a covariate was conducted on the problem behavior composite score of the SSRS. A significant main effect was revealed for group, $F(1, 97) = 7.74, p < .006$. Children with LLD displayed significantly more problem behaviors ($M=112.16$) according to teachers' perceptions, than children without LLD ($M = 101.40$).

Mediators of the Effects of LLD Status on Problem Behavior

According to the statistical technique developed by Baron and Kenny (1986), a variable functions as a mediator to the extent that it accounts for the relation between an independent and an outcome variable. Although this technique provides a test of whether the data are consistent with the model, it does not demonstrate causality.

Initially, correlations were computed among the key variables to be used in the hierarchical regression analyses. These correlations indicated that social discourse was related to both children's social competence ($r = .53, p < .0001$) and children's problem behavior ($r = -.42, p < .0001$). Furthermore, social competence was correlated with problem behavior ($r = -.77, p < .0001$).

Social discourse skill can be identified as a mediator of the relation between LLD status and problem behavior if, given a significant relation between LLD status and social discourse, the effect of LLD status on children's problem behavior is significantly lessened or eliminated (perfect mediation) when social discourse is introduced as a significant predictor into the model. Regression analyses were conducted to examine this mediator model, with the effects of Performance IQ partialled. A multiple-regression analysis revealed that LLD status and social discourse skill were significantly related, $F(1, 97) = 60.49, p < .0001, R^2 = .55$, suggesting that

Variables in the equation		β	Model R^2
Social discourse			
Step 1	LLD status	.30*	.12**
Step 2	LLD status	.10	.16**
	Social discourse	-.29*	
Social competence			
Step 1	LLD status	.30*	.12**
Step 2	LLD status	.00	.59***
	Social competence	-.77***	

* $p < .01$. ** $p < .001$. *** $p < .0001$.

having an LLD has a negative effect on children's social discourse performance. On Step 1 of a hierarchical regression, LLD status was entered into the model and found to be a significant predictor of problem behavior, $F(1, 96) = 16.15, p < .0001$, suggesting that having a language learning disability also has a detrimental effect on children's behavior in the classroom, even after the influence of nonverbal intelligence has been controlled. On Step 2, the social discourse composite score was entered into the model and accounted for significant additional variance, $F(1, 96) = 8.78, p < .003$. The result of adding social discourse to the model was the reduction to nonsignificance of the previous significant relation between LLD status and problem behavior, $F(1, 96) = .55, p > .45$. This finding suggests that social discourse mediates the effect of an LLD on children's problem behavior. The total model predicted 16% of the variance, $F(1, 96) = 5.80, p < .001$ (see Table 1).

Next, the potential of social competence to mediate the effect of LLD status on children's problem behavior was assessed. Social competence is a mediator of the relation between LLD status and problem behavior if, given a significant relation between LLD status and social competence, the effect of LLD status on children's problem behavior is significantly lessened or eliminated (perfect mediation) when social competence is introduced as a

significant predictor into the model. Again, regression analyses were conducted to examine this mediator model, with the effects of Performance IQ partialled. A multiple-regression analysis revealed that LLD status and social competence were significantly related, $F(1, 97) = 13.26, p < .0003$, suggesting that having an LLD has a negative effect on children's social competence. On Step 1 of a hierarchical regression, LLD status was entered into the model and again found to be a significant predictor of problem behavior, $F(1, 96) = 16.15, p < .0001$. On Step 2, the social competence composite score was entered into the model and accounted for significant additional variance, $F(1, 96) = 109.01, p < .0001$. The result of adding social competence to the model was the reduction to nonsignificance of the previous significant relation of LLD status with problem behavior, $F(1, 96) = .01, p > .93$. This finding suggests that social competence mediates the effects of an LLD on children's problem behavior. The total model predicted 59% of the variance, $F(1, 96) = 46.01, p < .0001$ (see Table 1).

Relative Effects of Social Discourse and Social Competence on Problem Behavior

To determine the relative effects of social discourse and social competence on children's problem behavior, the

two variables were examined simultaneously in relation to problem behavior. Given that both social discourse and social competence mediated the effects of LLD on such behavior, it was of interest to determine if, when examined simultaneously, these variables maintained their direct effects, or whether social discourse's influence was better explained through its negative effect on children's social competence. To test this model, LLD status was entered first, then the social discourse composite, and, finally, the social competence composite. If the inclusion of social competence negated the previous independent effect of social discourse, then the hypothesized model that social skills is more centrally associated with problem behavior would be supported. Alternatively, if social discourse retained its predictive power on children's behavior after social competence was entered into a regression model, then one could assume that both impaired social discourse and social competence have independent, additive deleterious effects on children's behavior.

A hierarchical regression analysis was conducted to examine the above model, with the effects of Performance IQ partialled. On Step 1, LLD status was entered into the model and found to be a significant predictor of problem behavior, $F(1, 97) = 16.15, p < .0001$. Similarly, on Step 2, the social discourse score was entered into the model and accounted for significant

additional variance, $F(1, 96) = 8.78, p < .003$. On Step 3, social competence was entered and made an additional significant contribution toward predicting problem behavior in children, $F(1, 97) = 109.01, p < .0001$. However, the result of adding social competence to the model was the reduction to nonsignificance of the previous significant relation of social discourse with problem behavior, $F(1, 96) = .00, p > .99$. The total model predicted 59% of the variance, $F(1, 96) = 32.88, p < .0001$ (see Table 2).

The above result indicates that poor social skills, as opposed to social discourse, are more centrally associated with problem behavior in children with LLD. However, the importance of social discourse is still evident, given the significant relation between social discourse and social skills when nonverbal IQ is controlled, $F(1, 97) = 8.36, p < .004$.

Discussion

A developmental-organizational framework was employed to examine the independent and relative effects of social discourse and social competence on the risk for problem behavior in children with language learning disabilities (LLD) and control children (children without LLD). Initial group comparisons revealed results consistent with previous investigations of samples of children with LLD. That is, social discourse skill was more de-

ficient for a clearly defined group of children with LLD compared with a control group of children without LLD. Additionally, based on teachers' perceptions, children with LLD were rated as exhibiting significantly less social competence (i.e., assertion, cooperation, self-control) and more problem behaviors than children without LLD. The finding that impaired social discourse and poor social skills mediated the effect of LLD on children's problem behavior provides an empirical demonstration of hypothesized processes underlying problem behavior often put forth in the learning disability literature. Specifically, this demonstration delineates critical developmental processes that place children with LLD at risk for problem behaviors in the school setting. These results support the commonly held view that the primary processing deficits that characterize learning disabilities not only lead to learning failure, but also have a negative impact on broader social and behavioral domains (Bruck, 1986; Rourke, 1989). The identification of communicative skills and social competence as salient mediators suggests that compromised higher order social processing skills, as opposed to lower order primary processing deficits (i.e., impaired syntax and semantic language development), are what ultimately affect the behavioral functioning of children with LLD. However, not all social processing skills related to LLD have a similar direct impact on teachers' perceptions of problem behavior in children. When social discourse and social skills were examined simultaneously in relation to problem behavior, social discourse did not retain its predictive value. This suggests that children's impaired social interactional functioning is central to the development of secondary clinical behavioral symptomatology.

The Central Role of Social Skills

The central role of children's poor social competence in predicting negative behavior ratings is supported

TABLE 2
Relative Effects of Social Discourse and Social Competence
on Problem Behavior

	Variables in the equation	β	Model R^2
Step 1	LLD status	.30*	.12**
Step 2	LLD status	.10	.16**
	Social discourse	-.29*	
Step 3	LLD status	.00	.59***
	Social discourse	-.00	
	Social competence	-.77*	

* $p < .05$. ** $p < .01$. *** $p < .001$.

empirically and theoretically. The preponderance of social competence deficits has been extensively documented in clinical anecdotes and empirical research (Bender & Wall, 1994; Gresham & Elliott, 1987) in the learning disability literature. As well, the distinction between social skill difficulties as a primary or secondary deficit of learning disabilities has been the center of recent controversy (Gresham & Elliott, 1989). Furthermore, the presence of positive social behaviors (e.g., assertion, cooperation) and the absence of negative social behaviors (e.g., poor self-control) examined in this study seem to be important for initiating and maintaining good peer relationships among children with normally developing language and achievement (Dodge, 1983; Ladd, 1988). Positive peer relationships have often been hypothesized as protecting against the development of problem behaviors (Hartup, 1983; Offord, et al., 1990). They provide a context in which children acquire a variety of social competencies, serve as resources for emotional support and security, and function as precursors of later relationships (Price & Ladd, 1986). Additionally, problem behaviors can interfere with the learning and practice of effective social strategies necessary to engage others successfully (Gresham & Elliott, 1990). Historically, theorists have posited the broader developmental implications of positive peer relationships. For example, Piaget (1932) emphasized the importance of peer relationships for a child's moral development, while Mead (1934) espoused social relationships as essential for the development of self.

The Role of Social Discourse

Though the association between social discourse and problem behavior in children with LLD was diminished when the social skills factor was entered into the regression analysis, the importance of social discourse cannot be overlooked, given the significant correlation between social discourse

and social skill ratings. The causal relations among social discourse, social skills, and problem behavior were difficult to untangle due to the correlational nature of the current design; however, it could be speculated that one mechanism underlying both poor social functioning and poor behavioral functioning was impaired communication competence. Relationships with others are regulated through communication. The effectiveness and success of social interactions depend on one's ability to monitor the linguistic, physical, nonverbal, and cognitive context (Prizant & Wetherby, 1990; Prutting, 1982). The social discourse task used in the present study specifically assessed the understanding of language in various social contexts by measuring children's ability to (a) comprehend the meaning of metaphors and inferences; (b) express the meaning of ambiguous sentences; and (c) create sentences that expressed the thoughts, emotions, and intentions of others. The failure to comprehend others' meaning and express one's own desires, needs, and opinions will ultimately manifest in behaviors that are perceived by others as socially incompetent, such as the failure to follow routines and effectively interact with others in classroom settings. The persistent negative reactions by other children, teachers, and parents often incited by the lack of socially competent behaviors exhibited by some children with LLD, and the experience of repeated social failure by these children, may then lead to emotional distress manifested as secondary clinical characteristics, such as internalizing and externalizing symptomatology.

Limitations

Some limitations of the study should be acknowledged. The measure of social discourse in this study was a performance task. Optimally, children's expression and interpretation of social discourse should be examined within a spontaneous conversational context. Multiple indicators (e.g., self-

ratings by children, parent ratings, behavior observation) of social competence in the school setting would have been optimal in order to provide a more valid and reliable assessment of these behaviors. Teachers were not blind to the children's LLD status, and this knowledge may have influenced their ratings of the children's behavior. An alternative explanation for the finding that social competence accounted for the impact of social discourse on children's problem behavior is that the power of the relation was inflated due to the fact that the social competence and problem behavior scores were obtained from the same measure, source, and procedure—teacher ratings. An important focus of future research would be to clarify the potentially mediational role that social competence plays in predicting children's problem behavior by incorporating more extensive independent measures of social competence. Assessment of peer status, reciprocity, and conceptualization of friendship may be potential targets. Though the data support the proposed mediation models, transactional influences among the factors are not only possible but probable. Confirmation of the models would ultimately require a longitudinal study.

Implications for Research and Intervention

In addition to having important implications for the intervention of children with LLD, the findings have broader implications for the use of the developmental-organizational framework in research and clinical practice. Within the context of that framework, this research supports the new vanguard of developmental psychology that emphasizes investigating relations among multiple domains of functioning to determine adaptive and maladaptive developmental pathways. Specifically, the findings underscore the utility of, and need for more, integrated research when investigating the processes underlying behavioral risk

in children with LLD. Furthermore, the results provide an impetus for investigating complex mediated relations, as opposed to simple linear relations, when assessing processes underlying behavioral outcomes, especially in clinical groups. By examining the dynamic organization and interaction of domains, factors critical in influencing developmental outcomes can be uncovered and serve as targets for effective remediation. Future research should examine the extent to which other social-cognitive skills, such as emotion decoding, social problem solving, and empathy, mediate the influence of LLD on ratings and observations of children's emotional and behavioral functioning, as these skills may serve as potential foci for intervention with children with LLD.

Results from the current study also suggest that the continued routine assessment and monitoring of broader social discourse skills, in addition to social competence, in children with LLD is important. The structural and semantic language skills of children with LLD are often the focus of assessments, but broader communicative skills such as the ones evaluated in this study should not be neglected. By focusing only on skills assumed to be related to the child's primary learning difficulty, assessment and intervention plans may not fully address the child's social needs. The current results suggest that facilitating children's broader communicative skills not only could improve their interpersonal skills but could potentially alleviate problem behaviors. Interventions that focus on training children on a specific set of conversational skills linked to social competence have been shown to be effective in increasing positive peer responses among children with poor communication skills (Bierman & Furman, 1984). Furthermore, consultative intervention programs aimed at primary caregivers, clinicians, and teachers of children with LLD that are focused on (a) facilitating the understanding of how com-

munication impairments can affect children's behavior, and (b) providing strategies to structure the language environment to compensate for children's communication deficits could potentially be beneficial.

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AUTHORS' NOTES

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