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PEER RELATIONS AND BEHAVIORAL CHARACTERISTICS OF ISOLATED CHILDREN IN ELEMENTARY SCHOOL: A LONGITUDINAL INVESTIGATION

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by
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ABSTRACT

Research clearly shows that heterogeneity exists in the etiology, associated characteristics, and outcomes of social withdrawal/isolation. While individual level characteristics are thought to contribute to withdrawal and isolation, research suggests that peer relations may play an important role in the extent to which social withdrawal/isolation are maintained over time. The purpose of the present study was to identify subtypes of withdrawal and to determine which characteristics led to persistent isolation across third grade. Using a social cognitive mapping procedure, 146 children in second grade were identified as having no mutual friendships and as not belonging to any peer group in their classrooms. Using peer nominations for prosocial, internalizing, and externalizing characteristics, three subtypes were identified that correspond to those previously identified in the extant literature on withdrawal and isolation: an Active Isolates class, a Passive-Anxious class, and a Low Salience class. Aggressive and internalizing behaviors predicted peer victimization, which in turn was the only significant predictor of persistence in isolation over time. Gender differences were found in the relations of specific behavioral characteristics to persistent isolation in third grade. Observed relationships between behavioral characteristics, peer victimization, and subsequent isolation also differed between previously isolated and non-isolated children.
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DEDICATION

This dissertation is dedicated to the memory of my father, Daniel G. Norwalk and to my biggest fan, Danny Buske.
Chapter 1
PROBLEM STATEMENT

Introduction

Middle childhood, from approximately 6 to 11 years of age, is marked by considerable growth and change in children’s social development. Throughout elementary school, children begin to spend a considerable amount of time interacting with other peers, while adult supervision of these interactions gradually decreases (Gifford-Smith & Brownell, 2003). The types of play they engage in moves from pretend and rough play to more organized activities with formal and informal rules, such as sports, that require them to develop and build cooperation, leadership, and teamwork skills (Parker, Rubin, Erath, Wojslawowicz, & Buskirk, 2006). In addition, as children enter a larger and more diverse pool of peers, groups or cliques naturally form based on homophily, or the tendency to associate with other children that have similar social, behavioral, and/or demographic characteristics (Farmer, Xie, Cairns, & Hutchins, 2007). Peer groups represent a powerful influence on social development, as they facilitate the construction of beliefs, norms, and self-identity (Bagwell, Coie, Terry, & Lochman, 2000; Brown & Klute, 2003).

Heterogeneity in Social Withdrawal and Isolation

Given the salience and importance of the peer group for social development in middle childhood, it is reasonable to assume that difficulties in this context would put children at a disadvantage socially. Indeed, research has suggested that children lacking in peer interaction are
more likely to experience negative outcomes including negative self-concept, loneliness, lack of friends, and victimization (e.g., Findlay, Coplan, & Bowker, 2009; Ladd & Burgess, 1999).

Research has suggested that isolated children are not a homogenous group. Specifically, Rubin (1982) differentiated between two types of solitude: social withdrawal and social isolation. Social withdrawal refers to the active exclusion of oneself from his/her peers, and broadly encompasses other behavioral and emotional characteristics including inhibition and shyness (Rubin & Coplan, 2004). Social withdrawal consists of two subtypes, passive-anxious and unsociable, and is generally thought to be the result of factors internal to the child (i.e., the child isolates from his/her peers). Conversely, social isolation refers to the active isolation of a child by his or her peer group. Social or active isolation is thought to be the result of the actions of a child’s peers (i.e., isolation by his/her peers) (Asendorpf, 1993; Rubin & Burgess, 2001).

It is important to differentiate between each subtype when studying withdrawal/isolation, as each is associated with unique behavioral characteristics. Passive-anxious children tend to display more internalizing problems including shyness, and possess an approach-avoidance conflict (Asendorpf, 1990; 1993). Unsociable children, on the other hand, prefer to be alone than in the company of peers, and often prefer playing with objects rather than other children. These children do not appear to be shy or fearful of social interactions (Coplan, Prakash, O’Neil, & Armer, 2004), and in fact, often have comparable information-processing and social competence skills to non-withdrawn children (Harrist, Zaia, Bates, Dodge, & Pettit, 1997). Finally, socially isolated children, who are purposefully excluded from social interaction by their peers, tend to possess behavioral characteristics that are viewed as unfavorable including aggression and other disruptive behaviors.
Outcomes of Social Withdrawal and Isolation

Social withdrawal appears to be relatively stable across childhood and adolescence and associated with a host of negative outcomes (Rubin & Burgess, 2001). Common behavioral correlates of withdrawal, including shyness and behavioral inhibition, have been related to poorer general and peer self-concept, loneliness, depression, and anxiety (Findlay et al., 2009; Gladstone, Parker, & Malhi, 2006). Socially isolated children, who display both withdrawn and aggressive behaviors, appear to have the worst outcomes including loneliness, lack of friends, victimization, and strained relationships with teachers (Ladd & Burgess, 1999).

Trajectories of withdrawal and isolation toward subsequent maladjustment appear to be at least partly mediated by peer relations. Peer rejection/exclusion predicts negative outcome trajectories for socially withdrawn children, over and above anxious or aggressive behaviors alone (Ladd, 2006). Research suggests that socially withdrawn children whom have at least one mutual best friend may be viewed more favorably in their peer context; whereas a lack of friends or unstable friendships with equally withdrawn peers may put socially withdrawn children at risk for further rejection and/or victimization (see Rubin, Root, & Bowker, 2010).

Measuring Social Withdrawal and Isolation

Withdrawal/isolation has typically been measured using observational methods and/or rating scales. Some of these measure social withdrawal broadly, while others measure more specific traits such as behavioral inhibition, shyness, and social anxiety (see Rubin, Coplan, & Bowker, 2009 for a review of available measures). Another useful but less common paradigm for assessing isolation is the social network perspective. Within this paradigm, peer isolation is operationalized as the absence of membership in a peer group. Using a social cognitive mapping
procedure (Cairns, Perrin, & Cairns, 1985), children are asked to list from memory which children in their class “hang around together a lot.” Based on responses, statistical procedures are performed to identify peer groups based on the groups specified by each child, the number of times that a pair of children is named as being in the same group, and the similarity of peer affiliations between children in each identified pair.

The focus of the present study is on children who are *isolates*, or lack social interaction in a peer group context. This study borrows from social network research to define isolation as the absence of a peer group. The SCM procedure has many benefits for the study of peer groups and *isolates*. First, it does not rely on observational methods that may be subject to observer bias and reactivity, and that may be limited by the number of settings in which children can be observed. Second, unlike parent and teacher rating scales, SCM relies on peer perceptions of the social network. Peers are considered to have coinciding insights into the structure of their social network that adults may not have, and thus can provide accurate approximations of this structure (Gest, Farmer, Cairns, & Xie, 2003). Third, studies have attested to the validity of this method for identifying peer affiliations. Direct observations of peer interactions have revealed that children are much more likely to interact with peers identified through the SCM procedure than with other same-sex peers (Gest et al., 2003). Peer groups identified by the SCM procedure have shown high stability over a 3-week period (Cairns, Leung, Buchanan, & Cairns, 1995) and moderate stability over a 1-year period when classroom composition was stable (Neckerman, 1996). Finally, measuring social withdrawal and isolation in this way has the added benefit of examining the effects of friendlessness on the outcomes of socially withdrawn and isolated children.
Research Questions

In order to examine the behavioral characteristics and outcomes of isolated children, as identified by the SCM procedure, the present study will address two main research questions:

1. What are the social and behavioral characteristics of children identified as isolated in second grade?
   a. Peer-nominated social and behavioral characteristics
   b. Teacher-rated social and behavioral characteristics

2. Are particular social and behavioral characteristics related to more persistent isolation over time?
   a. Differences among aggression and shyness
   b. Gender differences

3. What is the relationship between individual behavioral characteristics, peer relations, and social isolation both within and across time?
Chapter 2

LITERATURE REVIEW

The following literature review begins with an overview of important social-developmental changes in middle childhood. Theoretical perspectives on the importance of social interaction also are briefly reviewed. The next section focuses on research on withdrawal and isolation. Specifically, each subtype is defined and outcomes associated with each reviewed. Finally, a review of sociometric and social network research is presented, as these methods were employed to measure isolation in the present study. The review ends with a more detailed statement of the specific research questions and hypotheses addressed in the present study.

Social Development in Middle Childhood

During middle childhood, children’s social functioning undergoes several significant changes. Upon school entry, children encounter a larger and more diverse group of peers to interact with both inside and outside of school (Parker et al., 2006). This larger pool of peers, coupled with a growing ability to take the perspective of others, gives children a deeper understanding that other children have views and beliefs different than their own (Eccles, 1999). As children become more cognizant of the differences between themselves and others, they begin to form friendships and peer groups based on homophily, or the tendency to associate with other children that have similar social, behavioral, and/or demographic characteristics as their own (Farmer et al., 2007).

According to Hartup (1992), friendships initially form through propinquity, or being in close physical proximity to others. School, therefore, provides the perfect opportunity for friendship formation, as children begin to spend considerably more time
with peers with decreasing adult supervision (Gifford-Smith & Brownell, 2003). Indeed, the number of close friendships that children possess gradually increases throughout middle childhood until adolescence (Epstein, 1986). Along with an increase in the quantity of close friendships, the quality of these relationships also deepens with age. Throughout childhood and into adolescence, friendships become less based on observable characteristics and more cooperative, intimate, and self-disclosing (Phillipsen, 1999; Newcomb & Bagwell, 1995). Mutual friendships are important to social development in middle childhood, as they provide opportunities to acquire and practice social skills, gain knowledge about the self and others, and practice reciprocity that will benefit future relationships (Hartup, 1992).

In addition to friendships, the peer group becomes an increasingly important influence on children throughout middle childhood. As children enter school and are faced with a larger population of peers, cliques naturally occur based on frequent interaction and shared interests and values (Farmer et al., 2007). Peer cliques typically range from three to eight members (Brown & Dietz, 2009) and are most commonly comprised of same-sex members. Peer groups provide a way in which children develop and/or adopt social and behavioral norms, and thus the behavior of individual children can be heavily influenced by members of their cliques (Bagwell et al., 2000).

**Theoretical Perspectives**

Several theorists have attempted to explain the importance of social interaction with other peers to healthy and normative social development. A brief review of six relevant theories, coming from research on personality and cognitive development, observational learning, and symbolic interactionism follows.
According to Sullivan (1953), interpersonal relationships are crucial for personality development. He proposed five stages of development, spanning from infancy to late adolescence, which he referred to as developmental epochs. The time between formal school entry and preadolescence, referred to by Sullivan as the “juvenile era”, is characterized by an increasing need for peer acceptance and relationships. Children become increasingly aware of the differences between themselves and their peers, and develop skills such as cooperation and compromise to accommodate those differences. This period also is marked by the formation of peer groups, and children become aware of groups that are viewed as favorable or popular, as well as those that are socially ostracized.

Piaget (1932) believed that social interaction with peers was important for cognitive growth and development. In adult-child interactions there is a clear differential in terms of cognitive ability, and children often defer to the adult and adopt his/her viewpoints as a result. In contrast, peer interactions provide opportunities for children to have discussions with others where no power differential exists. When interacting with peers, children bring their own cognitive abilities and preconceived notions about the world, some of which will inevitably be in disagreement with one another. When disagreement occurs between one child’s views and those of another, each is put into a cognitive imbalance which they will attempt to reconcile. If a child possesses necessary prior knowledge, he/she will be able to assimilate conflicting viewpoints into his/her existing cognition; if not, accommodation must occur to change the child’s current way of thinking to one that is consistent with the viewpoints of another. In either case, cognitive growth occurs as children attempt to reconcile differences between their own knowledge and that of another.

Unlike Piaget, Vygotsky (1978) believed that individual cognition could not be understood in isolation from the social and cultural contexts in which it occurs. As such, Vygotsky placed great importance on social interaction and believed it was necessary and critical
for cognitive development. Rather than taking new information from social interactions and fitting it into pre-existing cognition, Vygotsky believed that “any higher mental function was external and social before it was internal” (1960, pp. 197-198). That is, social conventions, norms, and values are passed on to children through more-experienced members of their individual cultures, shaping the way in which children interact with, and learn from, others. Thus, Vygotsky believed that children benefit most when interacting with adults or peers with a higher level of social skills and/or knowledge than their own.

According to Social Learning Theory (Bandura, 1977), children learn various social behaviors through peer interaction and modeling. The basic tenets of this theory are that behavior is acquired both directly by learning from, and indirectly by observing, the social behaviors of others (i.e., models). When certain behaviors are met with positive consequences, they are more likely to be imitated by the observer, whereas behaviors that are met with negative consequences are less likely to be imitated. Thus, peer interactions, particularly with a peer group, provide a context through which children come to learn the rules and norms of a particular social context. Socially acceptable behaviors are met with positive consequences (e.g., peer acceptance) while behaviors considered unacceptable to the peer group are met with negative consequences.

Two theorists, Cooley (1902) and Mead (1934), believed social interaction to be critical to the development of self-identity in childhood. Through his concept of the looking-glass self, Cooley theorized that self-identity is built through three processes: (1) imagining how we appear to others; (2) imagining how we are judged based on our appearance to others; and (3) building a sense of self, in part, based on these judgments and the feelings derived from them. The extent to which others’ perceptions affect an individual partly depends on the value an individual places on that relationship. Thus, social interaction, particularly with peers viewed as significant, provides
children with opportunities to gauge how others view them, and in turn, form their own perceptions of themselves based on these approximations.

Similar to Cooley, Mead (1934) theorized that self-identity arises from social interaction. In early childhood, children begin to engage in play through which they imitate the societal roles of adults, allowing them to gain the perspective of others as well as understanding of these various social roles. As they get older, children begin to engage in more organized, team-based game activities that require them to consider the perspectives of several individuals at once and view their own thoughts and actions in relation to this collective whole. This developmental progression allows children to formulate the concept of a “generalized other”, or the collective rules and norms of a given society or social group. In addition, Mead believed that, through social interaction, individuals develop a sense of self reflecting a “me” and an “I”. The “me” is based on perceptions of others, and represents a sense of self that is defined by how an individual is viewed by his/her social group. Conversely, the “I” represents the reactions of an individual to his/her social group.

Given the strong theoretical basis for the importance of social interaction to development, it is plausible that children lacking in social interaction are at a greater risk for negative social and developmental outcomes. However, research has suggested that socially withdrawn children are not homogenous. Specifically, subtypes of social solitude have been identified, each differing in social and behavioral characteristics and resultant outcomes.

Social Withdrawal and Isolation

Prior to the 1980s, the majority of research on social problems in childhood focused on externalizing disorders, with less emphasis on withdrawal and other forms of internalizing
behaviors. Rubin and Coplan (2004) suggested that this imbalance in the literature may be due to the fact that externalizing behaviors are more easily noticed and diagnosed, are viewed as more problematic than internalizing behaviors in the school setting, and have been shown to be stable over time and to lead to more negative outcomes. The little research on internalizing behaviors was complicated by differing terminology, including shyness, inhibition, rejection, and withdrawal, as well as conflicting definitions. Beginning in the early 1980s and extending into the 1990s, the works of Rubin and colleagues (e.g., Rubin, 1982; Rubin & Mills, 1988; Rubin & Asendorpf, 1993) brought some definitional clarity to this literature. Specifically, these researchers began to recognize that solitude, or a lack of social interaction (Rubin & Coplan, 2004), was a multi-faceted construct that varied across children in terms of behavioral and social correlates, as well as effects on peer relationships and long-term outcomes.

**Heterogeneity in Social Withdrawal and Isolation**

In the early 1980s, researchers began to recognize that socially withdrawn children were heterogeneous in their interactions (or lack thereof) with other children. Specifically, Rubin (1982) observed that there were various forms of nonsocial play in which children engaged, and that each was not necessarily maladaptive. Researchers have since corroborated these findings and identified three types of nonsocial play behaviors (see Coplan, Gavinski-Molina, Lagace-Seguin, & Wichmann, 2001). The first type is called *reticent*, and refers to children who tend to play alone while watching the play of others and/or wandering around. Children engaging in this type of behavior are thought to have high approach motivation, meaning they have a desire to play with other children, but are too fearful or anxious to do so (representing a high avoidance motivation; Asendorpf, 1990). The second type of play behavior is referred to as
solitary-passive (Rubin, 1982). Children displaying this type of behavior tend to play by themselves in the presence of peers, usually engaging in object oriented rather than imaginative play (e.g., playing with blocks). These children have been described as not only having low motivation to approach their peers, but also low motivation to avoid them (Asendorpf, 1990). Finally, solitary-active play involves repetitive, often disruptive sensorimotor activities in the presence of peers. Children engaging in this type of behavior have been viewed as being rejected and/or isolated by their peers due to these behaviors, rather than withdrawing from the peer group themselves (Rubin & Asendorpf, 1993).

Based on these various types of nonsocial play, Rubin (1982) distinguished between two types of solitude, social withdrawal and social isolation, each differing in terms of underlying causes and associated behaviors. Social withdrawal is “the consistent (across situations and over time) display of solitary behavior when encountering familiar and/or unfamiliar peers” (Rubin & Burgess, 2001, p. 883).

Although conceptually similar and related to shyness and inhibition, these terms should not be used interchangeably. Each shares a commonality in that they are all “behavioral expressions of solitude” (p. 9), however, they have slightly different meanings. Shyness refers to withdrawal that is prompted by concerns of others’ perceptions, while inhibition involves being alone in, or withdrawing from, new and unfamiliar social situations (Rubin & Asendorpf, 1993). Social withdrawal, then, can be viewed as an “umbrella term” (Rubin & Coplan, 2004, p. 516) that encompasses the constructs of shyness and inhibition.

Socially withdrawn children actively exclude themselves from their peers for various reasons, including feelings of anxiety, shyness, or lack of desire to interact with others. Conversely, social or active isolation refers to the exclusion of a child from social
interaction by his/her peers. Unlike social withdrawal, which is thought to result from internal child-level factors, active isolation is thought to be the result of the actions of a child’s peers (i.e., isolation by his/her peers) (Asendorpf, 1993; Rubin & Burgess, 2001). Active isolation is conceptually similar to sociometric rejection (i.e., being disliked by peers), although not all actively isolated children are necessarily considered rejected.

Rubin and Asendorpf (1993) drew further distinctions between types of social solitude. Specifically, these authors identified two subtypes of social withdrawal in addition to the aforementioned subtype of active isolation. Each of these three subtypes is described in detail next.

**Passive-anxious.** The first type of social withdrawal, labeled passive-anxious (Rubin & Mills, 1988), conflicted shyness (Coplan et al., 2004), or anxious solitude (Gazelle & Ladd, 2003) represents children who avoid social interaction with familiar peers due to internal feelings of anxiety, shyness, and/or inhibition. Although these children are motivated to interact with their peers, they are too fearful, inhibited, or shy to do so, and therefore have a low motivation to approach them (Asendorpf, 1990). These children will often engage in reticent behavior, playing on the periphery of social situations and/or observing their peers from afar.

Passive-anxious children are often excluded by their peers as early as Kindergarten (Gazelle & Ladd, 2003). In turn, passive-anxious children who experience the highest levels of peer rejection are at a greater risk for increasing levels of social avoidance, anxiety, and depression over time (Gazelle & Ladd, 2003; Gazelle and Rudolph, 2004). Reticent behavior, one distinguishing characteristic of passive-anxious children, is typically more noticeable to peers than other types of withdrawn behavior, and is associated with lower peer ratings of likeability (Hart et al., 2000). Children
engaging in reticent behavior are also more likely to be viewed as shy, and lacking in both academic and social competence (Coplan et al., 2001).

**Unsociable.** The second type of social withdrawal, referred to as *unsociable*, refers to children who prefer to play alone rather than with peers. According to Asendorpf (1990), these children have low approach motivation, indicating that they prefer to play alone, but do not have high avoidance motivation, in that they do not actively avoid social situations. These children typically can be seen engaging in solitary-passive play, preferring to play alone with objects such as books and other toys (Coplan, 2000). In early childhood, this type of behavior often is encouraged by adults and reflects task mastery and problem solving skills (Rubin, 1982). When children enter elementary school and are given ample opportunity to engage in social interactions with their peers, this type of play behavior may be an indication of social maladjustment and/or internalizing problems (Rubin & Mills, 1988).

**Actively isolated.** The third and final type of solitude, *active isolation*, refers to children who are actively excluded from social interactions by their peers. Active isolation is thought to be the result of external factors (i.e., a child is isolated by the peer group) rather than internal factors (i.e., a child is isolating from the peer group). Actively isolated children often engage in solitary-active types of play, characterized by repetitive motions (e.g., banging blocks together) and dramatic play (e.g., playing cops and robbers) in the absence of peers (Coplan et al., 2001; Rubin, 1982). This type of play is often viewed negatively by peers, and thus children engaging in solitary-active play are at a greater risk for being rejected by their peers (Rubin, 1982). While passive-anxious children are at a greater risk for internalizing difficulties, active isolates typically develop externalizing behavior problems (Asendorpf, 1993). Rubin and Mills (1988) described actively isolated children as immature, impulsive, and aggressive.
Outcomes of Social Withdrawal and Isolation

Given the heterogeneity in behavioral characteristics of socially withdrawn and isolated children, it is not surprising that heterogeneity in outcomes also exists. Research on the peer relations of passive-anxious children also has included studies of shyness and behavioral inhibition. Shyness in middle childhood has been related to poorer general and peer self-concept, loneliness, negative affect, and more frequent use of internalizing coping strategies (e.g., solving a problem alone rather than with a peer) (Findlay et al., 2009). Although shy children do not typically differ from their non-shy peers in terms of number and stability of friendships, the quality of these relationships is often poorer. This may be partially due to the tendency for similarly shy/withdrawn and victimized children to associate with one another (Rubin, Wojslawowicz, Burgess, Booth-LaForce, & Rose-Krasnor, 2004). Children who display behavioral inhibition, or the tendency to show wariness in novel situations (Kagan, 1997), early in life are at an increased risk of being bullied upon school entry, and in turn, developing depressive and anxious symptoms in adulthood (Gladstone, Parker, & Malhi, 2006).

Investigations on the social outcomes of unsociable children have been scarce, and the results have been mixed. Harrist et al. (1997) found that although unsociable children had higher rates of sociometric neglect, they were otherwise indistinguishable from their non-withdrawn peers in terms of teacher-rated social competence and social information processing skills. Asendorpf and Meier (1993) discovered that unsociable children did not differ from control children in their number of vocalizations during conversations, even though they preferred to play alone and/or at home when given free choice of social activities. Coplan et al. (2004) found that unsociable children made less social initiations towards peers and were rated by their teachers as having higher rates of peer exclusion and lower levels of prosocial behavior. Conversely, these children also tended to have higher attention spans and lower levels of negative emotionality.
Collectively, these results suggest that while *unsociable* children prefer to play alone, they do not necessarily differ in terms of social skills from their non-withdrawn peers, particularly in early childhood. Unfortunately, there have been no studies to date that have examined the social outcomes of unsociability over time.

Compared to normative children and those who are withdrawn but non-aggressive, aggressive/withdrawn children appear to have the worst outcomes including loneliness, lack of friends, victimization, and strained relationships with teachers (Ladd & Burgess, 1999). This type of isolation is viewed as particularly problematic by peers (Gavinski-Molina, Coplan, & Younger, 2003), and thus active isolates are much more likely to be rejected by their peers and less likely to be considered popular (Harrist et al., 1997).

**Social Withdrawal and Isolation and Peer Relations**

While research suggests that social withdrawal and isolation can have negative implications for children’s psychological and social well-being, not all withdrawn and isolated children experience negative outcomes over time. The extent to which developmental trajectories of withdrawal and isolation are shaped in maladaptive ways depends, in part, on social contextual factors such as peer relations. Several studies have demonstrated that peer rejection and exclusion mediate the relationship between withdrawal/isolation and subsequent internalizing and externalizing problem behaviors. For example, Gazelle and Ladd proposed a diathesis-stress model in which individual behavioral vulnerabilities (i.e., anxious solitude), in combination with interpersonal problems (i.e., peer exclusion) would predict the stability of anxious solitude over time. In support of this model, the authors found that anxious solitary children who experienced the highest levels of peer exclusion upon school entry also experienced the greatest stability in anxious solitude from kindergarten to fourth grade. To better explain this relationship, Ladd
(2006) proposed an additive model of psychological maladjustment whereby children’s behavioral propensities (i.e., aggressive or withdrawn) interact with the peer context (i.e., peer rejection or acceptance) to predict the formation and stability of psychological maladjustment over time. The results of Ladd (2006) supported such a model in which withdrawn or aggressive behavioral orientations, in combination with peer rejection, predicted subsequent internalizing and externalizing behaviors (respectively) from kindergarten through sixth grade.

The results of this previous research highlight that from a young age, a negative cycle between withdrawal/isolation and peer adversity begins to develop which lends itself to continuity of these behaviors over time and subsequent adjustment problems. First, socially withdrawn and isolated children are at a greater risk for victimization and exclusion than their non-withdrawn/isolated counterparts. From early childhood, withdrawing from the peer group may be viewed as going against the normative peer context and thus as unfavorable by peers (Rubin et al., 2006), causing these children to be disliked, rejected, and/or victimized. Anxious-solitude and its associated characteristics of shyness and behavioral inhibition may lead to children being viewed as easier targets for victimization, as they are not as able to defend themselves, thus reinforcing subsequent victimization (Hodges & Perry, 1999), while aggressive behaviors may provoke victimization from peers. In turn, when withdrawn and isolated children attempt to interact with their peers and are met with adversity, they often cope by withdrawing further from their peers (Parker et al., 2006). In addition, prolonged withdrawal may prevent children from developing appropriate social skills, and in turn, lack of social skills may contribute to socially unacceptable behaviors and thus further peer exclusion (Greco & Morris, 2005).
Measurement of Social Withdrawal and Isolation

Social withdrawal and isolation have been measured in several ways. Some of these methods measure social withdrawal broadly, without differentiating between subtypes, while other methods assess conceptually similar constructs such as shyness or inhibition (see Rubin et al., 2009). Other measures attempt to differentiate between the various subtypes of social withdrawal and isolation. A brief review of these measures follows.

One of the most common methods of determining isolation subtypes is to observe children in social situations, usually in free choice activities, and record the frequency of their interactions as well as the types of play they engage in (Rubin, 1982; Rubin & Mills, 1988). Some of these observations are conducted in naturally occurring settings such as classrooms or playgrounds, while others occur in laboratory settings. Rubin (1982) developed a behavioral taxonomy in which play behavior is coded along two dimensions. The first consists of “social participation” categories and the second consists of “cognitive play” categories (Rubin, 1982 p. 652). Using this taxonomy, Rubin (2001) developed the Play Observation Scale (POS) to be used with children in early and middle childhood, which includes types of social participation (i.e., solitary, parallel, and group play) and cognitive play (functional-sensorimotor, dramatic, constructive, and games with rules). Using similar coding schemes, subtypes of isolation are identified by observing differences in children’s methods of play. For example, children who tend to engage in parallel play and/or play alone while watching other peers interact (i.e., reticent play) would be classified as passive-anxious, while children who tend to engage in more object-oriented play by themselves (i.e., solitary passive play) would be classified as unsociable.
Peer ratings also have been used to determine subtypes of isolation. For example, the Revised Class Play (RCP; Masten, Morison, & Pellegrini, 1985), a broad measure of social withdrawal, was adapted to create the Extended Class Play (ECP). For both measures, children are told that they will be directing a play and are presented with a list of positive and negative roles. For each role, children are instructed to nominate peers in their class that would best fit that part. The RCP consists of 30 roles or items (15 positive and 15 negative) that load onto three factors: (1) Sociability-Leadership, (2) Aggression-Disruption, and (3) Sensitivity-Isolation. In an effort to further differentiate the Sensitivity-Isolation factor to describe active isolation and shyness/withdrawal, items were added to the RCP to create the ECP.

One limitation of measures of withdrawal subtypes is that they often neglect to accurately measure the unsociable subtype. Rating scales typically equate unsociability to shyness, and research (e.g., Coplan et al., 2004) has called into question whether observed solitary-passive play is a valid indicator of unsociability. Thus, Coplan and colleagues developed the Child Social Preference Scale (CSPS; Coplan et al., 2004) specifically to differentiate between the two subtypes of social withdrawal (i.e., passive-anxious and unsociability). The CSPS consists of 11 items, seven of which load on a shyness factor, and four that load on an unsociability factor. Parents rate the extent to which each item describes their child on a 5-point Likert scale.

Finally, early research attempted to use sociometric status to identify withdrawal and isolation (see Asendorpf, 1993). Specifically, assumptions were often made that social withdrawal and isolation were synonymous with sociometric neglect/and or rejection. Although there may be a correlation between withdrawal/isolation and different sociometric status positions, Asendorpf (1993) has warned against using sociometric status to identify withdrawal and isolation, stating that “social withdrawal is
a behavioral term that should not be confused with any sociometric classification” (p. 11). However, sociometric status can be an important source of information in helping to describe the peer relations of withdrawn/isolated children.

**Social Network Perspective**

The study and measurement of peer group formation and functioning has a long history. Researchers have conceptualized and measured peer groups in different ways. Kindermann and Gest (2009) identified three different methods that have emerged from research related to peer groups. The first focuses on social crowds, or peer groups that are defined based on similar stereotypical reputations (e.g., jocks). The second is grounded in sociometry (Moreno, 1934) and defines groups based on similar ratings of liking or disliking among group members. The third and final approach defines peer groups as individuals who have frequent interaction with one another. The latter two approaches are most relevant to the current study and are described in further detail below.

**Sociometric Methods**

Sociometric methods for measuring peer relations involve assessing “the positive and negative links between persons within a group” (Cillessen, 2009, p. 82). This line of research can be traced back to the theories of Jacob Moreno (1934) and his ideas on sociometry. Moreno likened members of social groups to atoms, each of which may attract or repel one another. Attraction refers to positive forces that bring people together, while repulsion refers to the negative forces that keep people apart. In addition, individuals can be described based on how they view members of their group, as well as how group members view them (Cillessen &
Bukowski, 2000). By determining patterns of attraction/repulsion (e.g., acceptance vs. rejection) among members of a group, a sociogram can be developed which portrays the social structure as a whole, as well as each individual’s position within it. Each member can be assigned individual scores based on the attraction/repulsion of other group members toward that individual, as well as several other social and behavioral characteristics (Hartup, 2009).

Although many different methods of sociometric assessment have been developed, the work of Moreno began a tradition of measuring peer relations along two dimensions (Cillessen, Bukowski, & Haselager, 2000): (a) positive factors that attract peers, and (b) negative factors that repel peers. Sociometric status, therefore, is an indicator of a child’s acceptance or liking (i.e., attractiveness to peers), and/or rejection or disliking (repulsion to peers). However, early uses of sociometric methods focused solely on the positive dimension (i.e., how much or how little children were accepted by their peer group), without measuring the negative dimension (i.e., how rejected they were). Children who received many nominations for being liked were considered popular, while children who received few nominations were considered rejected. While this method was useful for identifying popular and rejected children, it failed to identify children who were isolated, but not necessarily rejected (Peery, 1979).

In response to this problem, Peery (1979) introduced a method in which children are asked both with whom they like to associate and with whom they do not, thus assessing both attraction and repulsion. Based on responses, sociometric status was measured along two dimensions. The first was social preference, which represents a child’s level of likeability. The second dimension, social impact, represents the number of nominations, both positive and negative, that a child receives. Social preference is calculated by subtracting the number of negative nominations a child receives from the number of positive nominations, while social preference represents the sum of positive and negative nominations. Scores on each dimension yielded four sociometric classifications: Popular (high social impact and social preference
scores); Rejected (high social impact, low social preference); Amiable (low social impact, higher social preference); and Isolated (low social impact and social preference).

The work of Peery (1979) inspired several sociometric classification systems, two of which are most widely used today (Coie, Dodge, & Coppotelli, 1982; Newcomb and Bukowski, 1983). In the present study, the classification system devised by Coie and colleagues (1982) was used to determine sociometric status. In this method, children are asked to nominate three classmates each for whom they “like most” and “like least.” Using this information, social impact and social preference scores are calculated in a manner similar to Peery (1979), but are further standardized by grade level. Children can be classified into one of five categories of sociometric status: Popular, indicating higher social preference and “liked most” scores, and lower “liked least” scores; Rejected, indicating lower social preference and “like most” scores, and higher “like least” scores; Neglected, indicating low social impact scores; Controversial, indicating higher social impact scores, as well as higher “like most,” and “like least” scores; and Average, indicating social preference and social impact scores between -.50 and .50.

Social Network Research

Broadly conceptualized, the goal of social network research is to identify naturally occurring peer groups, determine how these groups function in relation to one another, and identify how groups and individuals within them fit into broader social structures (Cairns, Xie, & Leung, 1998). Rather than classifying and grouping children according to acceptance or likeability among peers, social network research focuses on associations among peers to identify groups (Farmer & Rodkin, 1996). Specifically, a typical procedure involves asking children to identify peers in their classrooms or other social networks who “hang around together”, thus
determining peer groups based on frequent interactions between children (Cairns et al., 1985). Using this method, it can be determined where a child fits into his/her broader social network.

The driving theoretical perspective behind social network research is a social-ecological framework. This framework was conceptualized through Bronfenbrenner’s (1977, 1979) Ecological Systems Theory, in which nested contexts interact to affect individual development. According to Bronfenbrenner, an individual child experiences a series of environmental systems, each subsumed by the next, ranging from immediate (i.e., microsystem) to broad (i.e., macrosystem). Within these systems, different levels of social influence exist (e.g., immediate peer groups, classrooms, schools, communities, and broader cultures). Aspects of the microsystem are typically thought to have the biggest impact on development, as this is the system in which a child comes into the most frequent and direct contact. One of these aspects within the microsystem is the peer ecology, or “that part of children’s microsystem that involves children interacting with, influencing, and socializing one another” (Rodkin & Hodges, 2003, p. 385).

An important influence within peer ecologies is that of the peer group. From a young age, children tend to gravitate towards peers who have similar values and characteristics as their own. As their associations become more frequent, a process of social synchrony occurs in which the behaviors of each individual child become mutually supportive of one another (Farmer et al., 2007). Social synchrony is facilitated by two processes. The first, reciprocity, refers to the process by which frequent interaction causes the actions of children to become more similar to one another. The second, complimentarity, describes the process by which the actions of two children, though different from one another, correspond in such a way as to support the behaviors of each (e.g., bully and a victim, or a follower and a leader). Through the processes of reciprocity and complimentarity, naturally occurring peer groups will form, each with distinct characteristics.
As peer groups form, they become nested within the overall social structure, which has a limited number of social resources. As children vie for these limited resources, some groups, and the children within them, will emerge more influential or central than others (Adler & Adler, 1996). In social network research, this concept is known as centrality. Social network centrality can describe a child’s level of influence within his/her own peer group (i.e., individual centrality), as well as the overall social context (i.e., social network centrality), and/or a peer group’s collective influence (i.e., group centrality). Rather than measuring social preference as sociometric status does, centrality is an indication of a child’s social influence or prominence. Four categories of centrality have been identified (Farmer et al., 2007): nuclear, secondary, peripheral, and isolated. Children and groups holding nuclear positions are most prominent in their social network and often are viewed as leaders in the classroom. Secondary positions are typically defined by their relationship to a nuclear member of a group, in that these children may help support and maintain a leader’s centrality within the social structure. Peripheral children are those who identify themselves as part of a particular peer group, but may or may not be recognized by nuclear members of a group as a member. Finally, isolated children are those who do not associate with any particular peer group.

Peer group membership and centrality are measured using a Social Cognitive Mapping (SCM) procedure (Cairns et al., 1985). In this procedure, children are asked to name peers in their classrooms or schools that “hang around together.” Participants are asked to list children from memory and are allowed to list groups of which they are not a member. Responses are then entered into a statistical program (SCM 4.0 computer program; Leung, 1996) which produces a detailed description of each child’s position (or lack thereof) within a peer group and the social network as a whole, as well as each peer group’s position within the social structure. Based on the number of nominations each child receives individually and as part of a particular group, social network centrality can be determined.
Although sociometric status and social network centrality are related constructs, they are not one in the same. Sociometric status often corresponds with social network centrality, in that nuclear centrality is typically associated with popularity and prosocial characteristics (e.g., Farmer & Rodkin, 1996); however, measures of likeability alone may not always accurately reflect a child’s position within his/her peer group or social network. For example, research has shown that two groups of popular children emerge in classrooms. The first is considered by teachers and peers as friendly, academically and socially competent, and athletic, while the second is considered aggressive, disruptive, less friendly, and athletic (Rodkin, Farmer, Pearl, & Van Acker, 2000). Although both types of popular children hold nuclear centrality positions within their social structures and are considered to be socially prominent and competent leaders, the former type is typically well-liked and thus considered sociometrically popular, while the latter is generally disliked and thus considered rejected (Farmer, Estell, Bishop, O’Neal, & Cairns, 2003). Similarly, it is likely that not all children with isolated centrality (i.e., not identified as belonging to a peer group) are considered neglected or rejected. Specifically, it is possible for members of a peer group to like another child, without considering him/her a member of the group (Parker et al., 2006). As such, researchers should collect information on both sociometric status and social network centrality, as well as associated social and behavioral characteristics, in order to determine a child’s standing within a particular social context.

**Benefits of using the Social Network Perspective for Measuring Isolation**

There are several benefits to using sociometric methods to identifying isolation subtypes and associated social and behavioral characteristics. First, past research typically has used observational methods, coding the frequency of interactions as well as the types of play that children engage in by themselves during free play periods. Observational methods are time
consuming and expensive, and therefore not always feasible. Likewise, there are often fewer opportunities to observe children in free play activities beyond preschool, thus forcing researchers to set up artificial play scenarios in laboratory settings. This may limit the generalizeability of the findings. Finally, the rate-of-interaction approach has been criticized by Asher, Markell, and Hymel (1981) as lacking in validity for identifying social withdrawal. Other methods relying on parent and teacher report are limited in that the reporters may not be familiar with a child’s behavior across multiple contexts. For example, in an effort to identify the three subtypes of isolation, Spangler and Gazelle (2009) used self-reports, peer nominations, teacher and parent reports, and playground observations. Results showed that peer nominations were consistently the most valid indicators of each subtype, followed by teachers, observations, and self-report. Parent reports provided the least valid sources of data.

From a social network perspective, isolation is defined as a lack of membership in a peer group, as identified through the SCM procedure. Therefore, this definition encompasses both subtypes of social withdrawal (i.e., passive-anxious and unsociable) as well as active isolation. This approach has many advantages over other measures that have typically been used to measure withdrawal/isolation. First, it is much more feasible, inexpensive, and unbiased than observational methods. Second, this approach employs the perceptions of peers who are familiar with individual children across multiple social contexts, and are considered expert reporters of their social network and peer affiliations within it (Gest et al., 2003). Third, in addition to other sociometric measures, this procedure can be used to simultaneously identify isolation subtypes and gain insight into the social and behavioral characteristics and peer relations of each. Finally, measuring isolation in this way allows for the examination of outcomes related to a complete lack of friends. Past research has typically examined stability in withdrawal as it is related to friendship quality and stability, while few studies have examined the effects of
friendlessness on subsequent withdrawal and isolation (for exceptions, see Bukowski, Laursen, & Hoza, 2010; Laursen, Bukowski, Aunola, & Nurmi, 2007). Given the importance of friendships to social development (Hartup, 1992), it is likely that a lack of friends may serve as an additional risk factor for subsequent withdrawal/isolation, peer adversity, and psychological maladjustment.

**Rationale and Purpose**

Research clearly shows that heterogeneity exists in the etiology, associated characteristics, and outcomes of social withdrawal/isolation. In order to design appropriate interventions for socially withdrawn behavior, it is important to identify the individual social and behavioral characteristics of isolated children. Withdrawal/isolation has typically been treated as the result of traits within the child. For example, biological factors and early temperament and attachment styles are thought to contribute to shyness and inhibition in early childhood (see Rubin et al., 2009). However, not all withdrawn children remain this way over time (e.g., Booth-Laforce & Oxford, 2008). Environmental and contextual factors, such as parenting styles (e.g., Coplan, Arbeau, & Armer, 2008) and peer relations are thought to play a role in the extent to which withdrawal/isolation develops and persists. The focus of the present study is on the latter factor of peer relations. While biological factors may predispose a child to socially withdrawn/isolated behavior, the peer context may serve to promote or hinder further development of these behaviors. Specifically, socially withdrawn behaviors may elicit a negative cycle in which children are viewed as easier targets for victimization (Hodges & Perry, 1999), causing them to further withdraw from their peers; in turn, prolonged withdrawal may prevent the development of normative social behavior, thus promoting further peer exclusion (Rubin et al., 2006). Conversely, research suggests that for many children, withdrawal decreases over time and
peer relations are not negatively affected (e.g., Ladd & Burgess, 1999). It appears that peer
victimization and exclusion mediate the relationship between shy/withdrawn behavior and later
negative outcomes. Likewise, aggressive behavior does not always lead to negative social
outcomes. Many aggressive children are rejected and viewed negatively by their peers, while
others are viewed as popular leaders (Rodkin et al., 2000).

This research suggests that peer relations may play an important role in the extent to
which social withdrawal/isolation are maintained over time; however, few studies have examined
why some withdrawn/isolated children are received negatively by their peers, while others appear
to integrate into the peer ecology. Likewise, methods of assessing withdrawal/isolation in the
past have typically involved observational measures and/or parent and teacher reports.
Sociometric methods provide a possible advantage over previous methods, as they require
minimal time and cost, and capitalize on peers who interact with a child across multiple social
contexts and have an accurate view of the social network as a whole, as well as how a child fits
within it. In addition, these methods can provide rich data on the peer relations and associated
outcomes of children from each subtype of withdrawal/isolation, as well as the peer contextual
factors that may support or maintain isolation over time.

The present study had three main purposes. The first purpose was to identify
heterogeneity in peer nominated social and behavioral characteristics among second grade
children identified as isolated within their social networks using latent class analysis (LCA).
LCA is a person-centered approach in that it identifies subgroups of a population based on
clusters of characteristics. Whereas variable-centered approaches seek to identify relationships
among variables that exist for all members of a population, a person-centered approach seeks to
identify subgroups of a population that are similar to one another and different from other groups
(Laursen & Hoff, 2006). Based on past research (e.g., Harrist et al., 1997; Rubin, 1982; Rubin &
Asendorpf, 1993), the following peer nomination variables were expected to differentiate groups:
aggression (i.e., disruptive, starts fights, gets in trouble, starts rumors, bullies), prosocial behaviors (i.e., cooperative, friendly), good student, shy, sad, picked on, and sociometric status. It was hypothesized that at least three groups would emerge: an unsociable group characterized by low nomination scores for all variables and a higher likelihood of neglected sociometric status, a passive-anxious group characterized by higher nomination scores for being shy, sad, and having neglected sociometric status, and an actively-isolated group characterized by higher nomination scores for aggression, being picked on, and rejected sociometric status.

The second purpose was to determine if specific social and behavioral characteristics predict persistent isolation (i.e., isolation over time) in the intermediate grades. Participants identified as isolated at the end of second grade were followed across Fall, Winter, and Spring of their third grade year. Results determined if particular characteristics were more predictive of persistent isolation than others. It was hypothesized that characteristics related to active isolates and passive-anxious subtypes of withdrawal and isolation (i.e., shy, aggressive, picked on, low likeability) at Time 1 would be more likely to lead to persistent isolation in third grade. Gender differences in the relationship between behavioral characteristics and persistence of isolation were also examined.

The third and final purpose was to examine the relationship between social isolation and other peer nominated variables (i.e., aggression, peer victimization, and shyness). It was hypothesized that socially isolated children who displayed aggressive and/or shy behaviors would be at a greater risk for peer victimization, and in turn, peer victimization would predict subsequent isolation over time.
Chapter 3

METHOD

Participants were drawn from the Institute of Education Sciences’ Social and Character Development (SACD) study. This study included a national evaluation of seven different programs designed to improve social and character development, implemented at seven sites, and selected by the Institute of Educational Sciences and the Center for Disease Control. For the present study, data from schools in rural areas of North Carolina were used. At this site, the intervention being implemented was the Competence Support Program (CSP). This intervention consisted of three components: Competence Enhancement Behavior Management, Social Dynamics consultation, and the Making Choices Social Skills curriculum.

All sites used common data collection procedures, random assignment procedures to intervention and control conditions, and the same battery of measures. In addition to the core battery of measures used by each site in the SACD study, two additional scales (i.e., Interpersonal Competence Scale – Teacher, and the Carolina Child Checklist) and sociometric data were collected. The final dataset for this project included nine waves of data, spanning the end of second grade to the end of fifth grade. Data from Waves 1 (end of Grade 2), 3 (middle of Grade 3), and 4 (end of Grade 3) were used for analysis, as these waves had the greatest number of isolates, and the least number of missing cases.
Participants

To address the first purpose of this study, peer nomination data from children identified through the SCM procedure as isolated at Wave 1 (end of Grade 2) were used. The original sample from which this sample of isolates was drawn consisted of 1,351 students in second grade (670 male, 681 female). Wave 1 consisted of 146 isolates from 13 schools and 42 classrooms. This sample had slightly more males (55.6%) than females. The majority of the sample was Caucasian (51.4%) or African American (30.1%), followed by Hispanic (7.5%), Multiracial (2.7%), and American Indian (1.4%). Ethnicity was unknown for 6.8% of the sample. Of the 146 Wave 1 isolates, 60 were assigned to treatment schools (i.e., received the CSP intervention) and 86 were assigned to control schools (i.e., business as usual). An independent samples t-test was conducted on the sample of isolates ($n = 146$) to determine if any peer nomination or teacher-rated variables of interest in the present study differed significantly across intervention and control schools. Results are presented in Table 3-1.
### Table 3-1 Results of Independent t-test between Treatment and Control Schools (n = 146)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean Difference (Control – Treatment)</th>
<th>t</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Peer Nominations</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooperative</td>
<td>2.34</td>
<td>.30</td>
<td>144</td>
<td>.76</td>
</tr>
<tr>
<td>Friendly</td>
<td>-2.06</td>
<td>-.30</td>
<td>144</td>
<td>.76</td>
</tr>
<tr>
<td>Good Student</td>
<td>-1.73</td>
<td>-.20</td>
<td>144</td>
<td>.84</td>
</tr>
<tr>
<td>Shy</td>
<td>1.62</td>
<td>.13</td>
<td>144</td>
<td>.89</td>
</tr>
<tr>
<td>Sad</td>
<td>8.98</td>
<td>.92</td>
<td>144</td>
<td>.36</td>
</tr>
<tr>
<td>Picked on</td>
<td>.01</td>
<td>.08</td>
<td>144</td>
<td>.94</td>
</tr>
<tr>
<td>Aggression</td>
<td>12.73</td>
<td>.90</td>
<td>144</td>
<td>.37</td>
</tr>
<tr>
<td><strong>Teacher Ratings</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aggression</td>
<td>-.52</td>
<td>-1.09</td>
<td>49</td>
<td>.28</td>
</tr>
<tr>
<td>Academic Achievement</td>
<td>-.78</td>
<td>-1.51</td>
<td>49</td>
<td>.14</td>
</tr>
<tr>
<td>Affiliation</td>
<td>.25</td>
<td>.68</td>
<td>49</td>
<td>.50</td>
</tr>
<tr>
<td>Popularity</td>
<td>.34</td>
<td>.79</td>
<td>49</td>
<td>.44</td>
</tr>
<tr>
<td>Olympian</td>
<td>.41</td>
<td>1.11</td>
<td>49</td>
<td>.27</td>
</tr>
<tr>
<td>Internalizing</td>
<td>-.32</td>
<td>-.97</td>
<td>49</td>
<td>.34</td>
</tr>
<tr>
<td>Overall Interpersonal Competence</td>
<td>.15</td>
<td>.48</td>
<td>49</td>
<td>.63</td>
</tr>
</tbody>
</table>

There were no statistically significant differences \((p < .01)\) between the intervention and control groups, suggesting that any observed differences in this sample were not attributable to intervention effects.
Measures

Identifying peer groups. In order to identify distinct peer groups within each classroom, a social cognitive map (SCM) procedure was used (Cairns et al., 1985). For this measure, participants were first asked, “Are there some kids in your class who hang around together a lot? Who are they?” Participants were instructed to list as many groups as they can from memory, and to answer “No” if they could not think of any groups. The SCM procedure has been shown to be a valid indicator of actual peer affiliations. Specifically, direct observations of peer interactions have revealed that children are much more likely to interact with peers identified through the SCM procedure than with other same-sex peers (Gest et al., 2003). Peer groups identified by the SCM procedure also have shown high stability over a 3-week period (Cairns et al., 1995) and moderate stability over a 1-year period when classroom composition was stable (Neckerman, 1996).

After data were collected from students, their responses were entered into the SCM 4.0 computer program (Leung, 1996). In order to identify peer groups, this program takes into account the specific groups identified by each research participant, the number of times that a pair of students are named as being in the same group, and the similarity of peer affiliations between students in each identified pair. (A detailed description of the SCM program and procedures can be found in Gest et al. [2003]).

Centrality. The SCM program also was used to determine each participant’s centrality within the overall classroom (i.e., social network centrality). In doing so, the SCM program accounts for both a child’s centrality within his/her own peer group (individual centrality) and the centrality of the peer group within the overall social network (group centrality). Based on this information, each participant received one of four centrality classifications:
• Children are considered *nuclear* within the social network if they have high individual centrality (at least 70% of the nominations of the most nominated peer group members) within a high centrality group (at least 70% of the nominations of the most nominated groups).

• Children are considered *secondary* if they have high individual centrality in a medium centrality group (30–70% of the nominations of most nominated groups), or medium individual centrality (30–70% of the nominations of most nominated members of the group) in a high centrality group.

• Children considered *peripheral* to the social network have low centrality (less than 30% of the nominations of the most nominated peer group members) within a medium or high centrality group, or are members of a low centrality group (less than 30% of the nominations of the most nominated groups).

• Children who are not identified as belonging to any peer group are considered *isolated*.

**Peer-nominated social and behavioral characteristics.** In order to assess students’ perceptions of their peers’ social and behavioral characteristics, a peer nomination procedure was used (Farmer et al., 2003). Students were provided a list of 16 characteristics, including descriptions of each, and asked to nominate up to three peers who fit each description. Students were allowed to nominate themselves and/or the same person for more than one characteristic. Eleven of these peer-nominated characteristics were used in the present study. Table 3-2 presents each variable as well as descriptions of each as they were presented to participants.
Table 3-2 Description of Peer Nomination Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooperative</td>
<td>“Here is someone who is really good to have as part of your group, because this person is agreeable and cooperates—pitches in, shares, and gives everyone a turn.”</td>
</tr>
<tr>
<td>Friendly</td>
<td>“This person is usually friendly to others.”</td>
</tr>
<tr>
<td>Good Student</td>
<td>“This person makes good grades, usually knows the right answer, and works hard in class.”</td>
</tr>
<tr>
<td>Shy</td>
<td>“This person acts very shy with other kids. It’s hard to get to know this person.”</td>
</tr>
<tr>
<td>Sad</td>
<td>“This person often seems sad.”</td>
</tr>
<tr>
<td>Picked On</td>
<td>“This person is picked on by others.”</td>
</tr>
<tr>
<td>Disruptive</td>
<td>“This person has a way of upsetting everything when he or she gets into a group—doesn’t share and tries to get everyone to do things their way.”</td>
</tr>
<tr>
<td>Starts Fights</td>
<td>“This person starts fights. This person says mean things to other kids or pushes them, or hits them.”</td>
</tr>
<tr>
<td>Gets in Trouble</td>
<td>“This person doesn’t follow the rules, doesn’t pay attention, and talks back to the teacher.”</td>
</tr>
<tr>
<td>Bullies</td>
<td>“This person is always hurting or picking on others.”</td>
</tr>
</tbody>
</table>
| Starts Rumors| “This person gossips and says things about others. This person is good at causing people to get mad at each other.”}
Sociometric status. Sociometric status (SMS) was calculated based on the procedures and methods outlined by Coie, Dodge, and Coppotelli (1982). Participants were asked to “name the three classmates you like most” and “name the three classmates you like least,” and this information was then used to calculate social preference and social impact scores. Social preference scores were calculated by subtracting the number of “liked least” nominations from the “liked most” nominations, and then standardizing this number within grade level. Social impact scores were calculated by summing the number of “liked most” and “liked least” nominations, and again standardizing this number within grade level. Based on social preference and social impact scores, children were identified as belonging to one of five levels of sociometric status: (1) Popular: these children are characterized by higher social preference and “like most” scores, and lower “like least” scores; (2) Rejected: these children are characterized by low social preference (< 1.0) and “like most” (< 0) scores, and higher “like least” scores (> 0); (3) Neglected children receive low scores (< -1.0) on social impact; (4) Controversial children have higher social impact (> 1.0), as well as higher “like most,” and “like least” scores (> 0); and (5) Average children are those with social preference and social impact scores between -.50 and .50.

Interpersonal Competence Scale-Teacher. Teacher ratings of participant’s social and behavioral characteristics were taken from the Interpersonal Competence Scale-Teacher (ISC-T; Cairns, Leung, Gest, & Cairns, 1995). For the ICS-T, teachers read a list of 18 statements and rated children individually on each using a 7-point likert scale. These 18 items yield six factors, presented in Table 3-3 along with the corresponding items:
Table 3-3 Description of ICS-T Variables

<table>
<thead>
<tr>
<th>Factor</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggressive</td>
<td>“Always argues,” “Gets in trouble” and “Always fights”</td>
</tr>
<tr>
<td>Affiliative</td>
<td>“Always smiles” and “Always friendly”</td>
</tr>
<tr>
<td>Popular</td>
<td>“Popular with boys,” “Popular with girls” and “Lots of friends”</td>
</tr>
<tr>
<td>Olympian/Physical Competence</td>
<td>“Good at sports,” “Good looking” and “Wins a lot”</td>
</tr>
<tr>
<td>Academic Achievement</td>
<td>“Good at math” and “Good at spelling”</td>
</tr>
<tr>
<td>Internalizing</td>
<td>“Always sad” and “Always worries”</td>
</tr>
</tbody>
</table>

Research using the ICS-T has shown it to have good psychometric properties, including moderate to high test-retest reliability coefficients over 3-week ($r = .81 - .87$) and 1-year ($\alpha = .43 - .42$) time periods (Rodkin et al., 2000).

**Procedure**

Teachers were asked to complete the ICS-T for each student in their classrooms during Fall and Spring of each school year. Teachers were offered $100 at each data collection point as compensation for participating. Demographic information for each student was collected via school records and a parent questionnaire.
In each participating school, letters of consent were sent out to parents of all students. Peer nomination data were collected in the Winter of each school year. All students with signed consent forms were brought together into their school’s cafeteria and informed of their rights to confidentiality, as well as their right to decline participation and/or withdraw from the study at any time. Children were seated in such a way so that no child was seated directly beside or across from another. A trained administrator read directions for completing the surveys aloud to the students, and researchers monitored the room to assist with any questions or misunderstandings. All participating students were compensated with pencils for their participation.

Analytic Plan

**Research Question 1.** To address the first purpose of identifying subtypes of isolated children at Wave 1 in the Spring of second grade, latent class analysis (LCA) was used. LCA identifies unobservable subgroups, or latent classes, based on observed scores from categorical variables (McCutcheon, 1987). To identify latent classes of *isolates* in the present study, LCA was applied to the following peer nomination variables: cooperative, acts shy, good student, sad, picked on, friendly, and an aggression factor (disruptive, starts fights, gets in trouble, starts rumors, and bullies). In order to account for the number of students providing nominations in each classroom, proportion scores for these peer nomination variables were calculated by dividing the number of nominations that a child received by the total number of children providing nominations (e.g., Farmer & Rodkin, 1996). This procedure creates continuous variables that can be compared across children, regardless of class size.

Given that LCA identifies latent classes based on categorical indicators, proportion scores in the present study were dichotomized to create categorical variables. First, quartiles for each
variable were calculated for the original sample of 1,005 second grade children for whom data were available. Next, the distribution of scores for the sample of 146 isolated children was examined in relation to quartile scores for the entire sample. Given that a high percentage of isolated children had high proportion scores for the Shy, Sad, Picked On, and Aggression variables, all those whose scores fell within the upper quartile were coded as “High” on these variables and those whose scores fell within the bottom 75% were coded as “Low.” A low percentage of isolated children had high proportion scores for the Cooperative, Good Student, and Friendly variable; thus, all those whose scores fell within the upper 50% were coded as “High” and those in the bottom 50% were coded as “Low.” Finally, sociometric status (i.e., popular, rejected, neglected, controversial, average) was coded so that children with rejected status were coded as 1, children with neglected status were coded as 2, and children with all other sociometric statuses (i.e., popular, average, controversial) were coded as 3.

LCA typically yields two types of parameter estimates: latent class membership probabilities (i.e., probability that a participant belongs to a latent class) and item-response probabilities based on class membership (Lanza, Collins, Lemmon, & Schafer, 2007). In the present study, the latter estimate referred to the probability that members of each class were categorized as “High” or “Low” on each peer nomination variable, and as each of the five sociometric status categories (i.e., Popular, Rejected, Neglected, Controversial, Average).

Models with increasing numbers of classes (i.e., 1-, 2-, 3-, and 4-class models) were tested and compared using the following criteria: (1) Akaike’s information criterion (AIC; Akaike, 1987), (2) Bayesian information criterion (BIC; Schwarz, 1978), (3) entropy statistics, and (4) Vuong-Lo-Mendall-Rubin and Lo-Mendall-Rubin statistics (Vuong, 1989; Lo, Mendall, & Rubin, 2001). Lower AIC and BIC values indicate better model fit. Entropy values, which range from 0 to 1, reflect the level of certainty by which each individual case is designated to a particular latent profile. Higher values
indicate greater certainty, while lower values indicate less certainty. Finally, the Vuong-Lo-Mendall-Rubin and Lo-Mendall-Rubin statistics compare a model with K number of classes to a model with K-1 classes. Statistically significant values (p < .05) indicate that the model with K classes provides a better fit to the data. These four criteria were used to determine model selection for further analyses.

After identifying latent classes based on peer nominated social and behavioral characteristics, descriptive statistics were examined including demographic variables (i.e., gender, ethnicity) and mean ICS-T factor scores to further describe each cluster of isolates.

**Research Question 2.** To address the second research question of which social/behavioral characteristics are related to more persistent isolation over time, bivariate correlations were first run between peer nomination variables at the end of second grade, as well as social preference and social impact, and number of waves of isolation in third grade (ranging from 0 to 3). Statistically significant correlations (p < .05) indicated that a specific characteristic at the end of second grade was related to more persistent isolation over time in third grade. In order to examine differences among LCA classes on persistence of isolation, one-way analysis of variance (ANOVA) was conducted with class as a factor and the number of waves of isolation as the outcome variable. Next, a series of regression analyses were run to examine the predictive power of individual social and behavioral characteristics (i.e., aggression, shyness, peer victimization) on persistence of isolation in third grade. Finally, to examine gender differences, correlations and descriptive statistics were run separately by gender.

**Research Question 3.** To further examine the relationships between peer victimization, isolation, and individual behavioral characteristics, path analysis was conducted using EQS for Windows 6.1 (Multivariate Software, Inc.) to test two hypothesized models. The first model
examined the relationships between shyness, victimization, and isolation and the second examined the relationships between these latter variables and aggression. In order to determine if relationships among variables remained the same between children previously identified as isolated in second grade ($n = 146$) and those identified as non-isolated ($n = 859$), a multi-group analytic approach was taken.

First, baseline models were tested simultaneously for each group using the same variables and patterns of path coefficients, with no equality constraints imposed. Several criteria were used to assess the goodness of fit of the hypothesized models to the observed data. The first was the chi-square statistic; however, due to its sensitivity to sample size (Bentler & Bonett, 1980), the following criteria were also used: (a) a ratio of chi-square to degrees of freedom less than 2 (Hair, Anderson, Tatham, & Black, 1995); (b) comparative-fit index [CFI] $\geq .95$; Hu & Bentler, 1999); and (c) a root mean square error of approximation (RMSEA $\leq .05$; Browne & Cudeck, 1993).

Next, all estimated path coefficients were constrained to be equal across both samples. The Wald test and Lagrange Multiplier test were used to identify which modifications to the parameters would result in a better fitting model for each group. After the best fitting model was identified for each group separately, constraints were again imposed across all common pathways. Model comparisons were made using the goodness of fit criteria described earlier as well as changes in chi-square, degrees of freedom, and CFI (Byrne, 2006).
Chapter 4

RESULTS

Descriptive Statistics

Prior to testing the proposed hypotheses, descriptive statistics were calculated to examine the assumptions associated with each analysis. Table 4-1 provides bivariate correlations between peer nomination variables at Wave 1.

Table 4-1 Bivariate Correlations among Peer Nomination Variables in Second Grade

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Cooperative</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Friendly</td>
<td>.70*</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Good Student</td>
<td>.68*</td>
<td>.72*</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Shy</td>
<td>.19*</td>
<td>.26*</td>
<td>.15*</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Sad</td>
<td>.03</td>
<td>.09*</td>
<td>.04</td>
<td>.40*</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Picked On</td>
<td>.02</td>
<td>.07*</td>
<td>.07*</td>
<td>.25*</td>
<td>.45*</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Aggression</td>
<td>-.17*</td>
<td>-.18*</td>
<td>-.16*</td>
<td>-.02</td>
<td>.13*</td>
<td>.30*</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Preference</td>
<td>.49*</td>
<td>.51*</td>
<td>.43*</td>
<td>.12*</td>
<td>-.12*</td>
<td>-.24*</td>
<td>-.56*</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>9. Impact</td>
<td>.33*</td>
<td>.31*</td>
<td>.29*</td>
<td>.09*</td>
<td>.11*</td>
<td>.28*</td>
<td>.41*</td>
<td>.01*</td>
<td>--</td>
</tr>
</tbody>
</table>

* p < .05

Not surprisingly, correlations between nominations for prosocial behaviors (i.e., Cooperative, Friendly, Good Student) were positive and statistically significant (p < .05), and in turn, these behaviors were related to higher social preference and social impact scores. Conversely, aggression was related to being sad, victimization, and being disliked, but positively related to higher visibility within classrooms. Shyness was related to being prosocial and slightly
well-liked, but also sad and picked on. Students nominated as shy were not viewed as aggressive by their peers. Finally, peer victimization (i.e., Picked on) was related to being aggressive, disliked, slightly prosocial, and sad.

Table 4-2 provides bivariate correlations between teacher-rated social/behavioral characteristics on the ICS-T and peer nomination variables in second grade.

Table 4-2 *Bivariate Correlations among Peer Nomination and ICS-T Variables across Second and Third Grade*

<table>
<thead>
<tr>
<th>Peer Nominations</th>
<th>Aggression</th>
<th>Academic Achievement</th>
<th>Affiliation</th>
<th>Popularity</th>
<th>Olympian</th>
<th>Internalizing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooperative</td>
<td>-.34*</td>
<td>.09</td>
<td>.28*</td>
<td>.33*</td>
<td>.15</td>
<td>-.05</td>
</tr>
<tr>
<td>Friendly</td>
<td>-.38*</td>
<td>.04</td>
<td>.37*</td>
<td>.31*</td>
<td>.25</td>
<td>-.02</td>
</tr>
<tr>
<td>Good Student</td>
<td>-.15</td>
<td>.30*</td>
<td>.15</td>
<td>.23</td>
<td>.23</td>
<td>-.11</td>
</tr>
<tr>
<td>Shy</td>
<td>-.12</td>
<td>-.18</td>
<td>-.09</td>
<td>-.25</td>
<td>-.24</td>
<td>.24</td>
</tr>
<tr>
<td>Sad</td>
<td>.25</td>
<td>.07</td>
<td>-.12</td>
<td>-.21</td>
<td>-.37*</td>
<td>.19</td>
</tr>
<tr>
<td>Picked On</td>
<td>.42*</td>
<td>-.24</td>
<td>-.37*</td>
<td>-.51*</td>
<td>-.55*</td>
<td>.27</td>
</tr>
<tr>
<td>Aggression</td>
<td>.54*</td>
<td>-.04</td>
<td>-.34*</td>
<td>-.32*</td>
<td>-.28*</td>
<td>-.03</td>
</tr>
</tbody>
</table>

*p < .05

Consistency between teacher and peer ratings of social/behavioral characteristics was small to moderate. The greatest consistencies in ratings occurred for aggression (*r* = .54) and academic achievement (*r* = .30). Children who were viewed as aggressive by their teachers also tended to be viewed as aggressive, picked on, and less prosocial by their peers. Conversely, peer-nominated prosocial behaviors were related to more positive teacher-rated characteristics (i.e., Affiliation and Popularity). Peer victimization was related to higher teacher-rated aggression, and
lower teacher-rated popularity, affiliation, and physical competence. There was less consistency across peer and teacher ratings of internalizing behaviors ($r = .24$). Teacher ratings on the Internalizing factor of the ICS-T were positively related to peer nominations for sad and picked on, although these correlations were not statistically significant.

**Research Question 1**

The first hypothesis was that at least three groups of socially isolated children would emerge: aggressive/rejected, internalizing/neglected, and unsociable, with this latter group characterized by low numbers of nominations and neglected sociometric status. AIC, BIC, entropy values, and Vuong-Lo-Mendell-Rubin and Lo-Mendell-Rubin statistics values for each of the tested models are reported in Table 4-3.

<table>
<thead>
<tr>
<th>Number of Classes in Model</th>
<th>AIC</th>
<th>BIC</th>
<th>Entropy</th>
<th>Vuong-Lo-Mendell-Rubin Likelihood Ratio Test</th>
<th>Lo-Mendell-Rubin Adjusted LRT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1425.60</td>
<td>1452.45</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>2</td>
<td>1321.00</td>
<td>1377.69</td>
<td>.77</td>
<td>-703.80 ($p = .045$)</td>
<td>122.15 ($p = .047$)</td>
</tr>
<tr>
<td>3</td>
<td>1255.80</td>
<td>1342.33</td>
<td>.90</td>
<td>-641.50 ($p = .014$)</td>
<td>83.53 ($p = .015$)</td>
</tr>
<tr>
<td>4</td>
<td>1255.65</td>
<td>1372.01</td>
<td>.86</td>
<td>-598.90 ($p = 1.00$)</td>
<td>19.75 ($p = 1.00$)</td>
</tr>
</tbody>
</table>

For the tested models, AIC values decreased as the number of classes increased from 1 to 4, suggesting that the 4-class solution provided the best fit to the data. Conversely, BIC values decreased from 1 to 3 classes, and then increased from 3 to 4 classes, providing support for the 3-
class solution. Typically when there is a contradiction between information criteria, BIC values are preferred over AIC values (Nylund, Asparouhov, & Muthén, 2007). Likewise, the difference in AIC values between the 3- and 4-class models was minimal. Although differences in entropy values were slight, the 3-class solution had the highest value. Finally, the Vuong-Lo-Mendall-Rubin and Lo-Mendall-Rubin statistics were not statistically significant when moving from a 3- to a 4-class solution. Collectively, these results suggested that the 3-class model provided the best fit to the data for isolates; thus, this model was selected as the best fitting model and used in subsequent analyses. Table 4-4 provides a summary of latent class probabilities and item-response probabilities based on class membership for the 3-class model.

Table 4-4 Conditional Item-Response Probabilities of Latent Class Membership (N=146)

<table>
<thead>
<tr>
<th></th>
<th>Class 1 Active Isolates (n = 32)</th>
<th>Class 2 Passive-Anxious (n = 27)</th>
<th>Class 3 Low Salience (n = 87)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latent Class Probabilities</td>
<td>95.3</td>
<td>95.8</td>
<td>95.8</td>
</tr>
<tr>
<td>Item-Response Probabilities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooperative</td>
<td>.11</td>
<td>.94</td>
<td>.00</td>
</tr>
<tr>
<td>Friendly</td>
<td>.22</td>
<td>.70</td>
<td>.09</td>
</tr>
<tr>
<td>Good Student</td>
<td>.20</td>
<td>.64</td>
<td>.11</td>
</tr>
<tr>
<td>Shy</td>
<td>.35</td>
<td>.49</td>
<td>.07</td>
</tr>
<tr>
<td>Sad</td>
<td>.76</td>
<td>.42</td>
<td>.10</td>
</tr>
<tr>
<td>Picked On</td>
<td>.83</td>
<td>.32</td>
<td>.00</td>
</tr>
<tr>
<td>Aggressive</td>
<td>.69</td>
<td>.02</td>
<td>.09</td>
</tr>
<tr>
<td>SMS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rejected</td>
<td>.63</td>
<td>.00</td>
<td>.13</td>
</tr>
<tr>
<td>Neglected</td>
<td>.18</td>
<td>.55</td>
<td>.67</td>
</tr>
<tr>
<td>Other</td>
<td>.19</td>
<td>.45</td>
<td>.20</td>
</tr>
</tbody>
</table>
Latent class probabilities were 95.3, 95.8, and 95.8, respectively, indicating a high degree of probability that isolates were correctly classified. Class 1 comprised 21.9% of the sample ($n = 32$). This class was nominated by their peers as being sad, picked on, and aggressive. Members of this class were not prosocial, and were less likely to be shy. Of the sociometric status categories, members of this class were most likely to be rejected by their peers. This class of children was conceptually most similar to the socially isolated subtype from previous research (Rubin & Asendorpf), and thus was labeled as *Active Isolates*. Class 2 comprised 18.5% of the sample ($n = 27$). This class was the most likely to be shy out of all three classes. Members of this class were overall prosocial (i.e., cooperative and friendly) and good students, but also had a moderate probability of being sad. Of the five sociometric status categories, Class 2 members had the highest likelihood of being neglected, followed by other. This class was labeled as *Passive-Anxious*, being most similar to this subtype previously identified by Rubin and mills (1988). Finally, Class 3 comprised the largest percentage of isolates (59.6%). Compared to the other classes, this class had the lowest probabilities of being nominated for any of the peer nomination variables. Likewise, members of this class were more likely than either of the other classes to be categorized as neglected by their peers. Although this class was conceptually similar to the *Unsociable* subtype identified in previous work (e.g., Rubin & Asendorpf, 1993), there were not enough data to conclude whether these children actively chose to withdraw from the peer group or not. Thus, Class 3 was labeled as *Low Salience* to reflect low numbers of nominations as well as neglected sociometric status.

To further describe each of these three classes, gender and the means and standard deviations of teacher-rated social and behavioral characteristics on the ICS-T are provided in Table 4-5.
Table 4-5 *Gender and Mean ICS-T Scores for each Subtype of Isolation*

<table>
<thead>
<tr>
<th></th>
<th>Class 1</th>
<th>Class 2</th>
<th>Class 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Active Isolates</td>
<td>Passive-Anxious</td>
<td>Low Salience</td>
</tr>
<tr>
<td></td>
<td>(n = 32)</td>
<td>(n = 27)</td>
<td>(n = 87)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>64.5%</td>
<td>19.3%</td>
<td>63.5%</td>
</tr>
<tr>
<td>Female</td>
<td>35.5%</td>
<td>80.8%</td>
<td>36.5%</td>
</tr>
<tr>
<td>ICS-T</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic</td>
<td>4.47 (1.69)</td>
<td>4.74 (1.81)</td>
<td>4.44 (1.97)</td>
</tr>
<tr>
<td>Achievement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affiliation</td>
<td>4.24 (.92)</td>
<td>5.85 (1.04)</td>
<td>5.24 (1.30)</td>
</tr>
<tr>
<td>Popularity</td>
<td>3.25 (1.03)</td>
<td>4.86 (1.45)</td>
<td>4.37 (1.43)</td>
</tr>
<tr>
<td>Olympian</td>
<td>3.69 (4.51)</td>
<td>4.51 (1.20)</td>
<td>4.65 (1.40)</td>
</tr>
<tr>
<td>Internalizing</td>
<td>3.76 (1.01)</td>
<td>3.76 (1.27)</td>
<td>3.41 (1.08)</td>
</tr>
<tr>
<td>Aggression</td>
<td>4.12 (1.24)</td>
<td>1.73 (.93)</td>
<td>2.76 (1.68)</td>
</tr>
<tr>
<td>Overall</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interpersonal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Competence</td>
<td>3.91 (.75)</td>
<td>5.25 (.87)</td>
<td>4.79 (.98)</td>
</tr>
</tbody>
</table>

Consistent with peer nominations, members of the *Active Isolates* class were rated by teachers as being the most aggressive of the three groups. Although children in this class received low rating for the internalizing factor, their mean scores were comparable to those of the other two classes. Children in Class 1 were also rated as lowest popularity, affiliation, physical competence (i.e., Olympian factor), and overall interpersonal competence. There were more boys than girls in this class. Teacher ratings for the *Passive Anxious* class were also fairly consistent with peer ratings. Children in this class were rated by teachers on the ICS-T as academic achievers, affiliative (i.e., prosocial), and low-aggressive. Ratings of popularity were highest for
this class when compared to the other classes. Contrary to peer ratings, members of the Passive Anxious class received low ratings on the Internalizing factor. Overall, this class had the highest Overall Interpersonal Competence ratings of the three classes. There were more girls than boys in this class. Finally, the Low Salience class received moderate ratings for all of the ICS-T variables. Members of this class had the lowest ratings for the Academic Achievement and Internalizing factors. There were more boys than girls in this class.

**Research Question 2**

In order to examine whether specific behavioral characteristics were related to persistent isolation over time, data from Winter of their third grade year were analyzed for the original sample of 146 isolates. Peer nomination data were available for all 146 participants for the Winter time point. Bivariate correlations were first calculated to examine the relationship between peer nominated social/behavioral characteristics between Spring of second grade and Winter of third grade (Table 4-6).
Table 4-6  *Bivariate Correlations among Peer Nomination Variables across Second and Third Grade*

<table>
<thead>
<tr>
<th>Third Grade</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Second Grade</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Cooperative</td>
<td>.35*</td>
<td>.39*</td>
<td>.41*</td>
<td>.10*</td>
<td>-0.05</td>
<td>-0.05</td>
<td>-0.12*</td>
<td>.36*</td>
<td>.17*</td>
</tr>
<tr>
<td>2. Friendly</td>
<td>.39*</td>
<td>.45*</td>
<td>.42*</td>
<td>.15*</td>
<td>-0.01</td>
<td>-0.06</td>
<td>-0.17*</td>
<td>.36*</td>
<td>.13*</td>
</tr>
<tr>
<td>3. Good Student</td>
<td>.40*</td>
<td>.47*</td>
<td>.58*</td>
<td>.09*</td>
<td>-0.06</td>
<td>-0.07</td>
<td>-0.13*</td>
<td>.35*</td>
<td>.15*</td>
</tr>
<tr>
<td>4. Shy</td>
<td>.14*</td>
<td>.16*</td>
<td>.11*</td>
<td>.47*</td>
<td>.34*</td>
<td>.03</td>
<td>-0.06</td>
<td>.07</td>
<td>-0.05</td>
</tr>
<tr>
<td>5. Sad</td>
<td>-0.03</td>
<td>-0.01</td>
<td>0.02</td>
<td>.33*</td>
<td>.45*</td>
<td>.20*</td>
<td>.12*</td>
<td>-0.15*</td>
<td>0.04</td>
</tr>
<tr>
<td>6. Picked On</td>
<td>-0.02</td>
<td>-0.01</td>
<td>0.00</td>
<td>.09*</td>
<td>.24*</td>
<td>.29*</td>
<td>.22*</td>
<td>-.23*</td>
<td>0.10*</td>
</tr>
<tr>
<td>7. Aggressive</td>
<td>-0.17*</td>
<td>-0.18*</td>
<td>-0.15*</td>
<td>-0.05</td>
<td>0.03</td>
<td>0.09*</td>
<td>.50*</td>
<td>-0.39*</td>
<td>0.15*</td>
</tr>
<tr>
<td>8. Preference</td>
<td>.28*</td>
<td>.29*</td>
<td>.29*</td>
<td>0.06</td>
<td>-0.09*</td>
<td>-0.14*</td>
<td>-0.29*</td>
<td>.46*</td>
<td>0.04</td>
</tr>
<tr>
<td>9. Impact</td>
<td>.13*</td>
<td>.17*</td>
<td>.17*</td>
<td>0.07</td>
<td>0.01</td>
<td>0.02</td>
<td>.22**</td>
<td>0.03</td>
<td>.27*</td>
</tr>
</tbody>
</table>

As can be seen from Table 4-6, there were positive and statistically significant relationships between prosocial behaviors across second and third grade. Prosocial behaviors were moderately stable between second and third grade. There was a small albeit statistically significant relationship between prosocial behaviors in second grade and being nominated as Shy in third grade. Aggression was also relatively stable over time \((r = .50)\), and negatively related to prosocial behaviors and being well-liked, but positively related to social impact and being sad and picked on. Shyness was also relatively stable over time \((r = .47)\). Children who were nominated as shy in second grade also tended to receive higher nominations for prosocial behaviors and being sad and picked on in third grade. Shyness in second grade was not related to social preference or social impact in third grade. Finally, there was a small-moderate positive correlation between nominations for picked on across second and third grade \((r = .29)\). Children
who received these nominations in second grade tended to receive higher nominations for being sad and aggressive and lower nominations for being well-liked, in third grade.

**Differences among Classes.** Table 4-7 provides a summary of the number of third grade waves in which each class of second grade isolates were again identified as isolated.

Table 4-7 Waves of Third Grade Isolation for Each Second Grade Latent Class

<table>
<thead>
<tr>
<th># of Waves of Isolation (Third Grade)</th>
<th>Second Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Class 1</td>
</tr>
<tr>
<td></td>
<td>Active Isolates</td>
</tr>
<tr>
<td></td>
<td>(n = 32)</td>
</tr>
<tr>
<td>0</td>
<td>50.0%</td>
</tr>
<tr>
<td>1</td>
<td>28.1%</td>
</tr>
<tr>
<td>2</td>
<td>15.6%</td>
</tr>
<tr>
<td>3</td>
<td>6.3%</td>
</tr>
</tbody>
</table>

As can be seen from this table, the majority of children identified as isolated at the end of second grade were no longer considered isolated at any time point during third grade. Of the three classes, children in the Low Salience group were least likely to be identified as isolated at any time point in third grade, whereas children in the Active Isolates group were most likely to be isolated for one or more time points. No children in the Passive Anxious class in second grade were identified as isolated at all three time points in third grade, while children in the Active Isolates class were most likely of the three classes to be isolated at all three time points.

In order to determine if there were statistically significant differences between the three classes in the number of waves they were isolated in third grade, an ANOVA was conducted with
waves of third grade isolation as the outcome variable and class as the categorical factor. Table 4-8 presents the results of the ANOVA.

Table 4-8 ANOVA Results for Class on Waves of Isolation

<table>
<thead>
<tr>
<th>Factors</th>
<th>df</th>
<th>SS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class</td>
<td>2</td>
<td>1.37</td>
<td>1.00</td>
<td>.37</td>
</tr>
</tbody>
</table>

The main effect for class indicated that there were not significant differences between classes on the number of waves they were identified as isolated in third grade. Due to these nonsignificant findings, subsequent analyses attempted to identify the specific social and behavioral characteristics related to persistent isolation over time for the total sample of children \( n = 146 \) identified as isolated at the end of second grade.

Based on the reviewed research, a regression model was specified with aggression, prosocial behaviors, shyness, and peer victimization as predictor variables, and the number of waves of isolation in third grade as the outcome variable (Table 4-9).

Table 4-9 Results of Regression Analysis Predicting Third Grade Waves of Isolation by Student Behavior in Second Grade

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Beta</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>--</td>
<td>4.94</td>
<td>.00</td>
</tr>
<tr>
<td>Picked On</td>
<td>.28</td>
<td>2.43</td>
<td>.02</td>
</tr>
<tr>
<td>Shy</td>
<td>.06</td>
<td>.71</td>
<td>.48</td>
</tr>
<tr>
<td>Aggression</td>
<td>-.06</td>
<td>-.66</td>
<td>.51</td>
</tr>
<tr>
<td>Prosocial</td>
<td>-.06</td>
<td>-.68</td>
<td>.50</td>
</tr>
</tbody>
</table>
The regression model only accounted for a small proportion of variance in waves of isolation ($R^2 = .05$). Of the predictor variables, peer victimization was the only variable to make an independent contribution to the prediction of persistent isolation in third grade, over and above the other predictor variables in the model. For subsequent models, interaction terms were created between the Shy and Picked On variables, and Aggression and Picked On. A hierarchical regression analysis was conducted to determine if the interaction terms could predict persistence of isolation over and above peer victimization alone (Table 4-10).

### Table 4-10 Results of Hierarchical Regression Analysis Predicting Third Grade Waves of Isolation by Student Behavior in Second Grade

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Beta</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>--</td>
<td>5.44</td>
<td>.00</td>
</tr>
<tr>
<td>Picked On</td>
<td>.21</td>
<td>2.57</td>
<td>.01</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aggression x Picked On</td>
<td>.04</td>
<td>.29</td>
<td>.78</td>
</tr>
<tr>
<td>Shy x Picked On</td>
<td>.11</td>
<td>1.02</td>
<td>.31</td>
</tr>
</tbody>
</table>

In the first step of the model, peer victimization was a statistically significant predictor of persistence of isolation in third grade. The interaction terms for Aggression and Picked On and Shy and Picked On in the second step of the model did not add prediction to persistence of isolation over and above peer victimization alone. These results suggest that peer victimization
predicted increased isolation over time, regardless of aggressive and shy behavioral characteristics.

**Gender Differences.** To examine whether behavioral characteristics were differentially related to isolation over time based on gender, bivariate correlations were calculated separately for boys and girls. These results are presented in Table 4-11.

Table 4-11 *Bivariate Correlations between Peer Nomination Variables in Second Grade and Third Grade Waves of Isolation for Girls and Boys*

<table>
<thead>
<tr>
<th>Waves of Isolation</th>
<th>Girls (n = 67)</th>
<th>Boys (n = 79)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooperative</td>
<td>-.09</td>
<td>.18</td>
</tr>
<tr>
<td>Friendly</td>
<td>-.16</td>
<td>.12</td>
</tr>
<tr>
<td>Good Student</td>
<td>-.09</td>
<td>-.04</td>
</tr>
<tr>
<td>Shy</td>
<td>.04</td>
<td>.14</td>
</tr>
<tr>
<td>Sad</td>
<td>.18</td>
<td>.26*</td>
</tr>
<tr>
<td>Picked On</td>
<td>.05</td>
<td>.39**</td>
</tr>
<tr>
<td>Aggression Factor</td>
<td>-.001</td>
<td>.10</td>
</tr>
<tr>
<td>Social Preference</td>
<td>-.11</td>
<td>-.28*</td>
</tr>
<tr>
<td>Social Impact</td>
<td>.06</td>
<td>.22</td>
</tr>
</tbody>
</table>

Correlations between waves of isolation and peer nominated sadness, victimization, and social preference were statistically significant for boys only. Boys who received more nominations for being sad and picked on, and/or fewer nominations for being well-liked, were more likely to be isolated at one or more time points in third grade. Although correlations for girls followed the same trend, they were smaller in magnitude and nonsignificant. These results
suggest that being sad, picked on, and disliked may be more detrimental for boys’ peer relations than girls’. Aggressive and prosocial (i.e., cooperative, friendly) behaviors, academic achievement, shyness, and social impact were not significantly related to isolation over time; however, some interesting differences in trends occurred between boys and girls. Whereas prosocial behaviors were negatively related to persistent isolation for girls, these characteristics were positively related to persistent isolation for boys. Likewise, correlations between waves of isolation and the aggression and shy variables were positive and larger for boys than girls. These results suggest that prosocial behaviors may be more valued and related to positive peer relationships for girls than boys, and conversely, aggressive behaviors and shyness are slightly more problematic for boys than girls.

Finally, descriptive statistics including means and standard deviations for children with differing levels of isolation are presented in Table 4-12, by gender. Figure 4-1 present a graphical representation of these same data for girls, and Figure 4-2 provides these data for boys.

Table 4-12 Means of Peer Nomination Variables for Differing Waves of Isolation by Gender

<table>
<thead>
<tr>
<th>Waves of Isolation in Third Grade</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boys</td>
<td>Girls</td>
<td>Boys</td>
<td>Girls</td>
</tr>
<tr>
<td></td>
<td>(n = 52)</td>
<td>(n = 37)</td>
<td>(n = 19)</td>
<td>(n = 13)</td>
</tr>
<tr>
<td>Cooperative</td>
<td>8.44</td>
<td>34.83</td>
<td>9.07</td>
<td>66.11</td>
</tr>
<tr>
<td>Friendly</td>
<td>11.83</td>
<td>35.06</td>
<td>13.28</td>
<td>55.83</td>
</tr>
<tr>
<td>Good Student</td>
<td>11.71</td>
<td>38.17</td>
<td>6.97</td>
<td>54.32</td>
</tr>
<tr>
<td>Shy</td>
<td>22.63</td>
<td>35.21</td>
<td>25.92</td>
<td>81.34</td>
</tr>
<tr>
<td>Sad</td>
<td>23.81</td>
<td>34.51</td>
<td>37.04</td>
<td>25.64</td>
</tr>
<tr>
<td>Picked On</td>
<td>21.58</td>
<td>40.17</td>
<td>37.93</td>
<td>39.55</td>
</tr>
<tr>
<td>Aggressive</td>
<td>47.93</td>
<td>24.29</td>
<td>33.40</td>
<td>34.21</td>
</tr>
</tbody>
</table>
Note. There were no boys with isolated status at all three waves.

Figure 4-1 Mean Peer Nomination Scores by Number of Waves of Isolation for Girls

Figure 4-2 Mean Peer Nomination Scores by Number of Waves of Isolation for Boys
For girls, there was a general downward trend for prosocial behaviors (i.e., cooperative and friendly) and academic achievement as waves of isolation went from 0 to 3. In other words, more persistent isolation for girls was related to lower peer nominations of prosocial behaviors. Conversely, for boys, there was a slightly upwards trend between prosocial behaviors and waves of isolation. Peer nomination scores for the cooperative and friendly variables tended to increase with persistent isolation. Academic achievement remained relatively stable across waves of isolation for boys. There was a quadratic effect for both genders on aggression, albeit in different directions. For girls, nominations of aggression increased from 0 to 2 waves of isolation, but were lowest for 3 waves; for boys, aggression decreased from 0 to 1 waves of isolation, and was highest for 2 waves. Nominations of being shy were highest for one and three waves of isolation for girls, while there was a general increase for boys from 0 to 2 waves of isolation. For the picked on variable, nominations increased slightly but remained relatively stable across waves of isolation for girls; conversely, nominations for picked on increased dramatically between 0 and 2 waves of isolation for boys. Finally, there was an upward trend for both genders on the sad variable, in that nominations for being sad increased with wave of isolation; however, this trend was more pronounced for girls than boys.

In summary, consistent with correlational data provided in Table 13, it appears that there are gender differences in the relationship between peer nominated social and behavioral characteristics and persistence of isolation. For girls, lower nominations for prosocial behaviors and academic achievement were related to more persistent isolation in third grade, and nominations for being aggressive and/or picked on do not appear to have a direct relationship. For boys, higher nominations for prosocial behaviors and being picked on are related to more persistent isolation, and academic achievement does not appear to have a direct relationship.
Research Question 3

To further examine the relationships between peer victimization, isolation, and individual behavioral characteristics, path analyses were conducted using EQS (Bentler, 1995). Two models were proposed and tested to examine shyness and aggression separately. To determine if these relationships differed for previously identified isolated and non-isolates in second grade, models were tested using a multiple group design to determine whether each model was invariant across these two groups.

The baseline model with no constraints imposed for Shy behaviors provided an adequate fit to the data, although falling slightly short of a prior fit criteria, $\chi^2 (14) = 56.26, p = .000$, CFI = .92, RMSEA = .09, SRMR = .06. Figures 4-3 and 4-4 present the standardized solution for the path analysis model examining shy behaviors for isolates and non-isolates, respectively.

![Path Model for Shyness, Social Isolation, and Victimization for Isolated Children in Second Grade (Standardized Coefficients)]
Shyness and victimization were both relatively stable between second and third grade for both groups of children. Shyness appeared to be a slightly stronger predictor of victimization for non-isolates in second grade, whereas victimization was a stronger predictor of subsequent isolation for previously identified isolates. All pathways in the model were next constrained to be equal across both groups, to determine if this model best explained the relationship among variables for both groups. Constraining all path coefficients resulted in degradation of model fit ($\Delta \chi^2(9) = 35.72, p < .01, \chi^2/df = 3.97, CFI = .87, RMSEA = .09$). Based on the results of the Lagrange Multiplier test, adding a pathway between shyness in second grade and victimization in third grade for non-isolates resulted in a better model fit for this group. All constraints between path coefficients were again imposed between groups (see Figure 4-5). This model provided good fit to the data ($\chi^2(21) = 39.06, p < .01, \chi^2/df = 1.86, CFI = .97, RMSEA = .05$). All parameter estimates were statistically significant ($p < .05$), with effect sizes ($R^2$) ranging from .05 to .26 for isolates, and .03 to .22 for non-isolates.
Isolates (Second Grade)

<table>
<thead>
<tr>
<th>Grade 2</th>
<th>Grade 3 Winter</th>
<th>Grade 3 Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shy</td>
<td>.52</td>
<td>Shy</td>
</tr>
<tr>
<td>.28</td>
<td></td>
<td>.23</td>
</tr>
<tr>
<td>Picked On</td>
<td>.26</td>
<td>Picked On</td>
</tr>
<tr>
<td></td>
<td>.08</td>
<td>.11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Isolation</td>
</tr>
<tr>
<td>Isolation</td>
<td>.37</td>
<td></td>
</tr>
</tbody>
</table>

Non-Isolates (Second Grade)

<table>
<thead>
<tr>
<th>Grade 2</th>
<th>Grade 3 Winter</th>
<th>Grade 3 Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shy</td>
<td>.47</td>
<td>Shy</td>
</tr>
<tr>
<td>.27</td>
<td></td>
<td>.20</td>
</tr>
<tr>
<td>Picked On</td>
<td>.33</td>
<td>Picked On</td>
</tr>
<tr>
<td></td>
<td>.11</td>
<td>.12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Isolation</td>
</tr>
<tr>
<td>Isolation</td>
<td>.36</td>
<td></td>
</tr>
</tbody>
</table>

Figure 4-5 Best Fitting Path Models for Shyness, Social Isolation, and Victimization for Isolated and Non-Isolated Children in Second Grade (Standardized Coefficients)

The same original model with no constraints was next run to examine Aggression. This model provided a good fit to the data ($\chi^2$ (14) = 33.11, $p < .01$, $\chi^2 / df = 2.37$, CFI = .97, RMSEA =
Figures 4-6 and 4-7 present the standardized solution for this model for isolates and non-
isolates, respectively.

Figure 4-6 Path Model for Aggression, Social Isolation, and Victimization for Isolated Children in Second Grade (Standardized Coefficients)

Figure 4-7 Path Model for Aggression, Social Isolation, and Victimization for Non-Isolated Children in Second Grade (Standardized Coefficients)

Similar to the path model for shy behaviors, social isolation, peer victimization, and aggression were all moderately stable over time. Aggression was a stronger predictor of
victimization for isolates than non-isolates, particularly in second grade. Likewise, victimization was a stronger predictor of subsequent isolation for previously identified isolates than non-isolates. Constraining all pathways to be equal across groups again resulted in a degradation of model fit ($\Delta \chi^2 (9) = 39.97, p < .001, \chi^2 / df = 4.44, \text{CFI} = .92, \text{RMSEA} = .08$). Based on the results of the Wald and Lagrange Multiplier tests, pathways between victimization and isolation for non-isolates were eliminated, and pathways between aggression in second grade and victimization and isolation in third grade were added. These changes resulted in a better fitting model for non-isolates. Equality constraints between common pathways were again imposed (see Figure 4-8). This multi-group model provided a good fit to the data ($\chi^2 (18) = 35.77, p < .01, \chi^2 / df = 1.99, \text{CFI} = .97, \text{RMSEA} = .05$). All parameter estimates were statistically significant ($p < .05$), and effect size ranged from .09 to .30 for isolates and .02 to .25 for non-isolates.
Isolates in Second Grade

Grade 2  
Aggression  →  .50  →  Aggression  Grade 3 Winter  
Picked On  →  .22  →  Picked On  
Isolation  →  .23  →  Isolation  Grade 3 Spring  

Non-Isolates in Second Grade

Grade 2  
Aggression  →  .37  →  Aggression  Grade 3 Winter  
Picked On  →  .30  →  Picked On  
Isolation  →  .14  →  Isolation  Grade 3 Spring  

Figure 4-8 Best Fitting Path Models for Aggression, Social Isolation, and Victimization for Isolated and Non-Isolated Children in Second Grade (Standardized Coefficients)
Chapter 5
DISCUSSION

The present study sought to take a person-centered approach in identifying the social and behavioral characteristics of social withdrawal and isolation, and their relationship with persistent isolation over time. Previous research (e.g., Rubin, 1982; Rubin & Asendorpf, 1993) has identified subtypes of isolation and withdrawal, typically based on observations of different types of interactions with other children in play situations; however, the use of a social network perspective has not been previously used to identify heterogeneity in social and behavioral characteristics among children identified as isolated. In addition, while previous research has typically focused on individual-level factors that contribute to withdrawal and isolation (e.g., Rubin, 2009), less focus has been placed on the environmental and contextual factors, such as peer relations, that play a role in developing and maintaining isolation over time.

Heterogeneity in Isolation

Based on the extensive work of Rubin and colleagues (e.g., Rubin, 1982; Rubin & Asendorpf, 1993), it was hypothesized that at least three sub-groups of isolation would emerge: an actively-isolated group, a passive-anxious group, and an unsociable group. Results from LCA supported this hypothesis, as a model yielding three classes provided the best fit to the data. The first was characterized by peer nominations for aggression, sadness, and peer victimization. This subtype is conceptually similar to the active isolate subtype proposed by Rubin (1982). Children in this class appeared to be actively excluded by their peers, as evidenced by higher levels of being picked on and a higher likelihood of sociometric rejection. Teacher ratings additionally
suggested that children in this class had the lowest levels of popularity, affiliation with other peers, and interpersonal competence.

The second subtype identified in the present study, labeled passive anxious, was characterized by peers as shy and sad, and was most likely to be neglected by their peers rather than actively rejected. Interestingly, children in this class were also viewed as prosocial (i.e., cooperative, friendly) and good students by their peers. While prosocial behaviors are typically thought to be a protective factor against peer difficulties and other forms of negative outcomes, they may actually serve a maladaptive function for socially withdrawn children. For example, Oh et al. (2008) found that peer perceptions of prosocial behaviors helped distinguish increasing versus decreasing trajectories of subsequent withdrawal over time. Children who are socially withdrawn may acquiesce to the demands of other children, thereby making them easier targets for victimization or exclusion.

The third and final subtype of withdrawal/isolation identified in the present study was characterized by low numbers of nominations for all social and behavioral characteristics, and were thus labeled as Low Salience. This subtype may be most closely associated with the unsociable subtype from previous research (Rubin & Asendorf, 1993). The majority of children (59.6%) identified as isolated in Grade 2 fell within this class. Although it cannot be ascertained from the present data whether these children were actively choosing to exclude themselves from their peers, they did not appear to have negative behavioral characteristics that would lead to rejection or exclusion by peers. In fact, similar to findings by Harrist et al. (1997), children in this class were most likely to be neglected by their peers. They also were neither nominated as being shy by peers nor victimized by peers. Finally, the largest proportion of children in this class as compared to the other two classes was not isolated at any time point in third grade.
Stability of Isolation over Time

Overall, isolation as measured in the present study was not a stable phenomenon. Of the 146 children identified as isolated, 53.7% were not isolated at any time point in third grade, and only 14.4% were isolated at multiple waves. Past research suggests that socially withdrawn children are as likely as their non-withdrawn counterparts to have at least one mutual best friend; however, these friendships tend to be less stable and of lower quality (Rubin et al., 2006), which may explain why many children in the present study entered in and out of isolation status between second and third grade.

It is also possible that the observed instability in isolation status was due to changing classrooms and thus different normative peer contexts in third grade. Depending on the social network structure and behavioral norms of a classroom, specific behaviors may be seen as maladaptive in one context and as adaptive in another. For example, Chang (2004) found social withdrawal and aggression were more acceptable in classrooms with high levels of these behaviors versus those with low levels. Therefore, classroom and peer group norms can have an impact on the extent to which aggressive and/or withdrawn behaviors are accepted, ignored, and/or shunned by peers.

Despite changing classrooms and the instability of isolation as measured in the current study, nearly 15% of children identified as isolated at the end of second grade continued to be isolated for two or three time points in third grade. It was hypothesized that behaviors related to active isolation (i.e., aggression, peer rejection) would be related to more persistent isolation over time. This hypothesis was partially supported. Contrary to expectations, subtype of isolation in second grade, in and of itself, was not a statistically significant predictor of persistent isolation in third grade. Although identifying subtypes of withdrawal and isolation demonstrates heterogeneity in this construct across children, subtype of isolation alone may not be predictive of
long-term outcomes. Even within subtype of withdrawal, different behavioral profiles and associated peer relations have been identified. For example, Gazelle (2008) identified four subgroups of anxious solitary children that were differentiated by agreeableness, normative behaviors, attention-seeking and immature behaviors, and externalizing behaviors. Not surprisingly, agreeable anxious solitary children demonstrated the most adaptive peer relations, while attention-seeking and immature behaviors were related to peer neglect and externalizing behaviors were related to peer victimization. Thus, looking at subtype alone may not fully capture individual differences and their interaction with the peer network.

In looking at the specific behavioral characteristics that predicted persistence in isolation, peer victimization was the only variable that added prediction to a regression model, over and above all other variables in the model (i.e., shyness, aggression, shyness x aggression). Higher levels of peer victimization were related to more persistent isolation over time, regardless of whether a child was aggressive, shy, or both. Peer victimization has been shown to be a robust predictor of aggressive and withdrawn behaviors and the persistence of these behaviors over time (Ladd, 2006; Oh et. al., 2008). Likewise, socially withdrawn children who experience peer victimization are much more likely to experience subsequent psychopathology than their non-victimized, withdrawn counterparts.

Consistent with prior research, gender differences also emerged in the outcomes of withdrawal and isolation. More persistent isolation was related to higher levels of internalizing behaviors (i.e., shy, sad) for boys. Social withdrawal and its associated behavioral characteristics such as shyness have been shown to be more strongly related to peer rejection (Gazelle & Ladd, 2003) and loneliness (Coplan, Closson, & Arbeau, 2007) in boys than in girls. Shy behaviors may violate male gender norms and thus appear as less socially acceptable (Rubin & Coplan, 2004). Conversely, in the present study, girls with the most persistent isolation tended to be not at all prosocial, and were considered sad and low academic achievers by their peers. Although
prosocial behaviors are thought to be universally related to peer preference (Stormshak, Bierman, Bruschi, Dodge, & Coie, 1999), prosocial behaviors have been shown to be more important for the peer acceptance of girls than boys (Crick, 1996; Gembeck, Geiger, & Crick, 2005).

**Pathways between Behavioral Characteristics, Isolation, and Victimization**

In order to further explore the interaction between social isolation and the peer relations, analyses were run to examine the interaction between individual peer nominated behavioral characteristics, peer victimization, and social isolation. The first noteworthy finding from these analyses was that the same pathways between shyness and peer victimization existed across previously isolated and non-isolated children, while pathways for aggression differed across these two groups. These findings suggest that in the present sample, shyness predicted peer victimization and in turn, peer victimization predicted subsequent isolation, regardless of previous isolation status. Interestingly, although shyness positively predicted concurrent victimization in second and third grade for both groups, shy behaviors in second grade were negatively related to victimization for non-isolates in third grade. Nonetheless, the magnitude and direction of the relationship between victimization and isolation were similar across both groups.

The second noteworthy finding was that peer victimization was more strongly related to subsequent isolation in third grade for aggressive children who were previously identified as isolated in second grade, than for aggressive children not previously identified as isolated. Although peer victimization has negative consequences for all children, not just those identified as socially isolated, a lack of friends may serve as an additional risk factor for this latter group. Compared to their aggressive or withdrawn only peers, aggressive-withdrawn children tend to viewed the least favorably by their peers (Hymel, Bowker, & Woody, 1993); however, mutual
friendship(s) may act as a buffer between peer difficulties and subsequent adjustment and social problems. For example, Laursen et al. (2007) found that social isolation predicted subsequent internalizing and externalizing problems for children without friends, while no such relationship was found among children with friends. Bukowski and Laursen (2010) found that trajectories between peer avoidance/exclusion and depressed affect over a 24-month period differed as a function of whether or not children had friends at various time points. Specifically, peer avoidance and exclusion were related to increases in depressed affect over time for children who were friendless, but not for children with friends.

Why would previously isolated, aggressive children be more affected by victimization than their non-isolated peers? One possible explanation is that previous isolation, in combination with aggressive behaviors, may give children a negative reputation with their peers. Social hierarchies in classrooms are often structured in such a way that more popular groups use exclusion and victimization as a means to maintain their prominence (Adler & Adler, 1995). More popular peers may victimize and ostracize isolated children in an effort to maintain their dominance, while less popular peers may do the same in an attempt to heighten their own social status (Adler & Adler, 1996). Once a child’s reputation as being socially isolated and disliked is established within their social context, members of more popular peer groups may use reputational biases as a way to further draw boundaries between themselves and those of lower social status (Hymel, Wagner, & Butler, 1990), thus maintaining subsequent peer adversity and problem behaviors over time. Peer reputations can have lasting effects on a child’s overall adjustment into adolescence (Morison & Masten, 1991) and even into adulthood (Gest, Sesma, Masten, & Tellegen, 2006).

Another possible mechanism by which victimization may more adversely impact previously isolated children is through negative peer perceptions. Ladd and Troop-Gordon (2003) found indirect pathways from friendlessness to psychological maladjustment that were
partially mediated by perceptions of peers. Specifically, children who experienced chronic friendlessness were less likely to view their peers as being supportive and trustworthy. Negative peer perceptions, in turn, may cause these children to attribute negative intentions to even ambiguous actions of peers, resulting in reactive forms of aggression (Salmivalli, Ojanen, Haanpaa, & Peets, 2005) and further victimization and isolation. Likewise, expectations of rejection may lead children to take a defensive stance in social situations by acting aggressively or withdrawing further from social situations (London, Downey, Bonica, & Paltin, 2007).

Finally, aggression may have served a different function for isolates and non-isolates. Research suggests that aggressive behaviors can actually be adaptive and serve to raise children to higher positions of social prominence within their classrooms. Socially competent children may use both aggressive and prosocial behaviors to manipulate their social structures and rise to the top of social hierarchies (Rodkin et al., 2000). Socially isolated children, on the other hand, may lack social competence and thus aggressive behaviors may provoke further victimization from their peers. Aggressive victims, also known as bully-victims, are often considered the most at-risk (compared to bullies or victims only) for psychopathology, antisocial behavior, poor attitudes towards school, peer rejection, and academic failure (Schwartz, 2000; Stein, Dukes, & Warren, 2007). While more socially competent children may use aggression to gain social goals, the behaviors of aggressive victims appear to be driven more by poor self-regulation, underlying emotional distress, and impulsivity (Schwartz, Proctor, & Chien, 2001).

**Social Network Isolation as a Measure of Withdrawal**

The results of the present study have implications for the use of a social network approach for measuring social withdrawal and isolation. Given the instability of this construct in the current study, it is possible that isolation as measured by a lack of peer group may not be a
sufficient indicator of withdrawal. Research has generally shown that social withdrawal and isolation are relatively stable across childhood and adolescence (Rubin & Burgess, 2001). Rather than using social network isolation as way of conceptualizing social withdrawal, it may better serve as an additional risk factor for persistent peer difficulties when combined with other variables, such as peer victimization.

The results of the present study also raise questions about exactly how problematic it is to have a lack of friendships. Although more likely to be neglected by peers, the majority of children identified as isolated in the present study were not shy, aggressive or victimized, and demonstrated average levels of teacher-rated interpersonal competence. This is consistent with prior research suggesting that children with neglected sociometric status are not necessarily an at-risk group, and in fact are similar to their sociometrically average peers (Newcomb, Bukowski, & Pattee, 1993). Likewise, most children in the present study identified as isolated in second grade did not continue to be isolated in third grade. In looking at the small subset of children who experienced persistent isolation over time, effect sizes for pathways between victimization and isolation were generally small. More research is clearly needed in this area. In an essay addressing research on friendships, Rubin (2004) raised valid questions to challenge assumptions that all children are in equal need of friendship, that children without friendships will not develop appropriate social interaction skills, and that all friendships provide opportunities for positive social and emotional growth.

**Limitations**

As with any study, the results of the present study must be interpreted in light of some limitations. The first was the relatively small sample size, which may have limited the capacity of the LCA analysis to identify subtypes. Given that there were only 146 participants, it is
possible that a larger sample may have produced a different solution for LCA analyses. Given sample size restrictions, it was also not possible to employ multi-level analytic techniques that would have better examined broader contextual factors and their effects on persistent isolation. For example, it is probable that as children entered different classrooms in third grade, the peer dynamics of each class changed, thus impacting the extent to which socially withdrawn and isolated behaviors were seen as acceptable or unacceptable. A second limitation is that, although subtypes identified in the present study were conceptually similar to those identified in past research, it is possible peer perceptions may not completely coincide with internal level factors. Although peer perceptions are an accurate measure of behavior, data from other sources (e.g., biological factors, teacher and parent report) would help corroborate these ratings and provide a more thorough picture of each subtype. A third limitation was the limited number of peer nomination variables available to measure behavioral characteristics associated with social withdrawal. In the present study, only the Shy variable was available (in conjunction with isolation) to describe socially withdrawn children. Although shyness is certainly an associated characteristic of withdrawal, it may not accurately capture this construct as it has been defined in the literature, and thus may have limited the ability to detect relationships among this subgroup of children. A fourth limitation was that friendships outside of the school setting were not assessed. Although the present sample may have been considered friendless within their classrooms, this does not necessarily mean that they did not have friends in other settings outside of school. Finally, although previous isolation emerged as a risk factor for victimization and subsequent isolation in the present study, data on the peer relations of children prior to Spring of second grade were not available; thus, it was not possible to conclude the direction of the relationship between these variables. Along these same lines, although several speculations were made as to the nature of the relationship between victimization and isolation in the present study, data were not available to directly test them.
Future Research Directions

The limitations of the present study highlight several potential directions for future research endeavors. First, models in which directionality can be further tested will help delineate whether isolation is caused by, the cause of, or reciprocally related to other variables including peer victimization, aggression, and shyness. Longitudinal studies following children from early in their schooling (i.e., preschool and kindergarten) will help determine which variables, if any, contribute to long-term stability of isolation. This type of study would also provide further insight regarding the stability of isolation throughout the elementary grades. Research is also needed to further study the mechanisms by which peer victimization contributes to stability in isolation over time. Second, multi-level analyses examining the effects of the classroom context and peer group norms on isolation are needed to determine whether these variables impact the formation and persistence of social network isolation. Finally, studies examining the correspondence between existing methods of measuring withdrawal/isolation and the use of the SCM procedure will help to further provide insight regarding the accuracy of these methods to identify social isolates.

Conclusion

The present study examined heterogeneity and stability of social withdrawal and isolation as measured through a social network perspective. Consistent with prior research employing person-centered approaches, three sub-types of isolation were identified based on peer nominated social and behavioral characteristics. Gender differences were observed in the relationship between behavioral characteristics and subsequent persistence of isolation. Contrary to expectations, peer victimization emerged as the only statistically significant predictor of
persistence in isolation, over and above aggression, shyness, and prosocial behaviors. Victimization was a more salient predictor of subsequent isolation for previously identified isolates than for non-isolates. Differences also emerged between isolates and non-isolates in the relationship between shy and aggressive behaviors and peer victimization. Although a small subset of isolated children (i.e., those with the highest levels of peer victimization) were at-risk for subsequent adverse peer relations, the majority of children identified as isolated in the present study were not shy or aggressive, and did not experience peer victimization or subsequent isolation. Future research should continue to examine the relationship between social isolation as measured in the present study, peer relations, and classroom contextual factors.
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