ABSTRACT

ANDREASSI, CRISTINA. The Relationships among Behavior, Social Cognition, and Peer Acceptance in School-Identified Children with Learning Disabilities. (Under the direction of Ann Schulte.)

This study examined the relationships among social cognition, externalizing behavior, and social acceptance in children with and without learning disabilities. It was hypothesized that social-cognitive accuracy and externalizing behavior would mediate differences observed in social acceptance between children with and without learning disabilities. School-identified children with learning disabilities (N = 55) in grades 3 through 5 were compared to their non-identified peers (N= 631) in terms of social acceptance. Social acceptance was determined using peer nominations of liked most and liked least, which were converted into an overall social preference score for each child. When children's learning disability status accounted for a small but significant portion of the variance in children's social acceptance (1.3%), mediation tests were conducted to determine if externalizing behavior or social cognitive accuracy functioned as mediators in the observed relationship. Externalizing behavior was assessed through teacher report on the Child Behavior Checklist. Social-cognitive accuracy was determined by calculating the extent to which individual children's reports of peer groups in their classrooms matched the social groups derived through Social Cognitive Mapping. The results indicated that externalizing behavior partially mediated the relationship between learning disabilities and social acceptance. No evidence was found that social-cognitive accuracy functioned as a mediator. Limitations, implications for improving children's social functioning, and future research on the social functioning, behavior, and social cognition of children with learning disabilities were discussed in light of these findings.

The Relationships among Behavior, Social Cognition, and Peer Acceptance in School-Identified Children with Learning Disabilities

by
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DEDICATION

To my parents, Gina and John Andreassi, who have been supportive and encouraging throughout my graduate career. Also, to my brother, John, and sister, Jeanine, who gave me much confidence and guidance during this endeavor.

BIOGRAPHY

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CHAPTER ONE

Introduction

Over the past two decades, increased attention has been given to investigating both the nature and function of children's peer relationships. The potential importance of these relationships has been brought to psychologists' awareness by research studies that have consistently documented links between childhood peer rejection/ low acceptance and negative outcomes such as criminality and psychopathology in adolescence and adulthood (e.g., Parker & Asher, 1987). These observed relationships between the quality of children's peer relations and global indicators of functioning are thought to arise at least partially through peers' influence on a number of developmental processes, such as social cognition (e.g., Brendgen, Bowen, Rondeau, & Vitaro, 1999) and behavior (Dishion, Patterson, & Greisler, 1994; Hartup, 1996). Even aspects of children's functioning that seem to be relatively unrelated to their social functioning, such as academic achievement, appear to be influenced by peers (e.g., Azmitia & Montgomery, 1993; Ladd, 1990).

In general, outcomes on behavioral, social-cognitive, and academic performance indices appear to be related to the nature of a child's peer relations in such a way that relationships with prosocial peers are associated with good outcomes in these domains, and relationships with antisocial peers are associated with negative outcomes (Dishion et al., 1994; Hartup, 1996). The fact that these outcomes may be related to specific aspects of one's peer relations and that peer rejection and low acceptance appear to have short and long-term negative consequences (Parker & Asher, 1987; Woodward & Ferguson, 1999) suggests that knowing about a child's peer relations may be helpful in understanding his or her current, as well as future, functioning (Hartup, 1996).

That peer relations and social status (e.g., being peer-rejected or low-accepted versus being average or popular) may play a role in important developmental outcomes has led to numerous studies examining the determinants of a child's success with peers. In particular, characteristics of the peer relations of children in general, as well as in particular subgroups such as aggressive children, children with emotional and behavioral disorders, and children with learning disabilities, have been researched. The present study was particularly concerned with the processes that might influence the social functioning of children with learning disabilities. Although definitions and criteria for a learning disability may vary from state to state, children who have been identified by their schools as having a learning disability typically have intelligence within the normal range and difficulty acquiring academic skills in the areas of reading, writing, or mathematics.

Concerns with understanding the nature of this particular population's peer relations stem from the fact that (a) children with learning disabilities are becoming increasingly integrated into regular education classrooms, (b) that social rejection/ low acceptance has been linked to current as well as future difficulties in adjustment and life functioning among children in general (e.g., Parker & Asher, 1987; Woodward & Ferguson, 1999), and (c) from findings that children with learning disabilities are less well-liked by their peers (Gresham & McMillan, 1997). Of particular relevance to this discussion is the fact that research dating back to the 1970s has documented that children with learning disabilities not only experience academic difficulties, but social difficulties as well, including difficulty interacting with peers (Kavale & Forness, 1996). For example, in one early investigation by Bryan (1976), children with learning disabilities received fewer votes of social acceptance and more votes of social rejection from their peers than children without learning disabilities. A more recent meta-analysis by Swanson and Malone (1992) supported this early finding. Across 39 studies, Swanson and Malone (1992) found that children with learning disabilities were more likely to be rejected and less likely to be accepted by peers than children without learning disabilities.

In trying to determine the processes responsible for children with learning disabilities' lower social status, the present study drew upon past theory and research which suggests that social cognition and behavior may be key factors in determining a child's social evaluation by peers. At the theoretical level, social information-processing models such as that by Crick and Dodge (1994) suggest that an array of complex interactions must take place accurately for peer acceptance to occur. The six reciprocal and ongoing steps of their model, which will be reviewed later in this document, include aspects of both children's social-cognitive ability and behavioral functioning, which are believed to influence peer evaluations of the child. Components of this model have been supported by research examining children's evaluations of hypothetical social situations (Fontaine, Burks, & Dodge, 2002). In addition, support for each of the social information-processing steps has been found by examining the ability of particular subgroups of children with social difficulties to carry out each step (e.g., Crick & Dodge, 1994; Graham & Hudley, 1994).

This research examining the relationship between the steps of Crick and Dodge's (1994) model and children's peer acceptance implicates very specific social-cognitive and behavioral factors in the peer acceptance process. Research studies have also investigated the relationship of social cognition and behavior to peer acceptance in more general terms (e.g., Cassidy, Werner, Rourke, Zubernis, & Balarman, 2003; Putallaz, 1988). This research also supports links between social-cognitive and behavioral functioning and the social acceptance of children in general and of children with learning disabilities.

For instance, children with learning disabilities appear to exhibit social-cognitive difficulties. Studies investigating the social cognitions of children with learning disabilities have found that they often have trouble interpreting nonverbal social information, such as facial expressions, gestures, and tone of voice, as well as difficulty interpreting verbal social information (e.g., Sisterhern & Gerber, 1989; Weiss, 1984). In addition to these social-cognitive deficits, behavioral difficulties also appear to be common. Research substantiates that problem behaviors that may lead to social difficulties are more common among children with learning disabilities than among their typically developing peers. Beginning as early as 1969, for example, Myklebust, Boshes, Olson, and Cole (as cited in McKinney & Feagans, 1983) reported teacher ratings that indicated that children with learning disabilities were less cooperative, less attentive, less organized, less capable of coping with new situations, less responsible, and less tactful than children without learning disabilities.

Given that current social-cognitive models suggest that behavior and cognition are intimately linked to social functioning (Crick & Dodge, 1994), it seems likely that the behavioral and social-cognitive difficulties often observed in children with learning disabilities are related to their troubled social status. Support for such a claim is weak, however, because there has been little research to date explicitly linking social cognition and behavior in children with learning disabilities to their social acceptance. For example, studies on social cognition have asked children with learning problems to identify the emotions expressed by individuals in pictures or on videotape but have not also investigated the social status of these same children according to peers (e.g., Holder & Kirkpatrick, 1991; Jackson, Enright, & Murdock, 1987). Similarly, studies substantiating that students with learning problems have difficulty with social relationships have examined their social status or how well-liked they are in the classroom, but have not also indexed their social-cognitive abilities (e.g., Ray, 1985). In addition, although conceptual frameworks such as Crick and Dodge's (1994) social information-processing model suggest that social cognition and behavior are intimately linked in determining a child's acceptance by peers, these two constructs, social cognition and social behavior, have not been investigated in the same group of children with learning disabilities, and their link with these children's social acceptance has not been examined. As a result, the extent that social cognition, as indexed by one's accuracy of social perception, and that behavior, as indexed by one's externalizing behaviors, predict the peer acceptance of children with and without learning disabilities was investigated in the present study in an effort to explore possible pathways that account for the aforementioned relationship between learning disability status and social status.

The ensuing literature review discusses research pertaining to these three domains of interest: social status, social behavior, and social cognition, in order to provide empirical support for their possible role in the lower peer acceptance of children with learning disabilities. In particular, past research on the relationship of social cognition and behavior to social acceptance among children in general, is first reviewed. Next, research comparing the social-cognitive and behavioral difficulties of children with learning disabilities to those of children without learning disabilities is discussed. And lastly, research indicating that children with learning disabilities are, in fact, not as well liked as their peers without learning disabilities is reviewed.

CHAPTER TWO

A Review of the Literature

Past research is now reviewed to familiarize the reader with differences found between children with and without learning disabilities in terms of their social status, social cognition, and behavior. More specifically, it is demonstrated that (a) in general, one's social cognition and behavior can influence their social acceptance by peers, (b) children with learning disabilities have social-cognitive deficits when compared to children without learning disabilities, (c) children with learning disabilities have more behavior problems than those without learning disabilities, and (d) children with learning disabilities are typically less accepted or have lower social status than children without learning disabilities. Empirical findings pertaining to these relationships were the basis for the hypotheses of the current study.

Before these relationships are fully discussed, however, the dimensions of social cognition, social behavior, and peer acceptance are defined to facilitate the reader's understanding and interpretation of the research findings and to provide a theoretical basis for how the present study operationally defined these constructs. Furthermore, Crick and Dodge's (1994) social information-processing model is reviewed in detail before research on the relationships listed above are discussed; this review was done in order to place the objectives of the current study within a comprehensive, theoretical framework.

Social Competence

Perhaps because of the considerable recent interest in children's social development in the research literature, a broad array of measures, derived from diverse theoretical perspectives, has been used to assess children's social functioning or competence (Gresham & MacMillan, 1997). As a result, the domains to be measured, ways of measuring them, and relationships among various measures and constructs, are continuing matters of debate in the research literature on social competence (Gresham & MacMillan, 1997; Kavale & Forness, 1996; Merrell & Gimple, 1998; Vaughn & Haager, 1994).

For the purposes of this chapter, the model of social competence proposed by Vaughn and Haager (1994) is employed. Vaughn and Haager (1994) broadly conceptualized social competence as a higher order construct that, like intelligence, is difficult to measure. As a result, they further divided social competence into four components that are easier to assess and that also serve as indirect measures of social competence. The four components of social competence they delineated are: (a) peer relations, (b) social skills, (c) behavior problems, and (d) social cognition. Each of these components is briefly summarized below.

Peer relations. Peer relations refer to the quality of one's relationships with peers (Vaughn & Haager, 1994). Given the findings mentioned previously concerning positive peer relationships and their role in further socialization, the presence of good peer relations can serve as one indicator of a child's overall social competence. Peer relations are typically assessed with measures of peer acceptance. Peer acceptance is the extent to which a child is viewed by his or her age-mates as a worthy social partner (Berk, 2000) and it is believed to be a good indicator of the quality of a child's peer relations because it uses peer informants to yield overall indices of acceptance and rejection. Sociometrics is a commonly used measure of peer acceptance that typically involves asking students to identify peers in their class who they like least and peers in their class who they like most (Bagwell et al., 1998). The majority of research studies summarized in Parker and Asher's (1987) review, for example, employed this measure of peer acceptance. The present study also used sociometrics as an indicator of a child's acceptance by peers.

Social skills. The term social skills, has been defined in many ways due to the wide range of behaviors that have been considered characteristic of being socially skilled (Kavale & Forness, 1996). For the purposes of this review, social skills are conceptualized according to a definition proposed by McFall (1982). He suggested that social skills are the specific behaviors a person uses to perform competently on a social task. In other words, social skills are certain positive behaviors instrumental to bringing about a desired social goal. An important aspect of McFall's (1982) definition is its incorporation of the idea that social skills need to be a part of a child's behavioral repertoire in order for the child to be judged socially competent.

This notion that social skills are necessary to achieve social competence is supported by research examining the existence of social skills deficits among children with peer relationship difficulties. For example, delinquent youths, who are more likely to be rejected by their peers (Dishion et al., 1994), have also been found to exhibit a number of observable social skills deficits such as deficiencies in eye contact, verbal acknowledgement of others' directives to them, use of questions, and appropriate head nods as well as deviant facial and body cues (Wahler & Dumas, 1986).

Behavior problems. Behavior problems are the third component in Vaughn and Haager's (1994) model. Although behavior problems may appear to be the converse of social skills, a child may lack particular social skills and display no problematic behavior, and children with behavior problems may also have a number of positive social skills. Therefore, the constructs of social skills and behavior problems are separated in Vaughn and Haager's (1994) model.

In most models of psychopathology, behavior problems are conceptualized along two broad dimensions, internalizing (e.g., anxiety, depressive behaviors) and externalizing (e.g., attention problems, aggression, coercion, antisocial behavior) behavior patterns (Achenbach, 1991a; Quay & Peterson, 1987; Reynolds & Kamphaus, 1992, as cited in Merrell, 1999). Both internalizing and externalizing patterns of behavior appear to be associated with social difficulties. This association is evident from research on the sociometric status of children who are aggressive and/or antisocial; they are more likely to be rejected by classmates than children without these behavioral features (Dishion et al., 1994). Similarly, internalizing behaviors, such as social withdrawal, may prevent children from experiencing many of the benefits of peer interaction (Parker & Asher, 1987), such as increased language skills and the ability to initiate interactions with others (Schneider, 1999).

Social cognition. The fourth and final aspect of social competence in Vaughn and Hagaar's (1994) model is social cognition. Social-cognitive development is the process whereby changes in cognitive functioning allow a child to engage in increasingly complex and potentially meaningful interactions with others (Merrell & Gimpel, 1998). This definition implies that the development and enactment of social behavior are very closely related to one's social-cognitive ability. It seems likely, then, that social cognition or social information-processing is an important mechanism by which social behaviors and subsequent social competence come about. The significance of such an association is that peer relationship problems may result from faulty social cognitions or social-cognitive deficits, in turn, leading to further social-behavioral and other difficulties (e.g., Jackson et al., 1987; Sisterhern & Gerber, 1989; Strain & Odom, 1985).

There is evidence to suggest that social cognitions may, indeed, play such a role in peer relationship difficulties. Research on social skills interventions offers indirect support for the influence of social cognition on behavior. For example, social skills training programs, overall, have not been very effective in teaching social skills (DuPaul & Eckert, 1994). However, more cognitively based programs have produced significant gains in the sociometric status of children who were among the least liked children in their class (Ladd & Asher, 1985). In a long-term follow up study, Oden and Asher (1977, as cited in Parker & Asher, 1987) found that teaching children social interaction concepts (e.g., participation, communication, cooperation, and validation-support) led to gains in acceptance that were not only maintained, but increased at one-year follow-up. It appears that helping children understand which social interactions are appropriate may lead to changes in behavior that can positively affect one's acceptance by peers over the long run.

In addition to this association between improved social understanding and greater peer acceptance, specific cognitive processes have been found to occur differently among children with social difficulties. For example, Dodge and Feldman (1990) found that low accepted children were prone to interpret ambiguous behavioral cues by other children as hostile provocations. Regardless of whether these children's biases are the cause of poor peer relationships or a consequence of them, this research suggests that faulty social cognition is associated with the presence of social behavioral and relationship problems.

Due to the important role that social cognition appears to play in peer relationships, as well as behavior, there has been an increased focus over the past 30 years on using social cognition as an indicator of social competence. At first, theories used in studies on children's social-cognitive abilities were largely adapted from those used in studies of nonsocial cognitive development such as perspective taking, role taking, and referential communication. Recent investigations, however, have examined more specific components of "on-line" cognition due to the mixed findings of studies on the global constructs mentioned above and the increased acceptance of social information- processing theories (Dodge & Feldman, 1990). This focus on more specific components of cognition has led to significant changes in the empirical and theoretical approaches used to study the social cognitions of children. Most importantly, it has led to the development of social information-processing models that are concerned with providing an increased understanding of children's social functioning (Crick & Dodge, 1994; Dodge et al., 1986).

Summary. As the discussion above reveals, there are multiple ways to conceptualize and assess children's social competence, ranging from peer acceptance to a focus on discrete behavioral competencies and deficits to cognitive measures. Current information-processing models combine these aspects into a comprehensive framework that delineates how children either achieve or fail to achieve social competence. Specifically, Crick and Dodge (1994) have offered what has now become a widely accepted social-cognitive framework for understanding and organizing empirical research pertaining to children's social functioning. This theoretical framework allows one to understand and evaluate the interplay between social cognition, behavior, and environment in determining children's social competence. It delineates the social-cognitive and behavioral processes that account for children's social behaviors and that are ultimately involved in how the child is perceived and reacted to by his or her peers. The next section provides an overview of this model.

Social Information-Processing Model

Overview. Crick and Dodge (1994), in an extension of an earlier model by Dodge et al. (1986), contended that cognition or knowing occurs when mental processes act upon a sensory input. This notion is central to most information-processing models. Unlike most models, however, Crick and Dodge (1994) focused their model on only one type of sensory input, social information. The model explains children's processing of social information using what is known about cognitive processing, in general, within an information-processing perspective. In their model, Crick and Dodge (1994) posited that there are six major steps that occur while a child is evaluating social information. Three major assumptions about information-processing underlie these major steps. One of these assumptions is that information-processing can take place in a parallel or simultaneous fashion; that is, individuals can be engaged in several social information-processing steps at the same time. In other words, information-processing at one step does not necessarily end before processing at another step begins. Although the steps of this model are thought to be occurring simultaneously in individuals, processing a particular stimulus into a behavioral response is believed to generally follow a certain sequence of steps.

Another important assumption of this model is its emphasis on reciprocal effects. In addition to considering the effects of social information-processing on social adjustment, the model hypothesizes and includes a representation of how social adjustment might influence subsequent information-processing about oneself, others, and future events or situations. A third major assumption of the model concerns the manner in which social adjustment may influence subsequent information-processing; mental representations of past events and encounters become integrated with other memories to form a general mental structure or schema that is stored in long-term memory. These latent mental structures or schemas become a part of the individual's general social knowledge and guide subsequent processing of social information. Social schemas, the notion of reciprocal effects, and the idea that new social knowledge influences future information-processing are represented in the model along with the model's six major steps: encoding of social cues, interpretation of those cues, clarification of one's goals, response access or construction, response decision, and behavioral enactment. Simultaneous processing is not represented in the model, but once again, is presumed to be occurring.

Research conducted prior to, as well as after, the development of this model provides support for the premises on which each step is based (e.g., Asarnow & Callan, 1985; Fontaine et al., 2002). Most pertinent to the present research is a recent, comprehensive study by Tur-kapsa and Bryan (1994) that assessed the social information-processing skills described by Dodge and his colleagues (1986) among low achieving students, average achieving students, and students with learning disabilities. When presented with a hypothetical social situation, the responses made by average achieving students suggested significantly better capability than those of students with learning disabilities on the encoding, representation, response search, response decision, and enactment processes of the social information-processing model. The majority of the research on this model, however, has compared aggressive and/or rejected children with children who do not have these characteristics or the social difficulties associated with them. As a result, it is this research that is highlighted as each step of Crick and Dodge's (1994) social information-processing model is described.

Encoding and interpretation of cues. These two initial steps are often discussed together. According to the model, children encounter a social stimulus in their environment and, if attention is directed toward the stimulus, they temporarily encode it. As encoding commences, an interpretation of the meaning of the cues also begins. These are perhaps the most important, as well as complex, steps of the model to achieve. Not only are there many different factors that can influence one's encoding and interpretations of a social stimuli, but how a cue is interpreted will influence all subsequent steps of the model.

One mechanism proposed to influence the encoding and interpretation of social cues is the schema for relevant social knowledge that an individual possesses (Crick & Dodge, 1994). Use of a schema in interpreting a social situation can be very efficient because it allows an individual to quickly interpret whether social cues are consistent or inconsistent with aspects of the social situation. At the same time, however, relying on schemas to interpret social cues can lead to false or biased conclusions. If an individual's schema is faulty or if the wrong schema is accessed, one may overlook relevant social cues that would otherwise dictate a more accurate interpretation of, and response to, the situation (Crick & Dodge, 1994).

The idea that biased interpretations of social information can result from an over-reliance on certain schemas, has been supported by research. For example, when Dodge and Tomlin (1987) presented hypothetical situations, aggressive children were more likely than nonaggressive children to overlook relevant cues they had been given concerning a provocateur's intent. Responses about the provocateur's intention suggested that aggressive children were relying on hostile schemas to make their interpretations rather than the actual information they had been given. Further support for the notion that an over-reliance on schemas can result in faulty interpretations comes from a study by Graham and Hudley (1994). These researchers primed aggressive and nonaggressive adolescents with sentences that conveyed either intentional, unintentional, or no fault on the part of a target individual for an occurrence. Afterwards, the adolescents were presented with a hypothetical vignette describing a negative outcome that occurred to them and that was initiated by a provocateur with ambiguous intentions. Aggressive adolescents judged the provocateur more negatively than nonaggressive adolescents when they had been primed with unintentional or neutral events. Thus, even when there is nothing in the environment to stimulate ideas of negative or hostile intent, some children, such as those who are aggressive, may be more likely to rely on preconceived notions or schema that they have rather than on the information they are given.

The results of these studies concerning the use of schemas to make inferences about social information lead to a related discussion about attributions of intent and attributions of causality. The connection between the two is that one's schema for an event can affect the nature of his or her attributions. Furthermore, these attributions can influence social cue interpretation and, in turn, determine how an individual responds to a particular situation. Attributions of causality are inferences individuals draw about why certain social events have occurred whereas attributions of intent involve what one believes about a particular person's intent when they committed an act. Although these attributional styles do not necessarily co-occur when interpreting a social situation, individuals are likely to use aspects of both attributions.

An example is useful in illustrating how aspects of one or both of these attributions might be used by, and might influence the behaviors of, a child. If John knocks into Jeanine while she is standing in line at the water fountain, she could attribute his fall to any number of external circumstances (attributions of causality). For instance, she could attribute John's knocking into her to the fact that he may have slipped on a small puddle of water near the fountain. In this case, Jeanine would not be likely to make an attribution as to the intent of John's behavior; she would likely conclude that John's fall was an accident and she might respond by checking to see if John has been hurt. However, Jeanine could also make an attribution of causality in which she believes that John knocked into her because there were too many children waiting in line at the fountain. If she then infers that John became impatient (attribution of intent) after waiting in line with all these children and knocked into her on purpose, Jeanine might get annoyed and push him.

Research into the social information-processing of distinct groups of children, such as those with depressive symptoms, indicates that attributions of causality reliably distinguish these individuals and may be instrumental in the onset and/or maintenance of their problems.

Those with depressive symptoms are more likely to attribute negative events to internal, stable, and global causes, for example (Quiggle, Garber, Panak, & Dodge, 1992). Similar to the results of research concerning schemas and attributions of causality, tendencies to make particular attributions of intent have been reliably associated with certain subgroups of children suggesting that this cognitive process may be instrumental in determining their behavior. Indeed, in a meta-analysis of 41 studies that were conducted between 1974 and 1999, a significant association between hostile attribution of intent and aggressive behavior was found; larger effect sizes were associated with more severe, aggressive behavior (Orborio de Castro, Veerman, Koops, Bosch, & Monshouwer, 2002).

Clarification of goals and response access or construction. Once children begin interpreting information about a certain social situation, they start to clarify the goal or outcome they desire from the situation. Crick and Dodge's (1994) model assumes that children bring particular goal orientations or tendencies to social situations that they can use as they are, revise, or ignore and form entirely new ones. Once a particular goal for a situation has been determined, the child can begin to access possible responses to the situation from long-term memory. Responses generated are typically those that are in pursuit of this situational goal but could also include responses to social cues for which there is no clear goal.

Differences appear to exist in the ability of children with certain behavioral features to engage in this response access or construction, suggesting that this step is associated with their behaviors. Once again, aggressive children, who engage in behaviors that may impart verbal or physical harm toward others, have been found to be qualitatively different from nonaggressive children in their ability to engage in this step. For example, Asarnow and Callan (1985) evaluated this ability to generate responses among fourth and sixth grade boys who had either been evaluated to have a positive peer status or a negative peer status as a result of their aggressive interactions. Those boys with negative peer status not only generated fewer solutions to hypothetical problems that had been presented to them, but also proposed less mature and more intensely aggressive solutions. Thus, both the quantity and quality of a child's responses, and presumably the goals he or she decided upon prior to accessing those responses, may be affected by attributes such as aggressiveness.

Response decision and behavioral enactment. In these last steps of Crick and Dodge's (1994) social information-processing model, children choose and enact a behavioral response from among those they have generated. Numerous factors have been hypothesized to be involved in weighing these different responses and selecting one. For example, it has been posited that expectations about the actual outcome of a behavioral response as well as of the actions and behavioral processes (i.e., the moral acceptability of the response, judgments of self-efficacy to carry out the response) associated with enacting it are evaluated. These evaluations, in turn, are believed to influence response selection and subsequent behavior.

These evaluative processes and their consequences are evident in a study conducted by Fontaine et al. (2002) that examined the responses of 124 ninth graders to videotaped hypothetical social interactions. Before viewing the videotaped interactions, participants were instructed to imagine that they were the protagonist. Immediately following this viewing, they were asked "What would you say or do if this happened to you?" After these free-responses were coded for aggressiveness, participants viewed another videotaped segment in which the protagonist engaged in an aggressive behavior. Following this second viewing, participants were asked to rate the aggressive response across six different dimensions of response evaluation including instrumental outcome, interpersonal outcome, self-approval, efficacy and moral agency, social acceptability, and global valuation. Factor analyses on these responses suggested that two main types of evaluation, response valuation and outcome expectancy, encompassing the evaluative processes mentioned above, were used during the response decision stage. This research highlights the importance of all different kinds of information in selecting a response. Expectations about both the direct ramifications of a response and one's evaluations of more subjective variables such as self-efficacy and moral judgment are paramount in selecting a response.

In addition to the measures mentioned above, Fontaine et al. (2002) obtained measures of the externalizing behavior of all participants when they were in seventh or eighth grade, ninth grade, and tenth or eleventh grade. Levels of externalizing behavior were then compared with ratings of response valuation and outcome expectancy for participants' responses concerning the ambiguous provocateur. Doing so revealed that a tendency to evaluate one's own aggressive behavior as more positive consistently and uniquely predicted externalizing behaviors later on in adolescence. Collectively, the results of this study suggest that many factors are involved in evaluating a response and doing so inappropriately is associated with inappropriate behavior.

Overall support for Crick and Dodge's (1994) model, as well as for the important role that social cognition plays in social behavior, is evident from the research above, which examines processing differences among aggressive and nonaggresive children at each step. The specific cognitive processing components proposed by this model have been found to be significant predictors of children's behavioral competence (Dodge & Price, 1994) and to be better predictors than the more global cognitive constructs that were used in earlier work (Crick & Dodge, 1994). Furthermore, there is evidence to suggest that measures from each successive step in the model provide unique increments in the prediction of social behavior (Dodge & Price, 1994). In other words, the more that is known about processing characteristics from this model, the better predictions pertaining to social behavior are. In particular, how these cognitive processes are carried out has been a good predictor of children's perception and judgment of social situations and of how they behave toward other children (e.g., Dodge & Price, 1994; Stromquist & Strauman, 1991).

This strong empirical support for Crick and Dodge's (1994) model along with certain conceptual implications that can be drawn from it, render it an appropriate framework for the present study. The research mentioned at the beginning of this section concerning schemas and attributions of causality and intent demonstrates how these cognitive variables are very influential in the first steps of the model, encoding and interpretation. Furthermore, information about the processes that occur at each subsequent step of the model indicates how the outcomes of these steps are contingent upon aspects of encoding and interpretation. The implication, then, is that how accurately one engages in these initial processes of encoding and interpretation is essential to arriving at an appropriate social response. In other words, the accuracy of one's encoding and interpretation is an important cognitive outcome variable. The present study, therefore, used children's accuracy in naming the social networks of their classrooms as a measure of their social-cognitive ability.

The Relationship of Social Cognition and Behavior Problems to Peer Acceptance

As preliminary evidence for the role that both social-cognitive ability and behavior problems may play in students' with learning disabilities' lower peer acceptance, relationships between these constructs among children in general is discussed. Initial ideas about the relationship social cognition and behavior may have to social acceptance is evident in Dodge, Petit, McClaskey, and Brown's (1986) proposed "model of social exchange in children." This model contends that children's processing of social information (later reformulated into a social information-processing model; Crick & Dodge, 1994) determines their behavior, which in turn, influences how that child's peers judge him/her. Thus, this early conception of social exchange in children, which was based on research findings by the authors that a child's performance at peer group entry significantly predicted peers' judgments of him or her, linked together social cognition, behavior, and peer acceptance.

Indeed, behavior among children has repeatedly been found to be predictive of peer acceptance. For instance, Dodge (1983), in an exploratory study, grouped a sample of boys into the sociometric categories of popular, rejected, neglected, controversial, and average. The behaviors of these boys were then observed and analyzed to determine if there were any behavioral predictors of peer status. Dodge's (1983) findings supported such a relationship. He found that boys who were rejected or neglected, for example, tended to engage in significantly higher rates of inappropriate behavior and those who were rejected were also significantly more likely to be aggressive. In contrast to these behavioral characteristics associated with rejected and/or neglected status, boys who were popular among their classmates tended to refrain from aggression. Boys who were controversial, on the other hand, tended to engage in significantly high rates of both prosocial and antisocial behaviors. Thus, varying social status classifications were related to different behaviors. Further support for such a relationship comes from studies such as that by Putallaz (1988), in which aggression and prosocial behavior by children during a peer entry task were predictive of peer rejection and peer popularity, respectively, four months later.

Similarly, it has been found that differences in social cognitions in children are related to their social status and this relationship seems to be evident as early as the preschool years. In a study with 67 preschool children, understanding of mind was assessed via two tasks (Cassidy, Werner, Rourke, Zubernis, & Balaraman, 2003). In the first task, the false belief task, children's theory of mind was assessed using a puppet that placed a toy car in a box and then left the room. While the puppet was gone from the room, the experimenter placed the car in a different box and children were asked where the puppet would look for the car when he returned to the room. If children took the perspective of the puppet when responding about the location of the car, they had completed the task successfully. The second understanding of mind task, the deception task, introduced children to a puppet who would leave footprints behind him while he was walking to hide some marbles in boxes. Children were then told about a king who gives the marbles to children and a robber who steals them and then asked what they would do if the king and robber came looking for the marbles. Children answered correctly if they appropriately described how they would help the king find the marble (e.g., darken the footprint markings) and attempt to deceive the robber (e.g., erased the footprints). In addition to these understanding of mind tasks, children assigned sociometric ratings to each classmate by placing a picture of him or her in a box that had either a generic picture attached to it displaying a happy child, a child with a neutral facial expression, or a child with a frown. Understanding of mind, which involved demonstrating a grasp of theory of mind and an ability to understand what actions need to be taken to elicit a desired response from another, was significantly and positively correlated with children's sociometric status nominations. Furthermore, understanding of mind accounted for changes in sociometric status above and beyond that explained by children's language ability.

Among older children, the social-cognitive abilities and social status of children with distinct attributes, such as aggressiveness or social withdrawal, appear different from those of children in general. For example, research on aggressive children has repeatedly demonstrated that these children are more likely to be rejected than nonaggressive children (Crick & Dodge, 1994). Other investigations have found that these groups of children also have significant differences in the nature of their social cognitions. For instance, when Dodge and Tomlin (1987) presented hypothetical situations to children, aggressive children were more likely than nonaggressive children to overlook relevant cues they had been given concerning a hypothetical individual's intent and more likely to attribute that individual with hostile intentions. The social status of these aggressive and nonaggressive children was not also examined in this study. Collectively, however, the findings of these studies seem to suggest that the social cognitions and social status of children are related.

A few studies have made somewhat more direct connections between social-cognitive ability and social status by examining both variables in school-aged children. For example, Harrist, Zaia, Bates, Dodge, and Pettit (1997) investigated both the social status and social cognitions of different subtypes of socially withdrawn and nonwithdrawn children. The four subtypes of socially withdrawn children included in this study were sad/withdrawn, active-isolates, passive-anxious, and unsociable. Information about these children's sociometric status was collected and hypothetical vignettes were used to assess their ability to engage in each step of Crick and Dodge's (1994) social information-processing model. Harrist et al. (1997) found that the general trend was for withdrawn subtypes who had social information-processing skills similar to those of nonwithdrawn children, to obtain a pattern of fewer negative social status nominations and for withdrawn subtypes exhibiting more social-cognitive difficulties to have more negative social status nominations. For instance, the passive-anxious withdrawn children only had some difficulty with the interpretation stage of Crick and Dodge's (1994) social information-processing model and 50% of these children were given an average social status by peers. Children in the unsociable subtype had social-cognitive abilities that were similar to those of the nonwithdrawn children and although rates of neglected status were slightly elevated among this group, the most common status among these children was average. Conversely, active-isolates had non-normative social information-processing at the encoding, response generation and response enactment stages of Crick and Dodge's (1994) model and this group also had higher rates of peer rejection and lower rates of average social status than any other withdrawn or nonwithdrawn group. Thus, withdrawn children with more social-cognitive difficulty tended to have less favorable sociometric nominations whereas those with less social-cognitive difficulty tended to have more favorable sociometric nominations.

Further support for a relationship between social cognition and peer status comes from a study by Yoon et al. (2000) that examined these variables in another group of children, children who were aggressive. Because all children were aggressive in this study, the negative valence of their behavior was less likely to be responsible for social status differences that existed among them. The researchers did, however, find that one significant difference between aggressive children who were rejected, and any aggressive children who were not rejected, was their social cognitions. Aggressive children who were not rejected were more likely than those who were rejected to believe that aggression brings about positive results and they were more confident in their ability to use aggression towards a peer in this way.

In addition, a few studies have examined the relationships among social cognition, social behavior, and peer acceptance, with respect to children in general, and have found support for a mediation model among these variables. For instance, when Dekovic and Gerris (1994) did a series of analyses, social cognition was found to account for a good portion of the differences that occur in social acceptance; when behavior was then examined with these variables, it also accounted for (although to a lesser extent) for differences in social acceptance. Thus, Dekovic and Gerris (1994) found evidence suggesting that behavior mediates the influence of social cognition on social acceptance. The results of this study support the contributions of both social behavior and social cognition to the social acceptance of children in general.

Findings from the studies mentioned above are of interest because similar relationships of social cognition and behavior to social acceptance in children with learning disabilities, rather than aggressive children or children in general, are of concern in the current study. Similar to the study by Dekovic and Gerris (1994), it was expected in the present study that social cognition and behavior would each contribute to explaining children's peer acceptance. Moreover, it was expected that these relationships would account for the differences in peer acceptance that appear to exist between children with and without learning disabilities via a correlational model. The following sections of the literature review, therefore, discuss how each of these constructs of interest, social cognition, behavior problems, and peer acceptance manifest differently in children with learning disabilities compared to children without learning disabilities.

Learning Disability Status and Social Cognition

Social cognition in children with learning disabilities has been investigated by a number of researchers (e.g., Jackson, Enright, & Murdock, 1987; Maheady & Maitland, 1982; Pearl & Cosden, 1982; Sisterhern & Gerber, 1989); however, very few of these studies have examined both social cognition and social acceptance to demonstrate that impairments in social cognition are related to lowered social status. Only one such study by Stiliadis and Wiener (1989) was found during the literature search for this review. Stiliadis and Wiener (1989) examined the social-perceptual abilities and sociometric status of 30 students with and 30 students without learning disabilities. Students with learning disabilities had more difficulty on social-perceptual tasks and on teacher ratings of social-cognitive ability than students without learning disabilities. In addition, social cognition, as rated by teachers, was also significantly related to lower peer acceptance for children with learning disabilities. Thus, this study suggests a link between social cognition and social acceptance for children with learning disabilities. The vast majority of the research literature, however, focuses only on the social-cognitive deficits of these students as indirect support for such a relationship between social cognition and peer acceptance among children with learning disabilities. As a result, the ensuing discussion focuses on studies that investigated the social cognitions of students with learning disabilities.

For the most part, studies examining the social cognitions of children with learning disabilities have been concerned with determining the types of social-cognitive deficits they possess and with ensuring that the social-cognitive tasks used tapped into abilities needed for day-to-day social interaction. Although this type of research was quite common in the 1970s and 1980s, it appears to have been less frequent in recent years. For instance, in a recent search of the terms “social cognition” and “learning disabilities” using 3 databases, 50 citations were found. Of those 50 articles, 30 articles were published between 1982 and 1994 and many of the ones after that failed to address either learning disabilities or social cognition (e.g. articles about praeder-willi syndrome and articles focused on teaching children with learning disabilities).

Despite the lack of current literature, research that has accumulated since the 1970s has consistently supported children with learning disabilities’ broad range of difficulties in social-perceptual skills such as empathy, role taking, and making social inferences (Holder & Kirpatrick, 1991). These deficits were primarily documented by examining whether children with learning disabilities could draw appropriate inferences from nonverbal behavior (e.g., Sisterhern & Gerber, 1989; Wiig & Harris, 1974). Investigations into the social-cognitive deficits of these children also examined their ability to interpret other types of social information, such as verbal information, and their ability to understand and enact verbal and nonverbal behaviors through role-taking and role-plays (e.g., Dickstein & Warren, 1980; Weiss, 1984). The interpretation of social information from both verbal and nonverbal behaviors was researched with a variety of methods. For example, videotaped segments of interactions, static pictures, and narratives were all used to present verbal and nonverbal social information to children with learning disabilities.

An additional area of investigation was the social-cognitive abilities of these children over time. This research focused on examining whether social-cognitive difficulties represent an actual deficit, or, simply take longer to develop among children with learning disabilities (e.g., Jackson et al., 1987). Lastly, a few more recent studies have compared children with and without learning disabilities on social-cognitive skills that are analogous to the steps in Crick and Dodge's (1994) social information-processing model. Results from these different types of studies are reviewed below to provide converging evidence for the wide ranging social-cognitive deficits of children with learning disabilities.

Deficits in interpreting nonverbal social information. Nonverbal behavior is inherent in all social interactions and is often more ambiguous than verbal behavior; additional interpretation into the nature of nonverbal behavior is therefore frequent and necessary. These interpretations can greatly affect one's impressions, and, in turn, how one communicates and behaves with others (Custrini & Feldman, 1989). For example, if children's assessments of nonverbal behavior are inaccurate, it could lead them to respond inappropriately. Research into the interpretations of nonverbal behavior by children with learning disabilities has, therefore, focused on whether they can accurately evaluate common nonverbal features such as facial expressions, gestures, and vocal tones.

For example, in an early investigation by Wiig and Harris (1974), a videotape of a young female, pantomiming nonverbal expressions of anger, embarrassment, fear, frustration, joy, and love was shown to adolescents with and without learning disabilities; those with learning disabilities made more substitutions or mislabeled these emotions more often than those without learning disabilities. Thus, adolescent students with learning disabilities appear to have difficulty using nonverbal behaviors such as body gestures and facial expressions to decipher emotions when conveyed in motion picture.

Similar results were found with respect to the ability of children with learning disabilities to interpret nonverbal information presented in static pictures. For example, when Bruno (1981) asked children with and without learning disabilities who were between the ages of 9 and 11 to interpret pictures of social situations, those with learning disabilities were significantly more inaccurate in their interpretations of visual cues; they made a greater number of false inferences and were more likely to focus on irrelevant details. In addition, even when shown simple static pictures, children with disabilities had difficulty interpreting the overall meaning of social situations (Saloner & Gettinger, 1985).

Although earlier research on the interpretation of nonverbal social information by students with and without learning disabilities typically presented only visual information, the majority of more recent research focused on varying the modality of the information. This research was driven by the need to clarify the nature of the social-cognitive difficulties that contribute to children with learning disabilities' problems interpreting social interactions. In particular, whether having information from more than one modality (e.g., visual and auditory information) makes it easier or harder for the child to be accurate in their interpretations has been of interest. The results of this research are instrumental in determining under what conditions children with learning disabilities are more likely to interpret social information accurately as well as in determining the extent of their difficulties. Trouble interpreting information from both modalities and from each modality separately would imply more serious difficulties with social-cognitive processing than difficulty only with a combination of modalities. In addition, pinpointing specific modalities (such as visual information) that are difficult for the child to interpret may indicate which ones are likely contributing to difficulty integrating information from more than one modality (e.g., visual and auditory).

Two relatively more recent investigations, one by Jackson et al. (1987) and the other by Sisterhern and Gerber (1989), used videotaped segments to present nonverbal behavior to students with and without learning disabilities. Furthermore, these videotaped segments showed alternating clips of pure visual, pure auditory, and a combination of visual and auditory information. The results of these investigations substantiate and extend those of the two aforementioned studies: adolescent students with learning disabilities were found to be less skilled in understanding nonverbal social information when it was presented visually as well as when it was multisensory (both visual and auditory) in nature. Whether information from the auditory channel alone is difficult for these children to interpret is less clear. Neither Jackson et al. nor Sisterhern and Gerber found children with learning disabilities to be at a significant disadvantage in their ability to interpret nonverbal auditory cues. In contrast, Jarvis and Justice (1992) found that junior and senior high school-aged students with learning disabilities were significantly less accurate in interpreting taped recorded (and thus auditory) stories that depicted adults in happy, anxious, angry, and sad social interactions. Because these stories were spoken, however, the children were really being presented with two aspects of information. The information was both verbal and auditory in nature; difficulty interpreting the verbal content of this information could have been interfering with their ability to interpret auditory nonverbal cues, such as affective tone.

Deficits in interpreting verbal social information. Indeed, additional support for difficulty interpreting verbal information has come from the results of studies such as those of Pearl and Cosden (1982) and Weiss (1984). Pearl and Cosden (1982) showed students with learning disabilities and those without learning disabilities clips from soap operas and asked them to assess the feelings displayed; children with learning disabilities were consistently less accurate than their classmates in understanding these more life-like social interactions which included verbal expressions. The results of this study, therefore, suggest that in addition to children with learning disabilities having difficulty discerning the meaning of nonverbal social cues they see, they may also have trouble interpreting the meaning of verbal information they hear.

Additional research by Weiss (1984) provides further evidence that children with learning disabilities may have trouble interpreting social information presented verbally as well as indirect evidence for deficits in the social information-processing of these children. Unlike the latter studies' presentation of nonverbal visual and verbal auditory information at the same time with soap opera vignettes, children in Weiss' (1984) study either saw videotaped interactions or heard verbal descriptions of those interactions. Children with learning disabilities interpreted both the videotaped and verbal descriptions of scenarios as more unfriendly than children without learning disabilities, suggesting that it is difficult for them to interpret social interactions even when verbal information is presented separately.

In addition, when these children were later asked about the content of the verbal information they had been presented with, children with learning disabilities recalled fewer correct items than children without disabilities indicating difficulty with the storage and retrieval of verbal information. This finding is not surprising given that cognitive and academic difficulties are defining features of learning disabilities. It is, nonetheless, a significant finding because difficulty storing and retrieving verbal social information suggests that the inaccurate interpretations of children with learning disabilities may result from information not being encoded properly, the first step in Crick and Dodge's (1994) social information-processing model. Furthermore, if social information is not being encoded and retrieved properly, the implication is that these children are evaluating social cues without having access to relevant information and are likely relying on other knowledge or information they possess. In other words, children with learning disabilities, like aggressive children, may be overlooking relevant social information and interpreting the social behavior of others negatively due to an over- reliance on faulty schemas they possess for social situations or events (Crick & Dodge, 1994).

Lastly, the results of the study by Weiss (1984) are significant because they suggest that social-cognitive difficulties are really associated with the child's learning disability rather than other behavioral features they may possess. Both the children with and the children without learning disabilities were also classified as being aggressive or nonaggressive. Difficulty interpreting nonverbal visual and verbal auditory information was consistently more difficult for aggressive and nonaggressive children with learning disabilities than for children of these behavioral sub-types who did not have learning disabilities. This finding is of interest because aggression has not only been found to commonly co-occur with learning disabilities, but to be a characteristic of children who are not well accepted by their peers (e.g., Konstantareas & Homatidis, 1989; Parker & Asher, 1987). In addition, aggressive children are more likely than nonaggressive children to make faulty, hostile, attributions when interpreting social information due to a reliance on inappropriate schemas (Crick & Dodge, 1994). Thus, the social-cognitive difficulties of children with learning disabilities could actually be a function of other behavioral features they may possess such as aggression. That this study by Weiss (1984) found similar social-cognitive deficits among children with learning disabilities regardless of whether they were aggressive or nonaggressive suggests that learning disabilities uniquely contribute to the social-cognitive processing deficits of children above and beyond contributions made by aggression. As suggested above, and consistent with social information-processing theory, however, it is possible that these deficits of children with learning disabilities and difficulties of aggressive children may manifest in a similar manner (e.g., an over-reliance on inaccurate schemas).

In addition to the above research on verbal and nonverbal communication, research on children with learning disabilities' role-taking skills also provides support for the premise that they evidence social-cognitive deficits. Role-taking or being able to put oneself in another person's shoes is a complex cognitive-affective activity that is critical to gaining further knowledge of and compassion for others (Shantz, 1975). It seems logical, then, that if children have trouble interpreting the emotions of others due to social-cognitive deficits, that these deficits would also lead them to have difficulty understanding and taking the viewpoint of others; this appears to be the case. In a study by Dickstein and Warren (1980), children from age five to eleven were asked to engage in three role-taking tasks. One task was to determine what another child was thinking, a second what another was feeling, and a third what another child was seeing from a different perspective. Across all three tasks, children with learning disabilities performed less competently than children without disabilities. These findings have also extended to the role-playing of various real-life situations such as making friends. For example, Stone and LaGreca (1984) had children with and without learning disabilities take the role of making friends with a new child at school. While engaging in this task, children with learning disabilities received a lower overall rating on a global judgment of their social competence, indicating that their schema for how to go about making friends with another child may not have been accurate.

Somewhat more current investigations have been concerned with whether these extensive difficulties represent an actual deficit, or rather, a deficiency that improves over time. For example, as mentioned earlier, studies such as that of Sisterhern and Gerber (1989) have included several age groups of students. Although all of the 14, 16, and 18 year-old students who participated in this study improved in their ability to interpret visual and multi-sensory nonverbal social cues, across the age groups, adolescents with learning disabilities continued to show poorer social-perceptual ability. Similarly, when Jackson et al. (1987) examined 11, 14, and 17 year-old children with and without learning disabilities over time, they all improved in their ability to interpret nonverbal social information, but proportional differences in their abilities remained. These findings suggest an actual deficit in social-cognitive ability in children with learning disabilities. If the differences in social-cognitive ability of children with and without learning disabilities were the result of a developmental lag, then proportionate differences between these two groups should have lessened with age.

Deficits within the framework of social information-processing. Earlier, support for the present investigation's use of Crick and Dodge's (1994) model to account for the social difficulties of children with learning disabilities was inferred by conceptualizing research on these children's specific social-cognitive deficits within the basic tenets of the model. Although research directly examining the model's ability to explain the social difficulties of children has primarily been done with aggressive and nonaggressive children, initial evidence for the model's usefulness in explaining the social difficulties of children with learning disabilities does exist.

In particular, the results of two key investigations, one by Tur-Kaspa and Bryan (1994) and another by Bauminger, Edelzstein, and Morash (2005), directly link the manner in which children with learning disabilities process social information with the steps of Crick and Dodge's (1994) social information-processing model. Tur-Kaspa and Bryan (1994), compared children with learning disabilities in the third, fourth, seventh, and eighth grades with low achieving and high achieving students from the same grades on several measures. All students were assessed on their social information-processing skills as well as on teacher ratings of their overall social competence and school adjustment. Social information-processing skills were assessed with an adapted version of Dodge's (1986) original social information-processing skills measure. This measure assesses social information-processing skills by presenting individuals with social scenarios (the adapted version had five) on videotape and then by asking a series of questions which tap into each step of the model. For example, to assess how well an individual has encoded information about the scenario, the first step of the model, children were presented with the following prompt: "Tell me everything you remember about the story."

The results of this study by Tur-Kaspa and Bryan (1994) are notable to the current investigation in several ways. First, students with LD had significantly lower performance on the encoding, representation, response search, response decision, and enactment processes of the model in comparison to average-achieving students. Thus, this study provides direct evidence for the usefulness of Crick and Dodge's (1994) social information-processing model in characterizing the social-cognitive difficulties of these students. Second, there is evidence from this study to suggest that students with learning disabilities have difficulty with two of the most important of these social information-processing steps, encoding and the ability to generate competent solutions. These difficulties appear to be the result of actual deficits in processing rather than an artifact of low academic achievement; students with learning disabilities scored significantly lower on these steps than did low achieving students. Third, children in the lower grades' social information-processing skills were significantly correlated with teachers' ratings of social competence and school adjustment. This finding, at least for younger children, supports the notion that accurate completion of each step of

Crick and Dodge’s (1994) model will result in being judged or evaluated as socially competent; the implication then is that poor performance on these social information-processing steps can account for one’s social difficulties. Lastly, a noteworthy result of this study is that the social information-processing abilities outlined in Crick and Dodge’s model (1994) were able to reliably differentiate between those children with and those children without learning disabilities (Tur-kaspa & Bryan, 1994). In other words, poor performance on the steps of this model was so common that children with learning disabilities could be identified based on this performance alone.

Bauminger et al. (2005) also compared children with and without learning disabilities on social-cognitive processes associated with Crick and Dodge’s (1994) social information-processing model. Similar to Tur-Kaspa and Bryan (1994), Bauminger et al. (2005) found that children with learning disabilities had more difficulty than those without learning disabilities encoding social cues and generating an ample number of solutions (although solutions that were generated were usually competent and similar to those of children without learning disabilities). With respect to the response decision step of the model though, children with learning disabilities produced fewer appropriate responses than those without learning disabilities. Unlike Tur-kaspa and Bryan (1994) these researchers examined whether the response decision of a child was in line with the social goals they identified in the clarification of goals step. In addition to naming fewer social goals, children with learning disabilities were less likely to produce social goals congruent with their response decision.

In sum, research on children with disabilities and in particular, children with learning disabilities, suggests that these individuals have clear deficits in their ability to interpret and understand social information that they might be presented with during everyday interactions. These deficits appear to exist regardless of the modality in which the information is presented, the age of the child, and the presence of other problematic behaviors such as aggression. In light of this theoretical support for social-cognitive deficits among children with learning problems, the present study took a more ecological approach and extended this research by examining the implications of these deficits for children with learning disabilities in inclusive classrooms and by also considering the effects that other factors, such as these students' behavior, would have.

Learning Disability Status and Behavior Problems

In addition to social status differences and social-cognitive differences between children with and without learning disabilities, research dating back to the late 1960s has substantiated that problem behaviors are more common among children with learning disabilities. In 1969, for example, Myklebust, Boshes, Olson, and Cole (as cited in Bryan & Bryan, 1983) reported teacher ratings indicating that children with learning disabilities were less cooperative, less attentive, less organized, less capable of coping with new situations, less responsible, and less tactful than those without learning disabilities. Similar to these teacher ratings, Dorval, McKinney, and Feagans (1982) found through direct observation, that interactions that occurred between teachers and children with learning disabilities were more likely to involve the use of behavior management techniques as a result of rule violations they had made than interactions between these teachers and students without learning disabilities.

The presence of behavioral difficulties among children with learning disabilities is also supported by research using cluster analysis. The use of this technique indicates that behavior problems coincide with learning disabilities frequently enough for specific behavioral subtypes of this group of children to be identified. Cluster analysis studies such as that by Speece, McKinney, and Appelbaum (1985) have identified several behavioral subtypes of learning disabilities, most of which are characterized by maladaptive behaviors such as varying amounts and patterns of attentional problems, conduct problems, and personal adjustment problems.

Additional research on these behavioral characteristics of children with learning problems suggests that the presence of inattentive and hyperactive behaviors are those that are most associated with learning difficulties in kindergarten and the elementary school-age years. In two related studies, one by Hinshaw, Morrison, Carte, and Cornsweet (1987; as cited in Hinshaw, 1992) and the other by Morrison, Mantzicopoulos, and Carte (1989; as cited in Hinshaw, 1992) kindergarten children at risk for learning disabilities (as assessed by their perceptual and prereading skills) were rated to be behaviorally deviant across all dimensions of a teacher rating scale called the Revised Problem Behavior Checklist. However, in both studies, although there was a significant negative correlation between the presence of inattention and hyperactivity and prereading achievement, this relationship either did not also exist between conduct problems and prereading skills, or, if it did, when attention problems were partialled out, negative associations between conduct problems and prereading no longer existed. In addition to clarifying the nature of specific behavioral correlates of learning difficulties, these studies are noteworthy because they demonstrate that inattentive and hyperactive behaviors are related to academic readiness problems in children at a young age, before being exposed to an academic curriculum.

A study by Frick (1991; as cited by Hinshaw, 1992) also found inattention and hyperactivity to be more associated with learning difficulties than conduct disorder in school-age children. Children were classified as ADHD, conduct disordered, or as a control group on the basis of parent, teacher, and child interview information. Furthermore, six to 20 percent (depending on the criteria used) of the ADHD and conduct disordered children showed signs of underachievement. Further analyses controlling for the presence of both ADHD and conduct disorder symptoms in some children, however, revealed that only ADHD was uniquely associated with underachievement; the apparent relationship between conduct disorder and underachievement was really due to the presence of attention-related problems in many children with conduct disorder.

Other research, although not necessarily concerned with differentiating among behavior problems that co-occur with learning disabilities, documents strong overlap between inattentive and hyperactive behaviors and learning disabilities in school-age children. In terms of attention-related behaviors, Gresham and Reschly (1986) found that teachers rated children already identified with learning disabilities to be less competent on behaviors such as attending, completing tasks, following directions, and independent seatwork. With respect to hyperactivity, Lambert and Sandoval (1980; as cited in Bruck &

Hebert, 1982) reported that in a school sample of children identified with hyperactivity, 43% could be objectively classified as having a learning disability.

Similarly, children already identified with learning disabilities have been found to exhibit problems with hyperactivity. For example, in a study by Bruck and Herbert (1982), 15% of children identified with a learning disability also displayed high levels of hyperactivity. Furthermore, hyperactivity was found to be strongly related to interpersonal relationship ratings, regardless of whether or not a child had a learning disability. However, given that hyperactive behaviors have a fair amount of comorbidity with learning disabilities and that hyperactivity, rather than disability classification was related to peer ratings in Bruck and Herbert 's (1982) study, it may be that behavioral aspects of children with learning disabilities, such as their hyperactivity, are responsible for lower social status.

In addition to the single studies mentioned above, meta-analytic reviews of research in this area corroborate links between behavior problems and learning difficulties. The meta-analysis, mentioned earlier, by Swanson and Malone (1992) also included studies that indexed children with learning disabilities' behaviors. When effect sizes were calculated across studies examining behavioral characteristics such as aggression, personality, inadequacy-immaturity problems, and the ability to stay on-task, moderate to highly positive effect sizes (e.g., ES= .49-.98) were found. These results suggest that children with learning disabilities have a tendency to be more aggressive, to have more negative ratings with respect to personality problems and inadequate/immature behavior, and to have difficulty attending, compared to their peers without learning disabilities.

A more recent investigation by McConaughy and Mattison (1994) also examined the relationship between learning disabilities and behavior problems. The nature of this relationship was examined in greater depth, however, by comparing the behavior ratings of parents and teachers for children who had been classified with serious emotional disturbance (SED) and learning disabilities (LD) according to state definitions of these disabilities with children who had no disability label. The results of this study, like those of the aforementioned studies, confirmed that children with learning disabilities are more likely to have behavior problems than children without disabilities; children identified with a learning disability had more behavior problems than normative samples of a comparable age and gender.

Moreover, McConaughy and Mattison (1994) extended the results of past research on the behavior problems of children with learning disabilities by also investigating the severity of these behavior problems. They found that in addition to having a greater number of behavior problems than children without LD, large percentages of children with LD had behavior rating scores greater than or equal to borderline cut off points indicative of clinical deviance. In other words, students with LD not only appear to have a greater number of behavior problems than students without LD but to exhibit behavior problems that are of a greater intensity. Just how intense are these behaviors of children with learning disabilities? In order to determine the relative severity of children with learning disabilities' behavior problems, their behaviors were also compared to those of children with a serious emotional disturbance. Given that the presence of behavioral and/or emotional problems is a defining feature of serious emotional disturbance, children classified as SED should exhibit a greater number and severity of behavior problems than children identified with LD. Indeed, children who had been identified as SED were rated significantly higher than children with learning disabilities on all scales of the teacher version of the CBCL (TRF) and all but one scale of the CBCL (Somatic Complaints). In addition, a significantly greater number of children with SED were rated to be above the borderline clinical cut points on all scales of the CBCL and TRF. Thus, although children with LD appear to have a greater number of and more intense behavior problems than children without LD, the nature of these problems is not as grave as that of children with a serious emotional disturbance.

Learning Disability Status and Peer Acceptance

Research dating back to the 1970s has documented that children with learning disabilities not only experience academic difficulties, but also have difficulty interacting with peers (Kavale & Forness, 1996). The results of sociometric status research on children who have learning disabilities have consistently indicated that these children are less likely to be accepted than their peers without learning disabilities. For example, in one early investigation by Bryan (1976, as cited in Wong, 2000), children with learning disabilities received fewer votes of social acceptance and more votes of social rejection from their peers than children without learning disabilities. A decade later, when Ray (1985) compared the social characteristics of students with and without learning disabilities in third through sixth grade mainstream classrooms, those with learning disabilities were more likely to have a rejected status and less likely to have a popular status among their peers.

Further corroboration for this less favorable social status comes from two earlier meta-analytic reviews, one by Swanson and Malone (1992), which compiled the results of 39 studies on children with learning disabilities, and the other by Ochoa and Olivarez (1995), which used the results of 17 sociometric studies of children with learning disabilities. Both meta-analyses found that children with learning disabilities were less accepted and more socially rejected than their peers without learning disabilities. It is interesting to note, however, that in the meta-analysis by Swanson and Malone (1992), even though a majority of children with learning disabilities in the studies examined were less accepted and/or more socially rejected, by default, between 16 and 22% of these children had to have been at least as well accepted as those without disabilities. The authors did not, however, point these results out, despite their significance in suggesting that although most children with learning disabilities have a lowered social status, not all of them do. Thus, peer difficulties among these children are common but are not a defining characteristic or an unequivocal consequence of learning disabilities. Peer difficulties are, however a very likely aspect of these children's lives, as is evident by the two meta-analyses mentioned above and a more recent one which is now discussed.

A recent meta-analysis by Nowicki (2003), which compiled the results of studies since 1990, similarly documents that children with learning disabilities are often not well-accepted and are more likely to be rejected by their peers than those without learning disabilities. This particular meta-analysis is notable, however, because it provides some additional information not previously included in meta-analyses. Recent studies concerning the peer acceptance of children with learning disabilities have compared their social status to that of different subgroups of children without learning disabilities, such as low-, average-, and high-achieving students, to determine if comparisons with these different groups alter the relationship between peer acceptance and learning disabilities. This more recent meta-analysis by Nowicki (2003) incorporated such research.

Nowicki (2003) aggregated the results of 32 studies. Some of these studies compared the social status of children with learning disabilities to those without learning disabilities in inclusive classrooms and some compared children with learning disabilities to students characterized by low, average, and/or high average academic achievement in inclusive settings. When studies had not created different achievement categories for students without learning disabilities, these students were placed in the average- to high-achieving category for the meta-analysis. Effect sizes indicating the difference between these groups on sociometric status were then computed. Comparing peer ratings of social preference for children with learning disabilities to that of average- to high-achieving students yielded a large effect size, indicating that students without learning disabilities typically received higher social preference scores. In contrast, the effect size computed for differences in the social preference scores of children with learning disabilities and low-achieving children was medium; there was, however, a range of variability in these studies with respect to social preference scores. This was largely due to two studies by Vaughn and colleagues that resulted in widely differing effect sizes (Nowicki, 2003). In particular, in one study by Vaughn et al. (1992; as cited in Nowicki, 2003), negative, medium effect sizes were reported and indicated that children without learning disabilities preferred those with a learning disability over low-achieving children in their classroom. In contrast, in another study by Vaughn et al. (1990) children in kindergarten preferred low-achieving classmates over those who had a learning disability. The medium effect size reported by Nowicki (2003), therefore, tentatively, indicates that low-achieving children have better social status in inclusive classrooms than children with learning disabilities, but that this difference is not as great as when children with learning disabilities are compared to average-to high-achieving students.

The results of this meta-analysis therefore suggest once again that children with learning disabilities are not as well regarded by their peers as children without learning disabilities. Furthermore, the differences in effect size found when these children were compared to average/ high-achieving students and low-achieving students may suggest that peers view children with learning disabilities and low-achieving students as more similar with respect to being socially competent. These findings are interesting because they suggest that there may be a common feature among these children that is associated with their lower social status. Any number of things could explain such a difference. For example, similar social status ratings among children with learning disabilities and low-achieving children could suggest that either a common cognitive feature among these children contributes to both their academic and peer difficulties, or that stigmatization due to the academic difficulties of both children may lead to negative peer views.

The latter notion has, in fact, been suggested as an alternative explanation for children with learning disabilities' social difficulties. It has been suggested that it is the stigmatization of having a learning disability and receiving special services, more so than social difficulties, that results in lower peer status (Bryan & Bryan, 1986). If stigmatization were contributing to poor acceptance and rejection, then the social behavioral problems of these children would not be very predictive of their peer status. Instead, low social acceptance and rejection would be artifacts of being labeled with a learning disability. Research into the social difficulties of children with learning disabilities, however, suggests that these children's social problems and low acceptance/rejection are not a result of their disability label but are features of the disability itself. In a study examining the sociometric status of students in kindergarten, those who were later identified with learning disabilities were more likely to have had low peer acceptance ratings and a rejected status in kindergarten (Vaughn, Hogan, Kouzekanani, & Shapiro, 1990). Given that poor sociometric ratings were present before the children were even "labeled" as having a learning disability, social difficulty does not appear to be the result of stigmatization but, rather, an associated feature of the disability.

In conclusion, then, individual studies and meta-analyses of these studies concur with respect to the relationship between learning disability status and peer acceptance. Children with learning disabilities typically have social difficulties, which are evident by the fact that they are not as well received by their classmates as those without learning disabilities. In particular, children with learning disabilities tend to be less socially accepted and more socially rejected than their peers without learning disabilities. Students with learning disabilities also appear to be less socially accepted and more socially rejected than low-achieving students but the extent of this difference has not always been found and the effect does not appear to be as great as it is for high-achieving students.

CHAPTER THREE

Research Aims

Statement of the Problem

As detailed in the previous chapter, children with learning disabilities are more likely to have low acceptance or to be rejected by their peers than children without learning disabilities (e.g., Swanson & Malone, 1992). Although the lower peer acceptance of children with learning disabilities has been repeatedly documented, few, if any, studies have examined the pathways that might explain this relationship. The research literature does, however, provide some intriguing clues that the lower peer acceptance of children with learning disabilities might be explained by their impaired social cognition and/or higher levels of disruptive behavior. Specifically, research has found that, on the average, children with learning disabilities differ from their normally achieving peers on both social cognition and social behavior (e.g., McKinney & Feagans, 1984; Sisterhern & Gerber, 1989). Furthermore, other researchers studying predictors of peer acceptance in the general population of children have found that social cognitions and social behavior predicted children's sociometric status (e.g., Putallaz, 1988; Yoon et al., 2000).

Despite these observed associations, few studies have linked the social cognitions and behavior of children with learning disabilities to their peer acceptance and virtually no studies have explored the relationship among these variables in the same group of children. The present investigation was, therefore, unique in that it directly examined whether compromised functioning in two general domains, social cognition and behavior, may "explain" the lower social acceptance observed in children with learning disabilities as compared to their peers without learning disabilities. In order to investigate such a relationship, correlations among learning disability status (learning disabilities versus no learning disabilities), social cognition (as assessed by children's accuracy in reporting peer friendships), externalizing behavior, and peer acceptance were reviewed by drawing upon extant data from a large study of children's social functioning.

Investigating the links between these variables and lower peer acceptance in children with learning disabilities is an important objective given the well-documented association that exists between peer status and children's current and future functioning (e.g., Parker & Asher, 1987). Although links between children's peer status and current and future functioning are correlational, developmental theorists have suggested that social acceptance likely provides very important opportunities for the development of adaptive psychosocial functioning and adjustment and, thus, that it is a variable of great interest. In the present study, the relationships of social-cognitive deficits and levels of externalizing behavior to lowered peer acceptance in children with learning disabilities were tested with a mediation model using a correlational design. Thus, similar to research examining the relationship between peer status and children's current and future functioning, the design of the present study can lead to implications about the relationships among these variables but not direct causal inferences. A correlational design is a necessary first step in research examining the processes that lead to the lowered peer acceptance of children with learning disabilities, however. Such research sets the stage for testing this hypothesized causal model more directly. For example, interventions addressing the cognitive and behavioral deficits of children with learning disabilities could be designed and their impact on children with learning disabilities' social acceptance examined.

In sum, then, the aim of the present study was to find initial evidence demonstrating that the social cognitions and behaviors of children with learning disabilities are related to differences in peer acceptance that exist between these children and children without learning disabilities. More specifically, social cognition and externalizing behavior were predicted to account for (mediate) the relationship that research has repeatedly demonstrated between learning disability status and peer acceptance (e.g., Swanson & Malone, 1992). The following hypotheses were designed to fulfill the conditions that Baron and Kenny (1986) have outlined as necessary to demonstrate that a variable mediates an already demonstrated relationship between two variables.

Hypotheses

Hypothesis 1. Children's disability status (LD vs. nonLD) will predict their peer acceptance, such that classification as LD will be negatively related to children's social preference scores.

Support for this hypothesis comes from research that has repeatedly demonstrated that, within inclusive classrooms, children with learning disabilities tend to have lower social status than those without learning disabilities. For instance, in one early investigation by Bryan (1976, as cited in Wong, 2000), children with learning disabilities received fewer votes of social acceptance and more votes of social rejection from their peers than children without learning disabilities. A decade later, when Ray (1985) compared students with and without learning disabilities, those with learning disabilities were more likely to have a rejected status and less likely to have a popular status.

Further corroboration for this less favorable social status comes from two meta-analytic reviews, one by Swanson and Malone (1992), which compiled the results of 39 studies on children with learning disabilities, and the other by Ochoa and Olivarez (1995), which used the results of 17 sociometric studies of children with learning disabilities. Both meta-analyses found that children with learning disabilities were less accepted and more socially rejected than their peers without learning disabilities. A more recent meta-analysis by Nowicki (2003) similarly found that children with learning disabilities were not well-accepted and more likely to be rejected by peers than those without learning disabilities.

In addition, Nowicki (2003) also aggregated the results of studies to compare the social status of children with learning disabilities to students without learning disabilities who were characterized as having low, average, and/or high average academic achievement. Nowicki (2003) found that peer ratings of social preference for children with learning disabilities compared to those for average- to high-achieving students yielded a large effect size, indicating that average/high achieving students typically received much higher social preference scores. In contrast, the effect size for differences in social preference scores between children with learning disabilities and low-achieving children was medium. Although two studies among those comparing students with learning disabilities to low-achieving students produced discrepant results, this medium effect size, tentatively, indicates that low-achieving children have higher social status than children with learning disabilities, but that this difference is not as great as when children with learning disabilities are compared to average/ high achieving children. That the peer acceptance of low-achieving students is more similar to that of children with learning disabilities than to that of average/high achieving students suggests more similarities among these two groups with respect to social competency. However, a comparison between these two groups, children with learning disabilities and low-achieving children still produced a medium effect size in peer acceptance, thus suggesting that the lower peer acceptance of students with learning disabilities is more than just an artifact of the low academic achievement that these students also have.

Thus, there is much support, indicating that children with learning disabilities are more likely to be rejected and less likely to be accepted by classmates than children without learning disabilities. Additionally, the meta-analysis by Nowicki (2003) tentatively suggests that the presence of a learning disability is uniquely related to lower peer acceptance, above and beyond that of just the low academic achievement that these children tend to have. As a result, it was predicted in the current study that whether a child had a learning disability would be related to peer acceptance, such that the presence of a learning disability would be associated with lower social preference scores.

Hypothesis 2. Children's disability status (LD vs. nonLD) will predict their social-cognitive accuracy, such that classification as LD will be negatively related to children's accuracy in identifying the peer groups in their class.

Support for this hypothesis comes from research dating back to the 1970s that has consistently reported that children with learning disabilities have a broad range of difficulties in social-perceptual skills (Holder & Kirpatrick, 1991). Such deficits were primarily documented by examining whether children with learning disabilities could draw appropriate inferences from both nonverbal behavior and verbal social information (e.g., Dickstein & Warren, 1980; Sisterhern & Gerber, 1989; Weiss, 1984; Wiig & Harris, 1974). More current research has demonstrated that children with learning disabilities also have more difficulty than those without learning disabilities when presented with social information and asked questions that tap into each step of Crick and Dodge's social information-processing model (1986, 1994). Few studies have used this methodology so it is noteworthy that two studies (Bauminger et al., 2005; Tur-Kapsa & Bryan, 1994) that did so both found that children with learning disabilities were less accurate in the first step of Crick and Dodge's model (1986, 1994), encoding social information, than those without learning disabilities.

Thus, research since the 1970s has demonstrated that children with learning disabilities have social-cognitive deficits and Tur-Kapsa and Bryan (1994) and Bauminger et al. (2005) extended these findings to include difficulties engaging in steps, such as encoding, from Crick and Dodge's (1986, 1994) social information-processing model. Given these findings, it was asserted in the present study that children with learning disabilities would have more difficulty encoding social information regarding the peer groups that exist in their classroom than children without learning disabilities.

Hypothesis 3. Children's disability status (LD vs. nonLD) will predict their externalizing behavior, such that classification as LD will be positively related to teacher ratings of children's externalizing behavior on the CBCL.

Support for this hypothesis comes from research dating back to the late 1960s that has substantiated that problem behaviors are more common among children with learning disabilities. In 1969, for example, Myklebust, Boshes, Olson, and Cole (as cited in Bryan & Bryan, 1983) found that teachers rated children with learning disabilities as less cooperative, less attentive, and less tactful than those without learning disabilities. Relatively more recent studies have used more advanced statistical analyses to detect and support that having a learning disability is related to the presence of behavior problems. For instance, Speece, McKinney, and Appelbaum (1985) used cluster analysis on behavioral ratings of children with learning disabilities and identified behavioral subtypes of learning disabilities, most of which were characterized by maladaptive behavior such as attentional problems, conduct problems, and personal adjustment problems.

Additional research, using methods such as statistical control of behavioral characteristics and meta-analysis have also supported a relationship between learning disabilities and externalizing behavior. For instance, two related studies, one by Hinshaw, Morrison, Carte, and Cornsweet (1987; as cited in Hinshaw, 1992) and the other by Morrison, Mantzicopoulos, and Carte (1989; as cited in Hinshaw, 1992) examined the behaviors of kindergarten children at risk for learning disabilities (as assessed by their perceptual and pre-reading skills). Both studies found a significant negative correlation between inattention and hyperactivity and pre-reading achievement, but this relationship either did not exist between conduct problems and pre-reading skills, or, if it did, when attention problems were partialled out, the relationship was no longer upheld. These studies suggest that learning difficulties and externalizing behavior, such as hyperactivity, co-exist and do so from an early age.

Furthermore, these behavior problems that tend to exist in children with learning difficulties from a young age appear to be associated features of the disability rather than a distinct, co-morbid disorder. McCounaghey and Mattison (1994) conducted a meta-analysis across studies examining the behavioral characteristics of children with learning disabilities and across studies assessing the behavioral characteristics of children with serious emotional disturbance (SED). Although moderate (and significant) effect sizes were found for externalizing behavior in children with learning disabilities, they did not reach the level of the behavior problems that characterized children with a SED, for whom behavior problem effect sizes were high compared to typical children. In light of the above research findings, which suggest that behavior problems are an associated feature of learning disabilities, it was posited in the present study that children with learning disabilities would exhibit greater externalizing behavior, as assessed by CBCL teacher ratings, than children without learning disabilities.

Hypothesis 4. Across the entire study sample (LD and nonLD combined), children's social-cognitive accuracy will be related to peer acceptance, such that greater accuracy in identifying peer group members within in one's class will be associated with higher social preference scores.

Support for this hypothesis comes from research investigating the social cognitions and peer acceptance of children in general and from research on different sub-groups of children whose social-cognitive abilities and peer acceptance vary. With respect to children in general, varying social-cognitive ability (e.g., theory of mind) among 67 pre-school children was found to predict their sociometric status within the classroom, such that social-cognitive ability was significantly and positively correlated with sociometric status nominations they received. Furthermore, understanding of mind accounted for changes in sociometric status above and beyond that explained by children's language ability (Cassidy et al., 2003).

Additional support for an association between social cognition and peer acceptance among children comes from research that examines these variables among different sub-groups of children such as those who are socially withdrawn or aggressive. For instance, in a study by Harrist et al. (1997), information about the sociometric status of four sub-groups of socially withdrawn children was collected and hypothetical vignettes were used to assess their ability to engage in each step of Crick and Dodge's (1994) social information-processing model. The general trend was for withdrawn subtypes who had social information-processing skills similar to those of nonwithdrawn children, to obtain a pattern of fewer negative social status nominations and for withdrawn subtypes, exhibiting more social-cognitive difficulties, to have more negative social status nominations. Similarly, aggressive children tend to have more negative social status among their classmates (Crick & Dodge, 1994) but when their social-cognitive abilities are more accurate, their social status tends to be better than that of aggressive children with less proficient social-cognitive ability (Yoon et al., 2000).

In general, then, children who have better social-cognitive ability tend to have more positive social status or peer acceptance within their classrooms. Additionally, among children with certain behavioral features, such as aggression or withdrawal, those with better social-cognitive ability (i.e., abilities that are more similar to those of children without such behaviors) tend to have better social status. Given these findings, it was predicted that among all children of the present study, greater social-cognitive accuracy in naming the peer groups of one's classroom would be predictive of greater social preference by classmates.

Hypothesis 5. Across the entire study sample (LD and nonLD combined), children's externalizing behaviors will be related to peer acceptance, such that more frequent reports of externalizing behavior by teachers will be related to lower social preference scores.

Support for this hypothesis comes from research that has repeatedly found that behavior among children is predictive of their peer acceptance (Crick & Dodge, 1994). For instance, Dodge (1983), in an exploratory study, grouped a sample of boys into the sociometric categories of popular, rejected, neglected, controversial, and average. The behaviors of these boys were then observed and analyzed to determine if there were any behavioral predictors of peer status; he found that this was the case given that boys who were rejected or neglected tended to engage in significantly higher rates of inappropriate behavior and rejected boys were also significantly more likely to be aggressive. In contrast to these behavioral characteristics associated with rejected and/or neglected status, boys who were popular among their classmates tended to refrain from aggression and controversial boys tended to engage in significantly high rates of both prosocial and antisocial behavior. Thus, varying social status classifications were, in fact, related to different behaviors. Further support for such a relationship comes from studies such as that by Putallaz (1988), in which aggressive and prosocial behavior by children during a peer entry task predicted peer rejection and peer popularity, respectively, four months later.

Given these findings, which indicate that inappropriate or acting out behavior among children tends to predict less positive social status nominations by peers, it was asserted that among all children who participated in the present study, those deemed to have greater externalizing behavior on CBCL teacher ratings would also tend to have less positive social preference scores from classmates.

Hypothesis 6. The relationship of learning disability status to children's peer acceptance (as indicated by social preference scores), will be at least partially mediated by their social cognitions and behaviors.

Support for this hypothesis comes from the research reviewed thus far in providing evidence for the aforementioned hypotheses and also from one additional investigation. Research discussed thus far has associated the presence of a learning disability with lower peer acceptance (e.g., Ochoa & Olivarez, 1995; Ray, 1985; Swanson & Malone, 1992), social-cognitive deficits (e.g., Dickstein & Warren, 1980; Sisterhern & Gerber, 1989; Tur-Kapsa & Bryan, 1994), and externalizing behavior problems (e.g., McConaughey & Mattison, 1994; Speece, McKinney, & Appelbaum,1985) and has also linked social-cognitive ability (e.g., Cassidy et al., 2003; Yoon et al., 2000) and externalizing behavior problems (e.g., Dodge, 1983; Putallaz, 1988) to the peer acceptance of children in general. Additionally, at least one investigation, by Dekovic and Gerris (1994) has found support for a mediational model among these variables for children in general; social-cognitive ability predicted one's social status and this relationship was at least partially mediated by these children's behavior.

The above research findings related the variables of the hypothesized model to one another in children with learning disabilities and/or among children in general, but did so in separate investigations. Although the investigation by Dekovic and Gerris (1994), studied these variables together and found support for their role in a model among one group of children, these were children in general, and children with learning disabilities were not also compared to them. Thus, although there is converging evidence from many different lines of research which implicates the hypothesized model, this cannot be assumed without specifically investigating the role that social-cognitive difficulties and behavior problems play in mediating the peer acceptance differences of children with and without learning disabilities (Barron & Kenny, 1986). It is possible, for example, that the effects of only one of these hypothesized mediators, such as behavior alone or social cognition alone, very strongly contributes to peer acceptance differences between children with and without learning disabilities so that the other does not add much weight to these differences. For instance, although, Crick and Dodge's (1994) model has been supported and asserts that cognitions lead to behaviors which, in turn, lead to social judgments by others, it is possible that, because behavior is most salient to the observer, knowledge regarding this variable may be enough to predict the peer acceptance differences of children with and without learning disabilities.

CHAPTER FOUR

Method

Study Overview

The data for the present study were drawn from a previously conducted study, the School Friendship Project. This project, led by Drs. Ruth Pearl and Thomas Farmer, was a longitudinal investigation of children's social and behavioral functioning.

The School Friendship Project involved the collection of sociometric and behavior rating data from 1,212 students in 57 classrooms. These classrooms were from seven elementary schools, located in two school districts, in the Chicago, Illinois, area. Although the School Friendship Project had a longitudinal component, only data from the second wave of data collection were used in the present study. Information from the second rather than the first cohort of each wave was used because the Child Behavior Checklist (CBCL-Teacher report form), which assessed one of the primary constructs in the present study, was not introduced into the data collection procedures of the School Friendship Project until the second wave of data collection. The first cohort completed the second wave of data collection in Fall of 1998. The second cohort completed the second wave of data collection in Fall of 1999. Data from both cohorts were used in the present study.

Participants

Although 1,212 children were included in the School Friendship Project, not all participants' data were included in the present study. Four hundred nine students were excluded because there was no indication of their special education status in the data files. An additional 80 students, 60 from cohort one and 20 from cohort two, were excluded because, although they were receiving special education services, they had a classification other than a learning disability. Lastly, 37 children were excluded because they did not have parental consent to participate. All remaining children, 55 classified with learning disabilities, and 631 with no special education classification, were included in the present study. Demographic information pertaining to these 686 children is presented in Table 1 below.

Table 1
Demographic Characteristics

	LD		NLD		All	
Characteristic	*N*	%	*N*	%	*N*	%
Gender						
Female	21	38.2	354	56.1	311	45.3
Male	34	61.8	277	43.9	375	54.7
Grade						
3	0	0.0	2	.3	2	.3
4	49	89.1	624	98.9	673	98.1
5	6	10.9	5	.8	11	1.6
Ethnicity						
African American	7	12.7	31	4.9	38	5.5
White	34	61.8	420	66.6	454	66.2
Hispanic	12	21.8	115	18.2	127	18.5
Asian	1	1.8	37	5.9	38	5.5
Other	1	1.8	26	4.1	27	3.9
Missing	0	0.0	2	.3	2	.3
Total	55		631		686	

Note. NLD= children not identified with a learning disability; LD= children identified with a learning disability.

Measures

Social-cognitive accuracy. The measure of social-cognitive accuracy used in the present study is derived from information gained through Social Cognitive Mapping (SCM).

SCM is a technique for investigating children's peer networks within the classroom. Each child is simply asked "Are there some kids in your classroom who hang around together a lot? Who are they?" The names of students and peer groups listed by each child are then aggregated by a computer program, SCM 4.0 (Center for Developmental Science, 1998), which calculates the correlations among reports of peer pairings by children's classmates. Students whose profiles are significantly correlated with 50% of the other identified members in a group are considered to be in that group.

In the present study, consistent with Leung's (1996) earlier SCM research, students' responses were transformed into a proportion of correct responses using d prime, a measure derived from signal detection theory. In signal detection theory, which is typically used in experimental psychology to determine an individual's accuracy in perceiving sensations, there are four possible outcomes of exposure to a sensation or signal (such as a flash of light). Judgment outcomes include making a hit (saying a signal or sensation is present when it was), a false alarm, (saying a signal is present when it was not), a correct rejection (saying a signal is not present when it was not) or a miss (saying a signal is not present when it was) (McNichol, 1972). D prime is a measure that reflects how accurate respondents are in detecting a signal when it is present and how accurate they are in not responding when there is no signal. Leung (1996) applied a distribution free measure of d prime to the SCM responses to characterize how accurate members were identifying members of their own peer group. The advantage of this technique is that it takes into account response bias. It may be, for instance, that a child correctly identifies many peer group members (hits), but also incorrectly identifies many peers whom the rest of the class does not indicate as members of that group (false alarms). Even though the student would not be accurately discriminating groups of students in his or her class, the student's hit score would be 100%. However, he or she would have many false alarms. If only hits were counted, the student would appear very accurate. D prime corrects for this bias.

To calculate d prime, two proportions or indices are calculated which are analogous to determining the number of "hits" and "false alarms" that are made. The first, called OVERLAPscm (calculated by NUMboth/NUMscm) is the proportion of children who an individual child names to his or her peer group who are also reported to be in that group by the class. This measure indicates the degree to which the child is accurate in naming the same children to his or her peer group as the rest of the class (hits). A child's over-inclusiveness (false alarms) is not reflected in this first index. As a result, the second index, OVERLAPself (calculated by NUMboth/NUMself) determines the degree to which a child falsely names children who have not been identified to be in that group by the rest of the class. These two proportions are averaged into a single accuracy score.

Leung (1996) only examined social-cognitive accuracy with respect to a child's naming of his/her own peer group. In the present study, however, whether children's ability to encode social information, in general, explained differences in the peer acceptance of children with and without learning disabilities was of interest. As a result, a more comprehensive look at children's accuracy in perceiving all peer groups within their classroom was used in the present study; the OVERLAPscm and OVERLAPself proportions were calculated for each peer group a child identified to exist within their classroom. In other words, if a child named four peer groups to exist within their class, OVERALPscm and

OVERLAPself proportions were calculated by comparing each of the four peer groups to the SCM group the child was attempting to name. These OVERLAPscm and OVERLAPself proportions obtained for each peer group a child identified were then summed separately. The resulting two OVERLAPscm and OVERLAPself proportions were then averaged to obtain a social-cognitive accuracy score for each child in identifying the peer groups in his/her classroom.

Data supporting the reliability and validity of the SCM technique, upon which the social-cognitive accuracy measure is based, are strong. Cairns, Leung, Buchanan, and Cairns (1995) found high, stable, test-retest reliability coefficients (e.g., .74-.84) for both peer and peer group classifications based on two SCM administrations over three weeks. The validity of social information provided by SCM procedures has been documented through its relationship to observational and survey data. Students are more likely to interact with those who have been identified as members of their group (Farmer, Stuart, Lorch, & Fields, 1993); there is substantial overlap between self-reported friendships and SCM assignment of children to peer groups (Cairns et al., 1995); and there is a strong consensus among students in their naming of peer groups (e.g., Leung, 1996).

There is less information about the reliability and validity of the accuracy measure derived from SCM procedures. Given that the SCM procedure has good test-retest reliability (e.g., Cairns, Leung, Buchanan, & Cairns, 1995), SCM accuracy scores are likely to also be stable. Validity for the social-cognitive accuracy measure is not well documented, but a recent study by Andreassi (2004) does provide some support for the validity of this measure. In this study, social-cognitive accuracy predicted children's social status; as one's accuracy in identifying the peer groups to which one belonged increased, one's social network centrality also increased. These findings are consistent with Crick and Dodge's (1994) social information-processing model, which predicts that one's ability to engage in different social-cognitive processing steps is related to one's judgment by peers and with research that has demonstrated links between social cognition and social status (e.g., Cassidy et al., 2003; Harrist et al., 1997).

Behavior. A slightly modified version of the Child Behavior Checklist (CBCL) Teacher's Report Form (TRF; Achenbach, 1991) was used to assess children's problem behaviors in the present study. The TRF is designed to obtain teacher's reports of children's behavioral/emotional problems, as well as academic performance and adaptive functioning. Examples of items include "Acts too young for his/her age," "Hums or makes other odd noises in class," and "Fails to finish things he/she starts." The TRF has 118 such items that have eight syndrome subscales, and three broadband or composite scores.

For this project, one CBCL item was reworded as two separate items and the academic and adaptive functioning items were put on a 3-point Likert scale similar to the items of the CBCL that index behavioral and emotional issues. Neither of these changes affected the scoring of the CBCL. However, the Likert scale of the CBCL was modified in the present study; in the present study, teachers were told to respond to items on a scale ranging from 0 to 2 whereas response options on the actual CBCL range from 1 to 3. To remain consistent with the CBCL scoring, however, when teacher responses were tallied in the present study, the numbers were converted to the 1 to 3 Likert responses of the actual CBCL.

Only the broadband Externalizing scale, comprised of behavior items representing hyperactive, aggressive, and delinquent behaviors was used in the present study. Each child's Externalizing raw score was converted to a T score, based on single sex norms, to yield a standardized Externalizing score. The CBCL Externalizing scale has been shown to have good test-retest reliability (r = .77) after two months' time and inter-rater reliability between teachers has been fairly good (r =.66) for the Externalizing scale (Achenbach, 1991). The validity of the Externalizing composite score, as evident by its concurrent validity, for instance, is also adequate. In particular, the Externalizing scale has been found to be correlated highly with similar subscales on the Conners' Revised Teacher Rating Scale, a well-established measure. The Externalizing scale is highly correlated (r =.83) with the Conduct Problem scale of the Conners' and moderately correlated (r =.63) with the Hyperactivity scale on the Conners' (Achenbach, 1991).

Sociometrics. Sociometric procedures are widely used to determine the peer acceptance of students. There are, however, a variety of ways in which to use sociometric procedures to derive measures of peer acceptance. In the School Friendship Project, students were asked to list "the 3 students in your class that you like most," and "the 3 students in your class that you like least." In the present study, social preference scores (Coie, Dodge, & Copotelli, 1982) for each child based on the number of nominations each child received for being "liked most" and "liked least" were computed. First, the number of nominations for being liked and the number of nominations for being disliked that each child received were summed. These nominations were then standardized by individual classroom, based on the mean number of liked and mean number of disliked nominations, as well as the standard deviations for these means. A social preference score was then obtained by subtracting the standardized nominations a child received for being disliked from the standardized nominations that child also received for being liked. These social preference scores were then again standardized within class and were used as an indicator of each child's overall acceptance within the class.

Test-retest reliability estimates of sociometric ratings have ranged from .42 -.84 (Coie et al., 1982; Gresham & Stuart, 1992; Newcomb & Bukowski, 1984; Ray, 1985). Validity data are hard to assess with these measures. Discriminant validity appears to be high, however, among the sociometric categories. Cairns (1983) pointed out that "when… studies are considered collectively, one of the most impressive outcomes is the level of agreement on how children of differing sociometric status differed in terms of their social behavior" (p. 433).

Procedure

The researchers in the primary study first contacted school district officials in the Chicago area. After two school districts agreed to participate, schools in those districts were contacted. When a school agreed to participate, the study was explained to third grade teachers (including those with mixed-grade classrooms) and if they agreed to participate, information about the study as well as parental consent forms were sent home with their students.

Once parental consent forms were returned from a class, two researchers with the School Friendship Project visited the classroom. At this point in time, teachers were given a consent form to sign, stating their willingness to respond to surveys for the study. In addition, they were told that they would be given a small monetary compensation for participating. Teachers were told that they could complete these forms while students completed questionnaires and that all forms would be picked up at the end of the session. The researchers then introduced themselves to the class and told students that they were "doing a study about how schools can help children in a class get along with each other." In addition, the researchers informed students that if their parents had said it was okay for them to participate, that they would now give them surveys and a form telling them a little more about the study in order to make sure they wanted to participate. At this point in time, children who did not have parental consent were given activity packets to keep them occupied during the study. For those who had parental consent, child surveys along with child consent forms were distributed.

The child assent form was then reviewed with students to make sure that they wanted to participate and to inform them that they could discontinue participating at anytime and/or refuse to answer any items they did not want to. Once child assent forms were signed and collected, children with survey packets were given general instructions for filling out the forms while those with activity packets were told they could work on the packets as they chose. Children with survey packets were reminded not to talk during the survey and to raise their hand if they had a question about anything in the survey. When the children were ready to begin, they were verbally led through the instructions for each questionnaire and given time to complete each one. After the surveys and activity packets were collected, the children were debriefed. They were reminded of the purpose of the study and were asked to keep their answers to themselves. Children were also allowed to ask any further questions at this point.

This procedure was followed for each classroom in cohort one, that began participating in the Fall of 1998, and for each classroom in cohort two, that began participating in the Fall of 1999. Data were collected in this manner for these same cohorts each Fall and Spring, beginning in the Spring of 1998 and ending in the Fall of 2001.

CHAPTER FIVE

Results

This chapter describes the data analysis procedures and results for the research hypotheses presented in Chapter 3. The chapter begins with an overview of the data analysis procedures followed by the results for each hypothesis.

Data Analysis Procedures

Data analysis was conducted in two stages. First, descriptive statistics such as means, standard deviations, and effect sizes were computed to obtain overall information about the sample with respect to the three main variables of interest: externalizing behavior, accuracy, and social preference. In addition, correlations among the variables being investigated in the present study, as well as relationships between these variables and demographic characteristics (e.g., the relationship between accuracy and ethnicity) were determined. Second, inferential statistics were employed to test the hypotheses outlined in Chapter 3 in order to examine whether externalizing behavior and social-cognitive accuracy each mediate the relationship between learning disability classification and social preference. Baron and Kenny's (1986) guidelines for determining whether a variable functions as a mediator were followed to test these hypothesized mediation relationships. More specifically, Baron and Kenny (1986) posited that: (a) changes in the independent variable must significantly account for variations in the hypothesized mediator; (b) variations in the mediator must significantly account for changes in the dependent variable; and (c) when the first two paths are controlled for, a previously significant relationship between the independent and dependent variable should no longer exist. Baron and Kenny (1986) recommended regression analyses for determining the significance and strength of these predictive relationships and the Sobel test to determine whether any reduction in the variance accounted for by the independent variable from step (a) to (c) is significant. All analyses conducted to test the hypotheses of the present study used a criterion of .05 to reject the null hypothesis.

Descriptive and Preliminary Analyses

Missing data. Thirty-one children completed all study measures, but did not list any peer groups on the SCM measure. Should children fail to provide peer groups, the SCM measure does not require them to indicate why. It is possible that the children may have failed to respond because they did not know their classroom peer groups. In this case, the appropriate score for these children would be a zero. Alternatively, children may not have responded because they did not want to name classroom friendships or were tired. Because it was not known which factor led the children to omit the identification of their classroom peer groups, social-cognitive accuracy data for all 31 children (5 LD and 26 NLD) were left as empty cells, and, thus, were missing data points in the study analyses.

Means and standard deviations. The means and standard deviations of the three main study variables, externalizing behavior, social-cognitive accuracy, and social preference, were computed for children with and without learning disabilities and for all children (See Table 2). Of note in this table is the fact that the standard deviations of Externalizing behavior for both children with and without learning disabilities is roughly half that of the normative sample for the CBCL measure and the fact that the mean social preference for nonLD students was positive while for students with LD it was negative.

Table 2

Means, Standard Deviations, and Effect Sizes of Accuracy, Externalizing Behavior, and Social Preference for Students with and without Disabilities.

	NLD		LD		Total		
Variable	*M*	*SD*	*M*	*SD*	*M*	*SD*	*ES*
Externalizing Behavior	53.72	4.61	56.20	5.94	53.90	4.75	-.52
Social-Cognitive Accuracy	.78	.12	.77	.13	.78	.12	.083
Social Preference	.14	1.02	-.36	1.11	.10	1.03	.50

Note. NLD= children not identified with a learning disability; LD= children identified with a learning disability.

Correlations. Table 3 presents the correlations between study variables and gender as well as the intercorrelations among study variables. Preliminary analyses involving demographic variables (both gender and ethnicity) were conducted to determine whether these variables were related to study variables and should, therefore, be controlled in testing relationships among the variables of interest. A significance criterion of .10 was used to decide whether a demographic variable was sufficiently confounded with a study variable that it needed to be added as a control variable in any regression analyses.

Gender was significantly correlated with all of the variables of interest in the present study. Although these correlations tended to be small (e.g., $r \leq .145$), their significance, nevertheless, suggested that gender should be included as a covariate to guard against gender effects being mistakenly interpreted as effects of the variables of interest.

ANOVA and Chi-square analyses were used to examine the relationships between ethnicity and the variables of interest in the present study. Three one-way ANOVAs were run in which ethnicity was the independent variable and the study variables of externalizing behavior, social-cognitive accuracy, or social preference served as the dependent variables. Ethnicity was related to externalizing behavior, $F(4, 673) = 6.88$, $p<.01$, such that having an African American heritage was related to higher rates of externalizing behavior relative to other ethnic groups. This finding suggested that ethnicity should also be included as a control variable in the analyses. A Chi-square analysis testing for differences in the proportion of various ethnicities by the LD and NLD classifications was not significant.

Table 3

Intercorrelations Among Learning Disability Status, Behavior, Social Preference, and Gender.

Variable	1	2	3	4	5
1.Learning Disability Status	____	.135**	-.020	-.131**	-.098*
2.Externalizing Behavior		____	-.019	-.333**	-.102**
3.Accuracy			____	.065	.135**
4.Social Preference				____	.145**
5.Gender					____

Note. *N*= 686. Learning Disability Status was coded whereby 0= children without a learning disability and 1= children with a learning disability. **p*<.05, two tailed; ***p*<.01, two tailed.

Examining Table 3 indicates that, as would be expected, correlations among most of the hypothesized predictors within the hypothesized mediation model were significant. Only the correlation between learning disability status and social-cognitive accuracy, *r* (684) =-.020, *p* =.606, and the correlation between the two hypothesized mediators, externalizing behavior and social-cognitive accuracy, *r* (653) = -.019, *p* =.637, were not significant. Typically, when examining the predictive nature of relationships, correlations among multiple predictors should be low (low multicollinearity) so that contributions to variance in the dependent variable are likely distinct to each variable. According to Kenny (2006), however, it is inevitable that there will be multicollinearity among variables in a mediation model because, in such a model, both the independent variable and mediator must contribute to variance in the dependent variable.

Hypotheses

The results of analyses pertaining to each hypothesis of the present study are now provided. As mentioned above, gender was correlated with all study variables whereas significant differences in outcomes according to ethnicity only occurred for externalizing behavior. As a result of these findings, both variables, gender and ethnicity, were included as covariates in all of the study analyses. Thus, all results reported below are the values obtained when the effects of one's gender and ethnicity were controlled (i.e., entered first in the regression analysis).

Hypothesis 1. Hypothesis 1 stated that children's disability status (LD vs. nonLD) would predict their peer acceptance, such that classification as LD would be negatively related to children's social preference scores. This relationship, which must be supported to begin testing for mediators, was investigated using simple regression; social preference scores were regressed on learning disability status. As hypothesized, learning disability status significantly predicted and was negatively related to social preference scores, *B*(680)= -.117, *p*=.002. The amount of variance in social preference accounted for by learning disability status was small 1.4% (R^2 = .014).

It is interesting to note, however, the effects that gender and ethnicity have on this relationship by examining what the relationship between learning disability status and social preference would have been if these variables had not been included as covariates. In particular, the relationship between learning disability status and social preference would have been stronger without the control variables, *B*(683) = -.131, *p*=.001. The difference in these results was mostly due to the effects of gender, which significantly predicted social preference, *B*(681) = .137, *p*<.001, such that being a female was associated with having a higher social preference score. Thus, it could be that much of the apparent differences between the nonLD and LD group in social preference may be associated with the higher proportion of boys that were in the LD group compared to the nonLD group (see Table 1).

Hypothesis 2. Hypothesis 2 predicted that children's disability status (LD vs. nonLD) would be negatively related to social-cognitive accuracy, such that classification as LD would be inversely related to children's accuracy in reporting classroom peer groups. When simple regression was used to regress accuracy on children's learning disability status, disability status did not significantly predict children's social-cognitive accuracy, *B*(654) = -.020, *p*=.606. Thus, Hypothesis 2 was not supported.

Hypothesis 3. Hypothesis 3 posited that children's disability status would predict their externalizing behavior, such that classification as LD would be positively related to teacher ratings of externalizing behavior on the CBCL. The results of a multiple regression analysis supported Hypothesis 3, given that the presence of a learning disability was related to more pronounced levels of externalizing behavior, $B(676) = .126$, $p = .001$.

Hypothesis 4. Hypothesis 4 predicted that across the entire study sample (LD and nonLD combined), children's social-cognitive accuracy would be related to peer acceptance, such that greater accuracy in reporting members of one's peer group would be associated with higher social preference scores. Kenny (2006) stated that because mediator and outcome variables can both be influenced by the effects of the independent variable, the independent variable should always serve as a covariate when examining the effects of a mediator on the dependent variable. Examination of Hypothesis 4, therefore, involved running a multiple regression analysis in which learning disability status (in addition to gender and ethnicity) and social-cognitive accuracy were entered into the model to predict the dependent variable, social preference. Support was not found for Hypothesis 4, given that social-cognitive accuracy did not predict social acceptance by classmates beyond chance levels, $B(651) = .044$, $p = .262$. As is evident from these results the beta coefficient was positive indicating that, had the relationship been significant, the results would have been in the predicted direction. It is also interesting to note that if disability status, gender, and ethnicity had not been controlled, the relationship between social-cognitive accuracy and social preference would have appeared significant, $B(652) = .065$, $p = .01$.

Hypothesis 5. Hypothesis 5 predicted that across the entire sample, children's externalizing behaviors would also be related to peer acceptance, such that more frequent reports of externalizing behavior by teachers would be related to lower social preference scores from peers. As with Hypothesis 4, in order to estimate the effects of externalizing behavior on social preference without influence from the independent variable, multiple regression, was used. Learning disability status and externalizing behavior were entered together as predictors. When learning disability status was controlled, externalizing behavior significantly and negatively predicted children's social acceptance by peers, B (676)= -.311, p<.001. Thus, Hypothesis 5 was supported.

Table 4.

Summary of Regression Analyses Predicting Externalizing Behaviors and Social Preference Controlling for Gender and Ethnicity

Dependent variable	Step	Predictors	B	R^2
Externalizing Behavior	1.	Controls		
		Gender	-.103**	.009
		Ethnicity	-.026	.000
	2.	Predictor		
		Education Classification	.126**	.014
Social Preference	1.	Controls		
		Gender	.148**	.012
		Ethnicity	-.053	.003
	2.	Predictors		
		Education Classification	-.117**	.013
	3.	Predictors		
		Externalizing Behavior	-.311***	.109
		Education Classification	-.083**	.005

Note: * p < .05, ** p < .01, *** p < .001

Hypothesis 6. Hypothesis 6 predicted that the relationship of learning disability status to children's peer acceptance (as indicated by social preference scores), would be at least partially mediated by their social cognitions and externalizing behaviors. This last step in Baron and Kenny's (1986) model for testing a mediator is only examined if several preconditions, already examined in the present study with Hypotheses 1 through 5, are supported. These preconditions are that the independent variable, mediator, and dependent variable, must all be related to one another. Given that the relationship between the independent variable, learning disability status, and one of the hypothesized mediators, social-cognitive accuracy, failed to reach significance (Hypothesis 2) there was no need to complete the final step of Barron and Kenny's (1986) model for this particular mediator.

However, all preconditions were met in the case of the second hypothesized mediator, externalizing behavior (i.e., Hypotheses 1, 3, and 5, were supported). Therefore, the final step in Barron and Kenny's (1986) model for testing a mediator was implemented. This final step involved comparing the amount of variance in social preference accounted for by learning disability status when the hypothesized mediator was and was not included in the regression analysis. Without including the hypothesized mediator (externalizing behavior), learning disability status accounted for 1.3% of the variance in social preference scores. When externalizing behavior was included in the regression analysis as a predictor, however, learning disability status only accounted for .5% of the variance in social preferences scores. Thus, including externalizing behavior reduced the amount of variance in social preference scores that was "explained" by learning disability status by a little over 50%. However, the amount of variance in social preference associated with both the independent variable and mediator was rather small (11.4%).

In order to determine whether the original relationship between learning disability status and social preference is significantly reduced when the mediator is included in the regression analysis, the Sobel test must be used. The Sobel test standardizes the reduction in the relationship that occurs between the independent and dependent variables when the mediator is included. With the Sobel test, one obtains a t-statistic by dividing the product of two unstandardized beta coefficients (one describes the relationship between the independent variable and mediator and the other describes the relationship between the mediator and dependent variable) by the square root of the variance. An interactive Sobel test created by Preacher and Leonardelli (2006) was used in which the values mentioned above were entered and the standardized t-statistic was found. For the present study, the results of the Sobel test indicated that externalizing behavior was a significant mediator, $t\ (679) = -3.06$, $p=.002$, in the relationship between learning disability status and social preference scores.

Post-hoc Analyses

After testing the hypotheses of the present study, a small number of additional analyses were conducted to better understand the findings. First, to gain a better understanding of the extent to which students with learning disabilities are likely to be rejected by peers, the number of students in the LD group who were one or more standard deviations below the classroom peer acceptance mean was compared with the number of nonLD students who had a similar standing in their classroom. For nonLD students, about 13% of students fell one or more standard deviations below the mean, a figure close to what would be expected with a normally distributed variable. This figure was about twice as high for students with LD (25%). Thus, although many more students with learning disabilities presented with social acceptance difficulties than students without learning disabilities, a large proportion of students with learning disabilities still scored within normal limits. The implications of the fact that there may be large numbers of students with learning disabilities who are well accepted by peers will be elaborated upon in the discussion chapter.

Second, the relationship between social-cognitive accuracy and social preference was also further explored. Because differences in the social-cognitive accuracy of children with and without learning disabilities did not lead to differences in their social preference scores, it was of interest to determine whether this might have occurred because social-cognitive accuracy only predicted social preference among the children with learning disabilities. Such a relationship between the social-cognitive accuracy and social preference of students with learning disabilities was not found however, $r = -.047$, $p=.75$.

Third, the impact of treating blank SCM protocols as missing data rather than as indicating a lack of knowledge regarding the classroom peer groups was explored. As mentioned in the preliminary analyses section, 31 of the 686 students who participated in the present study provided no listing of classroom peer groups on the SCM protocol. If these students did not answer because they did not know the classroom peer groups, then treating their blank protocols as missing data could have distorted the study results by eliminating the lowest scoring respondents. If non-responders were disproportionately represented in the LD group, this choice for how to treat the blank protocols might explain the failure to find the predicted relationship between LD status and social-cognitive accuracy. To assess this possibility, the regression analyses in which social preference scores were regressed on social-cognitive accuracy and social-cognitive accuracy scores were regressed on learning disability status were rerun with zeroes entered for all missing social-cognitive accuracy data. These relationships were still not found to be significant. However, by assuming zeros for the missing data, the relationship between social-cognitive accuracy and social preference approached significance, B (3, 679)= .071, p= .06.

CHAPTER SIX

Discussion

Children with learning disabilities are at high risk for social difficulties, particularly poor peer relationships. Studies using sociometric procedures, for example, have repeatedly found that children with learning disabilities are more likely to be rejected and less likely to be accepted by their peers than children without learning disabilities (e.g., Ochoa & Olivarez, 1995; Swanson & Malone, 1992). Given that rejection by peers places a child at risk for long term negative consequences (Parker & Asher, 1987), understanding the reasons for these children's peer difficulties is of considerable interest to researchers and practitioners.

In addition to peer acceptance difficulties, research into the social cognitions of children with learning disabilities indicates that they tend to have impairments in their ability to interpret nonverbal and verbal social information compared to children without learning disabilities (Tur-Kaspa & Bryan, 1994; Weiss, 1984). Children with learning disabilities also appear to exhibit higher rates of externalizing behaviors (Bruck & Herbert, 1982; Gresham & Reschly, 1986). Across a number of different populations other than children with learning disabilities, functioning in these two domains has been found to be related to peer acceptance (Crick & Dodge, 1994; Dodge, 1983; Harrist et al., 1997; Yoon et al., 2000).

It seemed reasonable, based on these converging research findings, to hypothesize that impaired social-cognitive ability and the presence of externalizing behaviors among children with learning disabilities might help explain their documented difficulties with peer relations. Past research, however, has focused mostly on examining differences in variables, such as social-cognitive ability or peer acceptance and rejection, that occur between children with and without learning disabilities (Meadan & Halle, 2004). Very little research has been conducted that attempts to demonstrate links among several domains of social functioning such as externalizing behavior, social-cognitive ability, and social acceptance in children with learning disabilities. The primary objective of the present study, therefore, was to test a model where social-cognitive ability and externalizing behavior mediated the relationship between LD status and peer acceptance. This model was tested in a correlational design using data from a large scale study of children's social relationships. Results indicated that externalizing behavior partially mediated the relationship between LD status and peer acceptance. The study failed to find a mediating role for social-cognitive functioning.

This chapter contains a discussion of the results from the present study. It begins by placing the results relative to the six research hypotheses in the context of existing research and discussing possible reasons why some of the hypotheses were not supported. The discussion of individual hypotheses is followed by a general discussion that focuses upon mediation test results. The third and fourth sections delineate the limitations of the present study and directions for future research. The chapter concludes with a brief discussion of implications for practice.

Hypotheses

Hypothesis 1. Hypothesis 1 predicted that children with learning disabilities would have lower peer acceptance, as measured through social preference scores, than children without learning disabilities. This hypothesis was based on past research that documents that children with learning disabilities are more likely to be rejected and less likely to be accepted by their peers than those without learning disabilities through the use of various sociometric methodologies in both single investigations (e.g., Gresham & Reschly, 1986; Ray, 1985) as well as meta-analyses of these studies (e.g., Ochoa & Olivarez, 1995; Swanson & Malone, 1992). The findings of the present study were, thus, consistent with and further support past research given that children with learning disabilities tended to have lower social preference scores than their classmates without learning disabilities. In fact, children with learning disabilities had a negative mean social preference score whereas children without learning disabilities had a positive mean social preference score. In addition, the effect size for this difference in social preference scores was moderate (*ES*=.50) and falls within the range of effect sizes that have been found for these children with respect to social preference in other studies. For instance, when Nowicki (2003) compiled studies of the social preference scores that children with learning disabilities obtained compared to children who were average- to high-average achieving students, an effect size of 1.0 was found. When studies on the social preference differences between children with learning disabilities and low achieving students were compared, a lower effect size of .34 was obtained by Nowicki (2003).

Hypothesis 2. Hypothesis 2 predicted that children with learning disabilities would be less accurate in reporting the peer groups within their classroom than those without a learning disability. Social-cognitive accuracy, defined in the present study by the overlap between children's identification of the peer groups in their classroom and the consensus naming by the class (as determined by the SCM methodology), was not found to predict one's classification as learning disabled.

Failure to find a significant relationship between learning disability status and social-cognitive accuracy in reporting the peer networks within one's classroom appears inconsistent with a large body of research on the social-cognitive skills of students with LD dating back to the 1970s. However, although previous investigations have examined a range of social-cognitive abilities, none have focused on social-cognitive accuracy in particular, as the present study did. Social cognition research has found that children with learning disabilities experience more difficulties interpreting nonverbal social cues, such as facial expressions and body gestures (e.g., Sisterhern & Gerber, 1989; Wiig & Harris, 1974). Two more recent studies, one by Tur-Kaspa and Bryan (1994) and another by Bauminger et al., (2005), compared the social-cognitive abilities of children with and without learning disabilities using vignettes of hypothetical social situations, and asking these children questions tapping into the steps delineated in Crick and Dodge's (1994) social information-processing model. Both investigations found that children with learning disabilities had more difficulty with certain steps of the Crick and Dodge model (e.g., encoding social cues, generating ample solutions, making appropriate response decisions) than children without learning disabilities and, more importantly, difficulties were noted in a step similarly tapped into by the task of the present study (i.e., the ability to encode social information regarding the peer networks within one's classroom).

There are several possible reasons for the failure to find a relationship between LD status and social-cognitive accuracy. One possible reason is that the accuracy measure used was not appropriate. Perhaps the social-cognitive tasks used in previous studies are more valid measures of social-cognitive ability than the social-cognitive accuracy measure used in the present study. It may be that choosing peers within one's classroom is too easy a task, and processing social information from social vignettes or interpreting nonverbal and verbal social information, better index children with learning disabilities' true social-cognitive difficulties. Some evidence that identifying peer networks in one's class may be too easy a task is suggested by the fact that a ceiling effect appears to have occurred in this variable for all children in the present study. Specifically, the mean accuracy scores for both learning and nonlearning disabled children in the present study were high as well as very similar (e.g., 77 and 78 percent of the peer groups identified by children with and without learning disabilities were also the peer groups identified by the class).

However, it might be argued that the present study used a more ecologically valid approach to assessing children's social-cognitive accuracy than methods previously used (e.g., reading and interpreting hypothetical vignettes) given that children were asked to make social interpretations within the real world setting of their classroom. It may be, therefore, that this measure is a more accurate representation of their social-cognitive abilities; perhaps social-cognitive difficulties among children with learning disabilities present as problematic within research investigations (e.g., Jackson et al, 1987; Sisterhern & Gerber, 1989) but are not as much of a problem in real life. Either scenario, that the task is too easy or that social-cognitive accuracy is not a social-cognitive ability that is problematic within certain real world settings, could have led to the failure to find the predicted relationship between disability status and social-cognitive accuracy in the present study.

Both potential threats (that the social-cognitive accuracy task used was too easy or that social-cognitive accuracy is not a good index of one's social-cognitive ability) to Hypothesis 2 are also suggested by the results of the only other previous investigation of social-cognitive accuracy in children with and without learning disabilities (Andreassi, 2004). The findings from this investigation were the same as those of the present study in that no differences between the social-cognitive accuracy scores of children with and without learning disabilities were found. Furthermore, this previous investigation used a similar but less stringent measure of social-cognitive accuracy; accuracy proportions were only calculated to compare the peer group to which each child named him/herself with the group to which the class named him or her. The accuracy measure of the present study would appear to be a more comprehensive and presumably more valid measure than that of the previous study, given that it was based on accuracy proportions comparing all peer groups a child names to exist within the classroom with the consensus naming of peer groups by the class. That a relationship between learning disability status and social-cognitive accuracy was still not found when the present study increased the demands of this accuracy measure could further suggest that the social-cognitive accuracy measure is simply too easy of a task. Alternatively, the fact that the results with respect to social-cognitive accuracy and learning disability status did not change when a more stringent accuracy measure was used, could further support the notion that the construct of social-cognitive accuracy is not a good index of one's social-cognitive abilities.

Another possible explanation for the failure of the present study to find a relationship between learning disability status and social cognition is that social cognition may not be sufficiently impaired for children with learning disabilities when they are examined as one group. Perhaps particular subgroups of children with learning disabilities (e.g., those with a nonverbal learning disability) are more impaired in their processing of social information than children without learning disabilities. Most of the previous research examining differences in social cognition between children with and without learning disabilities has not specified the type of learning disability (e.g., Jackson et al., 1987; Sisterhern & Gerber, 1989) and thus, a preponderance of children with one type of learning disability may have unknowingly been used in studies that found group differences in social-cognitive functioning. For example, if social-cognitive difficulties are only found in certain groups of students with LD, such as those with nonverbal learning disabilities, social-cognitive differences would be found between a sample primarily composed of children with nonverbal learning disabilities and children without learning disabilities; an LD sample consisting of equivalent proportions of children with various learning disabilities or primarily composed of children with learning disabilities that are not associated with impaired social-cognitive ability, however, could result in a failure to find a relationship between learning disability status and social-cognitive accuracy (as was the case in the present study). The idea that there may be subgroups of children with learning disabilities who vary in their social-cognitive abilities, such as those with verbal or nonverbal learning disabilities, has been suggested by Meadan and Halle (2004) and Tur-Kaspa and Bryan (1994).

Furthermore, this notion that subgroups of children with learning disabilities may have unique associated impairments is indirectly supported by the results of the present study with respect to one's peer acceptance (rather than social-cognitive accuracy). As mentioned earlier, approximately 25% of students with learning disabilities fell one or more standard deviations below the classroom peer acceptance mean. Although this was a higher proportion of students than existed among those without learning disabilities (13%), the results still suggest that 75% of students with learning disabilities fell within normal limits of the mean peer acceptance rating for their classroom. This high proportion of students with learning disabilities who fell within normal limits of the mean peer acceptance rating could indicate that there is one particular subgroup of children with learning disabilities that is less well accepted by peers compared to those with other types of learning disabilities. If one subgroup of children with learning disabilities is less well accepted than other children with learning disabilities, then it could also be that this same group or another subgroup of children with learning disabilities may be those who possess social-cognitive difficulties; others with learning disabilities may not possess social-cognitive difficulties and this may explain why the results of the present study did not support differences in the social-cognitive abilities of children with and without learning disabilities.

An additional explanation for the failure to find support for Hypothesis 2 is that some third variable, related to social-cognitive ability, accounted for the differences in social-cognitive ability found in children with and without learning disabilities in previous studies (e.g., Jackson et al., 1987; Maheady & Maitland, 1982; Pearl & Cosden, 1982; Sisterhern & Gerber, 1989), and that the LD and nonLD groups in the present study did not differ on this variable. For example, verbal ability may be related to social cognition given that recent research investigations have shown that children with verbal language difficulties such as those with autism or language disorders tend to have greater difficulties in the social-cognitive realm (Botting, 2007; Lewis, Abbeduto, Murphy, Richmond, Giles, Bruno, & Schroeder, 2006). Although most studies have found that children identified as learning disabled tend to have lower verbal ability than normally achieving peers (Hinshaw, 1992), it is possible that the learning disabled and non-learning disabled samples in the present study were more equally matched on this variable than those in previous studies.

One indicator that some of the difference in social-cognitive functioning observed between students with and without learning disabilities may be attributed to variables other than learning disability status comes from a study by Tur-Kaspa and Bryan (1994). They reported that children with learning disabilities had somewhat impaired social-cognitive skills compared to low-achieving children without disabilities but that these skills were most impaired when compared to average- to high-achieving children without learning disabilities. Thus, the results of this single study tentatively support the notion that varying achievement levels, and perhaps verbal ability, in comparison samples could impact the differences observed between children with and without learning disabilities in terms of social-cognitive ability. In their discussion, Tur-Kaspa and Bryan (1994) suggested the possibility of a relationship between low achievement/ low IQ and impaired social-cognitive ability but additional research in this area would need to be conducted to provide more evidence for the possibility that such a relationship may have influenced the results of the present investigation.

Hypothesis 3. Hypothesis 3 proposed that children's learning disability status would predict their behavior, such that those with a learning disability would exhibit higher rates of externalizing behavior. This relationship was found in the present study and is consistent with past research indicating that externalizing behaviors are more frequent among children with learning disabilities. For instance, children with learning disabilities have been found to require significantly more behavior management techniques from teachers (Dorval et al., 1982), and to engage in significantly more off-task and less on-task behavior (McKinney & Feagans, 1984). In addition, cluster analysis has revealed several behavioral sub-types in the population of children with learning disabilities that are characterized by maladaptive behaviors (e.g., Speece et al., 1985).

The strength of the relationship between LD status and externalizing behavior in the present study is indicated by its effect size (*ES* = -.50). It is notable that this effect size is similar in strength to the relationship in the present study between learning disability status and social preference (*ES*=.52), a relationship that has been given paramount attention over the years due to the current and long term effects that peer rejection has been found to have on psychosocial and life adjustment (e.g., Parker & Asher, 1987). The relationship found between learning disability status and externalizing behavior in the present study and previous studies has important implications for understanding the functioning of these students in a classroom setting, a topic that will be explored further in the implications section.

Hypothesis 4. Hypothesis 4 predicted that social-cognitive ability would be related to social status. In other words, greater accuracy in identifying the classroom peer groups would be associated with greater social acceptance by peers, regardless of whether or not a child had a learning disability. This relationship was not found, and thus, Hypothesis 4 was not supported by the present study.

Support in the literature for Hypothesis 4 was drawn from one investigation into the social cognitions and peer acceptance of children in general, and from research on different subgroups of children whose social-cognitive abilities and peer acceptance tended to vary.

With respect to children in general, preschool children were found to have varying social-cognitive abilities and this was found to predict their sociometric status such that social-cognitive ability was significantly and positively correlated (*r* =.34) with sociometric nominations received (Cassidy et al., 2003). Although aggressive children tend to have a more negative social status (e.g., Dodge, 1983), when these children's social-cognitive abilities were investigated, those who had less accurate social-cognitive abilities were less well liked by peers than those who had more accurate social-cognitive abilities (Yoon et al., 2000). Similarly, Harrist et al. (1997) collected information about the sociometric status of four different subtypes of socially withdrawn children and used hypothetical vignettes to assess their ability to engage in each step of Crick and Dodge's (1994) social information-processing model. Withdrawn subtypes who had social information-processing skills similar to those of nonwithdrawn children tended to obtain fewer negative social status nominations whereas withdrawn subtypes exhibiting more social-cognitive difficulties tended to have more negative social status nominations.

In thinking about this research used to support the assertion that social-cognitive ability is related to social acceptance among all children, one cannot help but notice that a good portion involved particular subgroups of children, such as aggressive children or children who were socially withdrawn. Perhaps, then, it could be postulated that the present study did not find social-cognitive ability among all children to predict social status because these differences may actually only hold true for very specific subgroups of children or extremes within the general population. An additional study by Meadan and Halle (2004) found that social-cognitive difficulties varied among children with learning disabilities.

Although a very small sample was used, children with learning disabilities who had higher social status had better social-cognitive abilities than children with learning disabilities who had lower social status. Thus, Meadan and Halle’s (2004) finding lends further support to the idea that social-cognitive abilities and their effects on social status may vary according to certain characteristics of children or among certain types of children, rather than for all children. Such an association could also explain why the relationship between social-cognitive accuracy and social preference was found when characteristics such as learning disability status and gender were not controlled, but when controlled, the relationship no longer held true. However, if the relationship between social-cognitive accuracy and social preference among only the children with learning disabilities in the present study is examined, a significant relationship is not found, $r = -.047$, $p = .75$. Perhaps the characteristics or variables that have led to a relationship between social-cognitive accuracy and social preference in children with learning disabilities in Meadan and Halle’s (2004) study were not present in the children with learning disabilities who participated in the current study.

Hypothesis 5. Hypothesis 5 suggested that externalizing behavior among all children would predict their social acceptance, as measured by social preference scores. The present study found support for this hypothesis given that higher rates of externalizing behaviors among all children were significantly associated with lower social preference scores. This finding is in accordance with previous research, which has found that different status categories, such as being rejected or neglected are associated with different behaviors, such as inappropriate/ aggressive behavior and refraining from aggression, respectively (Dodge, 1983). Further support for such a relationship comes from studies such as that by Putallaz (1988), in which aggression and prosocial behavior by children during a peer entry task were predictive of peer rejection and peer popularity, respectively, four months later.

However, the amount of variance in social preference scores accounted for in the present study by externalizing behavior (R^2 = .11) was less than that found in previous research. For example, although prosocial (rather than externalizing) behavior was used, when Dekovic and Gerris (1994) examined whether social cognition and social acceptance are mediated by prosocial behavior in first through fifth graders, behavior was significantly related to social acceptance and contributed 23% to 60% (R^2 = .23 to R^2= .60) of the variance in social preference scores, depending upon grade. Perhaps a better investigation with which to compare the results of the present study is one by Petit, Clawson, Dodge, and Bates (1996). These researchers looked at various correlates of peer status (accepted or rejected), such as family variables (e.g., life stress, socioeconomic status) parenting variables (restrictive discipline, maternal interest) and aggressive behavior. Initial analyses indicated that all variables (family, parenting, and aggression) predicted one's status as either accepted or rejected. However, when multiple regression analyses were run in which behavior was controlled, the family and parenting variables no longer predicted peer status. Thus, the association between aggressive behavior and peer status was demonstrated to be a much more salient one. In this study by Petit et al. (1996), aggressive behavior contributed 23% (R^2 = .23) of the variance in one's status as either accepted or rejected.

Perhaps the smaller amount of variance that externalizing behavior contributed to social preference scores in the present study could have resulted from the fact that a broader construct (externalizing behavior) was used than the more narrow construct of aggressive behavior used in the Petit et al. (1996) study. In other words, externalizing behaviors include aggressive, hyperactive, and rule-breaking behaviors. Among these behaviors, it may be that aggressive behavior is the primary contributor to decreases in social preference whereas other externalizing behaviors, such as rule-breaking, may improve the esteem of peer classmates. Such antagonistic relationships among the various externalizing behaviors with social preference could have confounded the ability of the present study to find a stronger relationship between externalizing behavior and social preference.

In sum then, the finding in the present study that externalizing behavior predicts social acceptance among all children is consistent with previous research. However, externalizing behavior in the present study contributed a less sizeable proportion of variance (11%) to social preference compared to a previous investigation (23%) of acting out behavior and social acceptance (e.g., Petit et al., 1996).

Hypothesis 6. In Hypothesis 6, it was suggested that externalizing behavior and social-cognitive accuracy would mediate a relationship between learning disability status and social acceptance by one’s peers. This hypothesis was partially supported given that the conditions for mediation outlined by Baron and Kenny (1986) were met for children’s externalizing behaviors in the present study, but were not supported with respect to children’s accuracy in identifying peer groups within their classroom. Given that supporting the mediating roles of social-cognitive accuracy and externalizing behavior were the major objectives of the present study, the role of externalizing behavior as a mediator and the failure to support social-cognitive accuracy as a mediator between LD status and peer acceptance will be considered in depth in the next section.

General Discussion

The variables of externalizing behavior and social-cognitive accuracy were chosen as potential mediators of peer acceptance in the present study because children with learning disabilities have been found to have lower levels of peer acceptance and to differ from children without learning disabilities in terms of their externalizing behavior (e.g, McKinney & Feagans, 1984) and social-cognitive ability (e.g, Bauminger et al., 2005; Tur-Kaspa & Bryan, 1996). Evidence that social cognition and externalizing behavior functioned as mediators of peer acceptance would link three well-documented findings in the learning disabilities literature.

Support for the mediating role of externalizing behavior in the lowered peer acceptance of children with learning disabilities was found in the present study. However, the data did not support the mediating role of social-cognitive accuracy. These study outcomes are now considered within a broader research context.

Externalizing behavior as a mediator. The present investigation is the first to test and support a model in which the lower peer acceptance of children with learning disabilities arises as a result of elevated rates of externalizing behavior. Support for this relationship is important because it implies that addressing the externalizing behavior problems of a child with a learning disability could ameliorate the academic and/or the social difficulties associated with learning disabilities.

However, given that externalizing behavior did not fully mediate the relationship between learning disability status and peer acceptance in the present investigation, this finding must be interpreted with caution. When a variable does not completely mediate the predictive relationship between two variables, it may be that other variables are also influencing or mediating that relationship. In other words, variables other than externalizing behavior could be influencing or could be a mechanism through which the relationship between having a learning disability and lower peer acceptance within one's classroom comes about.

For instance, the low achievement of students with learning disabilities may falsely signal to classmates that these students are not as intelligent and, consequently, peers may be more likely to reject them. In addition, inattentive behaviors were not included among the behaviors tested in the mediational model of the present study. The CBCL rating scale, which was used to collect behavioral data from teachers, indexed separately internalizing behaviors (such as inattention) and externalizing behaviors (such as hyperactivity). Thus, it could be that behaviors of inattention also mediate the relationship between LD status and peer acceptance. Theoretically, such a mediational relationship would make sense given that Hinshaw (1992), in a review of studies, found that inattentive behaviors are more strongly associated with the presence of a learning disability than are hyperactive behaviors; children who show academic weaknesses at a young age and who are classified with a learning disability later on, also tend to present with symptoms of inattention. Symptoms of inattention could lead to a child's later classification with a learning disability if he or she misses out on learning a large amount of basic academic skills or, such symptoms of inattentiveness could result from children with learning disabilities' difficulties understanding material that is taught. In either case, the presence of inattentive behaviors in the academic arena and/or when interacting with peers could make these students seem less desirable as friends and lower these student's esteem from peers.

Alternatively, externalizing behavior may have only been a partial mediator in the relationship between learning disability status and peer acceptance because other, outside factors, could have resulted in the presence of both the externalizing behaviors and the learning difficulties of these students. As mentioned above, attentional weaknesses, both in terms of inattention and hyperactivity are often associated with the presence of a learning disability. Thus, it could be that impulsivity often associated with attentional weaknesses or expressive language difficulties sometimes associated with attentional problems leads to difficulty inhibiting behaviors and/or engaging in self-talk and, in turn, to the presence of externalizing behaviors. Similarly, as mentioned above, the presence of inattentive and/or hyperactive symptoms early on in life, could make learning difficult and could lead to the seeming presence of a learning disability or, such symptoms could further contribute to the already present learning problems of students.

Social-cognitive accuracy as a mediator. The present study failed to support the individual relationships of social-cognitive accuracy with learning disability status and social preference and, therefore, failed to support social-cognitive accuracy as a mediator in the overall model. A few possibilities exist regarding the failure to support social-cognitive accuracy as a mediator in the relationship between learning disability status and peer acceptance. For instance, this part of the model may not have been supported because social cognition may not actually predict or lead to the lower peer acceptance that children with learning disabilities typically experience. Instead, some of the other potential mediators described above, such as verbal ability, achievement, inattentiveness, and/or hyperactivity/impulsivity may serve as mediators in this relationship. The notion that social cognition may not really mediate the relationship between LD status and peer acceptance, is also a very interesting one to consider from a theoretical standpoint. In Crick and Dodge's (1994) model, engaging in steps to process social information leads to a decision about how to behave and then the enactment of the behavior. Behavioral enactment, in turn, leads to judgments by peers of that child's behavior. If the results of the present study are accurate, and if they are interpreted within the guidelines of Crick and Dodge's (1994) model, the implication is that students with learning disabilities may, in some cases, know the acceptable manner in which to think about social situations, but may not be able to enact or carry out an appropriate behavioral response (e.g., due to hyperactivity/impulsivity).

Alternatively, it may be that the social-cognitive accuracy measure was not a valid index of the social cognition construct. As mentioned previously, the task may have been too easy. This scenario seems plausible given that there appeared to be a ceiling effect for the accuracy scores of children with and without learning disabilities. If it were simply that the social-cognitive accuracy measure was an inappropriate index of social cognition and social cognition did actually mediate then an interrelationship between social cognition and behavior, as is suggested in the steps of Crick and Dodge's (1994) model, could exist. In other words, if support had been found for both social cognition and externalizing behavior as mediators, a relationship whereby greater social-cognitive ability is associated with fewer externalizing behaviors would likely exist among these mediators. Such a relationship would be loosely in line with the association between social cognition and behavior suggested by Crick and Dodge’s (1994) model. Finding that social cognition and externalizing behavior both serve as mediators, would also be more consistent with previous research suggesting that social-cognitive deficits exist among students with LD compared to those without LD (e.g., Sisterhern & Gerber, 1989).

Results of the present investigation support past research indicating the troubled peer acceptance of students with learning disabilities as well as research that documents the behavioral difficulties of these students (e.g., Dorval et al.,1982; Swanson & Malone, 1992). In addition to support for these past findings, the present investigation bridges together previous research that separately investigated the peer acceptance of children with learning disabilities, the externalizing behaviors of children with learning disabilities, and the general association of behavior to acceptance by one’s peers. Continuity among these domains of past research is suggested by the finding from the present investigation that having a learning disability predicts one’s externalizing behaviors and, in turn, one’s acceptance by peers.

Limitations of the Study

When interpreting the results of the present study, there are several limitations that should be considered. These limitations include threats to both internal and external validity.

Research design. The present study was correlational in design given that none of the variables examined in the School Friendship Project were directly treated or manipulated. As a result, a limitation of the present study was that a direct causal linkage among the variables of interest could not be established. Although only correlational in design, the finding of this study that externalizing behavior mediates the relationship between LD status and peer acceptance is an important first step in suggesting causal links among these variables.

Lack of demographic information. Another limitation of the present study was that only demographic data such as age, sex, and ethnicity were collected in the School Friendship Project. Thus, the effects of other variables on the domains of social functioning investigated in the present study are not known. For instance, information regarding socioeconomic status, overall IQ, verbal ability, and academic achievement were not provided. These variables could not be controlled in the present investigation and, therefore, it is not known if some of these variables may have influenced the outcomes obtained. For example, it could be that low achievement scores, in addition to externalizing behaviors, also contribute a sizeable proportion of the variance in children's social preference scores (e.g., children may be less willing to socially accept students who do not achieve good grades within the classroom). Given that low achievement is characteristic of children with learning disabilities, such a finding would suggest that low achievement may also be a mediator in the relationship between LD status and social preference. Similarly, without controlling for socioeconomic status, it is not known if this variable could also mediate the relationship between LD status and social preference.

The social-cognitive accuracy measure. Despite the theoretical and empirical underpinnings of the social-cognitive accuracy measure, previous research using this measure is limited to two known studies. Furthermore, one of the studies (Leung, 1996) did not use the accuracy measure as an index of one's social-cognitive ability but as a measure of children's tendency to use a self-serving bias when reporting their peers. The other study that employed this methodology (Andreassi, 2004) used it to find support for the hypothesis that accuracy mediates the relationship between learning disability status and social network centrality and failed to find such support.

A more comprehensive variant of social-cognitive accuracy measure was used in the present study than the one used in the earlier study by Andreassi (2004). In the present study, accuracy in naming all classroom peer groups was assessed instead of only assessing the accuracy with which the child named members of the same peer group to which the child had named him or herself. Continued lack of support for accuracy as a mediator, therefore, suggests that the social-cognitive accuracy measure might not be an appropriate way to operationally define social cognition. Such an idea is further bolstered by the fact that separate relationships of social-cognitive ability with learning disability status (e.g., Wahler & Dumas, 1986) and social preference (e.g., Cassidy et al., 2003) have previously been found.

The nature of learning disabilities. As mentioned earlier, it is possible that different subgroups of children with learning disabilities could possess varying degrees of social-cognitive ability. These subgroups may be defined by their social-cognitive abilities (Meadan & Halle, 2004) or by the presence of different types of learning disabilities (e.g., by the presence of a nonverbal versus a verbal learning disability). Difficulties in processing information that are associated with a specific learning disability may also be responsible for, or result in, the social-cognitive deficits that these students have. Given that the present study did not have information regarding the type of learning disability children had, this possibility could not be explored further and, thus, is a limitation.

Missing data. Accuracy data were missing for 31 children who participated in this study; five were children with learning disabilities (9% of the 55 students with learning disabilities) and 26 were without disabilities (3.8% of the 631 students with learning disabilities). Although these missing data did not comprise a majority of the data for either the children with or without learning disabilities in this study, the 9% and almost 4% of missing data for each group, respectively, might have lowered the power of the design to detect the hypothesized relationships. In other words, knowing the peer groups whom these children would have identified, or, alternatively, the reason why they omitted the data may have altered the results of this study with respect to social-cognitive accuracy.

Knowledge about the identification of learning disabilities. The determination of disability status in the present study was based on information from the School Friendship Project, which used disability classifications determined by the school. Given that data from the school were used, and that independent verification of these children’s disability status was not conducted via assessments of their cognitive ability and achievement, the results of this study may have looked very different if it had it been conducted in another state. Criteria for a learning disability vary widely from state to state and when the data were collected for this study in 1998 and 1999, the state of Illinois was using an ability-achievement discrepancy model (Reschly & Hosp, 2004) whereas other states such as New York and Connecticut were using a regression equation to identify learning disabilities. Thus, children identified as having a learning disability in the present study may not have been so identified in other states and, conversely, children not identified with a learning disability in the present study may have been identified as such in other states. Independent verification would have enabled the investigators to use pre-determined criteria, thus allowing researchers or school personnel in any state to determine the extent to which results from the present study apply to their population of students with learning disabilities. Furthermore, independent verification would make it easier for other investigators to understand findings from the present research and to replicate these findings, thus making the results more generalizable.

Directions for Future Research

In this section, future research that could be conducted to promote additional advances in understanding and remediating the social difficulties of children with learning disabilities is discussed. Some of these areas for future research were alluded to earlier in this chapter, but are now discussed in more detail.

Future research could examine, in an exploratory manner, whether the population of students with learning disabilities possesses varying social-cognitive abilities and then also investigate any correlates of these varying abilities. For instance, gender differences or varying ethnicity may be related to any differences that may exist in the way children with learning disabilities process social information. Alternatively, such research could focus on investigating whether there are differences in social-cognitive abilities that children with specific types of learning disabilities (e.g., verbal versus nonverbal) possess. Thus, there are several characteristics of children with learning disabilities that could be explored to determine whether and how social-cognitive abilities might vary among these children.

Few investigations have incorporated a component in which the social-cognitive abilities of low achievers have been compared to those of children with learning disabilities (e.g., Tur-Kaspa & Bryan, 1994). A future study could divide children without learning disabilities into high and low achievers and compare their social-cognitive abilities to those of children with learning disabilities. If differences are found between these groups, with low achieving students overall having more similar social-cognitive abilities, it would be interesting to examine whether achievement differences are related to social preference scores and, additionally, whether social-cognitive abilities mediate these differences.

An alternate measure of social-cognitive accuracy could be used in future research. Such research would shed further light on whether the relationships of accuracy with learning disability status and social preference were not found in the present study due to the methodology or because these relationships really do not hold true with respect to social-cognitive accuracy. Methodologies previously employed in research with children who have learning disabilities, such as those that present hypothetical social vignettes followed by questions tapping into each step of Crick and Dodge’s (1994) social information-processing model, could be used. Such a methodology may produce different results for a mediation model in which social-cognitive accuracy would be assessed by one’s ability to encode social cues presented (step 1 of Crick and Dodge’s model). Alternatively, using Crick and Dodge’s model in research might implicate other aspects of social cognition, such as a child’s ability to generate solutions or choose an appropriate response, as mediators in the relationship between learning disability status and social acceptance.

Additionally, the steps of Crick and Dodge’s (1994) model could be taught to children and they could then be asked to use these social information-processing steps to role play social scenarios as a way to tap into these processes in a more ecologically valid manner. Such a methodology might further support the results of the present study in revealing that it is one's behavior, as in the enactment of a behavioral response, and not one's social-cognitive accuracy that mediates the relationship between learning disability status and peer acceptance. Furthermore, future research could also investigate accuracy employing both social-cognitive tasks used in previous research as well as the measure derived from SCM used by the present study, to see if the SCM measure has concurrent validity.

The results of the present investigation suggest that causal relationships may exist among learning disability status, externalizing behavior, and peer acceptance. Such conclusions cannot be drawn, however, given the correlational research design of the present investigation. Future research could, therefore, focus on establishing evidence for causal links among these variables. For instance, information regarding the levels of externalizing behavior and the social acceptance of children with learning disabilities could be collected. Two groups of children, an experimental and a control group, could be matched on these variables. The experimental group could then be administered behavioral interventions to target their behavioral difficulties. Pre-and posttest comparisons of the levels of these children's externalizing behaviors and social acceptance by peers could then be made. A posttest decrease in externalizing behavior and increase in social acceptance by peers among the experimental group as well as no significant changes in these variables among the control group would implicate a causal relationship between externalizing behavior and social acceptance. Furthermore, the control group could also then be administered the same behavioral intervention so that pre-and posttest comparisons could be made a second time. A similar change in scores among this second group of children would further indicate a causal relationship among externalizing behavior and social acceptance.

Implications for Practice

The present study suggests that one mechanism through which peer status is determined for children with learning disabilities is their externalizing behaviors. Assuming this relationship is causal, this finding implies several strategies for ameliorating the social difficulties of children with learning disabilities. First, teachers who have students with learning disabilities in their classrooms can arrange their classrooms and teach in a structured manner so as to minimize behavioral difficulties these students might have (Kern & Clemens, 2007) and promote higher esteem from their peers. Second, given that the effectiveness of social skills training programs have been called into question by researchers due to a lack of maintenance/generalization (e.g., DuPaul & Eckert, 1994; Meloy & Kavale, 1990; as cited in Choi & Kim, 2003), the results of the present study suggest that altering these children's negative behaviors may be a key intervention target for effecting changes in peer status. Social skills training programs typically focus on teaching social-cognitive skills as well as prosocial behaviors that can be used in interacting with others. Instead, the results of the present study indicate that it may be more effective to focus on learning about any behavioral difficulties that a child with learning disabilities might have and to work on replacing those behaviors with more appropriate alternatives in the classroom. These more appropriate alternatives could be promoted and sustained through positive reinforcement until the externalizing behaviors are extinguished. Furthermore, using such a behavioral component would be one way in which to implement an experimental design to bolster the findings of the present study given that the results of this study are really the product of a correlational rather than a causal research methodology. For example, a study could be designed in which children with learning disabilities who tend to exhibit externalizing behaviors and have low peer acceptance are identified. Some of these children could be taught more positive behaviors to replace their externalizing behaviors (experimental group) whereas the rest of the children could participate in a control group. Analyses comparing the externalizing behaviors and peer acceptance of the experimental and control group from pre- to post-test could reveal whether such an intervention would be a useful one.

Results from the present study have implications for school psychologists in their role of promoting the social and emotional functioning of students. The present investigation indicates that a group at risk for social difficulties is children with learning disabilities. Secondary preventive efforts can, thus, be aimed at this group of children in identifying those who are not well accepted by peers. Such identification could be done by interviewing teachers or gathering sociometric data from classrooms. Once children with learning disabilities who are not well accepted by their peers are identified, their externalizing behaviors could be assessed. If results from the current study are further supported, the implication then is that interventions for children with learning disabilities who have low peer acceptance and high rates of externalizing behaviors could be developed by targeting their behavior. For instance, a functional behavior plan could be developed in which the antecedents and consequences of these children are determined in order to identify mechanisms for reinforcing alternative, more appropriate behaviors. In addition, results from the present investigation suggest that when a child is referred for testing to determine whether he or she possesses a learning disability, behavioral checklists that index externalizing behaviors such as the CBCL teacher report form and the Behavior Assessment

System for Children-Second Edition (BASC-2) as well as sociometric measures of peer acceptance could be used to further support the presence of a learning disability. In addition to further bolstering evidence of a learning disability, such information could be used to formulate specific IEP goals that would effectively target improving that child's social and emotional functioning.

In summary, this study was successful in supporting a model in which externalizing behaviors mediate the relationship between whether a child has a learning disability and social acceptance by peers. Children with learning disabilities tend to be less well accepted by their peers and this appears to be partly the result of acting out or externalizing behaviors in which they engage. This relationship is an interesting one that supports the findings of many investigations that have examined these variables separately. Additionally, this finding suggests that externalizing behaviors may be a key area for social skills training programs to target in improving peers' views of these children. With respect to social information-processing, many questions remain regarding the outcomes of the present study because previous research implicates it in the lower social status that children with learning disabilities tend to have. Future research that uses a different methodology to examine social-cognitive ability and that investigates the possible influence of additional features of these children, such as their low achievement or the type of disability they have, are needed to clarify the findings of the present study.

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