

## ABSTRACT

ANDREASSI, CRISTINA LYNNE. Social Cognition as a Mediator in the Relationship Between Disability Status and Social Status. (Under the direction of Ann Schulte)

This study examined the relationship between social-cognitive ability and social status in children with and without learning disabilities. Social cognitive mapping was used to determine children's centrality in the social network in their classroom and accuracy in reporting peer social networks. It was predicted that social cognition, as assessed through the accuracy measure, would mediate differences in social status, as assessed through social network centrality. Although children with learning disabilities had lower social network centrality, they did not differ from children without learning disabilities in terms of accuracy in reporting social networks in the classroom. Therefore, the mediation model was not supported. However, greater accuracy in reporting peer networks was predictive of greater peer involvement across both groups of children. Results are discussed in terms of implications for improving children's social functioning and future research on the topics of the social functioning and social cognition of children with learning disabilities.

SOCIAL COGNITION AS A MEDIATOR IN THE RELATIONSHIP BETWEEN  
DISABILITY STATUS AND SOCIAL STATUS

by

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DEDICATION

To my parents, Gina and John Andreassi, who have instilled in me the notion that there are no limits to what I can accomplish and whose constant love and support made this paper possible. Also, to my brother, John, and sister, Jeanine, who gave me much confidence and guidance during this endeavor.

## BIOGRAPHY

Cristina Lynne Andreassi was born on May 4, 1979 in Yonkers, NY. She is the daughter of Gina and John Andreassi and the sister of John and Jeanine Andreassi. She received her elementary and secondary education in Scarsdale and New Rochelle, NY, graduating from The Ursuline School in 1997.

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## Chapter 1

### Introduction

There is increasing awareness in developmental psychology of the interplay among the cognitive, social, and emotional domains in determining children's current functioning and long-term outcomes (Berk, 2000). How a child thinks and feels is thought to play an important role in determining his or her behavior, which then plays a role in the amount and quality of his or her social interactions (Dodge, Pettit, McClaskey, & Brown, 1986). These social interactions, in turn, contribute to subsequent changes in cognitive, social, and emotional development. In other words, social relationships are believed to make an important contribution to many aspects of a child's development (Craig, 2000).

Three important implications can be drawn from research concerning the interrelatedness among cognitive, social, and emotional domains in development and the notion that social relationships influence these domains. One is that children's social relationships merit attention because they may have far reaching effects. For example, children's relationships with peers have been shown to be related to a wide range of outcomes such as academic achievement (Ladd, 1990; Welsh, Parke, Widaman, & O'Neil, 2001), mental health (Parker & Asher, 1987; Woodward & Ferguson, 1999), and long-term adult functioning (Bagwell, Newcomb, & Bukowski, 1998).

A second implication of these interrelationships is that difficulties in the domain of cognitive development may not only impact academic functioning, but social functioning as well. This association between cognitive development and social functioning is supported by research that indicates that certain cognitive processes occur

differently among children with social difficulties. For example, the same language difficulties that contribute to some children's poor academic functioning appears to also affect their social functioning (Turkapsa & Bryan, 1994). These results suggest that cognition may play a direct role in areas of social functioning such as peer relationships and acceptance.

A final implication of this interrelatedness is that models of children's social functioning should include cognition. Models of children's social functioning that include the cognitive processes thought to underlie children's social behaviors have more explanatory power and, thus, greater implications for intervention than models that do not. For example, the work of Dodge et al. (1986) and Crick and Dodge (1994) has led to the development of a social-cognitive model that describes how children process social cues in their environment and enact social behavior. How well children implement the social information-processing steps described in this model is thought to determine their success in engaging in socially appropriate behaviors and, consequently, how they are perceived by others. Components of the 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).

The growing awareness of the role of cognitive factors in social functioning, and the importance of social functioning in children's long-term outcomes, has resulted in researchers' interest in the social functioning of one group of children, children with learning disabilities. Although specific definitions and criteria for a learning disability

may vary in school systems from one state to the next, the term generally refers to the presence of a specific deficit in using spoken or written language, reading, and/or mathematics while maintaining integrity in general intellectual functioning (Mash & Barkley, 1996). 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) confirmed 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 addition to these social-behavioral problems, children with learning disabilities exhibit social-cognitive difficulties. For example, 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). Given that current social-cognitive models suggest that behavior and cognition are intimately linked (Crick & Dodge, 1994), it seems likely that the social functioning and social-cognitive difficulties of children with learning disabilities are related. Support for such a claim is weak, however, because there has been little research to date explicitly linking the social cognition and social behavioral

functioning of children with learning disabilities. 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 nature of the same children's social relationships (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).

An important goal of the present study, therefore, was to provide more direct evidence of a link between impaired social-cognitive functioning and low acceptance in children with learning disabilities. To do so, the relationship between one aspect of children's social-cognitive functioning, the accuracy of their perceptions, was examined in relation to these same children's level of acceptance. It was predicted that children with learning disabilities, as a group, would show impairment in both areas relative to nondisabled peers, and that across disabled and nondisabled groups, accuracy of social perception would be related to peer acceptance.

To investigate children's peer acceptance and social cognition, the present study used a new methodology called Social Cognitive Mapping (SCM). SCM was a critical piece in conducting this research due to the type of information it provides. SCM not only allows the peer perceptions of children to be indexed, but also provides an assessment of social status by examining the distinctive peer groups that exist within classrooms. In the past, children's social status with peers has been largely examined by an alternate method of indexing children's social acceptance, sociometrics (Farmer &

Farmer, 1996). The more detailed information provided by the SCM methodology makes it a desirable approach to assessing children's peer functioning (Farmer, Van Acker, Pearl, & Rodkin, 1999). An explanation of these advantages of SCM and how it is conducted will be provided in the literature review of the next chapter.

The present investigation employed the SCM methodology to assess children's peer relationships and perceptions in six classrooms of a North Carolina elementary school. All classrooms included both regular and special education students. The social networks and accuracy of social perceptions of children with learning disabilities in these classrooms were contrasted with the social networks and accuracy of social perceptions of the children's nondisabled peers. In addition, the relationship between the accuracy of children's social perceptions and their degree of social acceptance in the classroom was examined. The present study makes a contribution to the research literature concerning the social-cognitive ability and social functioning of children with learning disabilities by explicitly linking their deficits in social information-processing skills to lowered social status and by employing a recently developed methodological innovation (SCM) to do so.

## Chapter 2

## A Review of the Literature

The following chapter reviews literature relevant to the present study's objectives and methodology. First, research related to the role of peer relationships in children's development and adjustment will be briefly summarized. Second, different conceptualizations of, as well as methods of measuring, children's social functioning will be described. This discussion of children's social functioning will then be followed by a review of research on one model that has been used to conceptualize as well as index the social functioning of children, Crick and Dodge's (1994) social information-processing model. Afterwards, literature substantiating the impaired social functioning of children with learning disabilities will be presented, along with a review of research that indirectly supports a link between impaired social functioning and social-cognitive deficits among children with learning disabilities. Lastly, an overview of the Social Cognitive Mapping (SCM) methodology and its important contributions to the proposed study will be discussed.

*Children's Social Functioning with Peers*

Children's social functioning with peers plays a key role in their academic, social, and behavioral development (e.g., Bagwell et al., 1998; Welsh et al., 2001). Mutual socialization appears to account for this relationship. Although friends may start out similar to each other on one or several salient characteristics, through their interactions with one another, they tend to reinforce each other on these features as well as develop new ones (Hartup, 1996). Furthermore, this mutual socialization can occur in terms of both positive and negative aspects of friends' cognitive, social, and behavioral skills.

Research has demonstrated, for example, the positive influence of peer interaction on the socialization of aggressive impulses (Hartup, 1978, as cited in Parker & Asher, 1987) and on cognitive (Azmitia & Montgomery, 1993), social-cognitive (Brendgen, Bowen, Rondeau, & Vitaro, 1999; Dunn, Cutting, & Fischer, 2002), and linguistic development (Zajac & Hartup, 1997). Conversely, antisocial friends appear to reinforce one another on negative behaviors. For example, antisocial dyads are much more likely to engage in deviant talk and use coercion with one another (Dishion, Patterson, & Griesler, 1994).

Given the significant influence that friendship can have on aspects of children's development, it seems plausible, then, that a lack of peer relationships could result in a wide range of negative effects. Limited opportunities for positive peer interaction could lead to fewer opportunities to learn normative and adaptive modes of social conduct and social cognition (Parker & Asher, 1987). Poor social conduct and cognition, in turn, could lead to further difficulties in getting along with others and, thus, to difficulties in overall functioning. To investigate whether poor social conduct and social cognition influence one's ability to function, numerous studies have examined the effects of low peer acceptance (e.g., being rejected or neglected by one's classmates) on children's later adjustment. Indeed, Parker and Asher's (1987) seminal review of studies dating back to the 1950s on peer relationships and later life adjustment indicates that low peer acceptance is related to dropping out of school as well as to juvenile and adult criminality. Studies since this review have also documented a link between children's peer relationship problems and later psychosocial difficulties such as internalizing and externalizing behavior problems (Woodward & Ferguson, 1999). In addition, social and academic difficulties are also associated with peer relationship problems such as low peer

acceptance. For example, in a 12-year follow-up study conducted by Bagwell et al. (1998), greater peer rejection in the fifth grade was found to be associated with lower school performance, vocational competence and aspiration level, and with reduced participation in social activities.

### *Social Competence*

Perhaps because of the considerable 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) will be 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 which also serve as indirect measures of social competence. The four components of social competence they delineated were: (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 involves asking students to identify peers in their class whom they like least and peers in their class whom 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.

Like sociometrics, Social Cognitive Mapping (SCM), which will be described in more detail later in this chapter, also provides a measure of overall peer acceptance. SCM gauges the overall peer acceptance of a child both formally and informally. It serves as an informal indicator of a child's peer acceptance by elucidating whether he or she may be a member of one, several, or no peer groups. Formally, SCM determines a child's overall peer acceptance by assigning each child a social network centrality level that indicates how prominent he or she is within the classroom's social groups. In addition to gauging the overall acceptance of the child by the class, when SCM is conducted the child's reciprocal friendships, another aspect of peer relations, can be assessed.

*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 will be

conceptualized according to a definition proposed by McFall (1982). He suggests 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 third aspect of social competence in Vaughn and Hagar'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 is 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 on 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's (1994) social information-processing model (an extension of the model by Dodge et al., 1986) contends that cognition or knowing is the result of mental events that act upon a sensory input. Crick and Dodge's (1994) model is more focused than most information-processing models, however, because it is interested in 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, according to an information-processing perspective. Crick and Dodge's (1994) model posits that there are six major steps that occur while a child is evaluating social information. In addition, there are three assumptions about information-processing that are presumed to underlie these major steps. One of these assumptions is that information-processing can take place in a parallel or simultaneous fashion; 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 occur simultaneously, the sequence of processing that occurs from a particular stimulus to a behavioral response is believed to follow a linear progression.

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.

The review of research 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). Pertinent to the present research is the fact that a recent, comprehensive study by Turk-kapsa and Bryan (1994) assessed those 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 that are associated with them. As a result, it is this research that will be highlighted as each step of Crick and Dodge's (1994) social information-processing model is described.

*Encoding and interpretation of cues.* These 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 steps are perhaps the most important as well as complex ones of the model to achieve; not only are there many different factors that can influence one's encoding and interpretations, 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). Using schema can be very efficient because it allows individuals to quickly interpret whether social cues are consistent or inconsistent with aspects of the social situation. At the same time, however, relying on schemata 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 schema, 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'd 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'd 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 and 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 schemata to make inferences about social information lead to a related discussion about attributions of intent and attributions of causality. These processes are related because one's schema for an event could affect the nature of his or her attributions. Attributions influence social cue interpretation and, in turn, determine how an individual responds to a situation. Attributions of causality are inferences individuals draw about why certain social events have occurred. For example, Jeanine may make an attribution as to why another child knocked into her at the water fountain. If she believes that the other child knocked into her because she slipped on a small puddle of water then Jeanine might respond by checking to see if the child has been hurt. If Jeanine believes that the other child knocked into her because there were too many other children around, she might ignore the

occurrence all together. 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).

Attributions of intent also involve making inferences but, involve inferences about what a particular person's intent was when they committed an act. For example, if John walks over to a group of children on the playground and they all start to laugh, he could infer that they are doing this on purpose (in other words, with hostile intent) so that he will feel uncomfortable and leave. Alternatively, he might infer that something funny was said right before he walked up to the group. Which inference John makes will determine whether he interacts with the group and if so, it will determine whether or not he decides to aggress toward the group. Similar to the results of research concerning schemata 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 (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 either use as they are, or 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), which 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, which encompass those 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 uniquely and consistently 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 nonaggressive 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 schemata 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 regarding the processes that occur at each subsequent step of the model elucidates 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.

#### *Social Functioning in Children with Learning Disabilities*

Initial interest in the peer relationships of children with learning disabilities seems to have been spurred by a 1974 article by Tanis Bryan titled, "Peer popularity of learning disabled children," given that a large portion of research on the topic was conducted afterwards, during the 1970s and 1980s (Donahue & Wong, 2002), with relatively few studies appearing after 1990. Investigations into the peer relations of children with learning disabilities have repeatedly substantiated, however, that these children have social difficulties (Bryan, & Bryan, 1983; Saloner & Gettinger, 1985). In fact, support for the social difficulties of children with learning disabilities has been so extensive that social skills deficits are now referenced in definitions of learning

disabilities (Kavale & Forness, 1996). Research into the social difficulties of these children has found support for their difficulties along all of the dimensions of social competence outlined earlier. In the next sections, the social difficulties of children with learning disabilities with respect to the dimensions of peer relations, social skills, behavior problems, and social cognition will be reviewed.

*Peer relations.* Difficulty with social functioning among children with learning disabilities is indicated by research into the peer relations of these children with their classmates. Because social acceptance is an overall measure of how well a child is liked or not liked by classmates, the results of sociometric status research are considered by some to be a direct indicator of children with learning disabilities' peer relations and, thus, social difficulties (Farmer, Pearl, & Van Acker, 1996). The results of sociometric status research on children who have learning disabilities consistently indicate that these children are less likely to be accepted than their peers without learning disabilities. For example, 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. Similarly, two meta-analytic reviews, one by Swanson and Malone (1992) and the other by Ochoa and Olivarez (1995) found that children with learning disabilities were less accepted and more socially rejected than their peers without learning disabilities.

It has been suggested by some, however, that it is the stigmatization of having a learning disability and receiving special services, more so than social difficulties, which 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.

*Social skills.* The social problems of children with learning disabilities have also been substantiated with research into their specific social skills deficits. The results of one key review and several smaller studies will be highlighted to provide evidence for the social skills deficits of these children.

The review, conducted by Kavale and Forness (1996), is of significance because it utilized a stringent, quantitative technique called meta-analysis on a large number of studies. Kavale and Forness (1996) aggregated the results of 152 studies that examined the social skills deficits of children with learning disabilities as reported by teachers, peers, or the students themselves. Ratings by teachers revealed that the social skill deficit they perceived to be most common for students with learning disabilities was less frequent social interaction with students without learning disabilities. Across the studies

that used peer assessments, seven out of ten students with learning disabilities were reported to possess lower social status, and to interact, play, and empathize with others at lower levels than students without learning disabilities. Peers also viewed these students with learning disabilities to be less popular, less competent with verbal and nonverbal communication, and less cooperative. Self-assessments revealed that more than 7 out of 10 students with learning disabilities viewed themselves to have social skills deficits that distinguished them from their peers without learning disabilities. In particular, students with learning disabilities specified that they possessed deficits in interpreting nonverbal communication and reported deficiencies in social competence. Taken together, these findings suggest the presence of deficits that interfere with their understanding of social situations as well as their ability to generate appropriate responses to those situations.

Overall, Kavale and Forness (1996) found that when compared to children without learning disabilities, about 75% of students with learning disabilities exhibited social skills deficits, such as the ones described above, that distinguished them from students without learning disabilities. In addition, these results were found regardless of whether the data came from studies in which teachers, peers, or students themselves assessed social skills functioning, and irrespective of the major dimension of social skills being examined.

Further evidence for the social skills deficits of students with learning disabilities comes from a comprehensive, single investigation that was not included in Kavale and Forness' (1996) review. In a study by Gresham and Reschly (1986), teachers, parents, and peers were asked to rate the social skills of students with and without learning disabilities. Both parents and teachers rated children with learning disabilities to be

significantly less capable with respect to interpersonal and self-related behaviors. Behaviors that were rated on these domains included skills such as the ability to accept authority, help others, express feelings, and have a positive self-attitude. In addition, peer ratings indicated that children with learning disabilities were perceived to engage in significantly fewer positive social interactions than children without learning disabilities. Thus, compared to children without LD, children with LD, exhibited significant and consistent deficits across parent, teacher and peer ratings, indicating similar difficulties with social skills at home and at school.

More indirect support for the social skills deficits of children with learning disabilities comes from studies that examine the nature of these children's friendships. When children with learning disabilities do have friends, the quality of these friendships appears to be compromised; it is likely that impairment in friendship quality results from not having the appropriate skills needed for more effective interactions. In particular, children with learning disabilities have been found to report higher levels of conflict, lower levels of validation, and more problems with relationship repair than children without learning disabilities (Weiner & Schneider, 2002). Other studies, such as that of Wenz-Gross and Siperstein (1997), have also found that children with learning disabilities have friendships characterized by less validation as well as less contact, intimacy, and loyalty.

*Behavior problems.* Behavior problems are of interest in investigating social difficulties because behaviors, by nature, affect how individuals interact with one another. Problematic behaviors such as distractibility, noncompliance, and aggressiveness can antagonize other children and make the disciplinary role of parents

and teachers difficult. Research substantiates that problem behaviors that may lead to social difficulties are more common among children with learning disabilities. Beginning as early as 1969, for example, Myklebust, Boshes, Olson, and Cole (as cited in McKinney & Feagans, 1983) reported teacher ratings that revealed 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.

These behavior problems are not only more common among children with learning disabilities than they are among children without learning disabilities, but the likelihood of their occurrence appears to be quite high. Indeed, research suggests that behavior problems are a stable or characteristic feature of the learning disability; in a review of studies published between 1970 and 1977, it was found that when individuals were asked to describe children with learning disabilities, their descriptions were just as likely to include problematic behavioral features (e.g., hyperactivity, irritability, and impulsivity) as they were learning-related symptoms (e.g., school failure and specific learning deficits) (Keogh, Major-Kingsley, Omori-Gordon, & Reid, 1982, as cited in Bryan and Bryan, 1986).

Investigations of these children's interactions with parents and teachers, in particular, have confirmed that a relationship between learning disabilities and behavior problems exists. For example, Dorval, McKinney, and Feagans (1982) found 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 that occurred between these teachers and

students without learning disabilities. In addition, parents of both boys and girls with learning disabilities have classified them as more likely to disobey, brag, be impulsive and aggressive, and have tantrums (Konstantareas & Homatidis, 1989).

More recent investigations into the behavior of children with learning disabilities also provide convincing evidence for a link between learning disabilities and behavioral difficulties. Swanson and Malone (1992) conducted a meta-analysis of research on children with learning disabilities that included studies that indexed these children's behaviors. In particular, 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 for these variables, suggesting 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.

Another more recent investigation by McConaughy and Mattison (1994) also examined the relationship between learning disabilities and of 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 were reported to have 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 to be 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.

*Social cognition.* As mentioned in the discussion concerning the components of social competence, an investigation into problematic peer relationships is not complete without considering the role of social cognition. Examining the role of social cognition in peer interactions is necessary given that social cognition is thought to mediate the relationship between a social cue and one's responses to that cue. For children with learning disabilities, it may be that the same information-processing deficits that interfere with their acquisition of academic content interfere with their interpretation of social cues. Substantiating the existence of social cognitive deficits among children with learning disabilities could suggest that intervening with these children's problematic social cognitions may be a more effective means of improving their social functioning and acceptance. That altering social cognition may be another way to improve children's social difficulties is of interest due to the ineffectiveness of social skills training programs in maintaining and generalizing the behavioral and social gains that children make (e.g., DuPaul & Eckert, 1994; La Greca, 1993; Zaragoza, Vaughn, & McIntosh, 1991). Research on the specific social-cognitive deficits of students with learning disabilities will now be reviewed to provide more direct evidence for the role of social cognition in these students' troubled peer relationships and to indirectly support altering social cognition as a means to improve the relationships of students with learning disabilities.

*Research on the Social Cognitive Deficits of Students with Learning Disabilities*

As stated previously, research on the social functioning of students with learning disabilities slowed after the initial flurry of research following Bryan's (1974) seminal article, with few articles appearing after 1990. Research studies on the topic of social cognitive difficulties of children with learning disabilities have also been less frequent in

recent years. Research that has slowly accumulated since the 1970s, however, has been consistent in confirming the broad range of difficulties that children with learning disabilities have with respect to social perceptual skills such as empathy, role taking, and making social inferences (Holder & Kirpatrick, 1991). These deficits have primarily been documented by examining how well children with learning disabilities are able to make inferences from nonverbal behavior (e.g., Sisterhern & Gerber, 1989; Wigg & Harris, 1974). Investigations into the social-cognitive deficits of these children has also examined their ability to interpret other types of social information, such as verbal behavior 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 has been researched using a variety of methods. For example, videotaped segments of interactions, static pictures, and narratives have all been used to present verbal and nonverbal social information to children with learning disabilities. An additional area of investigation has been the social-cognitive abilities of these children over time. This research has focused on determining 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). Results from these different types of studies will now be reviewed in order to provide converging evidence for the wide ranging social cognitive deficits of children with learning disabilities.

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 they communicate and behave 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 nonverbal behavioral interpretations of children with learning disabilities has, therefore, focused on whether they are able to accurately evaluate common nonverbal features such as facial expressions, gestures, and vocal tones.

For example, in an early investigation by Wigg 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 interpreting nonverbal behaviors such as emotions, when they are conveyed through various body gestures and facial expressions in motion pictures.

Similar results have been 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.

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 the more recent research has focused on varying the modality of the information. This research has been driven by the need to clarify the nature of the social-cognitive difficulties that contribute to children with learning disabilities' trouble 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 will be more likely to interpret social information accurately as well as in determining the extent of their difficulties; trouble interpreting information from both modalities as well as 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 behaviors 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 which 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.

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 that they see, they may also have trouble interpreting the meaning of verbal information they hear.

Weiss' (1984) study provides evidence that children with learning disabilities may have trouble interpreting social information presented verbally, and provides 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 this 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 that they have difficulty storing and retrieving 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 already 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 that they have 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 both groups with no learning disability. 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).

More recent studies have also documented the extent of children with disabilities' social-cognitive difficulties by demonstrating that they have trouble interpreting the overall meaning of social situations even when simple static pictures are shown (Saloner & Gettinger, 1985). In addition, more current investigations have been concerned with whether these extensive difficulties represent an actual deficit, or rather, a deficiency that improves over time. In order to do so, 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 that an actual deficit in social-cognitive ability exists among 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.

In addition to the above research on verbal and nonverbal communication, research on children with learning disabilities' role-taking skills also provides support for 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 displayed inferior ability to 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 be accurate.

Earlier in this section, support for the present investigation's extension of Crick and Dodge's (1994) model to explain 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 one key investigation by Tur-Kaspa and Bryan (1994) directly link the manner in which children with learning disabilities process social information and the steps of Crick and Dodge's (1994) social information-processing

model. In this study, children with learning disabilities in the third, fourth, seventh, and eighth grades were compared 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 two 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 proposed 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 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 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 (Turkaspas & 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.

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 attempted to take a more ecological approach and extended this research to examine the implications of these deficits for children with learning disabilities in inclusive classrooms. Before describing this study, a description of social cognitive mapping will be provided. This methodology allows the assessment of both social cognition and social status, and was the primary measure used in the present investigation.

*Sociometrics and Social Cognitive Mapping*

Sociometrics have traditionally been used to determine a child's social functioning within the classroom. An alternative to sociometrics, however, called social cognitive mapping (SCM), has recently been developed and provides a more complex and perhaps more accurate view of social functioning. Sociometric procedures simply ask each child to "name three peers you like most" and "name three peers you like least." The number of nominations in both categories is then used to assign a particular child a label of accepted, rejected, or shy/withdrawn. These labels are considered to be indicators of the extent to which the child possesses social relationships within the classroom, and thus, of their overall social functioning in that context.

In contrast, Social Cognitive Mapping (SCM) asks children "Are there some kids in your classroom who hang around together a lot? Who are they?" These questions provide information analogous to that of sociometrics because they identify children who have one, several, or no peer groups and who may, therefore, have a greater likelihood of being accepted or rejected by the class as a whole. Unlike sociometrics, however, much more information can be obtained with Social Cognitive Mapping. At the most basic level, SCM uses the information children provide about who "hangs out" with whom, to identify all of the peer groups that exist within the classroom. This is done by analyzing the number of nominations each child receives for being in the classroom's peer groups (See Table 1).

Further analysis of the responses to SCM probes can provide information above and beyond that of simply determining the composition of peer groups within a classroom. How salient a particular peer group is within the class, as well as how salient

an individual in that group is, can also be assessed. In addition, each student's "social network centrality" or their overall salience within the classroom can be determined.

This is done by combining the centrality level of an individual student's peer group with his or her centrality within that group (See Table 1). Thus, the SCM procedure combines information from nominations by the rest of the class concerning the social networks that exist and which students are a part of these networks, to determine how salient a particular student is within the class as a whole (Farmer et al., 1999).

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Table 1

Information Available from  
SCM

Information	How it is calculated conceptually	Specifics
Peer groups present in classroom	Looks at how often students are named together (nominated) in the same group by classmates.	Students whose profiles are significantly correlated with at least 50% of the other members in a group are considered to be in that group.
Centrality level of each peer group	The peer group of the child who is named most frequently by classmates is considered the central peer group. All other peer groups are compared to this group to determine their centrality.	For each social group in the classroom, the average number of nominations for the two students most frequently named in the group is compared to the average of the two students with the highest number of nominations in the most central group.

Table 1. (Continued)

Information	How it is calculated conceptually	Specifics
Centrality level of each student in each peer group	Calculated by comparing the number of nominations each student receives to the two students in their group(s) with the most nominations.	The number of times an individual student is named to the classroom's peer groups is compared to the average of the two students in their group with the greatest number of nominations to the class.
Social network centrality of each student	Designated by taking into consideration the individual's centrality within a group as well as the centrality level of that particular peer group within the class.	Different combinations of individual centrality and peer group centrality are used to designate whether a child is a nuclear, peripheral, secondary, or isolated member of their class.

As a result of these many different analyses that can be performed on responses to SCM probes, social cognitive mapping is thought to provide several advantages over sociometrics. First, SCM is a much more comprehensive approach to learning about a child's social functioning. Responses to SCM probes provide information about a child's social world that extends well beyond that of his or her overall acceptance (as is done with sociometrics) or that of simply naming the peer group to which the child belongs. Identifying the peer groups a child is part of indicates with whom they associate, as well as whether or not that student is perceived to associate with more than one peer group.

Additionally, information provided by social cognitive mapping can be used to determine how salient each child and their respective peer groups are within the classroom.

This wealth of information gathered by social cognitive mapping brings up a second advantage of the technique. Because it directly indexes which peer groups a child is a part of, as well as how salient that child and his or her respective peer group are within the classroom, it seems to be a much more accurate indicator of how well a child gets along with peers and thus, of overall social functioning. This is in contrast to sociometrics, which draws conclusions about a child's social functioning based on nominations of whether or not they are liked by most of their classmates. These nominations are translated into acceptance or rejection labels that are typically used to make assumptions about the child's social relationships, and thus social functioning, within the classroom.

In particular, many studies have interpreted acceptance and rejection labels to be synonymous with whether or not that child has friends in the class (e.g., Bullock, 1992). This thinking may be flawed, however; nominations of acceptance by a child's classmates are not necessarily synonymous with whether or not he or she has friends. It is possible, for example, for students who associate with less popular children to like and nominate popular students more frequently than their own friends. In addition, students who are considered to have a "rejected status" are those who receive many negative nominations and only a few positive ones. Although such a label implies that these children have no friends, the positive nominations they receive suggests that they may, indeed, have some associates. Thus, studies of children with disabilities that conclude that they are isolated from their classmates because they are more likely to be rejected,

may be too pessimistic (Ray, 1985; Sale & Carey, 1995, as cited in Pearl et al., 1998). Indeed, support for the idea that children with disabilities can have friends comes from studies such as those by Juvonen and Bear (1992), which have examined the social adjustment of children with and without learning disabilities in inclusive classrooms. These researchers found that 67% of students with a learning disability had at least one reciprocal positive friendship nomination as compared to 78% of children without a learning disability. These nominations suggest that children with disabilities tend to have friendships and that the likelihood of this occurring may be very similar to that of their nondisabled peers.

A third advantage of social cognitive mapping, which is essential for reaching the objectives of the present study, is its ability to provide information about social perception. A child's social perceptions can be indexed with SCM by examining their accuracy in identifying peer groups within the classroom. Because each child is asked to name all of the peer groups that exist within their class, an individual child's responses can be compared to those of the rest of the class. Thus, consensus nominations by the rest of the class can be used as a standard with which to compare the accuracy of students' perceptions in identifying social relationships. In the present study, this accuracy or inaccuracy of a particular student's perceptions was, in turn, used as a gauge of their social-cognitive ability. Low similarity between a student with learning disabilities' perception of the social networks in his or her class and consensus namings by the rest of the class indicated difficulties in social cognition, whereas high similarity in the perceptions of these two informants indicated good social-cognitive functioning.

A final advantage of SCM, which provides additional support for using this methodology in the present investigation, is the strong empirical support that has been found for its psychometric properties. Conceptual support for the method comes from research findings such as those described earlier in which SCM appears to provide a more complete and accurate picture of the child's social world than sociometrics. The fact that social cognitive mapping has the potential to provide a broader range of information about children's peer relationships is inconsequential however, if these procedures are not also sound. It is of great importance then that SCM has demonstrated strong reliability and validity in determining peer groups and in supporting the notion that peers play a role in a child's behavioral development (Farmer et al., 1999).

As a result of the strong research properties and comprehensive information that social cognitive mapping provides, this technique is being used more frequently in research. Greater recognition of the resourcefulness of this technique is evident by the wide range of studies that have used SCM in the past decade. In addition to being employed in a 15-year longitudinal investigation (Cairns & Cairns, 1994), SCM has been used in a variety of investigations throughout the United States and in foreign countries such as China (e.g., Leung, 1996). Common to all of these studies is their interest in identifying the peer networks of students in general, or more typically, of certain types of students, such as those with emotional and behavioral disorders and students with disabilities (e.g., Farmer et al., 1999). SCM research on these peer groups has focused on identifying common behavioral features among these students and the degree to which these features are present or correlated among members.

Studies using SCM procedures have found that children tend to be a part of peer groups or to affiliate with those who are similar to themselves on salient features. Gender appears to be one of these features; classroom social networks in elementary and middle school appear to be almost exclusively made-up of same-sex peers (e.g., Farmer & Hollowell, 1994). Behavioral characteristics also tend to be similar among social networks. For example, Farmer and Farmer (1996) found that, in general, classroom social groups appear to be formed on the basis of similar aspects of their members' functioning, such as antisocial, prosocial, and shy behavior. Similarly, Xie, Cairns, and Cairns (1999) have found that students who are aggressive tend to affiliate with others who are aggressive and that students who are nonaggressive tend to affiliate with other nonaggressive students.

SCM has also been used to identify common behavioral features and social mechanisms among peer groups abroad. These studies are of significance because they indicate the widespread acceptance of SCM and provide a means with which to obtain information about the similarities and differences that exist in the social processes at work across cultures. For example, Leung (1996) found that similar to American children, Chinese children tend to affiliate in groups with other children who were of the same sex, in the same classroom, and similar on several behavioral tendencies such as aggressiveness. Unlike American children, however, social groups also tended to form around values that were characteristic of the Confucian ideal such as being cooperative, hard working, and polite.

In terms of children with disabilities, research using SCM has been critical in substantiating that these children do, in fact, have friends (e.g., Pearl et al., 1998). This

information has led to a better understanding of children with disabilities' social relationships, and in turn, further supports the idea that SCM procedures provide a more comprehensive and accurate picture of children's social functioning than sociometrics. In addition, the results of this research are comparable to those of studies conducted with regular education and non-American students; children with learning disabilities, including those with learning difficulties and emotional and behavioral disorders, tend to associate with those who are similar to themselves on social and personal characteristics. Moreover, these children tend to associate with those who share or are similar to themselves on their problematic behavior features (Farmer et al., 1996). For example, Pearl et al. (1998) used SCM to identify the social networks of classrooms that included students with learning disabilities and reviewed peer-assessed behavioral features to classify each group as either prosocial or antisocial. Although the majority of children with learning disabilities in this investigation were part of peer networks that were neither antisocial nor prosocial, in comparison to their peers, students with learning disabilities were over-represented in antisocial peer groups.

These results are of concern given the earlier discussions of mutual socialization or the ways in which similar features are reinforced and maintained among friends. The implication, then, is that students with learning disabilities, who are likely to have social skills deficits, may be drawn to networks of students who typically engage in antisocial behaviors; this may place students with learning disabilities at risk for further social difficulties. Thus, in addition to knowing that these children are likely to have friends, knowing who these friends are, is essential in fostering an understanding of their social difficulties. SCM is a useful tool toward understanding the reciprocal interactions that

may lead to and maintain a child's behavior given its potential to identify all those with whom a student associates. The present study, however, focused on using SCM to examine the social cognition of children with LD and whether it is related to their social acceptance in the classroom.

## Chapter 3

## Research Aims

*Statement of the Problem*

As is evident from the literature review in the previous chapter, peer relationships are instrumental in the course of children's development and in turn, their current functioning and long-term outcomes. Such an association between peer relationships and children's functioning implies that improving aspects of one's peer relations could be an effective way to alter or prevent adjustment problems in children who have or are at-risk for social difficulties. As a result, researchers have begun to search for factors that mediate one's success in peer relationships. For instance, researchers have investigated factors that may influence the extent and quality of peer relationships among children at-risk for social difficulties such as aggressive children (e.g., Dodge & Tomlin, 1987) and children with learning disabilities (e.g., Kavale & Forness, 1996; Wiener & Schneider, 2001). In particular, the role of social cognition in the peer relationship difficulties in these populations has been of interest (Oborio de Castro et al., 2002; Reiff & Gerber, 1990). Whereas studies concerning the social cognition and peer problems of aggressive children have examined these variables together (e.g., Strassberg & Dodge, 1987) as well as separately, evidence for the role of social cognition in the peer difficulties of children with learning disabilities has been limited to separate investigations of these variables.

A primary aim of the present study, therefore, was to attain more direct evidence for a mediating influence of social cognition in the social problems that children with learning disabilities experience. Additionally, a noteworthy feature of the present study is that the social cognitive mapping (SCM) technique has never been used exclusively to

examine the social networks of children with learning disabilities. Up until this investigation, SCM has only been used with groups of children who have had different disabilities such as behavioral and emotional disorders, educable mental retardation, speech and language impairment, students with learning disabilities (e.g., Farmer & Farmer, 1996; Pearl et al., 1998). Furthermore, these investigations have primarily been interested in documenting the peer groups to which diverse groups of students with disabilities belong, and the behavioral characteristics of these children's social networks (e.g., Farmer et al., 1999). The present investigation is therefore unique in its examination of two general areas in the same group of children with and without learning disabilities; the accuracy of naming the social networks that exist within the classroom and the social status of each child within their peer group and within the classroom overall was assessed. It was predicted that children with learning disabilities would have lower social status within the classroom, less accurate social perceptions of the social networks within the classroom, and that deficits in these two areas would be related.

#### *Research Questions and Hypotheses*

*Question 1.* Do children with learning disabilities differ from their classmates in terms of social status?

*Hypothesis 1.* Children with learning disabilities will have lower social network centrality classifications in their classroom than children without learning disabilities.

Support for this hypothesis comes from sociometric research, which has demonstrated that children with disability classifications, in general, are not as well-liked (e.g., Cary & Sale, 1985; as cited in Farmer et al., 1998) and from initial SCM research that has examined the relationship between a peer groups' behavioral characteristics and

the behavioral characteristics and social status of students with and without disabilities in the group (e.g., Farmer et al., 1999; Pearl et al., 1998). This research has found that children with disabilities, in general, tend to be members of peer groups, but are under-represented in prosocial groups and over-represented in groups that are deviant or have behavior problems (e.g., Pearl et al., 1998). This finding among children with learning disabilities is of interest given that aggression and antisocial behavior have been found to be correlates of low peer acceptance as well as later adjustment difficulties (Parker & Asher, 1987). Research concerning the association between the presence of a learning disability and one's social status has not been conducted with SCM. Thus, it was a unique aim of the present study to use this more comprehensive methodology to demonstrate that children with learning disabilities are, in fact, members of peer groups and tend to have lower social status within the classrooms' social networks.

*Question 2.* Do children with learning problems have accurate social cognitions with respect to the social dynamics of their classrooms?

*Hypothesis 2.* Children with learning disabilities will be less accurate reporters of the social networks in their class as compared to nondisabled peers.

Support for this hypothesis comes from research concerning the social-cognitive functioning of children with learning disabilities. It has been substantiated that in comparison to children without disabilities those with learning disabilities have difficulty with a number of social-cognitive tasks (Bryan & Bryan, 1986). For instance, these children have difficulty accurately interpreting nonverbal social cues such as facial expressions and gestures (e.g., Saloner & Gettinger, 1985) as well as verbal social information (e.g., Weiss, 1984) regardless of whether this information is presented

visually, auditorially, or via a combination of these modalities (e.g., Jackson et al., 1987; Jarvis & Justice, 1992; Pearl & Cosden, 1982; Sisterhern & Gerber, 1989).

Furthermore, more recent research by Tur-Kaspa and Bryan (1994) has demonstrated that children with learning disabilities not only have trouble with tasks that rely on aspects of social cognition in general, but with each of the five specific processes of social cognition originally proposed to be involved in social information-processing by Dodge and his colleagues (1986). This finding is of great significance given that Dodge's model has been found to be predictive of one's social behavior, and in turn, of judgments made by peers concerning social competence (Dodge et al., 1986). Thus, children with learning disabilities appear to have difficulty processing social information across a number of different social-cognitive processes and tasks. As a result, it was expected that children with learning disabilities would have difficulty using their schemas concerning social interactions to determine the social structures within their classrooms; similarity between an individual child's peer reports and the consensus naming by the rest of the class was used as an indicator of social-cognitive accuracy.

*Question 3.* Are accuracy of social perception and social status linked?

*Hypothesis 3.* The less accurate children are in reporting social relationships within their classroom, the lower their social network centrality will be.

Such a hypothesis is supported by research concerning the social cognitions and social functioning of children in general. It has been suggested and support has been found for the idea that when a child is not well received by peers it is due, in part, to inappropriate behaviors that result from difficulty processing social information (Dodge et al., 1986). For example, Dodge and his colleagues (1986) found that children who

competently processed social information (e.g., by generating appropriate social responses to hypothetical situations and recognizing those responses that would be inappropriate) were also more likely to be successful on a contrived peer group entry behavior task. Whether or not a child was successful with the peer group entry task was, in turn, predictive of their peers' judgments and perceptions about them. Further support for the notion that social perception is associated with social behavior comes from this study's finding that peers who judged a child positively displayed more sociable and less negative behaviors toward that child. Given this information, it is posited that social-cognitive deficits, as indexed by accuracy in reporting social relationships within the classroom, will be related to ones' social network centrality, a more comprehensive indicator of prominence and status.

*Question 4.* Does accuracy of social perception mediate the relationship between social status and learning disability status?

*Hypothesis 4.* Less accurate social perceptual abilities among children with learning disabilities will be responsible for a lowered social status in comparison to children without learning disabilities.

Children with learning disabilities have been found to have social-cognitive deficits (Bryan & Bryan, 1986; Jackson et al., 1987) and it has been substantiated that these children are not well-accepted by their peers (e.g., Swanson & Malone, 1992; Ochoa & Olivarez, 1995; Ray, 1985). Past research (e.g., Dodge et al., 1986) has also found a positive association between social cognition and social functioning among children in general. If the proposed study confirms that children with learning disabilities are not well-accepted (e.g., lower social status) and that they also have social-cognitive

deficits (e.g., less accurate perceptions of their classroom's social networks), it might seem reasonable, then, to conclude that the lower social status of these children results from their social-cognitive deficits.

However, this cannot be assumed without further investigating the role that social cognition plays in mediating the relationship (Barron & Kenny, 1986) between learning disabilities and social status. It is possible that other factors such as behavior problems, which have been found to exist among children with learning disabilities (e.g., Konstantareas & Homatidis, 1989; McConaughy & Mattison, 1994) and which appear to be associated with peer rejection (e.g., Dishion et al., 1994; Parker & Asher, 1987) could be responsible for the lower social status of these children compared to children without disabilities. Indeed, the social-cognitive difficulties of children with learning disabilities may actually be an artifact of their behavior problems, or may simply be a characteristic of the processing deficits these students have that are unrelated to lower social status. Thus, it is necessary for the present study to provide more direct evidence that supports the contention that social cognition is responsible for the lower social status of children with learning disabilities among their peers.

## Chapter 4

## Method

The present study used Social Cognitive Mapping (SCM) to investigate the social networks of classrooms that included students with learning disabilities. Extant data from a study of inclusive classrooms was used.

*Participants*

Across two years, parental permission to complete SCM (as well as additional measures of academic functioning) was sought for all children in a total of six third, fourth, and fifth grade classes in one suburban North Carolina elementary school . Parental permission was granted for a total of 95 children in the six classrooms, with classroom participation rates ranging from 60 to 90 percent.

In 12 cases, parental consent for participation was obtained for children across both years of data collection. For these children, only responses from the first year in which they participated were used.

Of the 95 students who completed SCM questionnaires, data from 80 students with and without learning disabilities were retained for use in the present study. Children were excluded from the present study if they had a special education classification other than a learning disability (n=6) or if they did not supply meaningful SCM data (e.g., they did not report any peer groups in the class; n=9).

Within the final sample of 80 students, there were 15 students who were classified with learning disabilities and 65 who had no special education classification.

Identification of children with learning disabilities was based on the state of North Carolina's guidelines. These guidelines specify that specific learning disabilities refer to

children with various processing disorders “who, after receiving instructional intervention in the regular education setting, have a substantial discrepancy between ability and achievement “ (North Carolina Department of Public Instruction, 2000). Determination of special education status was based on a review of the district’s state special education head count. Students were considered learning disabled if they were receiving services as a student with learning disabilities during the school year in which SCM data were collected. See Table 2 below for a description of the demographic characteristics of the sample.

Table 2

*Demographic Characteristics*

Characteristic	<u>LD</u>		<u>NLD</u>		<u>All</u>	
	N	%	N	%	N	%
Gender						
Female	5	33.3	28	43.1	33	41.3
Male	10	66.7	37	56.9	47	58.8
Grade						
3	2	13.3	13	20.0	15	18.8
4	7	46.7	17	26.2	24	30.0
5	6	40.0	35	53.8	41	51.3
Ethnicity						
African American	1	6.7	6	9.2	7	8.8
White	13	86.7	49	75.4	62	77.5
Asian	1	6.7	8	12.3	9	11.3
Other	0	0.0	2	3.1	2	2.5
Total	15		65		80	

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

*Measures*

*Social Cognitive Mapping.* Social Cognitive Mapping or SCM, was developed by Cairns and his colleagues (Cairns, Garipey, & Kinderman, 1990; Cairns, Perrin, & Cairns, 1985) as a means of assessing the social networks among children using peer reports. The measure yields information not only about the social groups within a classroom, but also information about overall acceptance of individual children and the match between individual children's reports of the peer groups in their classrooms and their classmates' reports.

In order to obtain this information, students are presented with a single question, "Are there some kids here in your classroom who hang around together a lot?" The children are then asked to list the children who are members of each group and are reminded to include themselves in a group if they think they belong to it. The child may dictate the answers to an examiner or write the answers on the sheet provided (see Appendix A). When children write their responses, SCM may be administered in a group setting.

A variety of social-cognitive measures can be derived from these peer reports. Derivation of these measures begins with entry of individual children's responses into a computerized scoring program SCM 4.0 (Center for Developmental Science, 1998). After the children's responses are entered, the program produces a series of three related matrices, the recall, co-occurrence, and correlational matrices.

The recall matrix simply lists the clusters of students named by each participant. The co-occurrence matrix lists the number of times each student is paired with each other student in the class in their classmates' recall of social groups. The correlational matrix consists of the correlations between all possible pairs of children in a classroom that

reach a criterion value of .40 (where the correlation indexes the consistency with which pairs of children appear in their classmates' recall of social groups).

Determination of peer groups is based on the correlations that appear in the correlational matrix. For a child to be considered a member of a peer group, classmates' reports of his or her social group must correlate .4 or above, with at least half (50%) of the other children reported by peers to be in that group.

An example is useful for understanding the construction of these matrices. For instance, Ms. Smith's fourth grade class has 24 members and parental permission to administer the SCM measure is granted for 16 of the 24 students. The student who is named to any social group by the most classmates is Jake. All 16 informants include Jake in their listing of social networks in the classroom. Jake has a best friend, Tyrone, and is also friendly with a third student, Mark. Thirteen of the respondents list Tyrone in the same group as Jake in their reports of social networks. Five respondents mention Mark, and in each case, Mark is also paired with Jake.

In this case, the co-occurrence matrix would show Jake listed 16 times with himself on the diagonal of the matrix. For the cell in the matrix representing the pairing of Jake and Tyrone, the entry would be 13, and for the cell pairing Jake and Mark the entry would be 5. For the correlation matrix, the entry for the pairing of Jake and Tyrone would be .98, and the entry for Jake and Mark would be .80. Furthermore, because Jake's, Tyrone's, and Mark's pairings all correlate with each other above the .4 cut-off, all three would be included in the same peer group. Once the peer groups in the classroom have been determined using the procedures outlined above, the number of nominations each child receives is used to determine his or her level of centrality within

the classroom's social structure. Centrality is a combination of the student's centrality level in their peer group and the centrality of the peer group within the class as a whole. Group centrality is determined by comparing the average nominations received by the two most-nominated members of each social group with the average number of nominations received by the two most nominated members in the social group that contains the most salient peer in the classroom.

To continue the example, Jake has received the most nominations to any social group of the children in his classroom. His social group would therefore be classified as a high centrality social group. Other peer groups in the classroom would also be classified as having high centrality if the average of their two most frequently nominated members was  $\geq .70$  times the average of the two most nominated members of Jake's peer group (Jake and Tyrone). A peer group would have medium centrality if the average nominations of its two most frequently nominated members were between .30 and .70 times the nominations of Jake and Tyrone. Lastly, if the average of the two most frequently nominated members of a peer group was  $\leq .30$  times the average of the most nominated members of Jake's group, that group would be said to have low centrality (Farmer et al., 1999).

The centrality of each student in his or her peer group is determined by comparing the number of nominations he or she receives with the number of nominations received by the two members of his or her peer group with the greatest number of nominations to the group. A student has high centrality in a peer group if the frequency of nominations he or she receives is  $>.70$  times the average of the two most frequently nominated members of the same group, medium centrality if this number of nominations he or she

receives is between .30 and .70, and low centrality if this frequency of nominations is < .30. Therefore, Jake and Tyrone would be considered central members of their peer group. Mark would have medium centrality.

Lastly, each student's social network centrality relative to the entire class, rather than relative to his or her peer group, is determined by combining the centrality of his or her respective group with his or her centrality within that group. The four levels of social network centrality that a student can be assigned are nuclear, secondary, peripheral, and isolated. Classifications are made based on the following:

1. Students are classified with nuclear social network centrality if they have high centrality in a high-centrality group (Jake and Tyrone).
2. Students are said to have secondary social network centrality if they have either medium centrality in a high-centrality group, or high or medium in a medium-centrality group (Mark).
3. Students are classified as peripheral when they have low centrality in a high or medium-centrality group, or are members of a low centrality-group.
4. Students are said to be isolated if they are not recognized as members of any peer group.

The reliability of these measures of student social groups and social status are satisfactory. 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 across a three-week period. These figures compare favorably with the test-retest reliability estimates of sociometric ratings, which have ranged from

.42 -.84 (Coie, Dodge, & Copotelli, 1982; Gresham & Stewart, 1992; Newcomb & Bukowski, 1984; Ray, 1985).

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).

*Social-cognitive accuracy.* Although the SCM computer program does not provide a direct index of social-cognitive accuracy, Leung (1996) has proposed a method that can be used to determine an individual child's accuracy in reporting the social networks in his or her classroom. Accuracy is determined by comparing a child's report of his or her own social group in the classroom to the consensus reporting of the class. Social-cognitive accuracy is essentially obtained by calculating the proportion of overlap between an individual's report of his or her own peer group and the consensus report by all peers in the class.

Two proportions or indices are calculated. The first, called OVERLAP<sub>self</sub> (calculated by NUM<sub>both</sub>/NUM<sub>self</sub>) is the proportion of children whom an individual child names to a 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 a group as the rest of the class. However, this index does not take into consideration the number of children whom an individual child names who are not also in the group the

class identifies. It is possible, for example, for a child to name many of the same peers to a group as the rest of the class names, yet also name many others that have not been identified to be in the group according to the consensus naming. The inaccuracy of the child's over-inclusiveness would not be reflected in this first index. As a result, the second index,  $OVERLAP_{scm}$  (calculated by  $NUM_{both}/NUM_{scm}$ ) determines the degree to which a child misses or falsely names children who have not been identified to be in that group by the rest of the class. Because both of these indices are needed to provide a comprehensive picture of a child's social-cognitive accuracy, the present investigation averaged the two social-cognitive accuracy scores from these indices into a single social accuracy score for each child.

*Decision rules.* In the investigation by Leung (1996), the overlap calculations compared the report of a child concerning the peers in his or her own network with the names of those who had been identified by the class as a whole to be members of the group. However, this procedure was not always possible in the present study. For example, there were times when a child did not name him- or herself to a peer group and there were other times when a child would name him or herself to two peer groups. As a result of these occurrences, a set of decision rules were drawn up in the present study for determining which peer group would be used to compare a child's naming with the consensus naming by the rest of the class. The decision rules were as follows:

1. If children named themselves to only one peer group, then that group was used for the overlap calculations.
2. If children named themselves to two peer groups then the first peer group they named themselves to was used.

3. If children did not name themselves to a peer group but listed one similar to the SCM grouping they were named to, then that peer group was used.
4. If children did not name themselves to a peer group and none of the other groups they listed were similar to the SCM grouping they were named to, they were given an accuracy score of 0.
5. If children only named themselves to one peer group but were listed in two SCM groupings, the group the child named was used.
6. If children named themselves to one peer group and the SCM grouping they were named to was completely different, the groups were still compared for the overlap calculations.

### *Procedure*

The SCM data used in present study were collected as part of a larger two-year study of students and teachers who were participating in a general education/special education co-teaching arrangement. At the close of each school year, all students for whom parental consent had been obtained completed the SCM measure.

To complete the SCM measure, students met individually with a member of the university research staff in a quiet place in the classroom or in the hallway. After a brief introduction to the study, students were read the instructions for the SCM measure and either dictated to the researcher or wrote their responses on the SCM protocol. For the proposed study the question “Are there some kids in your class who hang around together a lot?” was presented both verbally and on the written form. Students were also told that if they could not think of any peer groups, that they could simply write “no” on the form. If they were able to think of some groups, the students were told to list them all in the

spaces provided; there was room on the interview form for students to list up to five peer groups in their class. They were informed that they could turn the page over and write on the back if they needed more space, however, and that they didn't have to fill in all of the lines provided. Students were also told that they should include themselves, if they were listing a peer group to which they belonged. All of these comments were also written on the interview form.

When children finished their SCM report and a brief oral reading measure (not used in the present study), they were thanked for their participation and told to rejoin their class.

## Chapter 5

## Results

This chapter will describe in detail the data analysis procedures and results for the research questions and hypotheses presented in Chapter 3. The chapter begins with an overview of the data analysis procedures and a description of some of the modifications in the data set which were made in order for the analyses to be conducted. Following this section, results from the data analyses for each hypothesis are presented.

*Data Analysis Procedures*

Data analysis was conducted in two stages. First, descriptive statistics such as frequency counts, percentages, and means and standard deviations were computed to obtain overall information about the sample with respect to the three main variables of interest; disability classification, social network centrality, and accuracy (see Tables 3 and 4). Second, inferential statistics were computed to determine the nature of the relationships among these variables and, ultimately, whether social-cognitive accuracy mediates the relationship between disability classification and social network centrality classification. For these analyses, the significance level of .05 was used as the criterion for rejecting the null hypothesis. Logistic and multiple regression analyses were used to examine whether or not each hypothesis was upheld in supporting the predicted mediation model.

It is important to note that some changes in the data set were made in order to perform the statistical analyses. When an initial chi-square analysis was computed to examine whether social network centrality classification varied by disability classification, one of the table cells had only three students and one was empty (see Table

3). The presence of empty cells or cells with such a small number of participants threatened the validity of the analyses. As a result, three out of the four categories (secondary, peripheral, and isolated) of the social network centrality classification variable were collapsed together into one category, termed non-nuclear for the remainder of this document (see Table 4). Thus, in subsequent analyses, students could only be classified into one of two social network centrality classifications, nuclear or non-nuclear.

Table 3

*Number and Percent of Students in Each Social Network Centrality Classification by Disability Status*

Social Network Centrality	Disability Classification		Total (N)
	NLD	LD	
Nuclear			
n	53	7	60
%	88	12	
Secondary			
n	10	7	17
%	59	41	
Perhipheral			
n	2	1	3
%	67	33	
Isolated			
n	0	0	0
%	0	0	
Total (N)	65	15	80

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

Table 4

*Number and Percent of Students in the Collapsed Social Network Centrality Classifications by Disability Status*

Social Network Centrality	Disability Classification		Total (N)
	NLD	LD	
Nuclear			
n	53	7	60
%	82	47	
Non-nuclear			
n	12	8	20
%	18	53	
Total (N)	65	15	80

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

Table 5

*Mean Accuracy Scores for Students with and without Disabilities by Social Network Centrality*

Social Network Centrality	NLD		LD		Total Accuracy	
	Mean	SD	Mean	SD	Mean	SD
Nuclear	.774	.240	.802	.096	.777	.227
Non-nuclear	.594	.313	.628	.376	.607	.330
Total Accuracy	.741	.261	.709	.287	.735	

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

### *Hypotheses*

*Hypothesis 1.* Hypothesis 1, as described in Chapter 3, asserted that children with a learning disability would have lower social network centrality classifications than their classmates without a learning disability. In other words, it was hypothesized that learning disability classification would predict one's social network centrality

classification. In order to determine whether this relationship existed, a logistic regression analysis was conducted. This analysis revealed that social network centrality was related to learning disability classification,  $\chi^2(1, N=80) = 7.08, p=.01$ . Furthermore, the predicted direction of this relationship held true; students without a learning disability were more likely to be classified as nuclear (82%) than students with a learning disability (47%).

*Hypothesis 2.* Hypothesis 2 compared the accuracy of children with a learning disability to those without a learning disability in reporting the social networks in their classrooms. It was expected that children with a learning disability would be less accurate reporters of the social networks in their class. To determine whether learning disability status predicted the degree of accuracy in naming the social networks in one's classroom, a multiple regression analysis was performed regressing accuracy on disability classification. The results of this analysis were not significant,  $F(1,78) = .173, p>.05$ . Although Hypothesis 2 was not supported, the means were in the expected direction. The average accuracy score for children without a learning disability was greater than the average accuracy score for those with a learning disability (see Table 5).

*Hypothesis 3.* Hypothesis 3 examined the relationship between social-cognitive accuracy and social network centrality classification for the entire sample, regardless of children's disability status. It was expected that overall, the less accurate children were in reporting social relationships within their classroom, the lower their own social network centrality would be. A logistic regression analysis was performed regressing social network centrality classification on accuracy. The results of this analysis were

significant,  $X^2(1, N= 80) = 5.46, p = .02$ , with the likelihood of having a non-nuclear classification increasing as accuracy decreased.

To provide an indication of the strength of the relationship between social network classification and accuracy, a point-biserial correlation coefficient was calculated. A value of .276 was obtained, indicating a small, but significant relationship between the two variables.

*Hypothesis 4.* Hypothesis 4 examined whether the relationship between disability status and social network centrality was mediated by children's social-cognitive accuracy. As discussed in Chapter 3, several preliminary relationships must be present in order to demonstrate that social-cognitive accuracy serves as a mediator. Disability classification must predict both social network centrality and social-cognitive accuracy (tested in Hypotheses 1 and 2 respectively). In addition, social-cognitive accuracy must predict social network centrality (tested in Hypothesis 3). If all three of these relationships are supported, a fourth test is performed to provide support for the mediation hypothesis.

As indicated in the results for Hypotheses 1 through 3, only two of the three preliminary relationships necessary to demonstrate mediation were supported. Because the present study failed to find a relationship between disability status and social-cognitive accuracy, there is no logical basis for arguing that social-cognitive accuracy mediates the relationship between disability status and social network centrality classification. Hypothesis 4 was, therefore, not supported.

Had all three preliminary relationships been found in the present study, the final step in demonstrating the mediation model would have involved comparing the odds ratio

from the analysis conducted in Hypothesis 1 with the odds ratio of this analysis conducted a second time with accuracy added as a control variable. A significant drop in the odds ratio from the first to the second analysis would have demonstrated that much of the variance attributable to disability classification could be explained by students' social-cognitive accuracy. Although preliminary tests did not support the mediation model, the odds ratios obtained from logistic regression when accuracy was and was not a control variable were examined to better understand the relationships among the variables of this study.

Odds ratios indicate an increase (or decrease) in the odds of being in a particular outcome category when the value of the predictor increases by one unit. The odds ratio is computed as  $e^b$  where  $e$  is the natural logarithm and  $b$  is the beta coefficient or the parameter estimate obtained from logistic regression. For Hypothesis 1, the odds ratio calculated from the beta coefficient was 5. This value indicates that children with a learning disability were 5 times more likely to have a non-nuclear social network centrality classification than children without a learning disability. As mentioned earlier, the odds ratio from Hypothesis 1 should be reduced when this analysis is conducted a second time with accuracy added as a control variable. Although the results of this second logistic regression analysis were significant,  $X^2(2, N= 80) = 14.35, p < .01$ , there was not a significant decrement in the odds ratio from the first to the second analysis, as was expected. Instead, the odds ratio increased to 6.67. These results, once again, indicate a failure to support the mediation model.

## Chapter 6

## Discussion

Children with learning disabilities show difficulties in social functioning (Bryan & Bryan, 1983). This troubled functioning has been demonstrated in numerous ways, including the use of measures that index peer functioning and measures that index social-cognitive ability. Studies using sociometric procedures 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). Research into the social cognitions of these children indicates that they also tend to have impairments in their ability to interpret social information (Tur-Kaspa & Bryan, 1994; Weiss, 1984).

It seems reasonable to hypothesize on the basis of these lines of research that impaired social-cognitive ability among children with learning disabilities may be responsible for their difficulty with peer relationships. Very little research has been conducted, however, which attempts to demonstrate that there is a direct link between these domains of social functioning and social-cognitive ability among children with learning disabilities. A primary objective of the present study, therefore, was to investigate whether such a relationship exists among social functioning and social-cognitive ability in a group of children with learning disabilities.

In addition, the present study made use of an alternate methodology to assess social functioning. The majority of past research has investigated the social functioning of children with their peers using sociometric rating procedures. Sociometrics may not be the most accurate methodology, however, given that ratings of like and dislike are

taken to be synonymous with whether or not a child has friends (Bullock, 1992). Evidence suggesting that this may not be a valid assumption comes from studies such as one by Juvonen and Bear (1992) which found that most children with learning disabilities reported at least one reciprocal friendship in inclusive classrooms. These findings imply that there is ambiguity in interpreting the results of sociometric procedures. As a result of this ambiguity, the present study used a relatively new technique called social cognitive mapping to assess social functioning. Social cognitive mapping takes into account both the number and quality (e.g., nuclear, non-nuclear) of children's actual peer relationships within the classroom

This chapter contains a discussion of the results from the present study. In the first section, results relative to the four research hypotheses are discussed. The second section delineates limitations and the third section implications of the present study. The chapter will conclude with a discussion of directions for future research.

### *Hypotheses*

*Hypothesis 1.* Hypothesis 1 predicted that children with learning disabilities would have lower social network centrality classifications in their classroom than children without learning disabilities. As predicted, children with learning disabilities were found to be less embedded within the social networks of their class than children without learning disabilities.

These findings are consistent with the findings of previous research (e.g., Ochoa & Olivarez, 1995; Swanson & Malone, 1992) investigating children with LD's social functioning using sociometric procedures and provide further support for the claim that learning disabilities have an impact on both academic and social functioning (Kravetz et

al., 1999). Unlike studies using sociometrics, the present results provide a picture of the extent to which the child is integrated into existing social groups in the classroom and indicate that children with learning disabilities are likely to have friends, but are not as likely to be viewed as central members of social groups within the classroom.

The present findings for Hypothesis 1 also support the utility of the social cognitive mapping methodology for research with students with learning disabilities. Social cognitive mapping has been found to be reliable and valid in investigations of the social networks of children with disabilities, in general (e.g., Farmer et al., 1999; Pearl et al., 1998). Social cognitive mapping has not been used, however, to specifically investigate the relationship between having a learning disability and one's social status within the classroom. Confirmation of Hypothesis 1 provides further indication that the SCM methodology is a useful tool for investigating differences in children's social functioning and characteristics of peer networks.

*Hypothesis 2.* Hypothesis 2 predicted that children with learning disabilities would be less accurate reporters of the social networks in their class as compared to children without learning disabilities. Accuracy, as determined by the overlap between an individual child's report of the peer networks in their classroom and the consensus naming by the class, was compared for each of these groups of students. Students with learning disabilities were not found to be less accurate than students without learning disabilities (although the means were in the expected direction). The failure to find a significant difference in accuracy of reporting social networks between children with and without learning disabilities is at odds with a large body of research that has repeatedly demonstrated that children with learning disabilities have more difficulty interpreting

social information than children without learning disabilities (e.g., Jackson et al., 1987; Jarvis & Justice, 1992; Saloner & Gettinger, 1985; Sisterhern & Gerber, 1989).

One possible explanation for failure to support Hypothesis 2 in the present study is the small number of students with learning disabilities who participated. This small sample reduced the power of the study and made it more difficult to detect the effect of disability status on social-cognitive accuracy. One indicator that this is a reasonable explanation is the fact that the mean level of accuracy for students with disabilities was lower than the mean for students without disabilities. Had a larger sample been available, this mean difference might have been significant.

Another explanation for the failure of the present study to support Hypothesis 2 is that accuracy in identifying the peer networks in one's class may be a low demand social-cognitive task. In other words, peer networks that exist within one's class may be so salient that all children can accomplish the task easily. Previous research examining children's social perceptions has used tasks that required the ability to process more subtle nonverbal and verbal social cues (Jackson et al., 1987; Saloner & Gettinger, 1985). Perhaps it is these harder tasks that differentiate between children with and without learning disabilities. This interpretation would suggest that social-cognitive skills still mediate the relationship between lowered social status and learning disabilities, but that it is proficiency at these harder social-cognitive tasks that are more closely related to how well children with or without learning disabilities are embedded within their classroom. However, if this explanation were true, accuracy in naming peers would not be related to social network centrality. That such a relationship was found in the present study

suggests that social-cognitive accuracy in naming peers plays a role in determining children's social network centrality.

A related possibility is that Hypothesis 2 was not supported because cognitive accuracy in identifying peer relationships within one's class is an ecologically valid task. Interpreting subtle nonverbal social cues and verbal social information is important for engaging in social interactions. It may be, however, that within the classroom setting, knowing who "hangs out" with whom is a better indicator of the social-cognitive accuracy of children with and without learning disabilities. Awareness of one's own relationships and the relationships of other children in the classroom requires the ability to observe social interaction between other children as well as the ability to perceive that an appropriate give and take interaction is occurring between them. Children with learning disabilities appear able to perceive these occurrences. Thus, a significant difference in the social-cognitive accuracy scores of children with and without learning disabilities may not have been found because children with learning disabilities are able to identify peer relationships within their classroom and this may, in fact, be a more valid indicator of important social-cognitive abilities than the tasks used in previous studies. Under these circumstances, the test of the mediation model in the present study failed because social-cognitive accuracy is important in children's social embeddedness, but is not what accounts for children with learning disabilities' diminished social status. At present, it is not clear how the peer network accuracy task used in the current study relates to the social-information processing tasks used in earlier studies (e.g., Jackson et al., 1987; Maheady et al., 1984; Sisterhern & Gerber, 1989). One direction for future

research would be an examination of various social-information processing tasks and how they are related to one another.

*Hypothesis 3.* Hypothesis 3 postulated that the lower the accuracy scores of children in reporting the social networks of their classroom, the lower their social network centrality would be. Despite the failure to find a difference among children with and without learning disabilities in being able to accurately identify peer networks, for all children, accuracy in identifying the peer networks of one's class was associated with one's own social network centrality classification. That is to say, greater accuracy among children was more likely to be associated with a nuclear social network centrality than a non-nuclear one.

Although the present study found a relationship between accuracy scores and social network centrality, it does not provide specific information concerning causality. There are several possible explanations for the relationship between accuracy and network centrality. First, being able to accurately identify relationships within one's class may lead to greater competency within social relationships and, hence, better social network centrality ratings. Second, it may be that being able to accurately identify peer networks in one's class depends on the degree to which one is embedded within different social networks within the classroom. In other words, greater interaction with those in a class may lead to a more accurate awareness of who "hangs out" with whom. Third, although social-cognitive accuracy and social network centrality are associated with one another, it may be that some third, unknown variable leads to the pattern of results found. For example, perhaps IQ determines one's social-cognitive ability and, in turn, accounts for the association between social-cognitive accuracy and social network centrality

(Stone & La Greca, 1984). Regardless of the exact nature of the relationship, the findings from Hypothesis 3 support that there is an association between students' social-cognitive accuracy and their social embeddedness within the classroom's social networks.

Although the effect size was small, the association between social-cognitive accuracy and social status is consistent with previous research on the relationship between social cognition and social competency (e.g., Tur-Kaspa & Bryan, 1994).

*Hypothesis 4.* Hypothesis 4 predicted that less accurate social perceptual abilities among children with learning disabilities would “explain” or mediate their lowered social status in comparison to children without learning disabilities. However, given that one of the preliminary relationships needed to demonstrate mediation (Baron & Kenny, 1986) was not supported (Hypothesis 2), the proposed mediation model was not feasible. The present study did not find support for its central hypothesis, that social-cognitive accuracy is the underlying source of group differences in social network centrality found in comparisons of children with and without learning disabilities.

Failure to find support for the mediation model could be due to several factors. One possibility, mentioned earlier in the discussion of Hypothesis 2, is that the small sample size of children with learning disabilities may have compromised the power of the statistical analyses, thus, making it harder to detect an effect. A second possibility, alluded to in the discussion of Hypothesis 2, is that the task required of children in SCM may be more ecologically valid than the tasks used in previous studies, and therefore, the results of the present study may be valid. Social-cognitive accuracy may not be a mediator in the relationship between learning disability classification and social network centrality. Some other variable associated with having a learning disability may be

responsible for lower social network centrality classification observed in this group. For example, the social stigma of a learning disability may be responsible for this group's lower social network centrality. Although some researchers have suggested that identifying a child with a learning disability is stigmatizing and can lower social status, other researchers have found that children with learning disabilities are rejected by peers even before they have been identified for special education (e.g., Vaughn et al., 1990). Another possibility is that lower academic achievement among students with learning disabilities may lead to greater rejection and, thus, lower social status within the classroom's social networks (Hoyle & Serafica, 1988).

The results of this study indicate that social-cognitive accuracy is involved in determining children's functioning with peers and hence social embeddedness, but is unrelated to disability status. A factor other than social-cognitive accuracy appears to account for children with learning disabilities' lowered social status. Consistent with the pattern of findings in the present study, one interesting possibility concerning the involvement of social-cognitive accuracy is that when children with learning disabilities have very accurate social perception, it compensates for the impact of the factor that has, overall, lowered their social embeddedness.

For example, one might hypothesize that difficulty with school tasks is salient in the classroom and explains the lowered social network centrality of children with learning disabilities. However, when students with learning disabilities are very good social information processors, they can achieve a central social role in the classroom peer networks. This hypothesis would explain why the mean social-cognitive accuracy score for students with learning disabilities who are nuclear was higher (although not

significantly higher) than the mean accuracy score for nuclear students without learning disabilities (see Table 5). This hypothesis would also explain why students without learning disabilities who were in the non-nuclear classification had lower (although not significant) mean social-cognitive accuracy scores than non-nuclear children with learning disabilities because unless they were very poor social information processors, their academic competence might compensate for their weaknesses in social information-processing. This explanation is speculative and would require further research to support it, but it does explain why children with learning disabilities who were nuclear members of classroom social groups appeared to have higher social-cognitive accuracy scores than nuclear children without disabilities.

#### *Limitations of the Study*

When interpreting the results of this study, several limitations should be considered. One limitation is the lack of diversity among the sample with respect to ethnicity. For students with learning disabilities, almost all students (86.7%) were Caucasian. Given that the proportion of African American students in the population of students with learning disabilities is 18% and that virtually no Hispanic students (a group that makes up 15% of students with learning disabilities) were included, it is unclear whether the results of this study represent those that would be found in the population of students with learning disabilities (22<sup>nd</sup> Annual Report to Congress, November 2000; Retrieved May 11, 2004, from <http://www.ed.gov>). It is possible that different results would have been obtained with a more representative sample.

An additional limitation of the present study is the fact that all student participants were enrolled at the same school. This condition could have limited the study's results in

a number of ways. First, the lack of diversity mentioned above, is likely to have resulted because all students were from the same public school and, thus, from a similar geographic area. Second, it is possible that conditions specific to this elementary school were responsible for the results obtained. For example, in this particular elementary school students with learning disabilities were almost fully included in regular education classrooms; services outside of the regular classroom typically accounted for less than 2 hours a week. Thus, children with learning disabilities from the study school were constantly in the presence of children without learning disabilities. It is possible, then, that students with learning disabilities may have had more opportunities to develop the more advanced social skills and social awareness of their peers without learning disabilities by way of interacting with them on a regular basis.

Determination of disability status in the present study relied on the disability classifications each student had received from the study school, rather than on making its own assessment of disability. The fact that an independent verification of learning disability status was not conducted could have, therefore, also limited the generalizability of the present study's findings. Because the criteria for identifying a child with a learning disability vary from state to state, the results of this study may not represent those that would be obtained in other states using different criteria for identification. An independent assessment of disability based on a pre-determined criterion would enable researchers in other states to assess the extent to which the results of the present study are applicable to their population of students with learning disabilities. Deciding upon a criterion for identification (e.g., a 15 point discrepancy between a child's IQ and

achievement) and conducting either a school record review or independent assessment to determine which students met this criterion would have been helpful toward this end.

An additional limitation of the present study is the fact that variables broader than social-cognitive accuracy and social network centrality were not collected. Information about other characteristics of these students such as their academic achievement and IQ were not obtained. Having access to this type of information would have enabled the present study to examine whether these variables might have been mediating the relationship between learning disability status and social network centrality classification.

A final limitation of the present study has to do with the fact that SCM is a new methodology and few definitive criteria or decision rules have been established regarding its use. Furthermore, for those decision rules that are in place, there isn't always a good understanding of their effect on outcomes. Thus, choices made by the investigator are often made without a clear understanding of how they will affect results. Some examples of decisions that are left to the discretion of the investigator include the cut-off point for determining a group and what social groups to include when calculating the accuracy of a child's report (e.g., all groups in which he or she was included or only the groups to which the child reported that he or she belonged).

### *General Discussion*

The primary purpose of the present study was to investigate social-cognitive accuracy and social functioning in a group of children with and without learning disabilities. Over the past 30 years, a considerable amount of research has been conducted concerning the social difficulties of children with learning disabilities (e.g., Kavale & Forness, 1996; Kravetz et al., 1999). Another line of research has focused

more on the processes thought to be involved in these social difficulties, presumably social-cognitive processes (e.g., Jackson et al., 1987; Sisterhern & Gerber, 1989). The findings of the present study are discussed in light of this previous research as well as its attempt to bridge these two lines of research.

Three overall conclusions can be drawn from the results of this study. First, for both children with and without learning disabilities, greater facility with social cognition is related to greater peer involvement (e.g., more embeddedness within the classroom). This finding suggests that social cognitions are important in the enactment of behavior and thus, indirectly involved in subsequent peer judgments of that behavior. This notion of social cognition, behavioral enactment, and peer evaluation being interconnected has been discussed in previous papers. Most notably, it has been incorporated into a social information-processing model by Crick and Dodge (1994) which has been well supported by research (e.g., Dodge & Tomlin, 1987; Fontaine et al., 2002).

Second, children with learning disabilities are less likely to be involved with a large number of peers in their classroom than children without learning disabilities. This finding supports previous research which has shown 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).

Third, based on the results of the present study, social-cognitive accuracy does not appear to be responsible for these differences in peer involvement among children with and without learning disabilities. Numerous possibilities could account for the failure to find this outcome. The limitations of this study which were discussed earlier could be

responsible for the failure to support social-cognitive accuracy as a mediator, for example. Alternatively, it may be that social-cognitive accuracy does not, in fact, mediate the relationship between having a learning disability and one's involvement with peers. An unknown aspect of the learning disability, or some outside factor that is associated with the presence of a learning disability, may be responsible for these differences in peer involvement in the classroom.

### *Implications*

These results have various implications for the implementation of interventions with children who have learning disabilities. First, the finding that children with learning disabilities have difficulty interacting with peers suggests that interventions to enhance social functioning should begin for children with learning disabilities who appear to have few, or no friends, soon after they have been identified. Because this group of children is at high-risk for social difficulties with peers and because a lack of, or troubled, peer relationships have been found to be associated with impaired psychosocial functioning and later life adjustment problems (e.g., Parker & Asher, 1987), beginning these interventions early is imperative. In addition to this preventive aspect, the younger a child is, the easier it generally is to alter his or her social and/or behavioral tendencies. Since the effectiveness of social skills training has not been well supported (e.g., DuPaul & Eckert, 1994), however, altering social and/or behavioral tendencies may be better achieved by other means. For example, teachers could give these children leadership roles within the class to enhance their acceptance by other students and, ideally, promote their learning of proper social behavior from increased interactions with classmates.

Second, in addition to enhancing social behavioral skills in the manner suggested above, the results of the present study imply that social cognition would be an important component to include in social behavioral interventions used with any child, including those with learning disabilities. Although the results of this study did not support the notion that social-cognitive ability is responsible for the differences in social functioning of children with and without learning disabilities, social cognition was an important variable in determining increased peer involvement among all children. Thus, including a social-cognitive component in social behavioral interventions with children who have learning disabilities is warranted. Given that the relationships observed in this study were correlational, rather than causal, demonstrating that improving social cognition improves social standing through intervention studies would enhance our understanding of social information-processing and its role in children's social functioning.

#### *Directions for Future Research*

Some directions for future research have been alluded to throughout this chapter. This final section will discuss some of these directions with the goal of better understanding the processes that are involved in children with learning disabilities' social difficulties. It is hoped that a better understanding of these processes will aid in the development of interventions that can improve and maintain social competence among children with learning disabilities.

Due to the failure to find support for social-cognitive accuracy as a mediator, several changes in the design of this study could be implemented for future research. First, more than one elementary school could be enlisted for participation in future social cognitive mapping studies with children who have learning disabilities. This would

enhance the diversity of the study sample in terms of ethnicity as well as exposure to inclusive classrooms. On a broader level, enlisting more than one elementary school for participation would afford a larger participant pool for inclusion in the study, thus enhancing statistical power.

Second, future research should also take into account the possibility that social-cognitive accuracy may not, in fact, be responsible for differences in the social embeddedness of children with and without learning disabilities. Thus, future studies should collect information about other variables and explore the possibility that it may be these variables which are contributing to the differences between children with and without learning disabilities in terms of social status within their classrooms. Variables associated with having a learning disability, such as stigmatization, for example, could be responsible for differences in the classroom social involvement of students with and without disabilities.

Finally, as mentioned earlier, future research on how social-cognitive accuracy as measured by SCM and social-cognitive tasks used in previous research relate to one another would provide useful information. Such research would likely highlight similarities and differences in what these tasks actually measure.

In summary, this study was successful in demonstrating that differences in social embeddedness, and presumably social functioning, exist among children with and without learning disabilities. The present study was also able to show that, in general, social-cognitive accuracy is predictive of one's embeddedness within the social networks of a classroom. The failure to support that social-cognitive accuracy mediates differences in social embeddedness between children with and without learning disabilities raises

many questions and points to importance of empirically testing assumptions about how two deficits that are logically and theoretically related, impaired social information-processing and lowered social status, may actually be linked. Studies are needed that further examine the role of social cognition as a mediator in children with learning disabilities' troubled social functioning. However, failure to support the mediator model in the present study suggests that other possibilities should also be explored.

## References

- Asarnow, J., & Callan, J. (1985). Boys with peer adjustment problems: Social cognitive processes. *Journal of Consulting and Clinical Psychology, 53*, 80-87.
- Azmitia, M., Montgomery, R. (1993). Friendship, transactive dialogues, and the development of scientific reasoning. *Social Development, 2*, 202-220.
- Bagwell, C., Newcomb, A., & Bukowski, W. (1998). Preadolescent friendship and peer rejection as predictors of adult adjustment. *Child Development, 69*, 140-153.
- Baron, R., & Kenny, D. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*, 1173-1182.
- Berk, L. (2000). *Child development* (5<sup>th</sup> Ed.). Needham Heights, MA: Allyn and Bacon.
- Brendgen, M., Bowen, F., Rondeau, N., & Vitaro, F. (1999). Effects of friends' characteristics on children's social cognitions. *Social Development, 8*, 41-50.
- Bruno, R. (1981). Interpretation of pictorially presented social situations by learning disabled and normal children. *Journal of Learning Disabilities, 14*, 350-353.
- Bryan, T. (1977). Learning disabled children's comprehension of nonverbal communication. *Journal of Learning Disabilities, 10*, 501-506.
- Bryan, J., & Bryan, T. (1983). The social life of the learning disabled youngster. In J. McKinney & L. Feagans (Eds.), *Current topics in learning disabilities* (pp. 57-84). Norwood, NJ: Ablex Publishing.

- Bryan, J., & Bryan, T. (1986). *Understanding learning disabilities* (3<sup>rd</sup> ed.). Mountain View, CA: Mayfield Publishing.
- Bullock, J. (1992). Children without friends: Who are they and how can teachers help? *Childhood Education, 69*, 92-96.
- Coie, J., Dodge, K., & Copotelli, H. (1982). Dimensions and types of social status: A cross-age perspective. *Developmental Psychology, 18*, 557-570.
- Craig, W. (Ed.). (2000). *Childhood social development: The essential readings*. Malden, MA: Blackwell Publishers.
- Crick, N., & Dodge, K. (1994). A review and reformulation of social information processing mechanisms in children's social adjustment. *Psychological Bulletin, 115*, 74-101.
- Crick, N., Grotpeter, J., & Bigbee, M. (2002). Relationally and physically aggressive children's intent attributions and feelings of distress for relational and instrumental peer provocations. *Child Development, 73*, 1134-1142.
- Crinjen, A., Achenbach, T., Verhulst, F. (1997). Comparisons of problems reported by parents of children in 12 cultures: Total problems, externalizing, internalizing. *Journal of American Academy of Child and Adolescent Psychiatry, 36*, 1269-127.
- Custrini, R., & Feldman, R. (1989). Children's social competence and nonverbal encoding and decoding of emotions. *Journal of Clinical Child Psychology, 18*, 336-342.
- Dickstein, E., & Warren, D. (1980). Role-taking deficits in learning disabled children. *Journal of Learning Disabilities, 13*, 378-382.
- Dishion, T., Patterson, G., & Griesler, P. (1994). Peer adaptations in the development of

- antisocial behavior: A confluence model. In L. R. Huesmann (Ed.), *Aggressive behavior: Current perspectives* (pp. 61-95). New York, NY: Plenum Press.
- Dodge, K., Pettit, G., McClaskey, C., & Brown, M. (1986). Social competence in children. *Monographs for the Society of Research in Child Development, 51*, 1-38.
- Dodge, K., & Feldman, E. (1990). Issues in social cognition and sociometric status. In S.R. Asher & J. D. Coie (Eds.), *Peer rejection in childhood: Origins, consequences, and intervention* (pp. 119-155). New York: Cambridge University Press.
- Dodge, K., & Price, J. (1994). On the relations between social information processing and socially competent behavior in early school-aged children. *Child Development, 65*, 1385-1397.
- Dodge, K., & Tomlin, A. (1987). Utilization of self-schemas as a mechanism of interpretational bias in aggressive children. *Social Development, 5*, 280-300.
- DuPaul, G., & Eckert, T. (1994). The effects of social skills curricula: Now you see them, now you don't. *School Psychology Quarterly, 9*, 113-132.
- Dunn, J., Cutting, A., & Fischer, N. (2002). Old friends, new friends: Predictions of children's perspective on their friends at school. *Child Development, 73*, 621-635.
- Farmer, T., & Farmer, E. (1996). Social relationships of students with exceptionalities in mainstream classrooms: Social networks and homophily. *Exceptional Children, 62*, 431-450.
- Farmer, T., Pearl, R., & Van Acker, R. (1996) Expanding the social skills deficit

- framework: A developmental synthesis perspective, classroom social networks, and implications for the social growth of students with disabilities. *Journal of Special Education, 30*, 232-256.
- Farmer, T., Stuart, C., Lorch, N., & Fields, E. (1993). The social behavior and peer relations of emotionally and behaviorally disturbed students in residential treatment: A pilot study. *Journal of Emotional and Behavioral Disorders, 1*, 223-234.
- Farmer, T., Van Acker, R., Pearl, R., & Rodkin, P. (1999). Social networks and peer-assessed problem behavior in elementary classrooms: Students with and without disabilities. *Remedial and Special Education, 20*, 244-256.
- Fontaine, R., Burks, V., & Dodge, K. (2002). Response decision processes and externalizing behavior problems in adolescents. *Development and Psychopathology, 14*, 107-122.
- Graham, S., & Hudley, C. (1994). Attributions of aggressive and nonaggressive african-american male early adolescents: A study of construct accessibility. *Developmental Psychology, 30*, 365-373.
- Gresham, F. (1992). Social skills and learning disabilities: Causal, contaminant, or correlational? *School Psychology Review, 21*, 348-360.
- Gresham, F., & MacMillan, D. (1997). Social competence and affective characteristics of students with mild disabilities. *Review of Educational Research, 67*, 377-415.
- Gresham, F., & Reschly, D. (1986). Social skills deficits and low peer acceptance of mainstreamed learning disabled children. *Learning Disability Quarterly, 9*, 23-32.

- Gresham, F., & Stuart, D. (1992). Stability of sociometric assessment: Implications for uses as selection and outcome measures in social skills training. *Journal of School Psychology, 30*, 223-231.
- Hartup, W. (1996). The company they keep: Friendships and their developmental significance. *Child Development, 67*, 1-13.
- Holder, H., & Kirkpatrick, S. (1991). Interpretation of emotion from facial expressions in children with and without disabilities. *Journal of Learning Disabilities, 24*, 170-177.
- Hoyle, S., & Serafica, F. (1988). Peer status of children with and without learning disabilities—A multimethod study. *Learning Disability Quarterly, 11*, 322-332.
- Jackson, S., Enright, R., & Murdock, J. (1987). Social perception problems in learning disabled youth: Developmental lag versus perceptual deficit. *Journal of Learning Disabilities, 20*, 361-364.
- Jarvis, J., & Justice, E. (1992). Social sensitivity in adolescents and adults with learning disabilities. *Adolescence, 27*, 977-988.
- Juvonen, J., & Bear, G. (1992). Social adjustment of children with and without learning disabilities in integrated classrooms. *Journal of Educational Psychology, 84*, 322-331.
- Kavale, K., & Forness, S. (1996). Social skill deficits and learning disabilities: A meta-analysis. *Journal of Learning Disabilities, 29*, 226-237.
- Kravetz, S., Faust, M., Lipshitz, S., & Shalhav, S. (1999). LD, interpersonal understanding, and social behavior in the classroom. *Journal of Learning Disabilities, 32*, 248-255.

- Ladd, G. (1990). Having friends, keeping friends, making friends, and being liked in the classroom: Predictor's of children's early school adjustment? *Child Development*, *61*, 1081-1100.
- Ladd, G., & Asher, S. (1985). Social skills training and children's peer relations. In L. L'Abate & M. Milan (Eds.), *Handbook of social skills training and research* (pp. 219-244). New York: Wiley.
- Leung, M. (1996). Social networks and self enhancement in Chinese children: A comparison of self reports and peer reports of group membership. *Social Development*, *5*, 146-157.
- Maheady, L., Maitland, G. (1982). Assessing social perception abilities in learning disabled students. *Learning Disability Quarterly*, *5*, 363-370.
- Maheady, L., Maitland, G., & Sainato, D. (1984). The interpretation of social interactions by mildly handicapped and nondisabled children. *Journal of Special Education*, *18*, 151-159.
- Mash, E., & Barkley, R. (Eds.). (1996). *Child Psychopathology*. New York: Guilford Press.
- McConaughy, S., & Mattison, R. (1994). Behavioral/emotional problems of children with serious emotional disturbances and learning disabilities. *School Psychology Review*, *23*, 81-99.
- McFall, R. (1982). A review and reformulation of the concept of social skills. *Behavioral Assessment*, *4*, 1-33.
- Merrell, K. (1999). *Behavioral, social, and emotional assessment of children and adolescents*. Mahwah, NJ: Lawrence Erlbaum Associates.

- Merrell, K., & Gimpel, G., (1998). *Social skills of children and adolescents: Conceptualization, assessment, treatment*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Ochoa, S. & Olivarez, A. (1995). A meta-analysis of peer rating sociometric studies of pupils with learning disabilities. *Journal of Special Education, 29*, 1-19.
- Orborio de Castro, B., Veerman, J., Koops, W., Bosch, J., & Monshouwer, H. (2002). Hostile attribution of intent and aggressive behavior: A meta-analysis. *Child Development, 73*, 916-934.
- Parker, J., & Asher, S. (1987). Peer relations and later personal adjustment: Are low-accepted children at risk? *Psychological Bulletin, 102*, 357-389.
- Pearl, R., & Cosden, M. (1982). Sizing up a situation: LD children's understanding of social interactions. *Learning Disability Quarterly, 5*, 371-373.
- Pearl, R., Farmer, T., Van Acker, R., Rodkin, P., Bost, K., Coe, M., et al. (1998). The social integration of students with mild disabilities in general education classrooms: Peer group membership and peer-assessed social behavior. *The Elementary School Journal, 99*, 167-189.
- Quiggle, N., Garber, J., Panak., & Dodge, K. (1992). Social information processing in aggressive and depressed children. *Child Development, 63*, 1305-1320.
- Ray, B. (1985). Measuring the social position of the mainstreamed handicapped child. *Exceptional Children, 52*, 57-62.
- Reiff, H., & Gerber, P. (1990). Cognitive correlates of social perception in students with learning disabilities. *Journal of Learning Disabilities, 23*, 260-262.

- Saloner, M., & Gettinger, M. (1985). Social inference skills in learning disabled and nondisabled children. *Psychology in the Schools, 22*, 201-207.
- Schippell, M., Vasey, M., Cravens-Brown, L., & Bretvled, R. (2003). Suppressed attention to rejection, ridicule, and failure cues: A unique correlate of reactive but not proactive aggression in youth. *Journal of Clinical Child and Adolescent Psychology, 32*, 40-55.
- Schneider, B. (1999). A multimethod exploration of the friendships of children considered socially withdrawn by their school peers. *Journal of Abnormal Child Psychology, 27*, 115-124.
- Shantz, C. (1975). The development of social cognition. In E. M. Hetherington (Ed.), *Review of child development research* (pp. 257-323). Chicago, IL: Chicago University Press.
- Sisterhern, D., & Gerber, P. (1989). Auditory, visual and multisensory nonverbal social perception in adolescents with and without learning disabilities. *Journal of Learning Disabilities, 22*, 245-249.
- Smith, D., & Nagle, R. (1995). Self-perceptions and social comparisons among children with LD. *Journal of Learning Disabilities, 6*, 364-371.
- Stone, W., & La Greca, A. (1984). Comprehension of nonverbal communication: A reexamination of the social competencies of learning-disabled children. *Journal of Abnormal Child Psychology, 12*, 505-518.
- Strain, P., & Odom, S. (1985). Peer social initiations: Effective intervention for social skills development of exceptional children. *Exceptional Children, 52*, 543-551.

- Stromquist, V., & Strauman, T. (1991). Children's social constructs: Nature, assessment, and association with adaptive versus maladaptive behavior. *Social Cognition, 9*, 330-358.
- Swanson, H., & Malone, S. (1992). Social skills and learning disabilities: A meta-analysis of the literature. *School Psychology Review, 21*, 427-443.
- Tur-Kaspa, H., & Bryan, T. (1994). Social information-processing skills of students with learning disabilities. *Learning Disabilities Research and Practice, 9*, 12-23.
- Tur-Kaspa, H., Margalit, M., & Most, T. (1999). Reciprocal friendship, reciprocal rejection and socio-emotional adjustment: The social experiences of children with learning disorders over a one-year period. *European Journal of Special Needs, 14*, 37-48.
- Vaughn, S., & Haager, D. (1994). Social competence as a multifaceted: How do students with learning disabilities fare? *Learning Disability Quarterly, 17*, 253-266.
- Vaughn, S., Hogan, A., Kouzekanani, K., & Shapiro, S. (1990). Peer acceptance, self-perceptions, and social skills of learning disabled students prior to identification. *Journal of Educational Psychology, 82*, 101-106.
- Wahler, R., & Dumas, J. (1986). "A chip off the old block": Some interpersonal characteristics of coercive children across generations. In P.S. Strain, M.J. Guralnick, H.M. Walker (Eds.), *Children's social behavior: Development, assessment, and modification*. New York: Academic Press.
- Weiss, E. (1984). Learning disabled children's understanding of social interactions of peers. *Journal of Learning Disabilities, 17*, 612-615.

- Welsh, M., Parke, R., Widaman, K., & O'Neil, R. (2001). Linkages between children's social and academic competence. *Journal of School Psychology, 39*, 463-482.
- Weinz-Gross, M., & Siperstein, G. (1997). Importance of social support in the adjustment of children with learning problems. *Exceptional Children, 63*, 183-193.
- Weiner, J., & Schneider, B. (2002). A multisource exploration of the friendship patterns of children with and without learning disabilities. *Journal of Abnormal Child Psychology, 30*, 127-141.
- Wiig, E., & Harris, S. (1974). Perception and interpretation of nonverbally expressed emotions by adolescents with learning disabilities. *Perceptual and Motor Skills, 38*, 239-245.
- Wong, B., & Donahue, M. (Eds.). (2002). *The social dimensions of learning disabilities: Essays in honor of Tanis Bryan*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Woodward, L., & Ferguson, D. (1999). Childhood peer relationship problems and psychosocial adjustment in late adolescence. *Journal of Abnormal Child Psychology, 27*, 87-116.
- Xie, H., Cairns, R., & Cairns, B. (1999). Social networks and configurations in inner-city schools: Aggression, popularity, and implications for students with EBD. *Journal of Emotional and Behavioral Disorders, 7*, 147-155.
- Zajac, R., & Hartup, W. (1997). Friends as coworkers: Research review and classroom implications. *The Elementary School Journal, 98*, 3-13.
- Zaragoza, N., Vaughn, S., & McIntosh, R. (1991). Social skills interventions and children with behavior problems: A review. *Behavioral Disorders, 16*, 260-275.

APPENDIX

**Directions**

Please answer the following questions. Put your answers on the lines which follow each question. You don't have to fill in all lines. Write down as much as you want. If you need more space for your answer, please turn the paper over and write on the back.

1) Some kids have a number of close friends, but others have just one "best friend", and still others don't have a best friend. What about you? Do you have a best friend? Circle the correct response.

( yes / no )

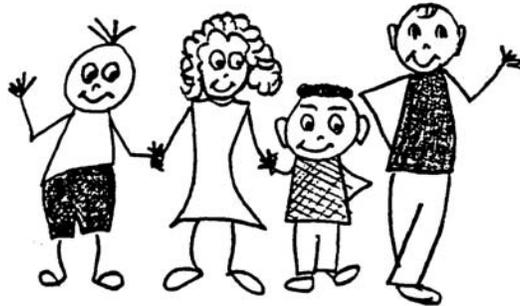
If you have a best friend, write his or her name. If this person is a classmate write "yes" beside his or her name. If this person is not in this class write "no" by his or her name. You may have more than one best friend.

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Remember you don't have to fill all the lines.

3) Are there some kids here in your classroom who hang around together a lot? Write their names on these lines.

Group 1: \_\_\_\_\_  
\_\_\_\_\_

Group 2: \_\_\_\_\_  
\_\_\_\_\_

Group 3: \_\_\_\_\_  
\_\_\_\_\_

Group 4: \_\_\_\_\_  
\_\_\_\_\_

Group 5: \_\_\_\_\_  
\_\_\_\_\_

If you hang around with a group, don't forget to name your group.

If you need more space turn the paper over. Remember you don't have to fill all the lines.

