SOCIAL ISOLATION IN MIDDLE CHILDHOOD: VARIABILITY AND VULNERABILITY

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SOCIAL ISOLATION IN MIDDLE CHILDHOOD: VARIABILITY AND

VULNERABILITY

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To address debate about risk associated with isolated behaviors during middle childhood, the present study utilized an extreme group approach to examine behavioral characteristics and social functioning of a large sample of children in grades 2-5 who scored 1.5 standard deviations above the classroom mean on an extensively studied, psychometrically sound measure of isolated behavior: the Sensitive-Isolated scale of the Revised Class Play (RCP; Masten, Morison, & Pellegrini, 1985). Children viewed by peers as extremely sensitive-isolated (SI) were first compared to a non-isolated comparison group (COMP) matched one-to-one on classroom, race, and gender, with regard to risk for peer rejection and friendlessness. Risk and/or protective benefits conferred by specific demographic factors (gender, race, grade-level) and behavioral characteristics (academic and athletic competencies) were examined.

Regression analyses revealed that SI children were at significantly greater risk for friendlessness and peer rejection relative to COMP peers. There were no main or interactive effects of demographic variables. Main effects of poor academic and athletic abilities were shown for peer rejection and friendlessness; poorer abilities were associated with increased risk for these outcomes. No interactive effects of academic or athletic abilities with group membership were demonstrated.

Latent class analyses within the SI group utilizing behavioral data from the RCP revealed the presence of three distinct classes of SI children: SI-Pure (66%), SI-Aggressive (26%), and SI-

Prosocial (8%). With regard to relative vulnerability for friendlessness, the SI-Pure class did not demonstrate greater risk for friendlessness relative to the SI-Prosocial class and was less likely than the SI-Aggressive class to be friendless. The SI-Pure class was more likely to be rejected than the SI-Prosocial class. The SI-Prosocial class showed the lowest risk for peer rejection. However, this protective effect was not present for the friendlessness variable. The SI-Aggressive class evidenced significantly relatively greatest risk for friendlessness and peer rejection.

Given increased risk for peer rejection and friendlessness associated with SI behaviors in middle childhood, the current study adds more evidence to the literature describing psychosocial difficulties for isolated children, particularly when these behaviors include comorbid aggression, underscoring the need for timely identification and intervention.

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PREFACE

I would never have been able to finish my dissertation without the guidance of my committee members, and support from my family and husband. I would like to express my deepest gratitude to my advisor, Dr. Robert Noll, for his guidance, caring, patience, and for providing me with the formative opportunities that have shaped my development as a researcher and clinician. His kindness, curiosity, and compassion are things I will carry with me in all my steps ahead. I thank Dr. Celia Brownell for her feedback as a committee member, as well as for her instruction in the classroom, something that shaped both the foundations and horizons of my interest in development. I would also like to thank Dr. Daniel Shaw and Dr. Elizabeth Votruba-Drzal for their roles in guiding my dissertation research. Special thanks goes to Dr. Susan Campbell, who has taught several of my most memorable classes and who was willing to step in with extensive feedback for my dissertation in its final stages. Her commitment to science and to her students has long been an inspiration.

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1.0   INTRODUCTION

Research on pe er relations has held a prominent place in the developmental literature with respect to the study of basic developmental processes, the study of individual differences, and the study of psychopathology (for a co mprehensive review see Ladd, 2005). A large body of empirical work in the 1980's and 1990's reported concurrent and predictive associations between measures of peer relations and a number of dimensions of child adjustment (i.e., social functioning, emotional well-being, physical health, academic achievement). One particular focus of research has been the identification of aspects of peer relations that may be considered markers of concurrent or subsequent disturbances in social functioning and child adjustment more broadly (Bukowski & Adams, 2005; Kupersmidt & Coie, 1990; Parker & Asher, 1987). In this work, markers refer to variables that index or represent a larger phenomenon. It is important to note that the types of markers represented in research on peers cannot be interpreted as evidence of causal links between peer relations and later adjustment, but rather as an indication that disturbances in peer relations are present and they may predict later problematic outcomes. In this way, measures of peer relations can be seen as important indices of global adjustment.

One specific marker of problematic relationships with peers that has been identified by empirical work is social isolation (Ladd, 2005). While research on social isolation is quite heterogeneous from both conceptual and methodological perspectives, capturing a variety of phenomenon ranging from teacher-reports of social exclusion to self-reports of loneliness, most

researchers agree that social isolation involves a behavioral endpoint of solitude, or lack of social interaction. Consistent with the push to identify aspects of peer relationships that may constitute markers of dysfunction, the present work focuses specifically on a behavioral phenotype of social isolation (e.g., outside observations of low levels of social interaction by teachers, parents, peers, or observers) rather than subjective reports of social experience (e.g., self-perceptions of isolation or loneliness). In focusing on isolated behaviors we hope to elucidate readily observable aspects of social isolation that may be important for understanding risk for broader dysfunction.

As early as kindergarten, children who are described as demonstrating isolated behaviors (e.g., less time spent with peers, more time spent alone) are more likely to report lower self-worth, and endorse more symptoms of internalizing problems (e.g., anxiety, depression) relative to their more sociable and socially interactive peers (Asendorpf, Denissen, & van Aken, 2008; Caspi, Bem, & Elder, 1989; Coplan, Prakash, O'Neil, & Armer, 2004; Stevenson-Hinde & Glover, 1996). Children described as behaviorally isolated in middle childhood (ages 6-10) are also more likely to experience peer rejection, academic difficulties, and school refusal (Coplan, Gavinski-Molina, Lagace-Seguin, & Wichmann, 2001; Gazelle & Ladd, 2003; Hart et al., 2000). Moreover, a number of studies have documented that risk associated with isolated behaviors in middle childhood extends into adolescence and early adulthood predicting both psychopathology and educational/occupational under-achievement (Asendorpf et al., 2008; Caspi et al., 1989; Coplan et al., 2004; Stevenson-Hinde & Glover, 1996). This broad array of problematic correlates suggests that socially isolated behavior may be considered a marker that has utility for identifying children who are at increased risk for more pervasive difficulties both concurrently and over time.

As research on t his topic grows, it is important to highlight that the broader field of inquiry into peer relations is becoming increasingly differentiated, moving from more global questions about friendships and adaptive versus maladaptive social behaviors, to a state of increased articulation and complexity (Bukowski, 2005). For example, there has been increasing interest in exploring ways in which sociodemographic factors (e.g., gender, age, race) may influence the correlates of maladaptive peer relations. Such nuanced associations are evident in work that has demonstrated that aggressive behaviors can be associated with both popularity and peer rejection among boys (Farmer, Estell, Bishop, O'Neal, & Cairns, 2003; Miller-Johnson et al., 2003; Rodkin, Farmer, Pearl, & Van Acker, 2000). There has also been growing interest in exploring variability within social behaviors, like aggression. For instance a number of authors now routinely make distinctions between physical and relational aggression that reflect not only differences in the nature of the behavior, but also in the functional correlates of these behaviors (Crick & Grotpeter, 1995; Prinstein, Boergers, & Vernberg, 2001).

Likewise, research on social isolation has begun to identify gender and/or age differences in the correlates of isolation (e.g., Coplan et al., 2001). Other research in this area has focused on exploring variability within isolated behaviors (e.g., active isolation versus passive isolation) and their functional correlates (e.g., Coplan et al., 2004). Unfortunately, findings across these studies have been somewhat inconsistent, likely owing to the conceptual and methodological heterogeneity within research on social isolation. Amidst this wave of more differentiated research on social isolation the "marker" status of this construct has become less clear (Harrist, Zaia, Bates, Dodge, & Pettit, 1997). As such, the present investigation revisits the original question of whether risk is conferred by socially isolated behavior generally, as well as new questions that have arisen as to the nature and functional significance of variability in the

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behaviors that define social isolation in childhood, with the overarching goal of developing a better understanding of which isolated children are most at risk for maladjustment.

To accomplish this goal we will begin with a discussion of the heterogeneity in theoretical conceptualizations of social isolation, followed by a r eview of the literature examining associations between socially isolated behaviors and two specific indices of social dysfunction: peer rejection and friendlessness. Exploration of these associations will allow for a better appreciation of the pervasiveness of social deficits in these children. Moreover, while social isolation may have tenuous status as a risk factor for broader dysfunction, peer rejection and friendlessness are two of the most widely agreed upon i ndicators of current and future maladjustment. Specifically, peer rejection has been described in the developmental literature as one of the most significant and negative social influences on children's psychological adjustment, having been repeatedly associated to internalizing and externalizing problems as well as poor academic functioning (for a comprehensive review of this topic see Bierman, 2004). In addition, an absence of a reciprocated friendship (i.e., friendlessness) is also considered to be a key index of maladjustment, as this deficit has been repeatedly associated with poorer social, emotional, and academic functioning, and diminished quality of life (Bukowski, Laursen, & Hoza, 2010; Criss, Pettit, Bates, Dodge, & Lapp, 2002; Erath, Flanagan, Bierman, & Tu, 2010; Hodges, Boivin, Vitaro, & Bukowski, 1999; Lansford, Criss, Pettit, Dodge, & Bates, 2003).

As this review explores associations between socially isolated behavior and social functioning both broader patterns of association, and subtype-specific patterns of association will be considered. Additionally we will highlight the role of both age and gender in these associations. Importantly, developmental research suggests that middle childhood (ages 6-10) may be a key developmental window for examining the nature and correlates of social isolation.

As children enter middle childhood they must begin to navigate changes in their social environment, most notably, the onset of formal schooling. The resulting dramatic increase in peer interaction places peers in a much more central position in children's social worlds as they transition to full-time schooling and often take on extracurricular activities. With this increase in time spent with peers, children also become increasingly concerned about being accepted by peers (Fordham & Stevenson-Hinde, 1999; Franco & Levitt, 1998; Nelson, Rubin, & Fox, 2005; Parker & Gottman, 1989; Parker, Rubin, Price, & DeRosier, 1995). With such increases in the centrality of peer interactions and the salience of peer acceptance, social isolation is thought to be a particularly potent stressor for children during this stage of development (Deater-Deckard, 2001).

Furthermore, cognitive and/or social cognitive abilities that mature during middle childhood set the stage for an increasingly sophisticated appreciation of oneself and one's environment (for better or for worse). For socially isolated children the likely reduced and/or biased set of social experiences they encounter may contribute to deficits in social skills and social understanding (i.e., social cognition) (Asendorpf & van Aken, 1994; Harrist et al., 1997; Nelson et al., 2005; Wichmann, Coplan, & Daniels, 2004). Moreover, as social self-evaluations become increasingly incorporated into children's self-concept and self-esteem (Fordham & Stevenson-Hinde, 1999; Franco & Levitt, 1998; Nelson et al., 2005; Parker et al., 1995; Wichmann et al., 2004), the experience of social isolation may contribute to heightened levels of negative affect. Such social cognitive and/or emotional biases have the potential to heighten difficulties navigating the impending, often stressful, transition to middle school, as well as the transition to adolescence more broadly. Given the well-documented sharp increase in risk for psychopathology that accompanies the transition to adolescence (Costello, Mustillo, Erkanli,

Keeler, & Angold, 2003), a better understanding of the nature of social isolation in middle childhood and its associated risk for more global deficits in social functioning may shed important light on ways to identify and intervene with children experiencing these difficulties prior to their entry into a developmental period of heightened risk. While a number of other risk factors (e.g., difficult temperament, harsh parenting, lower SES, academic difficulties) have also been associated with poorer social functioning during this developmental period (Ackerman & Brown, 2006; Calkins & Fox, 2002; Coplan et al., 2001; Cowan & Cowan, 2002; Eisenberg, Fabes, Guthrie, & Reiser, 2000; O'Connor, 2002), a better appreciation of the relative risk conferred by socially isolated behavior(s) during middle childhood may add to tools available for identifying and intervening with children who are at risk.

1.1   VARIABILITY WITHIN THE CONSTRUCT OF SOCIAL ISOLATION

A brief discussion of the construct of social isolation is necessary to ground the present review in its theoretical and historical context. While early studies of social isolation largely conceptualized isolation as a unitary phenomenon (e.g., Pekarik, Prinz, Liebert, Weintraub, & Neale, 1976; Rubin, Daniels-Beirness, & Hayvren, 1982), increasing interest in this topic has cultivated a diversity of theoretical perspectives on the nature of isolated behavior, its origins, and its consequences. For example, Kagan (1997) has extensively explored the biological underpinnings of characteristically wary behaviors in the face of novelty, which he has labeled inhibited behavior. Relatedly, Asendorpf (1990) has speculated that isolated behaviors are rooted in children's motivations to approach or avoid others, labeling behaviors driven by low approach and high avoidance motivations as shyness and reticence, respectively. Still other researchers

(e.g., Rubin, Gazelle) have highlighted the interplay between biologically based characteristics (e.g., dispositional anxiety), and interpersonal relationships and experiences within and outside the family (e.g., parental socialization practices, peer exclusion), highlighting ways in which isolated behaviors may reflect underlying processes of social withdrawal (Rubin & Mills, 1988) and social anxiety (Gazelle & Ladd, 2003), respectively. Such nuanced perspectives have contributed to growing acceptance of the notion that there may be different subtypes of social isolation that vary with regard to situational context, emotional or motivational influences, and developmental consequences (e.g., Coplan et al., 2004; Gest, Sesma, Masten, & Tellegen, 2006; Harrist et al., 1997; Rubin & Lollis, 1988; Rubin & Mills, 1988).

When synthesizing findings across empirical investigations of socially isolated behavior three general "process-oriented" subtypes of social isolation have been consistently described, each with differentiated behavioral characteristics: 1) Active Isolation, 2) Social Disinterest, and 3) Passive-Anxious Isolation. Children described as actively isolated are those who are deliberately (actively) avoided by play partners who do not wish to interact with them. Thus, the child's lack of social interaction is attributed to external factors (i.e., the child is isolated by others), although this rejection may be, in part, related to dispositional factors or behaviors present in the isolated child (e.g., aggression, social immaturity, difficulty regulating emotions). In work examining this subtype, actively isolated children are often identified by combining assessments of social isolation with additional indices of aggressive or disruptive behavior and/or assessments of peer exclusion (Gazelle & Ladd, 2003; Harrist et al., 1997).

In contrast, the socially disinterested subtype of isolation is thought to describe children who do not have a strong motivation to engage in social interaction, although they may not be strongly averse to or fearful of peer interaction. Rather, socially disinterested children appear to

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prefer solitary activities and may not find social interaction rewarding, suggesting an individual, rather than interpersonal source of solitude. In work examining this phenotype, socially disinterested children are identified by measurement strategies that tap into both preferences for solitary activity and/or weak interpersonal motivation (low social approach motivation) (Coplan et al., 2001; Coplan et al., 2004; Rubin, Hymel, & Mills, 1989).

Finally, the passive-anxious subtype of social isolation refers to children who are thought to be too anxious or fearful to initiate social interactions, despite a desire to do so. Although this subtype has received the most attention in empirical work, it is arguably the most heterogeneous of the subtypes capturing children described as shy, passively-withdrawn, behaviorally inhibited, and socially reticent. Among the passive-anxious subtype the driving force behind social isolation is thought to be fear or wariness of social interaction (i.e., social anxiety), again, reflecting an individual, rather than interpersonal process. Interestingly, several studies have documented that behavioral inhibition is a temperamental precursor of this social interactive style (Eisenberg et al., 1997; Gest, 1997). For these children, isolation may be deliberate as a child seeks isolation from the peer group in order to alleviate anxiety associated with social interaction (high social avoidance motivation). Such avoidant behaviors may more broadly reflect a history marked by failed attempts to successfully interact with peers due to anxiety or poorly developed social skills. Passive-anxious forms of isolation are typically measured by combining indices of social isolation with assessments of temperamental fearfulness/wariness, social anxiety, shyness, or observations of "onlooker" behavior in social situations (Coplan et al., 2001; Coplan et al., 2004; Hart et al., 2000; Nelson et al., 2005).

As researchers continue to explore these subtypes of social isolation, and as a consensus about these somewhat general subtypes emerges, it is important to note that there is continued

debate within the field relating not only to nomenclature and measurement strategies for assessing these subtypes, but also as to the functional implications of this variability (Bowker, Bukowski, Zargarpour, & Hoza, 1998; Coplan et al., 2001; Harrist et al., 1997; Nelson et al., 2005; Rubin, Hymel, & Mills, 1989). As we consider the vulnerability associated with socially isolated behaviors, will we continue to explore the extent to which variability in the types of isolated behaviors children exhibit adds to our understanding of risk among socially isolated children.

1.2 SOCIALLY ISOLATED BEHAVIORS: EVIDENCE FOR VULNERABILITIES

In service of the primary goal of this investigation (i.e., illuminating which isolated children are at greatest risk for maladjustment), we now turn to a review of the empirical work exploring the functional correlates of socially isolated behavior(s) in middle childhood. To focus this review and allow for best generalization across this work, only studies focusing on peer-, teacher-, or observational reports of socially isolated behaviors and risk for peer rejection and friendlessness were included.

1.2.1 Relationships between socially isolated behaviors, peer rejection, and friendlessness

Among studies of social isolation in middle childhood that do not differentiate subtypes of isolation, isolated behaviors have been widely associated with increased risk of peer rejection (Boivin & Hymel, 1997; Gazelle, 2008; Gazelle & Ladd, 2003; Hymel, Rubin, Rowden, & LeMare, 1990; Ollendick, Greene, Weist, & Oswald, 1990; Risi, Gerhardstein, & Kistner, 2003;

Rubin et al., 1982; Zeller, Vannatta, Schafer, & Noll, 2003) and a reduced likelihood of having a reciprocated friendship (Burgess, Wojslawowicz, Rubin, Rose-Krasnor, & Booth-LaForce, 2006; Zeller et al., 2003). Moreover, these associations have been demonstrated when using peer (Hymel et al., 1990; Ollendick et al., 1990; Zeller et al., 2003), teacher (Gazelle, 2008; Gazelle & Ladd, 2003), and observer (Boivin & Hymel, 1997; Rubin et al., 1982) reports of isolated behaviors to predict both sociometric (e.g., Zeller et al., 2003) and teacher-report measures of peer rejection (e.g., Gazelle & Ladd, 2003). However, several recent studies have suggested that boys who display isolated behaviors are more likely to be excluded and rejected by peers than girls who display these behaviors (e.g., Coplan et al., 2004; Gazelle & Ladd, 2003), suggesting that isolated behaviors may not be a universal risk factor for peer rejection.

Among studies that differentiate between subtypes of social isolation, these associations are more complex. Specifically, while peer rejection has been demonstrated in some children who display aggressive behaviors consistent with those that characterize the active isolation subtype (Bowker et al., 1998; Gazelle, 2008; Harrist et al., 1997), with one study suggesting that such behaviors confer the greatest risk for peer rejection relative to other types of isolated behavior (Harrist et al., 1997), another study failed to demonstrate this association (Coplan et al., 2001). Behaviors consistent with the passive-anxious subtype of social isolation have also been associated with peer rejection in a number of studies (Gazelle, 2008; Gazelle & Ladd, 2003; Hart et al., 2000; Nelson et al., 2005) with some studies suggesting that these behaviors confer the relatively greatest risk for peer rejection (Gazelle, 2008; Gazelle & Ladd, 2003; Hart et al., 2000; Nelson et al., 2005), particularly for girls (Gazelle, 2008). However, another study reported that behaviors consistent with passive isolation conferred increased risk for peer rejection only among boys (Coplan et al., 2001). Yet several other studies reported that passive-anxious

isolated behaviors were associated with increased risk for peer rejection only near the end of middle childhood (Coplan et al., 2001; Ladd, 2006), suggesting developmental changes in the consequences of passive isolation. Finally, socially disinterested behaviors have also been associated with peer rejection in several studies (Bowker et al., 1998; Coplan et al., 2001), although an equal number of studies have failed to demonstrate these relationships (Harrist et al., 1997; Hart et al., 2000). In summary, patterns of association between different behavioral subtypes of social isolation and risk for peer rejection are less clear than might be expected.

Interestingly, only one study (Gazelle, 2008) could be identified that considered how the types of isolated behaviors children display may influence their likelihood of having a reciprocated friendship. This study suggested that children with both high levels of solitary behavior and high aggression (e.g., active isolation) were the most likely to be friendless relative to children displaying behaviors consistent with other subtypes; however, all groups of isolated children displayed relatively greater risk for friendlessness relative to non-isolated peers. As exploration of subtypes of isolated behavior continues more research on this question is clearly needed.

Taken together, there appears to be compelling research suggesting that isolated children are at risk for other potentially serious social difficulties. It is unclear, however, whether characterizing the variability in isolated behaviors sheds additional light on which subsets of isolated children are most at risk for broader social dysfunction. Interestingly, several of the studies discussed above highlighted associations between isolated behaviors and social functioning that varied as a function of child gender and/or age. Such developmental and/or gender effects may be important to consider as we seek to understand which isolated children are most at risk.

1.2.2 Ongoing issues in understanding risk associated with socially isolated behaviors is childhood

Among studies that have examined base rates of isolated behaviors in middle childhood, few gender differences have been documented (Coplan et al., 2001; Coplan, Rubin, Fox, Calkins, & et al., 1994; Rubin & Coplan, 1998; Rubin et al., 1982). Moreover, among factor analytic studies of measures of social behavior that have compared factor solutions for boys versus girls, items loading on undifferentiated isolation-withdrawal factors have been largely the same for boys and girls (Luthar & McMahon, 1996; Masten et al., 1985; Zeller et al., 2003), suggesting isolated behaviors also manifest in a gender-independent manner. However, there is growing recognition that the correlates of socially isolated behaviors may differ for boys and girls. While early interest in this question was driven by assumptions from gender socialization literature suggesting that females are particularly attuned to relationships (Chodorow, Rocah, & Cohler, 1989; Gilligan, 1982) and as such might experience more significant difficulties in the context of social isolation, evidence from the broader literature suggests that social isolation represents a greater risk factor for boys. Specifically, socially isolated boys[1] tend to have more adjustment difficulties (including elevated risk for psychopathology) relative to socially isolated girls (Morison & Masten, 1991; Nelson et al., 2005; Rubin, Chen, & Hymel, 1993; Stevenson-Hinde & Glover, 1996). When considering specific social difficulties, socially isolated boys tend to have more negative peer experiences, including peer rejection and exclusion, than socially

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[1] While there has been movement in disability fields over the last two decades to utilize "people-first language" (e.g., boys with social isolation instead of socially isolated boys) for a number of reasons, predominantly to avoid dehumanization of individuals with disabilities, such language was not employed in the present work to increase clarity and facilitate integration with existing literature on this topic.

isolated girls (Coplan & Arbeau, 2008; Coplan et al., 2004; Gazelle & Ladd, 2003; Simpson & Stevenson-Hinde, 1985).

Such gender differences are now largely explained by the notion that in contemporary society, shyness or withdrawal may be less acceptable for boys than for girls (Sadker & Sadker, 1994). In support of this, several studies have suggested that in middle childhood socially isolated behaviors in boys (e.g., playing alone) are viewed more negatively or are even actively discouraged by parents and teachers (Engfer, 1993; Sadker & Sadker, 1994; Stevenson-Hinde & Glover, 1996). In contrast, such socially isolated behaviors in girls are less likely to be discouraged (Engfer, 1993; Stevenson-Hinde, 1989). In short, there appears to be consistent support for the notion that socially isolated behaviors are a greater risk factor for boys in comparison with girls; however, additional work exploring this question in the context of subtypes of isolation is clearly warranted, particularly given the inconsistent findings from the studies that have examined risk among subtypes of social isolation as a function of gender.

Furthermore, some research suggests that functional correlates of isolated behaviors are sensitive to developmental effects. The most consistent relationships to emerge from these studies are those employing repeated observations of isolated behaviors across childhood and then examining trajectories of difficulties in social and emotional adjustment. Specifically, children displaying more consistent patterns of socially isolated behaviors across childhood and adolescence have been shown to demonstrate significantly elevated risk for peer rejection and adjustment difficulties both concurrently and over time (Gazelle & Rudolph, 2004; Harrist et al., 1997; Oh et al., 2008; Rubin, Hymel, & Mills, 1989; Rubin & Mills, 1988). To the extent that the socially isolated behaviors in childhood reflect a cumulative history of these behaviors, risk associated with social isolation may tend to increase across childhood. Moreover, as the peer

group continues to gain importance, the consequences of isolated behaviors may become more severe (Rubin, Wojslawowicz, Rose-Krasnor, Booth-LaForce, & Burgess, 2006; Younger, Gentile, & Burgess, 1993).

Several studies have suggested that the association between isolated behaviors and peer rejection steadily increases with age (Ladd, 2006). However, other work has produced mixed results. Specifically, there is some evidence that associations between isolated behaviors and measures of peer acceptance become weaker across childhood (Coie, Lochman, Terry, & Hyman, 1992; Zeller et al., 2003). Taken together, additional cross-sectional work exploring ways in which age may influence the social consequences of isolated behaviors in particular is warranted. Given well documented decreases in the base rates of aggressive behavior across middle childhood, and the accompanying decreases in tolerance of such behaviors by peers, teachers, and parents (Coie & Dodge, 1998), it is possible that relative risk for social difficulties among actively isolated children may become more pronounced across middle childhood, specifically for actively isolated children who display aggressive behaviors. However, this question has not been fully addressed in the existing literature. In sum, more explicit characterization of developmental differences in associations between socially isolated behavior(s) and social functioning is needed as we work to identify which socially isolated children are most at risk.

1.2.3   Consideration of other relevant behavioral characteristics

Research examining the social correlates of isolated behaviors has rarely considered ways in which other socially relevant behavioral characteristics like academic achievement and athletic ability may add to our understanding of potential associations between isolated behaviors and

risk for peer rejection and friendlessness. Specifically, while academic abilities factor prominently into pop culture stereotypes of children who are isolated (e.g., the bookworm who eats lunch alone, or who is ignored or is bullied by peers), the role of academic abilities has not received a great deal of consideration in the literature on isolated behaviors, and the available empirical data do not necessarily support these stereotypes.

There is some evidence, however, to support an alternative view, that academic achievement has a direct and positive association with children's peer acceptance and friendships. Children with higher achievement scores are more often described as demonstrating prosocial and/or leadership behaviors, and they have greater peer acceptance characterized by higher "like ratings," and increased numbers of both friendships and reciprocated friendships (Ladd, Birch, & Buhs, 1999; Morison & Masten, 1991). These findings are fortified by evidence suggesting that, in general, children with learning disabilities have more problematic relationships with peers (i.e., fewer best friends, not well liked, more sensitive isolated behaviors, fewer leadership behaviors) relative to comparison children demonstrating average, or above-average academic achievement (Conderman, 1995; Kavale & Forness, 1996; Nabuzoka & Smith, 1993; Ochoa & Olivarez, 1995; Ochoa & Palmer, 1991; Wiener & Harris, 1993; Wiener, Harris, & Shirer, 1990). Furthermore, there is reason to believe that intelligence may serve as an important buffer for behaviorally vulnerable children (Radke-Yarrow & Brown, 1993), although there is more evidence of this to date in children with aggressive rather than isolated profiles (Luthar & Zigler, 1992; Masten et al., 1999). When this question has been considered in the literature on social isolation it is more often through the lens of academic difficulties as one of the negative sequelae that may accompany social isolation.

A handful of studies have explored the co-occurrence of academic difficulties and social

isolation, although, results are mixed with one study reporting a significant positive association (Coplan et al., 2001), and another failing to demonstrate this effect (Morison & Masten, 1991). Notably, one recent study that explored peer perceptions of academic difficulties among children displaying isolated behaviors reported that isolated children seen as more academically competent were also viewed as more "agreeable" by their peers (Gazelle, 2008). Moreover, this group of isolated children displayed relatively better psychosocial adjustment than groups of other isolated children without these characteristics. Given the difficulties isolated children may already have in navigating their school context it would seem that there is potential for academic problems to exacerbate social difficulties for isolated children. Conversely, to the extent that perceptions of better academic skills are associated with more positive peer perceptions of competence and likeability it may be that better academic abilities could temper some of the negative social consequences of isolated behaviors. Again, however, further research is clearly warranted before firm conclusions can be drawn.

Despite its social relevance (Page & Zarco, 2001), athletic ability also has not factored prominently into work exploring the social correlates of isolated behaviors. In recent years there has been increasing recognition that a child's motor skills and coordination abilities can make an important contribution to his or her social and emotional well-being, as the ability to perform well in physical activities, particularly in sports and games, is highly regarded by children (Wall, Reid, & Paton, 1990). In contrast, children with poor athletic skills may be avoided or ostracized as a result of these difficulties (Skinner & Piek, 2001). This notion has been somewhat supported by research exploring the social relationships of individuals with Developmental Coordination Disorder (DCD) (APA, 2000), a disorder characterized by marked impairment in motor coordination that is in excess of what would be predicted based on chronological age and level of

intellectual functioning. Notably, one of the diagnostic features of this disorder is poor performance in sports. Children and adolescents with DCD are repeatedly described by parents, teachers, trained observers, and peers as having deficits in social functioning and poorer peer relationships relative to children with average motor functioning (Cummins, Piek, & Dyck, 2005; Dewey, Kaplan, Crawford, & Wilson, 2002; Kanioglou, Tsorbatzoudis, & Barkoukis, 2005; Skinner & Piek, 2001; Smyth & Anderson, 2000). Although these difficulties could be driven by an organic (i.e., brain) substrate underlying the broader symptom profile of DCD, it is also possible that the coordination difficulties and poor athletic ability exhibited by these children have a unique and negative influence on their social functioning.

For isolated children who lack athletic ability difficulty navigating these competitive situations may engender further social difficulties (Fenzel, 2000; Miller & Coll, 2007; Page & Zarco, 2001; Rose-Krasnor, Campbell, Rubin, Booth-LaForce, & Laursen, 2007). This may be particularly true for boys who demonstrate isolated behaviors given the salience of athletic activities in boys' peer groups (Eder & Parker, 1987), and the greater social difficulties that have been reported for isolated boys (Morison & Masten, 1991; Nelson et al., 2005; Rubin et al., 1993; Stevenson-Hinde & Glover, 1996). However, it is also possible that the structured social interactions provided by athletic activities may facilitate new peer experiences and social skills. For an isolated child who is athletically competent, or even skilled, there may be fewer negative effects of these isolated behaviors on their psychosocial adjustment. Moreover, to the extent that athletic activities may serve as a constructive outlet for isolated children with relatively better athletic abilities, such abilities may further attenuate some of the effects of isolated behaviors on their adjustment. In sum, considering the roles of academic and athletic abilities may shed important light on risk or protective factors for children described as socially isolated. As

research continues to refine theoretical and methodological approaches to understanding isolated behaviors, considering these other characteristics as risk or protective factors may add to the developing picture of vulnerability associated with isolated behaviors during middle childhood.

1.2.4 Measurement Issues

In addition to our somewhat limited understanding of the role that demographic and other moderating variables play in the functional correlates of isolated behaviors, there are two important methodological issues that also may impede our ability to fully appreciate risk associated with isolated behaviors in middle childhood: 1) a focus on normal variability, and 2) limited range and sensitivity of measurement strategies for assessing subtypes of socially isolated behaviors.

First, present research on social isolation has largely focused on exploring normal variability in isolated behaviors. While such an approach has the advantage of yielding information that can be generalized across populations of children, it could be argued that the process/experience of social isolation is in and of itself an extreme phenomenon. That is to say, children who are repeatedly described as demonstrating socially isolated behaviors may have a qualitatively different experience of their social world. For example, a child who is described by his teachers as someone who "often plays alone," or who is nominated by 85% of his classmates as a person who is "often left out," may have a fundamentally different set of social experiences than a child who is described by his teacher as someone who "sometimes plays alone", or who receives nominations from 15% of classmates as someone who is "often left out." Adoption of an extreme group procedure provides the advantage of identifying children who are displaying the most significant levels of socially-isolated behaviors relative to peers and, therefore, are most

likely to be at risk for more pervasive disturbances with friendships and social acceptance. Examining the existence of subtypes of social isolation within an extreme sample may be particularly enlightening as it is unclear whether each of the differentiated subtypes of social isolation identified in prior research will likewise be identified in an extreme sample at highest risk for dysfunction. The value of adopting a carefully informed extreme group approach has been promoted by a number of investigators (Abrahams & Alf, 1978; Alf & Abrahams, 1975; Feldt, 1961; Kagan, Snidman, & Arcus, 1998; Preacher, Rucker, MacCallum, & Nicewander, 2005). Moreover, the extreme group approach has yielded unique insights in a number of clinical and behavioral domains in normative developmental samples (Hinde, 1998; Kagan, Snidman, Arcus, & Reznick, 1994; Kagan, Snidman, & Peterson, 2000; Strauss, Forehand, Frame, & Smith, 1984) and even among several studies that have examined aggression (Goossens, Bokhorst, Bruinsma, & van Boxtel, 2002; Moskowitz, Schwartzman, & Ledingham, 1985) and social acceptance (Rosenblum & Olson, 1997) in children. More often than not, unique patterns of association between social variables and outcomes of interest were only unmasked in extreme group contexts, suggesting an extreme-group strategy may shed important light on the nature and correlates of socially isolated behaviors.

Second, while theoretical and empirical work in this area continues to develop, researchers struggle with how to best capture subtypes of isolation using existing strategies for measuring socially isolated behaviors. At a larger level, there appears to be a disagreement in the field as to how to capture these "process-oriented" subtypes within global measures of social behavior, which lack the precision required to differentiate these more subtle behavioral differences. This is perhaps most true in research that utilizes peer and teacher nominations of social behavior. Specifically, a majority of existing peer (e.g., Revised Class Play, Pupil

Evaluation Index) and teacher (e.g., Revised Class Play, Teacher Report Form) nomination instruments for measuring socially isolated behavior have been restricted in their ability to fully capture the nuances of these subtypes due to limited numbers of items assessing isolated behaviors, particularly items that are refined enough to correspond to the differentiated subtypes (e.g., active-isolation). While the theoretical rationale for constructing these indices of specific isolated behaviors is in line with the current, more differentiated conceptualization of social isolation, and while these subtype scales often align with clinical impressions of social isolation, subtype indices are often based on only a few items (sometimes as few as one) (Harrist et al., 1997; Hart et al., 2000). Narrow-band social isolation scores from peer reported behavioral reputation data suffer from similar problems, with the derived factors being composed of a small number of items (Bowker et al., 1998; Gazelle, 2008; Gest et al., 2006). Perhaps more importantly, because existing measurement techniques were largely developed before researchers commonly assessed subtypes of social isolation, broad-band scales of social isolation do not always include items that may be useful and/or necessary for differentiating subtypes of isolated behavior. For example, among studies that attempt to partition the Sensitive-Isolated scale of the Revised Class Play (RCP) into subscales of social isolation, the subscale of active isolation does not include aggressive or disruptive behaviors (both characteristics that are quite relevant for this subtype) (Bowker et al., 1998; Gest et al., 2006). Similarly, in these studies the "shy" item failed to demonstrate significant loadings on the passive-anxious subscale (Bowker et al., 1998; Gest et al., 2006). While basing RCP subscales of isolation on the original items in the broad-band sensitive-isolated scale allows other RCP scales (e.g., aggressive-disruptive, prosocial, and leadership scales) to remain intact and preserves some of the psychometric integrity of this instrument, this approach has led to the construction of isolation subscales that may not entirely

represent the subtypes that have been theoretically articulated. Likewise, independently constructed peer-nomination (e.g., Gazelle, 2008) and observational scales (e.g., Rubin, 2001) for assessing specific subtypes of social isolation have been largely constructed on the basis of theory and face validity, as opposed to empirical data reduction techniques.

While observational studies have the distinct advantage of being able to capture assessments of these more process-oriented subtypes, most of the observational studies identified in this literature do not base their assessments on data across multiple time points or settings, limiting their generalizability. In contrast, one advantage of peer and teacher nomination measures for assessing socially isolated behaviors is their inherent reliance on repeated observations. Both peer- and teacher-report assessments of social isolation are based on observations of a child across the duration of the particular relationship. Because peers and, to a lesser extent, teachers have ongoing relationships with children, they have the opportunity to observe children across time points, and in a variety of contexts. While there is opportunity for bias to enter into these observations, they are nonetheless repeated observations that include observations of behavior in important social contexts. Similarly, studies of social isolation that involve classroom observations or peer nominations are typically based on a series of observations across a period of time and a variety of contexts, thereby reducing the opportunity for bias. Moreover, peer nominations of isolated behavior have the added advantage of being based on an entire classroom of peers, dramatically increasing the number of observations and the power and/or strength of these observations to describe meaningful differences in social behavior.

In addition to these methodological advantages, peer report measures of social behaviors may be an important source of information to consider from a conceptual standpoint as they are

arguably the most likely to tap into a child's actual social and emotional experiences. For example, consider a child who is described as "someone who often plays alone" by a majority of his classmates. Such a collective endorsement of social isolation is likely to reflect the kinds of social experiences a child encounters, and the tenor of his social interactions, in addition to his behavioral characteristics. Because children may see this boy as a loner, they may be less likely to initiate interactions with him, or be more likely to be dismissive of his attempts to join in their interactions, influencing the number and type of peer interactions this boy experiences in a very direct way. Similarly, to the extent that children may have an awareness of how they are viewed by their peers, such peer assessments of behavioral reputation for social isolation may more readily access the negative affect engendered by such perceptions. While parent and teacher reports of isolated behaviors clearly tap into behavioral characteristics, ultimately, how a child is seen by his peers translates most directly into a child's experience in his or her social world. As such, while all of these strategies have the advantage of repeated observations, peer nominations, for the reasons just noted, may be a particularly powerful tool for gathering information about children's socially isolated behaviors and their correlates.

The Sensitive-Isolated (SI) scale of the RCP (Masten et al., 1985) is one of the primary ways that researchers have measured "social isolation." The RCP is a descriptive matching method of peer assessment where children are asked to nominate peers on a variety of attributes or behaviors. Initially developed in the 1960's (Bower, 1969, Lambert & Bower, 1961) this measure of behavioral reputation asks that children pretend they are directors of an imaginary class play, and to "cast" their classmates into a variety of positive and negative roles. Nominations of each type are then tallied within the classroom to obtain global indices of peer reputation. Initially, factor analyses of peer nominations on the RCP with school-age children

(grades 3-7) revealed one positive factor (Sociability-Leadership) and two negative factors (Aggressive-Disruptive, and Sensitive-Isolated) for both boys and girls (Masten et al., 1985; Morison & Masten, 1991; Rubin & Cohen, 1986). However, more recent investigations of this instrument have lent support to the partitioning of Sociability-Leadership factor into two distinct factors representing somewhat different aspects of positive social behavior, namely Popular-Leadership behaviors and Prosocial behaviors (Gest et al., 2006; Zeller et al., 2003). In this way, this descriptive matching technique provides a cumulative, multi-informant assessment of both specific behaviors, or "roles" (e.g., someone who plays alone), and more general reputation for constellations of social behavior (e.g., Sensitive-Isolated).

It is important to note that behaviors as measured on the Sensitive-Isolated scale reflect not only socially isolated behaviors, but also affective sensitivity. Specifically, the SI scale of the RCP (Masten et al., 1985; Zeller et al., 2003) is composed of items assessing solitary behaviors (playing alone, often left out), affective sensitivity (sad, shy, feelings easily hurt), and social skill deficits (trouble making friends, can't get others to listen) (Masten et al., 1985; Rubin, Hymel, Lemare, & Rowden, 1989; Zeller et al., 2003). While some authors have argued that this heterogeneity confounds the use of this scale for assessing and describing socially isolated behaviors (Bowker et al., 1998; Weiss, Harris, & Catron, 2002), the scale has consistently demonstrated convergent and predictive validity with observational assessments of social isolation (Chen, Rubin, & Sun, 1992; Gest et al., 2006; Masten et al., 1985; Morison & Masten, 1991; Zeller et al., 2003), suggesting it is a reasonable way to identify children demonstrating socially isolated behaviors. Moreover, given the variability in individual items from the SI scale, and yet further variability across RCP scales assessing other social behaviors (particularly,

aggression) the broader instrument may be well suited to probing questions related to subtypes of socially isolated behavior.

Given the strength of peer nominations to describe aspects of children's social experience, and the utility of extreme group designs, a promising approach to understanding the nature and correlates of socially isolated behavior(s) may be to examine broader patterns of behavioral variability beyond items contained on any one existing scale of socially isolated behavior and including characteristics in related domains (e.g., aggression, disruptiveness) among a sample of extremely isolated children. One method for characterizing this behavioral variability among isolated children that may be particularly useful is latent class analysis. Class analysis involves the assignment of a set of observations into subsets (called classes) so that observations in the same class are similar in some sense. Class analysis refers to a general approach composed of several multivariate methods. Referred to as *person-oriented methods* by some (Bergman, 1996; Bergman & Magnusson, 1997; Cairns, Bergman, & Kagan, 1998) in contrast to *variable-oriented methods* like factor analysis, class analysis identifies and describes groups of individual cases defined by similarities along multiple dimensions of interest. These groupings can form the basis for understanding normal development, risk, or other outcomes. The logic of class analysis differs from that of methods that emphasize relations among variables. Fundamentally, class analysis involves sorting cases or variables according to their similarity on one or more dimensions and producing groups that maximize within-group similarity and minimize between-group similarity. As such, this statistical approach may be ideally suited to illuminating distinct, meaningful, subgroups of isolated children.

1.3   PRESENT STUDY

Given debate about risk associated with isolated behaviors during middle childhood, the present study utilized an extreme group approach to examine the behavioral characteristics and social functioning of a large sample of children in grades 2-5 who scored 1.5 standard deviations above the mean of their classroom on a n extensively studied, well-validated measure of children's socially isolated behavior: the Sensitive-Isolated scale of the RCP (Masten et al., 1985).

Aim 1. Having identified this sample, children viewed by their peers as SI were compared to a non-isolated comparison group of peers (COMP) matched one-to-one on classroom, race, and gender to determine whether they demonstrated greater risk for sociometric peer rejection and friendlessness. Explicit attention was devoted to understanding the role of gender and age in these associations. It was predicted that SI children would demonstrate greater risk for peer rejection and friendlessness relative to COMP children. Additionally, it was predicted that SI boys would demonstrate greater risk for peer rejection and friendlessness relative to SI girls. Cross-sectional analyses were conducted to examine whether risk for peer rejection and/or friendlessness varies as a function of grade level, with the prediction that risk for friendlessness and peer rejection would increase across grades 2-5. A second set of regression analyses examined the moderating role of peer perceptions of academic and athletic abilities among these groups. It was predicted that peer perceptions of both poorer academic and athletic abilities would be associated with increased risk for peer rejection and friendlessness among the SI group.

Aim 2. T he second aim of the present study was to examine whether there was functionally meaningful variability within the social behaviors displayed by SI children (i.e., Are there subtypes of social isolation that are more strongly associated with peer rejection and/or

friendlessness?). Based on previous work it was predicted that at least three subtypes of socially isolated children would be identified through Latent Class Analysis (LCA) of all RCP items: actively isolated, passive-anxious isolated, and socially disinterested. Subsequent analyses were conducted to examine whether class membership was associated with elevated risk for peer rejection and/or friendlessness, with explicit attention to whether this risk varied as a function of gender or grade level. It was predicted that children displaying both isolated and aggressive behaviors (i.e., actively isolated) would demonstrate the greatest risk for peer rejection and friendlessness.

2.0   METHODS

Data about behavioral reputation and peer acceptance were obtained from classrooms of children who were participants in studies about children's peer relations (e.g., Noll et al., 1999; Noll et al., 2007; Noll, Vannatta, Koontz, & Kalinyak, 1996; Vannatta, Gartstein, Short, & Noll, 1998). One aim of these studies was to assess the social functioning of children with a variety of chronic illnesses, which included obtaining school-based assessments of their peer relations at study entry. As a result, the study design provided the unique opportunity to obtain data about children's peer relations from school peer groups across the catchment area of a large, Midwestern, tertiary medical center that serves nearly all children with a severe chronic illness within a 50-mile radius. Although the classrooms represented in the present study were chosen on the basis of the presence of a child with a chronic illness, the majority of participants involved (approximately 97%) were children with no severe chronic illness. Thus, a rich database was created that represents information regarding a cross-section of school-aged children and young adolescents drawn from public and private schools in rural, suburban, and inner-city areas including children from diverse socioeconomic and cultural backgrounds. Data were collected over a span of 13 years (1990–2003) in schools within an approximately 100-mile radius of Cincinnati.

The children originally targeted for recruitment in the study were children of school age (Grades 2–12) who had been diagnosed with cancer, sickle cell disease, hemophilia, or juvenile

rheumatoid arthritis and their classmates. These pediatric chronic illnesses are randomly occurring events with respect to psychosocial characteristics of the child and sociodemographic characteristics of the family, with the exception of sickle cell disease, which within the United States occurs primarily in individuals of African ancestry. As a result, there were more Black children in the sample than would be expected from a random sampling of the catchment area, where Black Americans comprise approximately 15%–20% of the overall population (U.S. Bureau of the Census, 1990).

2.1   PARTICIPANTS

Data were collected from ~800 classrooms in Grades 2 through 12. Prior to classroom data collection, parental consent for participation or non-participation was obtained for 87% of the students enrolled in the classrooms sampled; 6% of non-participating students lacked parental consent for participation and 7% were absent on the day of data collection (Noll, Zeller, Vannatta, Bukowski, & Davies, 1997). Data were collected from participating students on one gender within a classroom. The gender chosen for each classroom was made *a priori* to match the gender of the target child with chronic illness. By research assistant observation in the classroom, racial composition of the sample was approximately 72% White, 27% Black, and 1% belonged to other racial/ethnic groups. Only children in grades 2-5 were included in the present analyses (*N*(classrooms)=226). All children with chronic illness were also excluded from the present investigation to control for potential confounding associations between chronic illness, social isolation, peer rejection, and friendlessness.

Consistent with several other extreme group studies in this general area (e.g., Rosenblum & Olson, 1997; Stuart, Gresham, & Elliott, 1991), children scoring more than 1.5 standard deviations above the classroom mean on RCP peer assessments of sensitive-isolated behavior were selected for the SI group. Because all RCP nominations were standardized within classrooms, use of a standard deviation as a cut-off point is thought to be preferable to a percent value, as it will control for variability in socially isolated behaviors between classrooms.

For each SI child, a same-classroom, same-sex, same-race, COMP was selected. Because aggressive behavior has been associated with both peer rejection and friendlessness (Dodge et al., 2003; Kupersmidt & Coie, 1990; Ladd & Troop-Gordon, 2003; Zeller et al., 2003) children scoring more than 1.5 standard deviations above the classroom mean on the RCP scale of aggressive-disruptive behaviors were excluded from the comparison sample. This facilitated a contrast between children demonstrating a high level of social isolation with children who were more behaviorally average with respect to negative social behaviors.

2.2   MEASURES

2.2.1   Revised Class Play

The RCP (Masten et al., 1985) is a classroom measure of children's behavioral reputation. Using a descriptive matching format, children and teachers are told to imagine that they are the director of a play and asked to "cast" the children from the classroom into 30 roles in a hypothetical play by choosing the child in the class (with the aid of a class roster) who best fit each role in the play. Of the 30 roles, 15 are proposed to reflect positive behavioral attributes, and 15 reflect negative

attributes (for a complete list of items, see Appendix A). Administration procedures were consistent with those outlined by Masten and colleagues (1985). Children were given a class roster that listed either all the boys or all the girls enrolled in their class, the gender matching that of the original target child. The children were told that the same child could be cast in more than one role; however, only one person could be chosen for each role. Self-selection was not permitted. For each role of the RCP the total number of nominations each child received from their peers was tallied. These individual item raw scores were standardized through z-score transformations within classroom (and as a result by gender) to adjust for unequal class size.

Previous factor analyses with a large subset of this sample have yielded a four-factor solution reflecting the following behavioral domains: (a) Leadership (10 items), (b) Prosocial (5 items), (c) Aggressive-Disruptive (5 items), and (d) Sensitive-Isolated (6 items). The individual item z-scores for each child were added within these domains to form raw domain scores. These raw domain scores were then z-score transformed to make them comparable across dimensions (as well as across classrooms). These domain scores have been demonstrated to be both internally consistent (Cronbach α's 0.82 to 0.89) and stable through adolescence (Reiter-Purtill & Noll, 2003; Zeller et al., 2003). RCP scores based on these dimensions were also shown to demonstrate convergent validity with peer acceptance measures (Zeller et al., 2003). Furthermore, several longitudinal studies have demonstrated both construct and predictive validity for the RCP measure as aggressive-disruptive and sensitive-isolated scores have been associated with subsequent emotional and behavioral problems (Hymel et al., 1990; Morison & Masten, 1991; Rubin, Hymel, & Mills, 1989).

This research group has added several supplemental roles at the end of the RCP. Three of these roles are relevant to chronic illness (e.g., "someone who is sick a lot," "someone who

misses a lot of school," and "a person who is tired a lot"). Additionally, there have been six roles added to assess nonsocial attributes including physical appearance, and athletic and academic abilities, two roles per attribute (Vannatta, Gartstein, Zeller, & Noll, 2009). This research group has used these additional roles since 1985. They have always been the LAST nine roles in the RCP (39 roles total). They were placed last to avoid influencing the integrity of the measure and are not included in the four-factor structure or the broadband domain scores. Single scores for physical appearance, athletic ability, and academic ability were created by first reverse scoring the item assessing positive peer perceptions of each attribute, then averaging the two standardized item scores. This resulted in standardized 2-item scales for physical appearance as well as academic and athletic ability where higher scores indicate more *negative* peer perceptions (Vannatta, Gartstein, et al., 1998; Vannatta et al., 2009) of these characteristics. These roles have been used in previous research and have been associated concurrently with multiple domains of social reputation and acceptance (Graetz & Shute, 1995; Vannatta et al., 2009; Vannatta, Zeller, Noll, & Koontz, 1998).

2.2.2 Three Best Friends

Children were asked to complete a positive nomination measure, naming their three best friends within the classroom. Children were provided a roster from which to make nominations that listed all the boys and girls within the classroom; unlike the RCP, cross-gender nominations were permitted. This measure generates two indices of peer acceptance: a social preference score, based on the number of times each student was nominated as a best friend by classmates, and a mutual friendship score based on the number of reciprocated (mutual) friendships for each child (i.e., friendships where the child both nominated and was nominated by the same peer). Both

total best friend nominations, and reciprocated friendship nominations were standardized within classroom. This methodology is thought to provide a stable and valid index of the presence of friendships, and of overall peer acceptance (Bukowski & Hoza, 1989). Children receiving no friendship nominations from peers in their classroom (reciprocated OR unreciprocated) were classified as "Friendless" for the present study. This was thought to represent the most potent indicator of an absence of friendships, and also helped to reduce the impact of missing reciprocated friendship data (which could not be obtained if a nominated peer was absent on the day of data collection or did not have parental consent).

2.2.3   Liking Rating Scale

This rating-scale measure assesses social preference based on the degree to which each child in the class is liked or disliked by peers (Asher, Singleton, Tinsley, & Hymel, 1979). Children are presented with a class roster, with a 5-point Likert rating scale next to each classmate's name ranging from (1) *someone you do not like* to (5) *someone you like a lot* and asked to provide a rating for each classmate (Asher et al., 1979). An average social preference score was computed for each child by averaging the ratings received from all children within the classroom. Scores were standardized within each classroom. This measure has been shown to be a reliable and stable index of a child's relative social acceptance (or "likeability"), with test-retest correlations of .81 to .86 over a 4-week interval (Asher et al., 1979; Ladd, 1981).

A data reduction technique was used to transform best friend nominations and scores on the Liking Rating Scale into Liked Most (LM) and Liked Least (LL) scores (Asher & Dodge, 1986). The Liked Most (LM) score was computed for each child by totaling the number of best friend nominations s/he received. The Liked Least (LL) score was computed for each child by

tallying the total number of "one" scores each child received on the Liking Rating Scale (Asher et al., 1979). Previous research has determined this strategy provides a stable and reliable measure of peer status (Asher & Dodge, 1986; Asher et al., 1979; Ladd, 1983). The LM and LL scores were then used to calculate Social Preference scores from a widely used sociometric technique (Brendgen, Little, & Krappmann, 2000; Coie, Dodge, & Coppotelli, 1982; Rogosch & Newcomb, 1989). Social Preference (SP) was obtained by the subtraction of LL score from the LM score. Students with an SP score less than -1.0, LM scores less than 0, and LL scores greater than 0 were classified as rejected.

2.3   PROCEDURE

In the elementary schools, data were collected within the primary classroom. Consent forms asking parents if their child could participate in a study about children's friendships were sent home with all of the students in each classroom. No data were collected until the late fall or winter of the school year to ensure that teachers and classmates had sufficient time to become familiar with students in each classroom.

The participants met as a classroom group and were told they were taking part in a "science project" about friendships. A trained research assistant administered all measures in a fixed order. Children first completed the RCP. Each RCP role was read aloud to the class and the children independently completed the instrument, with the assistance of a class roster. Children were then given instructions on how to complete the "three best friends" measure and the "like" rating scale. Children independently completed all measures.

2.4 DATA ANALYSIS STRATEGY

2.4.1 Power analysis

A power analysis was conducted to determine the power of the current sample ($N = 678$ for comparisons between SI and COMP, $N = 339$ for within SI group comparisons) to discover small to medium effects (with odds ratios (OR) corresponding to 1.49 and 3.45, respectively) (Cohen, 1992; Hsieh, Block, & Larsen, 1998). The α for the tests of these models was set at .05. For the entire sample ($N = 678$), for logistic regression of a binary dependent variable using four binary, independent variables the current power to detect a small effect (OR ≥ 1.49) was 1.96. For the SI sample ($N = 339$), for logistic regression of a binary dependent variable using four binary, independent variables the current power to detect a small effect was 0.83. This indicates that the present sample was adequately powered to detect small effects for both SI versus COMP comparisons, and for comparisons within the SI group.

2.4.2 Hypothesis testing and exploratory analyses

To assess whether children who are SI differed from COMP children on the basis of peer rejection and friendlessness, group membership (SI versus COMP) was entered as a predictor in two separate logistic regression models with peer rejection and friendlessness as outcome variables. Given explicit interest in the role of Sex, Grade, and Race, initially these demographic variables (sex, gender, race) were entered on the first step followed by group status on the second step to uncover the main effects of these variables. As no significant main effects of Sex, Grade, and Race were demonstrated in any of these initial regression models for either outcome variable

it was decided to place group status with these demographic variables (Group Status, Sex, Grade, Race) on the first step of final models. This increased power to detect main effects of Group Status while still yielding estimates of the contributions of demographic variables above and beyond that of group status.

Early models also included two additional demographic covariates on the first step: class size and racial composition of the classroom. Specifically, number of students in each classroom was included to control for potential effects of class size. Racial composition of the classroom was also included both independently and in interaction with an individual's race to control for potential effects of minority/majority status. As class size and racial composition of the classroom were not significant in any models they were trimmed from final models.

Interactions between demographic variables and group status (i.e., Group Status x Sex, Group Status x Grade, Group Status x Race) were then entered on the second step to explore demographic differences in the effects of group status on both outcome variables.

In the same fashion, subsequent logistic regressions were conducted with composite scores for peer perceptions of academic and athletic ability as predictors to explore whether these behavioral characteristics had unique or interactive effects on the two social outcome variables. In these models Group Status, Sex, Grade, Race, Academic Ability, and Athletic Ability were entered on the first step. Interactions between group status and demographic variables (i.e., Group Status x Sex, Group Status x Grade, Group Status x Race), and between group status and academic/athletic variables (i.e., Group Status x Academic Ability, Group Status x Athletic Ability) were then entered on the second step.

2.4.3   Latent class analyses

For analyses exploring subtypes of isolated behavior, LCA was used to identify relatively homogeneous and distinct classes of isolated behavior based on peer nominations for all 30 RCP items. This approach enabled the consideration of RCP items from other scales (i.e., aggressive-disruptive, prosocial, leadership) in hopes of revealing distinct behavioral classes within this sample of SI children.

LCA is a mixture method that examines the underlying structure of cases by treating item responses as imperfect indicators of an otherwise unobserved discrete and categorical latent variable, seeking to identify M unobserved subtypes (i.e., latent classes) of related classes. The *Latent Gold 4.5* software (Vermunt & Magidson, 2000) enables the fitting of latent class models and estimation of two sets of parameters, which include class membership probabilities and item endorsement probabilities for each class. To allow for LCA item-level data for the RCP behavioral roles were dichotomized as $0 =$ received no nominations for a given role, and $1 =$ received two or more nominations for a given role. This criterion was implemented to reduce the impact of chance nominations.

The goal of LCA in the present study was to identify the smallest number of latent classes that adequately describe associations among RCP peer nomination items. The number of classes assuming a single underlying latent variable was determined via several criteria (Bandeen-Roche, Huang, Munoz, & Rubin, 1999; McCutcheon, 1987; Magidson & Vermunt, 2000). First, a solution with *n* classes was compared to solutions with *n+m* classes, where the integer *m* ranges upward from 1, seeking the most parsimonious model. Observed behavioral characteristic endorsements were compared with expected behavioral characteristic endorsements predicted by the model by calculating a likelihood ratio goodness-of-fit value. When the number of observed

response patterns was large, as in this case, the likelihood ratio statistic did not follow the theoretical chi-square distribution. Therefore we present a bootstrapped *p*-value. For this test, a conservative alpha level (e.g., *p* > .05) was appropriate.

We then examined a set of model fit statistics, prominently the Bayesian Information Criterion (BIC), to compare the fit of alternative models. The BIC is a global goodness-of-fit index that considers sample size, number of free parameters, and value of likelihood function in weighing the fit and parsimony of the model; the lower the BIC the better the model. An additional goodness-of-fit statistic that was considered is the Average Weight of Evidence (AWE). Whereas the BIC is a global measure that weights the fit and parsimony of the model the AWE criterion additionally weights the performance of the classification (Banfield & Rafferty, 1993). As with the BIC, lower AWE values indicate better model fit. In addition, we conducted a comparison of the difference between the log-likelihood of the previous and current class via a chi square statistic. We also completed successive runs of the model to estimate the likelihood of obtaining a local solution. Finally, solutions with rare (< 1 %) classes were excluded. Once latent classes were established, each class was characterized by its own profile of endorsement probabilities for each of the RCP items, and each child was assigned a probability for membership in each class (Clogg, 1981). Subjects were then assigned to the class with the highest membership probability.

Class membership was then entered as a predictor in two separate logistic regression models with peer rejection and friendlessness as outcome variables. As with group status regression models, given explicit interest in the role of sex, grade, and race, initially these demographic variables were entered on the first step followed by class membership on the second step to uncover the main effects of the demographic variables. As no significant main

effects of sex, grade, and race were demonstrated in any of these initial regression models for either outcome variable it was decided to place class membership with the demographic variables on the first step of final models. This increased power to detect main effects of class membership while still yielding estimates of the contributions of demographic variables above and beyond that of class membership.

Interactions between demographic variables and class membership (i.e., class membership x sex, class membership x grade, class membership x race) were then entered on the second step to explore demographic differences in the effects of class membership on both outcome variables.

3.0   RESULTS

3.1   SAMPLE CHARACTERISTICS

From the total sample of 5,157 children, 2,654 had complete RCP data (due to single-gender RCP administration). Complete RCP data were obtained from 98% of children who were eligible. Of note, children without RCP data did not differ significantly from children with these data on the basis of race, gender, or grade level. From the sample with complete RCP data, a subsample of 339 SI children (from a total of 221 classrooms) was identified on the basis of scores for the RCP SI scale utilizing the aforementioned inclusion criteria (i.e., 1.5 SD above the classroom mean).

For each SI child a matched comparison peer ($N = 339$) was identified by selecting a peer from the same classroom of the same race and gender to the SI individual(s), and who did not have a score of greater than 1.5 SD on the RCP aggressive-disruptive domain. In the instance that a same-gender, same-race peer could not be identified a same-gender peer was selected for the comparison group. Information on friendship nominations was available for all participants. Of note, peer rejection status could not be calculated for 12 of the participants due to incomplete Liking Rating Scale data. Children with missing data on peer rejection did not differ from those with complete data on the basis of gender, grade, or overall SI score. Descriptive characteristics for demographic, friendship, peer acceptance, and RCP behavioral data of the SI and COMP

groups are presented in Table 1.

Table 1. Demographic characteristics, friendship and behavioral descriptive data, and group differences for SI and COMP groups

	COMP (N = 339)		SI (N = 339)		Group Differences	
	N	%	N	%	χ^2	Effect Size w
Males	178	52	177	52	.01	--
Black	81	25	82	26	.16	--
Grade 2	56	16	55	16	.02	--
Grade 3	89	26	90	26		
Grade 4	96	28	96	28		
Grade 5	98	28	98	28		
Peer Rejection	33	10	213	64	210.20***	1.34
No Reciprocated Friendships	50	15	127	51	84.29***	0.75
No Best Friend Nominations	19	6	132	39	109.75***	0.88
	$M^\dagger$	SD	$M^\dagger$	SD	t	Cohen's d
Friendships and Peer Acceptance†						
Reciprocated Friendships	0.33	0.89	-0.64	0.77	-14.139***	1.17
Best Friend nominations	0.40	0.95	-0.72	0.64	-17.810***	1.38
Overall Liking Ratings	0.45	0.79	-1.07	0.87	-23.58***	1.82
Likes Least Nominations	-0.41	0.68	1.04	1.12	20.14***	-1.57
RCP Scale Scores†						

RCP Sensitive-Isolated	-0.45	0.49	1.92	0.69	51.11***	-3.96
RCP Aggressive-Disruptive	-0.34	0.46	0.16	1.10	7.75***	-0.60
RCP Popular-Leader	0.43	1.04	-0.71	0.57	-17.70***	1.36
RCP Prosocial	0.37	1.00	-0.43	0.79	-11.43***	0.89
RCP Poor Academics	-0.28	0.93	0.74	1.02	13.64***	-1.05
RCP Poor Athletics	-0.35	0.97	0.97	0.89	18.42***	-1.42

[†]Values represent z-scores normed within classrooms, where $M = 0$, and $SD = 1$

*denotes $p <.05$, ** denotes $p <.01$, *** denotes $p <.001$; two-tailed test

When considering the descriptive characteristics of SI and COMP groups, no significant differences were found between groups on gender, race, or grade-level, consistent with the matched-comparison sample paradigm. However, descriptively, a number of significant differences emerged on peripheral measures of child social behavior, friendships, and peer acceptance (Table 1), building additional support for the unique nature of the SI sample. Additional information about specific gender differences within the SI group can be found in Table 2.

Table 2. Gender differences among children who are SI.

	Boys ($N = 177$)		Girls ($N = 162$)		Group Differences	
	M	SD	M	SD	t	Cohen's d
Friendships and Peer Acceptance[†]						
Reciprocated Friendships	-0.64	0.70	-0.65	0.83	.03	--
Best Friend nominations	-0.70	0.64	-0.73	0.65	.43	--
Overall Liking Ratings	-1.03	0.89	-1.11	0.86	.77	--

Likes Least Nominations	0.99	1.15	1.10	1.09	-.86	--
RCP Scale Scores[†]						
RCP Sensitive-Isolated	1.93	0.70	1.90	0.69	.45	--
RCP Aggressive-Disruptive	0.14	0.97	0.32	1.21	-2.52*	-0.16
RCP Popular-Leader	-0.70	0.58	-0.72	0.56	.31	--
RCP Prosocial	-0.31	0.87	-0.55	0.69	2.88**	0.31
RCP Poor Academics	0.66	1.13	0.83	0.87	1.50	--
RCP Poor Athletics	1.05	0.82	0.90	0.96	1.56	--

[†]Values represent z-scores normed within classrooms, where $M = 0$, and $SD = 1$

*denotes $p <.05$, ** denotes $p <.01$, *** denotes $p <.001$; two-tailed test

3.2   EFFECTS OF SI/COMP GROUP STATUS ON FRIENDLESSNESS

To examine the question of whether SI group membership was associated with friendlessness (e.g., not receiving any friendship nominations from classmates) a series of hierarchical logistic regressions were computed entering group status, gender, grade, and race on the first step. Interaction terms were then added (group status x gender, group status x grade, group status x race) on the next step to explore possible interactive effects of demographic variables with group status on friendlessness. Children who were in the SI group were significantly more likely to be friendless than were children in the COMP group ($B = 2.27$, OR = 9.70, p <.0001). Specifically, children in the SI group were more than nine times more likely to be friendless than COMP peers. No main or interactive effects of demographic variables were demonstrated, suggesting that gender, race, and grade were not independently or interactively associated with increased

risk for friendlessness (Table 3).

Table 3. Logistic regression predicting friendlessness from group status and demographic variables

Independent Variables	Step 1			Step 2		
	B (SE)	Wald	OR	B (SE)	Wald	OR
Main Effects						
Group Status	2.27 (0.27)	70.44***	9.70	2.10 (1.08)	3.81*	8.20
Gender (Male)	0.19 (0.22)	0.77	1.21	0.56 (0.52)	1.17	1.74
Grade	0.07 (0.10)	0.42	1.07	-0.03 (0.22)	0.01	0.97
Race (White)	-0.39 (0.24)	2.75	0.68	-0.41 (0.52)	0.62	0.64
Interactions						
Group Status (SI) x Gender (Male)	--	--	--	-0.45 (0.57)	0.63	0.64
Group Status (SI) x Grade	--	--	--	0.11 (0.25)	0.21	1.12
Group Status (SI) x Race (White)	--	--	--	0.02 (0.58)	0.00	1.02
	X^2	df	p	X^2	df	p
Overall Model Summary						
Likelihood Ratio Test	102.21	4	.00	103.08	7	.00
Goodness-of-fit Summary						

Homer-Lemeshow Test	4.39	8	.82	1.11	8	1.00

* denotes p < .05, **denotes p < .01, *** denotes p < .001

To examine the question of whether peer perceptions of academic ability and athletic ability interacted with group status and/or demographic variables a second logistic regression analysis was conducted adding in the main effects of these variables along with demographic variables on the first step, as well as their two-way interactions with group status on the second step. A main effect was revealed for peer perceptions of academic ability ($B = 0.35$, OR = 1.42, $p < .01$), and athletic ability ($B = 0.32$, OR = 1.37, $p < .05$). More specifically, for each one-standard deviation increase in negative peer perceptions of academic ability, risk for friendlessness increased by approximately 40 percent. Likewise, for each one-standard deviation increase in negative peer perceptions of athletic ability, risk for friendlessness increased by approximately 40 percent. However, no effects of academic and athletic ability were noted when considered in interaction with group status. This suggests that while lower academic and athletic abilities may independently predict risk for friendlessness, they do not moderate the effect of group status in this model (Table 4).

Table 4. Logistic regression predicting friendlessness from group status, demographic variables, and academic and athletic competencies

Independent Variables	Step 1			Step 2		
	B (SE)	Wald	OR	*B* (SE)	Wald	OR
Main Effects						
Group Status	1.57 (0.32)	25.03***	4.82	1.67 (1.17)	2.05	5.33
Gender (Male)	0.21 (0.22)	0.94	1.24	0.69 (0.54)	1.65	1.99
Grade	0.07 (0.10)	0.44	1.07	-0.02 (0.23)	0.01	0.98
Race (White)	-0.47 (0.24)	3.71	0.63	-0.50 (0.54)	0.85	0.61
Poor Academic Ability	0.35 (0.12)	8.77**	1.42	0.75 (0.30)	6.21*	2.12
Poor Athletic Ability	0.32 (0.13)	5.74*	1.37	0.60 (0.34)	3.20	1.82
Interactions						
Group Status (SI) x Gender (Male)	--	--	--	-0.57 (0.59)	0.94	0.56
Group Status (SI) x Grade	--	--	--	0.11 (0.26)	0.20	1.21
Group Status (SI) x Race (White)	--	--	--	0.04 (0.60)	0.01	1.04
Group Status (SI) x Poor Academic Ability	--	--	--	-0.48 (0.33)	2.15	0.62
Group Status (SI) x Poor Athletic Ability	--	--	--	-0.35 (0.37)	0.91	0.71

	X^2	df	p	X^2	df	p
Overall Model Summary						
Likelihood Ratio Test	121.96	6	.00	127.05	11	.00
Goodness-of-fit Summary						
Homer-Lemeshow Test	11.97	8	.15	6.55	8	.59

* denotes p < .05, **denotes p < .01, *** denotes p < .001

3.3   EFFECTS OF SI/COMP GROUP STATUS ON PEER REJECTION

To examine the question of whether SI group membership was associated with likelihood of peer rejection a s econd series of hierarchical logistic regressions were computed entering group status, gender, grade, and race on the first step. Interaction terms were then added (group status x gender, group status x grade, group status x race) on the next step to examine possible interactive effects of demographic variables with group status in predicting peer rejection. There was a significant increase in the likelihood of peer rejection among children who were in the SI group, relative to the COMP group ($B = 2.73$, OR = 15.29, p <.0001). Children in the SI group were 15 times more likely to be rejected than COMP peers. Again, no m ain or interactive effects of demographic variables were demonstrated, suggesting that gender, race, and grade were not independently or interactively associated with increased risk for friendlessness (Table 5).

Table 5. Logistic regression predicting peer rejection from group status and demographic variables

Independent Variables	Step 1			Step 2		
	B (SE)	Wald	OR	*B* (SE)	Wald	OR
Main Effects						
Group Status	2.73 (0.22)	153.47***	15.29	2.52 (0.90)	7.89**	12.44
Gender (Male)	0.08 (0.20)	0.18	1.09	0.59 (0.39)	2.34	1.81
Grade	0.13 (0.09)	1.95	1.14	0.07 (0.17)	0.18	1.08
Race (White)	0.17 (0.23)	0.55	1.19	-0.13 (0.42)	0.10	0.88
Interactions						
Group Status (SI) x Gender (Male)	--	--	--	-0.71 (0.46)	2.44	0.49
Group Status (SI) x Grade	--	--	--	0.08 (0.20)	0.16	1.09
Group Status (SI) x Race (White)	--	--	--	0.42 (0.50)	0.72	1.52
	X^2	df	*p*	X^2	df	*p*
Overall Model Summary						
Likelihood Ratio Test	207.71	4	.00	211.14	7	.00
Goodness-of-fit Summary						

Homer-Lemeshow Test	4.86	8	.77	5.67	8	.68

* denotes p < .05, **denotes p < .01, *** denotes p < .001

To examine the question of whether peer perceptions of academic and athletic abilities interacted with group status and/or demographic variables to predict peer rejection a second logistic regression analysis was conducted adding in the main effects of these variables along with demographic variables on the first step, as well as their two-way interactions with group status on the second step. In addition to the main effects of group membership already reported, main effects were also revealed for peer perceptions of academic ($B = 0.79$, OR $= 2.21$, $p < .001$), and athletic ability ($B = 0.40$, OR $= 1.49$, $p < .01$). Again, across the sample for each one-standard deviation increase in peer perceptions of poorer academic abilities, children were more than twice as likely to be rejected. Likewise, for each one-standard deviation increase in peer perceptions of poorer athletic abilities, children were approximately 50 percent more likely to be rejected. However, again no effects of academic and athletic abilities were noted when considered in interaction with group status. This suggests that while academic and athletic abilities may independently contribute to risk for peer rejection they do not do so in interaction with group status (Table 6).

Table 6. Logistic regression predicting peer rejection from group status, demographic variables, and academic and athletic competencies

Independent Variables	Step 1			Step 2		
	B (SE)	Wald	OR	*B* (SE)	Wald	OR
Main Effects						
Group Status	1.79 (0.26)	47.78***	6.00	2.11 (1.04)	4.11*	8.27
Gender (Male)	0.20 (0.22)	0.86	1.22	0.89 (0.44)	4.11	2.43
Grade	0.15 (0.10)	2.31	1.17	0.13 (0.19)	0.49	1.14
Race (White)	0.12 (0.25)	0.25	1.13	-0.22 (0.46)	0.23	0.80
Poor Academic Ability	0.79 (0.13)	38.03***	2.21	1.11 (-0.27)	17.07***	3.03
Poor Athletic Ability	0.40 (0.13)	8.82**	1.49	0.89 (0.30)	8.53**	2.43
Interactions						
Group Status (SI) x Gender (Male)	--	--	--	-0.92 (0.51)	3.29	0.40
Group Status (SI) x Grade	--	--	--	0.05 (0.22)	0.06	1.06
Group Status (SI) x Race (White)	--	--	--	0.48 (0.31)	0.80	1.62
Group Status (SI) x Poor Academic Ability	--	--	--	-0.43 (0.31)	1.97	0.65
Group Status (SI) x Poor Athletic Ability	--	--	--	-0.65 (0.34)	3.64	0.52

	X^2	df	p	X^2	df	p
Overall Model Summary						
Likelihood Ratio Test	275.35	6	.00	286.04	11	.00
Goodness-of-fit Summary						
Homer-Lemeshow Test	9.53	8	.30	9.94	8	.27

* denotes p < .05, **denotes p < .01, *** denotes p < .001

3.4   LATENT CLASS ANALYSES WITHIN THE SI GROUP

LCA models were fit to the 30 individual items (behavioral characteristics) of the RCP. The presence or absence of a behavioral characteristic was based on receiving 2 or more peer-nominations for that behavior. Model fit criteria, specified in the 'Methods' section indicated that 3 classes provided the best fit for the unique peer-reported behavioral characteristic profiles. Specifically, a 3-cluster solution demonstrated statistical significance (bootstrap $p = .15$), as well as the lowest BIC and AWE values. While a 4-cluster solution showed somewhat greater statistical significance in the bootstrap p-value ($p = .17$), it demonstrated poorer goodness-of-fit (increased BIC and AWE values), as well as a higher percentage of classification errors. As such, the addition of more than three classes decreased parsimony while also failing to produce a better-fitting solution.

The class solution information, including prevalence of assignment of individuals to each class, is presented in Table 7. Conditional probabilities for individuals within each identified class for all RCP roles, as well as the overall probability of item-endorsement for the entire SI group across all RCP roles is provided in Table 8. Unlike with factor analysis, where items within a measure cluster to form the basis of scales that may be used to determine population groups, LCA identifies clusters of individuals with similar characteristics from within a broader group. Class membership can then be related to likelihood of certain behavioral characteristics. In the present work, this allowed for creation of classes that were all highly likely to endorse the same roles on the SI scale, but that differed in regards to their behavioral characteristics on other scales. A graphical illustration of these behavioral profiles for each class is presented in Figure 1.

Each class is divided on the basis of the RCP 4-factor scales with Sensitive Isolated items, followed by Aggressive-Disruptive items, Popular-Leadership items, and Prosocial items. Names for the classes were chosen based on the pattern of symptom endorsement within the response profile. Descriptively these classes correspond to (1) Pure Isolation (SI-Pure, N=224, 66.5 %) (2) Isolated-Aggressive (SI-Aggressive, N=86, 25.5%) and (3) Isolated-Prosocial (SI-Prosocial, N=27, 8.0%). As predicted, co-occurring aggressive behaviors distinguished class 2 from other classes. For qualitative comparison, descriptive characteristics of the classes are presented in Table 9.

Table 7. Model fit indices for latent classes of behavioral characteristics among SI children

Solution	Npar	L^2	Bootstrap p value	BIC (LL)	AWE	Classification Error %
1-Class	30	3821.92	0.06	7760.46	8025.06	0
2-Class	61	3101.96	0.13	7220.93	7832.80	0.05
3-Class	92	2788.22	0.15	7087.61	7962.89	0.03
4-Class	123	2662.76	0.17	7142.57	8316.73	0.05
5-Class	154	2563.59	0.14	7223.83	8729.75	0.09

Table 8. Overall and conditional item-endorsement probabilities for SI children.

RCP Behavior	Overall Probability	Conditional Probabilities		
		SI-Pure	SI-Aggressive	SI-Prosocial
Sensitive-Isolated Roles				
Plays alone	0.58	0.63	0.46	0.55
Feelings easily hurt	0.53	0.56	0.40	0.79
Trouble making friends	0.63	0.58	0.88	0.23
Can't get others to listen	0.57	0.50	0.84	0.25
Shy	0.28	0.34	0.03	0.61
Often left out	0.69	0.69	0.69	0.77
Sad	0.62	0.67	0.46	0.81
Aggressive-Disruptive Roles				
Fights a lot	0.20	0.03	0.68	0.00
Loses temper	0.21	0.08	0.60	0.07
Shows off	0.14	0.07	0.34	0.00
Interrupts	0.24	0.11	0.63	0.00
Acts like a little kid	0.36	0.29	0.60	0.20
Bossy	0.15	0.02	0.49	0.02
Teases others	0.03	0.59	0.89	0.00
Picks on others	0.16	0.01	0.57	0.00
Popular-Leader Roles				
Good leader	0.03	0.00	0.00	0.38
Has good ideas	0.04	0.03	0.00	0.31

Has many friends	0.01	0.00	0.02	0.03
Someone everyone listens to	0.03	0.00	0.02	0.24
Good sense of humor	0.04	0.02	0.03	0.25
Makes new friends easily	0.01	0.00	0.00	0.14
Someone everyone likes	0.01	0.00	0.00	0.14
Someone who gets things going	0.03	0.01	0.03	0.14
Happy	0.07	0.05	0.04	0.29
Likes to play with others	0.07	0.06	0.06	0.16
Prosocial Roles				
Trustworthy	0.07	0.02	0.00	0.60
Waits his/her turn	0.13	0.10	0.01	0.65
Plays fair	0.06	0.05	0.00	0.34
Polite	0.07	0.00	0.01	0.69
Helps others	0.05	0.03	0.00	0.31

Table 9. Descriptive characteristics for SI classes

	SI-Pure (*N* = 224)		SI-Aggressive (*N* = 86)		SI-Prosocial (*N*=27)	
	N	*%*	*N*	*%*	*N*	*%*
Males	121	54	36	42	18	67
Black	55	27	22	28	5	22
Grade 2	28	13	23	27	4	15
Grade 3	55	25	24	28	9	33
Grade 4	67	30	23	27	6	22
Grade 5	74	33	16	19	8	30
Peer Rejection	140	63	70	83	3	12
No Reciprocated Friendships	87	52	34	53	6	40
No Best Friend Nominations	85	38	43	51	5	19
	M	*SD*	*M*	*SD*	*M*	*SD*
Friendships and Peer Acceptance[†]						
Reciprocated Friendships	-0.62	0.77	-0.74	0.76	-0.59	0.79
Best Friend nominations	-0.71	0.63	-0.87	0.63	-0.36	0.72
Overall Liking Ratings	-1.03	0.80	-1.58	0.62	0.22	0.78
Likes Least Nominations	0.94	1.04	1.77	0.91	-0.32	0.74
RCP Scale Scores[†]						
RCP Sensitive-Isolated	1.92	0.69	1.95	0.70	1.84	0.77
RCP Aggressive-Disruptive	-0.34	0.48	1.70	0.96	-0.57	0.35

RCP Popular-Leader	-0.80	0.38	-0.81	0.48	0.30	1.01
RCP Prosocial	-0.49	0.50	-0.88	0.42	1.46	0.85

[†]Values represent z-scores normed within classrooms, where $M = 0$, and $SD = 1$

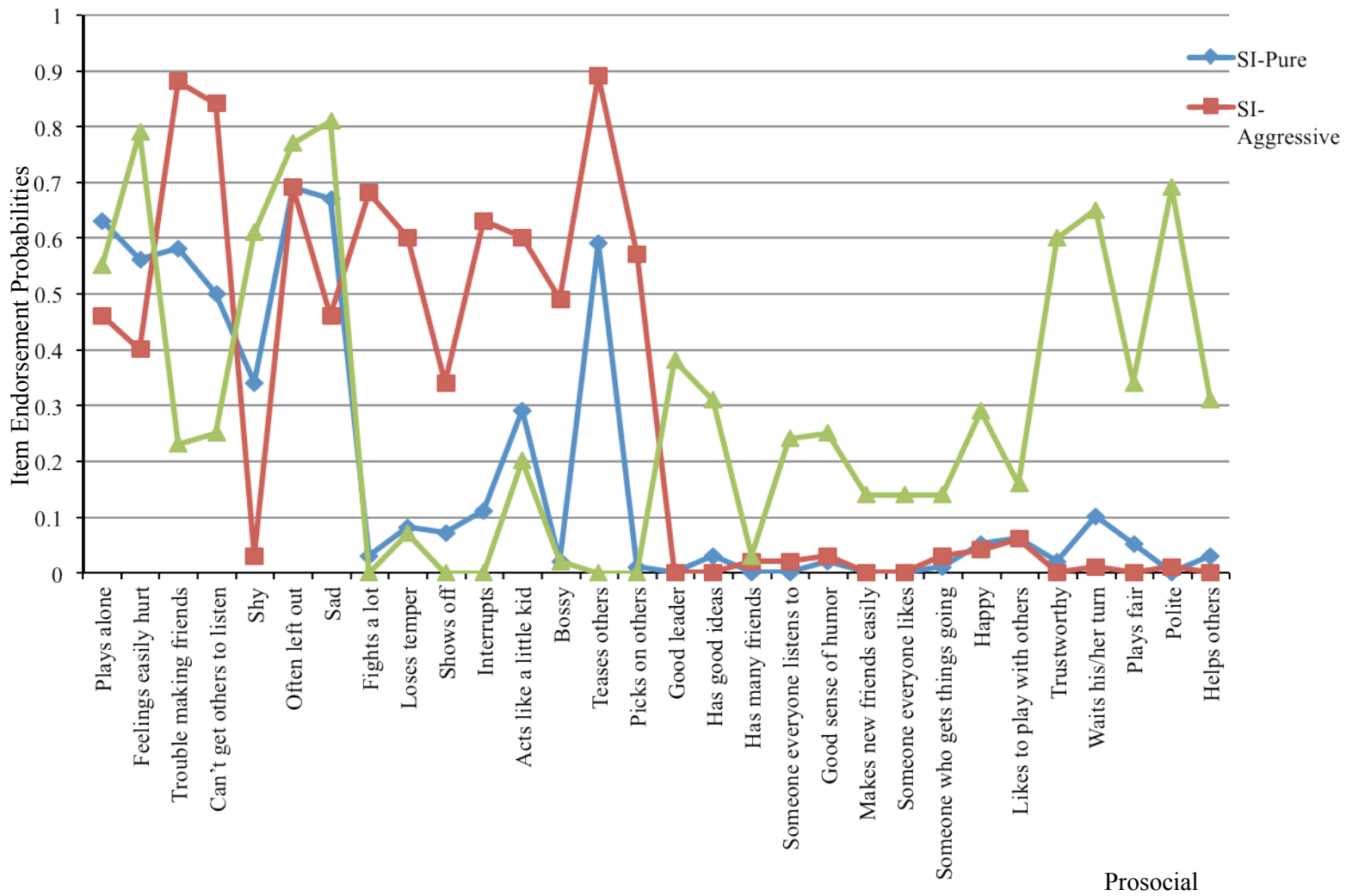*denotes $p < .05$, ** denotes $p < .01$, *** denotes $p < .001$; two-tailed test

Figure 1. Class membership profiles

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3.4.1 Effects of class membership on friendlessness

To examine the question of whether class membership was associated with likelihood of friendlessness (e.g., not receiving any friendship nominations from classmates) a series of hierarchical logistic regressions were computed entering class membership (utilizing the SI-Pure class as the reference class) and demographic characteristics in the first step. In the next step, interaction terms were added (class membership x gender, class membership x grade, and class membership x race) to explore possible interactive effects of demographic variables with class membership on friendlessness. For the class membership variable there was a significant increase in the likelihood of friendlessness for children who were in the SI-Aggressive class, relative to the SI-Pure class ($B = 0.55$, $OR = 1.72$, $p < .05$). Specifically, children in the SI-Aggressive class were almost twice as likely than SI-Pure children to be friendless. No significant differences were demonstrated between the SI-Pure and SI-Prosocial classes. A follow-up analysis utilized the SI-Prosocial class as the reference class to assess relative risk between SI-Aggressive and SI-Prosocial classes. These results suggested that not only are the SI-Aggressive children at somewhat greater risk for friendlessness relative to the SI-Pure class, but the SI-Prosocial class is at significantly reduced risk of friendlessness relative to the SI-Aggressive class ($B = -1.48$, $OR = 0.23$, $p < .01$). This suggests that children classified as SI-Aggressive are at relatively greatest risk for friendlessness. No interactive effects of demographic variables emerged, suggesting that gender, race, and grade do not moderate the risk for friendlessness (Table 10).

Table 10. Logistic regression predicting friendlessness from class membership and demographic variables

Independent Variables	Step 1			Step 2		
	B (SE)	Wald	OR	*B* (SE)	Wald	OR
Main Effects						
SI-Aggressive (versus Pure)	0.55 (0.28)[a]	3.82*	1.72	-0.49 (1.06)	0.22	0.61
SI-Pure (versus prosocial)	0.94 (0.97)[b]	2.66	2.55	0.51 (2.34)	0.05	1.66
SI-Prosocial (versus aggressive)	-1.48 (0.60)[b]	6.02**	0.23	0.49 (1.06)	0.22	1.64
Gender (Male)	0.23 (0.25)	0.85	1.25	-0.00 (0.30)	0.00	1.00
Grade	0.12 (0.12)	1.02	1.12	0.10 (0.14)	0.54	1.12
Race (White)	-0.36 (0.27)	1.79	0.70	-0.51 (0.32)	2.48	0.60
Interactions						
Gender (Male) x Class Membership (Aggressive)	--	--	--	0.85 (0.56)	2.32	2.34
Gender (Male) x Class Membership (Pure)	--	--	--	-0.39 (1.33)	0.09	0.68
Gender (Male) x Class Membership (Prosocial)	--	--	--	-0.46 (1.38)	0.11	0.63
Grade x Class Membership (Aggressive)	--	--	--	0.07 (0.26)	0.08	1.48
Grade x Class Membership (Pure)	--	--	--	0.26 (0.58)	0.21	1.30
Grade x Class Membership (Prosocial)	--	--	--	-0.33 (0.60)	0.31	0.72

Race (White) x Class Membership (Aggressive)	--	--	--	0.55 (0.62)	0.79	1.74
Race (White) x Class Membership (Pure)	--	--	--	-0.37 (1.34)	0.08	0.69
Race (White) x Class Membership (Prosocial)	--	--	--	-0.18 (1.40)	0.02	0.83

	X^2	df	p	X^2	df	p
Overall Model Summary						
Likelihood Ratio Test	10.81	5	.05	14.20	11	.22
Goodness-of-fit Summary						
Homer-Lemeshow Test	5.44	8	.71	2.92	8	.94

* denotes p < .05, **denotes p < .01, *** de notes p < .001; values with different alphabetical superscripts indicate statistically

significant group differences

3.4.2 Effects of class membership on peer rejection

To examine the question of whether class membership was associated with the likelihood of peer rejection a series of hierarchical logistic regressions were computed entering class membership (utilizing the SI-Pure class as the reference class) and demographic characteristics on the first step. Next, interaction terms were added (class membership x gender, class membership x grade, and class membership x race) to explore possible interactive effects of demographic variables with class membership on peer rejection. For the class membership variable there was a significant increase in the likelihood of peer rejection among children who were in the SI-Aggressive class relative to the SI-Pure class (B = 1.16, OR = 3.17, p < .01). Specifically SI-Aggressive children were more than three times as likely than SI-Pure children to be rejected by peers. Likewise, children in the SI-Prosocial class were significantly more likely to be friendless (B= 2.45, OR = 11.54, p <.001), relative to the SI-Pure class. Specifically, SI-Pure children were more than 11 times more likely to be rejected than SI-Prosocial children. Again, a follow-up analysis utilized the SI-Prosocial class as the reference class to examine relative risk between SI-Aggressive and SI-Prosocial classes. These results suggested that not only are the SI-Aggressive children at greater risk for peer rejection relative to the SI-Pure class, but that SI-Prosocial children are also at much less risk for peer rejection relative to the SI-Aggressive class (B = -3.60, OR = 0.03, p <.0001). Specifically, the SI- Prosocial children were *97 times less likely* than the SI-Aggressive children to be rejected by their peers. This suggests that children classified as SI-Aggressive are at relatively greatest risk for peer rejection, whereas SI-Prosocial children are relatively lowest risk for this outcome in contrast to other isolated children. Given the small cell sizes within the SI-Prosocial class for the peer rejection outcome (3 rejected versus 23 non-

rejected SI-Prosocial children) these results should be interpreted with caution as this increases

risk for multicollinearity. Although, examination of the majority of diagnostic collinearity

statistics for the main effects model (VIF, Tolerance, condition indices, and variance

proportions) were largely within normal parameters, suggesting that multicollinearity was not a

pronounced confound in these analyses; regardless these results should be interpreted with

caution.

Due to insufficient cell size, and more significant issues with multicolinearity between

the class membership and race variables, main and interactive effects of race were removed from

the second step of this model. No interactive effects of other demographic variables were

demonstrated, suggesting that gender and age were not moderators of the association between

risk for peer rejection and subtype of social isolation (Table 11).

Table 11. Logistic regression predicting peer rejection from class membership and demographic variables

Independent Variables	Step 1			Step 2		
	B (SE)	Wald	OR	*B* (SE)	Wald	OR
Main Effects						
SI-Aggressive (versus Pure)	1.16 (0.34)[a]	11.46**	3.17	0.31 (1.19)	0.07	1.37
SI-Pure (versus prosocial)	2.45 (0.64)[b]	14.50***	11.54	1.28 (2.58)	0.25	3.60
SI-Prosocial (versus aggressive)	-3.60 (0.70)[c]	26.43***	0.03	-1.59 (2.73)	0.34	0.20
Gender (Male)	0.14 (0.26)	0.30	1.15	0.19 (0.28)	0.47	1.21
Grade	0.22 (0.12)	3.35	1.25	0.22 (0.14)	2.65	1.25
Race (White)	0.43 (0.54)	0.63	1.54	--	--	--
Interactions						
Gender (Male) x Class Membership (Aggressive)	--	--	--	0.31 (0.69)	0.20	1.36
Gender (Male) x Class Membership (Pure)	--	--	--	2.02 (1.41)	2.06	7.57
Gender (Male) x Class Membership (Prosocial)	--	--	--	-2.33 (1.52)	2.36	0.10
Grade x Class Membership (Aggressive)	--	--	--	0.24 (0.34)	0.53	1.28
Grade x Class Membership (Pure)	--	--	--	0.05 (0.71)	0.01	1.05
Grade x Class Membership (Prosocial)	--	--	--	-0.29 (0.76)	0.15	0.75

Race (White) x Class Membership (Aggressive)	--	--	--	--	--	--
Race (White) x Class Membership (Pure)	--	--	--	--	--	--
Race (White) x Class Membership (Prosocial)	--	--	--	--	--	--

Overall Model Summary	X^2	df	p	X^2	df	p
Likelihood Ratio Test	44.33	5	.00	54.59	8	.00
Goodness-of-fit Summary						
Homer-Lemeshow Test	8.22	8	.41	2.13	7	.95

* denotes p < .05, **denotes p < .01, *** de notes p < .001; values with different alphabetical superscripts indicate statistically significant group differences

4.0 DISCUSSION

While SI behaviors in middle childhood have been associated with problematic social and emotional functioning in children both concurrently, and over time, debate continues about their status as a risk factor for more pervasive difficulties. Additional questions about the moderating role of variables such as age, gender, and race in reported associations, as well as controversy regarding the functional significance of behavioral variability among socially isolated children have clouded our ability to understand the risk associated with these behaviors.

The present study utilized an extreme group approach to examine the behavioral characteristics and risk for social dysfunction of a large sample of children in grades 2-5 characterized by their peers as SI. The goal of this work was to identify risk associated with SI behaviors more broadly, while also articulating the role of demographic factors and exploring meaningful patterns of behavioral variability within a sample of children perceived by peers as displaying the highest level of these behaviors (and, thus, who are most likely to be at risk for psychosocial difficulty). The primary outcomes of interest in the present study were friendlessness and peer rejection, two potent indices of social maladjustment. To examine risk associated with SI behaviors most broadly, children with high levels (i.e., ≥ 1.5 SD) of SI behaviors were examined in comparison to a sample of one-to-one matched peers (COMP), with particular attention to the risk and/or protective benefits conferred by specific demographic factors (gender, race, grade-level) and behavioral characteristics (academic and athletic abilities).

4.1 VULNERABILITY OF SENSITIVE-ISOLATED CHILDREN RELATIVE TO MATCHED COMPARISON PEERS

Logistic regression analyses revealed that children with high levels of SI behavior were at significantly greater risk for both friendlessness and peer rejection relative to matched comparison peers. This is consistent with literature citing pervasive psychosocial difficulties among isolated children (Boivin & Hymel, 1997; Burgess et al., 2006; Gazelle, 2008; Gazelle & Ladd, 2003; Hymel et al., 1990; Ollendick et al., 1990; Risi et al., 2003; Rubin et al., 1982; Zeller et al., 2003). The sizes of these effects were quite pronounced, with odds ratios of 9.70 and 15.29 for friendlessness and peer rejection, respectively. This confirms that the selection criteria used for determining the SI group did identify children whose isolated behaviors were associated with meaningfully poor social functioning. Contrary to predictions these analyses failed to demonstrate any main effects or interactive associations with gender, grade or race. That is to say, that there was no meaningful variability in risk for friendlessness or peer rejection based on these characteristics either across groups or within the SI group. This is quite striking given the large size of the present sample (N (total sample) = 678, N (SI sample) = 339) and consequent power to detect sizes of small effect, as well as sample diversity (26% Black). When considering our failure to support the hypothesis that boys with SI behaviors would be at relatively greater risk than girls with SI behaviors for both friendlessness and peer rejection it is important to note that one researcher in this area has reported associations with gender to be less pronounced or even absent in extreme group samples (Coplan, 2011). To the extent that the extreme group approach identifies the children with the most significant functional impairments it is likely that the risk conveyed by membership in the SI group outweighed any interactive role of gender as these children were already experiencing such significant psychosocial difficulty.

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Relatedly, given that the SI group was at such elevated risk for both friendlessness and peer rejection the statistical power to explore such demographic variability within the outcome variables may have been truncated as a function of this reduced variability.

While poor academic and athletic abilities increased risk for peer rejection and friendlessness, the combination of SI and poorer academic and/or athletic ability was not associated with increased vulnerability for SI children. As with gender, grade, and race, this highlights the notion that these social behaviors do not add to the understanding of risk/vulnerability among children displaying SI behaviors. This suggests that although these variables may not add to the understanding of which children with extreme SI behaviors are most at risk they are important variables to consider in future work exploring vulnerabilities for social dysfunction more broadly.

4.2 BEHAVIORAL VARIABILITY AND VULNERABILITY AMONG SENSITIVE-ISOLATED CHILDREN

The present study also sought to examine whether there was functionally meaningful behavioral variability within the SI group. While previous studies and theoretical work have suggested that there are meaningful sub-groups of SI children, obtaining a sufficiently large sample of these children to characterize this variability (both with regard to overall number, and to type and amount of behavioral data) has been problematic. The current research identified a relatively large sample of children with high levels of SI behaviors, a sample that is larger than those previously reported on in the literature, and obtained detailed behavioral data from a well-validated measure of social reputation (the RCP). Latent class analyses on the SI group utilizing

behavioral data from the RCP, strongly suggested the presence of three distinct classes of SI children who were characterized as SI-Pure (66%), SI-Aggressive (26%), and SI-Prosocial (8%).

4.2.1   SI-Pure children

In many ways the SI-Pure class aligned most closely with an undifferentiated type of social isolation wherein children exhibited a range of isolated behaviors (i.e., plays alone, feelings easily hurt, trouble making friends, can't get others to listen, left out, sad). Essentially, these children were nominated by peers as fitting every role from within the SI scale of the RCP, without significant likelihood of exhibiting other negative (e.g., aggression) or positive (e.g., leadership, prosocial) social behaviors. Approximately half of this group of children had one reciprocated friendship; this was comparable to the number of reciprocated friendships reported for the SI-Aggressive group, but less than was evident for the SI-Prosocial group.

With regard to relative vulnerability for friendlessness (receiving NO friendship nominations), the SI-Pure subgroup did not appear to express significantly greater risk relative to the SI-Prosocial group and were less likely than the SI-Aggressive group to be friendless. This suggests that absence of co-occurring aggressive behaviors may reduce the relative risk for friendlessness among the SI-Pure group. By extension it could be interpreted that some peers of SI-Pure children may be able to overlook their introverted nature enough to form a dyadic friendship. However, the SI-Pure group was more likely to be rejected by their peers than the SI-Prosocial group, though again this outcome was still more prevalent among the SI-Aggressive group. When considering this increased risk for peer rejection relative to the SI-Prosocial group it could be argued that the lack of positive social characteristics for the SI-Pure group leads them to be viewed more negatively by their overall peer group. This highlights ways in which the SI-

Pure child may be most at risk for social difficulties within their broader peer group, as opposed to within dyadic relationships.

These finding echo literature on social isolation in middle childhood that has repeatedly described increased risk for peer rejection among children broadly classified as displaying SI behaviors (Boivin & Hymel, 1997; Gazelle, 2008; Gazelle & Ladd, 2003; Hymel et al., 1990; Ollendick et al., 1990; Risi et al., 2003; Rubin et al., 1982; Zeller et al., 2003). Only two studies were identified examining friendlessness among undifferentiated samples of children with SI behaviors (Burgess et al., 2006; Zeller et al., 2003). Although both these studies showed an increased risk for friendlessness among children with SI behaviors, failure to demonstrate increased risk for friendlessness among SI-Pure children in the present study may challenge the notion that SI behaviors (in the absence of other positive or negative social behaviors) increase risk for friendlessness. At a minimum, more research is necessary to clarify this question.

4.2.2 SI-Aggressive children

As predicted, a second class of socially isolated children with comorbid aggressive-disruptive behaviors also emerged from the latent class analyses. The SI-Aggressive subgroup appeared behaviorally similar to a previously described "active-isolated" subtype of socially isolated children (Gazelle, 2008; Gazelle & Ladd, 2003; Harrist et al., 1997; Rubin & Mills, 1988), showing high levels of some isolated behaviors (i.e., left out, trouble making friends, trouble getting others to listen) as well as a number of aggressive-disruptive behaviors (i.e., fights a lot, loses temper, interrupts, acts like a little kid, bossy, teases others, picks on others). This corresponded to significantly higher scores on the RCP aggressive-disruptive domain relative to other groups. Descriptively, approximately half of the SI aggressive group had one

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reciprocated friendship, similar to the SI-Pure group, but the remaining half of this group received no friendship nominations at all, the highest percentage of any group. This suggests that feelings towards this group of children were the most polarized. This is echoed by the number of "likes least" nominations this group received, with the average likes least score 2-3 standard deviations higher than for the other groups, and their overall liking-ratings, which were substantially lower than for the other groups.

When examining risk for peer rejection and friendlessness associated with class membership in regression models, the SI-Aggressive class evidenced significantly greater risk for friendlessness and peer rejection relative to the SI-Pure and SI-Prosocial classes. This is consistent with a number of studies that have demonstrated the active-isolation subgroup of socially isolated children to be at the greatest risk for social maladjustment (Bowker et al., 1998; Gazelle, 2008; Harrist et al., 1997). Given the aversiveness of aggressive behaviors, particularly in context of their high visibility it is not surprising that these children appear to engender more ill will from their peers and experience more difficulty with dyadic friendships, and social acceptance. Moreover, when examining their behavioral profile there is an absence of factors that might help to temper these negative behaviors (e.g., good manners, fun to be around).

In integrating these findings with existing literature the present study lends further support to work that has demonstrated more negative social outcomes for children demonstrating behaviors consistent with the active-isolation subtype of social isolation (Bowker et al., 1998; Gazelle, 2008; Harrist et al., 1997). This highlights the vulnerability of these children and the need for targeted intervention and prevention efforts with children displaying both isolated and aggressive behaviors. When considering these findings in light of the growing literature on bullying it would seem that the fewer friendships and poor social reputation of SI-Aggressive

children would place them at greatest risk for bullying in comparison to other subtypes. Specifically, children with fewer friendships and lower peer acceptance have been shown to be at increased risk for bullying/victimization. Although friendships (Murray-Harvey & Slee, 2010), positive social characteristics (Anderson, Rawana, Brownlee, & Whitley, 2010), and better self-control and emotion regulation (Belacchi & Farina, 2010; Garner & Hinton, 2010) appear to attenuate some of the risk for victimization, this SI subtype appears to be relatively lowest on these dimensions. Moreover, given their co-occurring aggressive behaviors it seems likely that the SI-Aggressive subgroup may be at risk to fall into the commonly described bully-victim cycle (Gibb, Horwood, & Fergusson, 2011; Losel & Bender, 2011; Meland, Rydning, Lobben, Breidablik, & Ekeland, 2010). This highlights the need to focus intervention efforts on S I-Aggressive children to both prevent their victimization and interrupt what could escalate into a cycle of violence over time.

4.2.3   SI-Prosocial children

Finally, the last class that emerged, SI-Prosocial, displayed higher levels of prosocial behaviors (i.e., trustworthy, waits his/her turn, polite) than the other two classes alongside isolated behaviors (i.e., plays alone, feelings easily hurt, shy, often left out, and sad). Likewise, while not commonly endorsed (conditional probabilities less than 50%), the SI-Prosocial group was seen as exhibiting relatively more popular-leadership behaviors (i.e., good leader, good ideas, good sense of humor, happy, someone everyone listens to) than the other two classes. Interestingly, when examining the profile of sensitive-isolated roles displayed by these children, more difficulties regarding emotion regulation (i.e., feelings easily hurt, shy, sad) were identified

for this class. This may suggest a higher level of affective sensitivity in the context of some level of social competence (at least in comparison to other children demonstrating SI behaviors).

Notably, 60% of the children in the SI-Prosocial group had a reciprocated friendship, and 80% received at least one friendship nomination from classroom peers. Moreover, their average liking-ratings were actually at or somewhat above the classroom mean (and the means of the other SI groups) and they were less likely to receive "likes least" nominations. They also were rated as average in comparison to peers on leadership behaviors, and significantly higher than classroom peers (and other SI groups) on the RCP prosocial scale. This suggests that despite their elevated sensitive-isolated behaviors these children exhibit a higher degree of social connectedness, better social skill, and a generally more positive social reputation than children from other SI groups.

Similar subgroups of socially isolated children have not been extensively reported in this literature. Regardless, the current findings suggest a subclass of social isolation that may include children with some protective, adaptive behavioral characteristics. Of note, there is one prior study wherein a subgroup of "agreeable" isolated children were identified (Gazelle, 2008). In this study agreeable isolated children were described by peers as being friendly, nice, cooperative, and well mannered while simultaneously evidencing shyness, quietness, and difficulty joining others at play. Additionally, this subgroup displayed some desirable social characteristics (i.e., fun to be around, leadership qualities, and relatively high perceived intelligence). While this group appears behaviorally similar to the SI-Prosocial group in the present study and may provide emerging support for a distinct new subtype of social isolation, one important distinction between the prior and present studies is that Gazelle's agreeable isolated group did not appear to show the same emotional lability that was evidenced for the SI-

Prosocial class in the present study. Despite this departure the evidence broadly suggests there may be a subgroup of isolated children with some positive, potentially protective behavioral characteristics.

Notably, in the present study the SI-Prosocial class showed the lowest risk for peer rejection. This suggests that co-occurring prosocial characteristics may attenuate some of the risk associated with SI behaviors for these children. Again, these findings are similar to those of Gazelle (2008) who showed that agreeable isolated children were less at risk for low peer acceptance relative to isolated peers who were not agreeable. In contrast to the disrupting, aversive, and alienating behaviors displayed by the SI-Aggressive class it is easy to see how characteristics such as politeness and trustworthiness would be assets, perhaps protecting a child from some of the negative attention and ill will visited upon their more aggressive peers. However, it is interesting to note that this protective association was not present for the friendlessness variable. This suggests that while co-occurring prosocial behaviors may protect an isolated child from being actively rejected, they do not appear to affect whether or not the child has meaningful dyadic friendships in their class at school.

Here it is interesting to consider how some of the emotional lability described for the SI-Prosocial group may act as a barrier to meaningful dyadic social interactions. To this end, there is a substantive literature describing ways in which emotion dysregulation can impede social interaction and social engagement among children (Blandon, Calkins, Grimm, Keane, & O'Brien, 2010; Contreras, Kerns, Weimer, Gentzler, & Tomich, 2000; Fabes et al., 1999; Gazelle & Druhen, 2009; Perry-Parrish & Zeman, 2011; Rubin, Coplan, Fox, & Calkins, 1995). To the extent that such dysregulation is a stable characteristic, growing evidence suggests that over time this behavioral pattern is associated with more difficulty establishing and maintaining

meaningful friendships (Cohen & Mendez, 2009; Kim & Cicchetti, 2010). Moreover, the sadness and sensitivity displayed by the SI-Prosocial group may not only be a challenge for the social partners of these children, but also a sign of social disengagement that may accompany low or dysregulated affect (Suveg, Hoffman, Zeman, & Thomassin, 2009).

Such difficulties with affective sensitivity and related difficulties with peer rejection and friendlessness have previously been reported for the "passive-anxious" subgroup of isolated children (Coplan et al., 2001; Gazelle, 2008; Gazelle & Ladd, 2003; Hart et al., 2000; Ladd, 2006; Nelson et al., 2005). However, the absence of co-occurring positive social attributes in this previously identified subgroup makes it d ifficult to integrate the present findings into this literature and suggests the present SI-Prosocial group is unique in terms of behavioral profile and functional outcomes. Perhaps not surprisingly, the literature on the passive-anxious subgroup of isolated children is the least consistent both with regard to classification of these children and in terms of reported vulnerabilities for psychosocial difficulties. To the extent that the large sample size of the present study may have increased power to determine relevant characteristics for the sub-typing of children displaying socially isolated behaviors, the SI-Prosocial class may provide a new platform for investigating some of these issues related to the roles of both affective sensitivity and protective prosocial characteristics.

4.2.4   General comments about class analyses

The pattern of results across class analyses suggest the presence of meaningful variability within the socially isolated behaviors displayed by these children. In particular, significant variability in co-occurring aggressive and prosocial/leadership behaviors was demonstrated, with this variability associated with differences in the social functioning of SI children. While some of

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these findings align with existing literature new questions about the role of prosocial behavior and affective sensitivity have emerged. Additionally, the present study failed to provide support for the existence of a "socially disinterested" class of children among those exhibiting SI behaviors. While this might call into question the utility of continued exploration of this subtype in ongoing research, it is likely that the current methodology employing the RCP was inherently limited in its ability to identify such a subtype of SI children. Specifically, the lower social drive and motivation for social interaction that are thought to characterize this subgroup of SI children are not readily represented among RCP items. Aside from "someone who plays alone," which may be for more reasons than a personal desire to do s o, none of the RCP items assess characteristics that readily and uniquely map onto this subtype. Moreover, peer nominations for such behaviors are inherently limited in that they are external, rather than internal appraisals of this motivation. Who would know better than a child himself whether they preferred to play alone or with others? On the contrary, it is also possible that child who has no friends might be less likely to reveal that he does in fact want friends. Given these barriers, additional work employing self-report of social drive and/or observations of a child's contentedness during solitary play may be better suited to identifying this subtype of social isolation.

In looking across findings related to subtypes of SI children it is important to note that again, demographic variables (i.e., gender, grade-level, and race) did not appear to interact with class membership to predict either index of maladjustment. This suggests that SI behaviors when they are extreme, even when considered in a differentiated manner, appear to confer risk for maladjustment universally. When considering the implications of this, it would seem that specific attention to factors such as gender, grade/age, and race may not be as critical in identifying the SI children at highest risk; rather, attention to the variability within the behaviors

the SI child displays (and the related subgroup onto which that this variability maps) may provide the greatest utility in identifying the SI children who are most vulnerable.

4.3 LIMITATIONS AND FUTURE DIRECTIONS

In extending the present work the following limitations are important to consider: the use of an extreme group sample, reliance on data from one source, a cross-sectional design, a narrow range of outcome measures, and limited ability to consider the role of socio-cultural factors.

First, while utilization of an extreme group sample is thought to be an asset in the present work, it is important to acknowledge some of the inherent limitations of this methodology. Specifically, selection of children scoring at the upper end of the distribution of SI behavior resulted in the creation of a sample, which may have more limited generalizability, a common dilemma of extreme-group research. Because the present sample was not population-based and did not reflect the full range of variability in SI behaviors, it is possible that reported associations would not extend to the rest of the distribution of children exhibiting only some isolated behaviors. For instance, it may be that among children demonstrating slightly elevated levels of SI behavior co-occurring, aggressive behaviors do not increase risk for peer rejection and friendlessness. Likewise, for children demonstrating only somewhat elevated levels of SI behavior, factors such as age, race, and gender may be more significantly associated with risk for adverse outcomes.

Second, in interpreting and extending these data, one important aspect to consider is reliance on peer-report nominations of social behaviors. While this approach is considered to be ecologically valid, and quite powerful given that the data classroom peers provide is generated

across observations and peer observers, some authors have raised concerns that younger children in particular may be less attuned to and able to accurately report on the types of SI behaviors that were the focus of this investigation (Gazelle, 2008). Furthermore, it is critical to note that a child's peers are not likely to be the individuals responsible for the identification of at-risk children. Although teacher- and peer-report of social behaviors are moderately correlated (ranging from 0.3 - 0.5; Nabuzoka, 2003; Noll et al., 1999; Noll, LeRoy, Bukowski, & Rogosch, 1991; Pakaslahti & Keltikangas-Jarvinen, 2000; Younger, Schneider, Guirguis, & Bergeron, 2000), this is not a forgone conclusion. Moreover, there may be important differences and/or subtleties in the types of behaviors identified by peers and by teachers. For instance, whereas a child's teacher may readily identify a child who "plays alone" or who is "often left out," a child's peers may be more likely to have the occasion to observe behaviors such as "feelings easily hurt" or "can't get others to listen." To the extent that teachers may have more difficulty and/or less opportunity to make such subtle characterizations, the present study may have illuminated risk factors that cannot be readily identified by those who are in a better position to intervene. Furthermore, it is unknown whether teachers' observations of children's social behavior would yield the same three classes of SI children and result in the same associated vulnerabilities identified in the present work. This creates significant challenges in determining how to extend these data to inform intervention efforts.

In the same vein, this study employed a classroom-based data collection design in which children were able to nominate peers and list friends only from within their school classroom. Although this strategy is psychometrically robust, it limits our ability to understand the true and full extent of a child's social isolation. It is possible, if not likely, that children characterized by peers as exhibiting a high level of SI behaviors within their classroom are isolated across social

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contexts; alternatively, children who failed to receive any friendship nominations from classmates, may exhibit different patterns of acceptance, friendship, or social behavior outside their school classroom. For instance, a child in the extreme SI group at school may be viewed by peers from his or her neighborhood, religious center, or activity group (e.g., boy scouts, dance class) in a completely different manner. Such a child may also receive and/or reciprocate more friendship nominations with peers from these settings. Given that the present study was limited to selection of peers from within a child's classroom, it is impossible to ascertain the true extent of a child's social isolation and whether it extends across multiple contexts. Moreover, although a child's peers within his or her classroom do provide multiple perspectives on that child's behavior in that specific setting it still represents only one setting in which the child engages in social interactions. Despite the psychometric strength of the RCP and measures of peer acceptance and friendship employed in the present work they would likely be most powerful when considered from a broader ecological view. Future work incorporating peer nominations from multiple settings (e.g., school, youth center, religious center) would be better suited to answer this question and may reveal new insights about the pervasiveness of isolation for children high in SI behaviors at school, as well as ways in which social relationships outside the classroom setting could exacerbate or attenuate this risk. However, collection of data in these additional contexts would occur without the extensive history and psychometric validation that accompanies classroom data collection, and as such suggests the need for significant future work to fully understand the meanings of peer nominations outside the classroom setting (e.g., at churches, in boy scout troops etc.)

Likewise, observational assessment of socially isolated behaviors could further bolster current knowledge based on teacher or peer reports (Gazelle & Ladd, 2003; Gazelle & Rudolph,

2004), while offering the opportunity to potentially manipulate social scenarios and actors to gain a more process-oriented understanding of the ways these behaviors increase vulnerability. Finally, a consideration that may be particularly relevant for the SI-Aggressive group is obtaining data from the family/home environment. Given that these children were externalizing by definition and often rejected by their peers, it is likely that there is substantial overlap between this subgroup and those who have been identified as "aggressive victims" in the cycle of violence in other investigations (Schwartz, 2000). Because past investigations have indicated that aggressive victims often experience harsh, punitive, and abusive parenting (Schwartz, 2000; Schwartz, Dodge, Pettit, & Bates, 1997), studying these children in the context of their relationships with parents may be of substantial importance to understanding potential origins and correlates of this behavioral profile. Thus, even though peer sociometrics are considered the gold standard for assessment of peer relations and there is a great deal of evidence in support of their reliability, as our knowledge of socially isolated behaviors becomes increasingly refined such methods may not be ideally suited to more sophisticated alternatives for characterizing of these phenotypes and their mechanisms of action.

Third, in the context of the mechanistic questions noted above the weaknesses of having used a cross-sectional design become apparent. Although the present design is thought to represent an improvement over studies that utilized a narrow age range (Coplan et al., 2001; Gazelle, 2008; Harrist et al., 1997; Ollendick et al., 1990; Rubin & Mills, 1988) or did not fully explore age-specific associations in multi-age samples (Masten et al., 1985; Risi et al., 2003), it is unable to speak to trajectories of socially isolated behavior or the cumulative effects of isolated behavior for a given child over time. When considering the reported associations between socially isolated behaviors and peer adversity it is essential to highlight their

bidirectional nature. While peer rejection and friendlessness were conceptualized as outcome variables in this work, they could be just as easily considered as precursors of socially isolated behaviors. To the extent that such peer experiences could lead a child to distance him or herself and disengage from his social world this study was unable speak to how either the isolated behaviors or peer adversity unfolded over time. Specifically, for the children in this study displaying SI behaviors, it unknown whether these behaviors precipitated peer rejection and friendlessness, or whether the SI behaviors followed as a result of experiencing such peer adversity. Indeed, a longitudinal design would provide a more powerful strategy for both illuminating and understanding the sequelae associated with SI behaviors (both broadly, and specifically) across this period of middle childhood.

To fully understand the role that age may play in risk for maladjustment among children with SI behaviors, a longitudinal design that would follow children displaying SI behaviors across grades 2 through 5 would have several advantages over the present methodology. Specifically, it would allow for exploration of *both* concurrent and later risk for social dysfunction. To the extent that stability or change in SI behaviors could be measured across this time span, such work could also facilitate an understanding of the cumulative effects of SI behaviors over time. Additionally, repeated assessments would provide information regarding the stability of SI behaviors, and whether children who are consistently viewed by peers as SI are at greater risk than those with fluctuating difficulties. Further, precipitants of these changes (or lack thereof) could be explored. As children with SI behaviors are likely to be both the product and producer of difficult interpersonal relations, longitudinal work will be required to better understand how these processes unfold. Such work could probe questions related to any

variability that may be introduced as a result of the changing peer environments as children move from classroom to classroom each year.

Relatedly, there is little known about the stability of SI subtypes and their adjustment trajectories over time. Such a longitudinal design that followed subgroups of SI children over time would allow examination of this question alongside consideration of potentially powerful co-occurring behaviors (e.g., prosocial behaviors, aggression) and risk for social difficulties. Moreover, interesting and clinically relevant questions regarding the timing of these co-occurring behaviors could be explored. For example, characterization of the timing of prosocial and leadership behaviors displayed by the SI-Prosocial group could shed light on whether these prosocial behaviors developed as a compensatory strategy for children with a long history of behavioral inhibition, or whether their SI behaviors followed from a longer trajectory of behavioral inhibition despite the acquisition of these adaptive behavioral characteristics, perhaps as a result of peer adversity.

Fourth, this research utilized a narrow range of outcome measures to assess the social functioning of children in the extreme SI group. At a basic level, reliance on dichotomous outcome variables forces somewhat arbitrary cut-offs among data (as with the calculation of the peer rejection variable), and this strategy reduces our power to look for more subtle and/or continuous relationships. This is magnified when multiple predictors are dichotomous, as was the case with the present study. It increases the degrees of freedom and the number of contrasts to consider within the experimental design, and has the potential to lead to cumbersome models. To the extent that peer rejection is more of a continuous rather than categorical phenomenon the present study design limits our ability to understand an outcome where children may be "somewhat rejected" as opposed to "rejected." It should be noted, however, that some of the

largest and most striking effect sizes were demonstrated with the peer rejection variable, suggesting that despite implementing these cut-offs there was a great deal of meaningful variability to be explained through this variable.

At a more conceptual level, while peer rejection and friendlessness are indeed potent indices of psychosocial dysfunction and portend risk for problematic outcomes across psychosocial domains both concurrently and over time (Bierman, 2004; Laursen, Bukowski, Aunola, & Nurmi, 2007), they fail to capture the *emotional* impact of such social behaviors on these children. To the extent that there is a subgroup of children with SI behaviors who are less engaged and motivated by social interaction with peers (i.e., the socially disinterested subtype of social isolation), not having friendships or the experience of being rejected by peers may actually not represent a meaningful index of maladjustment. In fact, recent research has suggested that children with Asperger's Disorder (APA, 2000) are rated by peers as low on measures of social network centrality, peer acceptance, and friendships (Chamberlain, Kasari, & Rotheram-Fuller, 2007). Yet these children do not report higher levels of loneliness or social dissatisfaction than their classroom peers. To the extent that there may be some overlap between the extreme isolated group identified in this work and children with autism spectrum disorders this work may highlight a subgroup of isolated children who may be less sensitive to their social isolation and perhaps less at risk for maladjustment. As such, further characterization of the emotional functioning of these behavioral phenotypes is necessary to truly identify those children with SI behaviors who are most at risk for psychosocial difficulties. Incorporating self-, parent-, and/or teacher-reports of psychopathology would be a powerful way to begin to capture these data.

Relatedly, it is also possible that a more fine-grained consideration of the specific outcome variables employed could shed additional light on risk and resiliency among these

children. For instance, while presence of friendship is generally conceptualized as a protective factor there is considerable research exploring how variability in friendship quality (not just quantity) plays an important role in modulating this influence (e.g., Newcomb & Bagwell, 1995). Additionally, growing research on peer social networks suggests that a child's position (i.e., centrality) within their social network, both broadly and within a network's smaller subgroups, has important implications for the protective role of friendships (e.g., Farmer & Rodkin, 1996; Gest, Graham-Bermann, & Hartup, 2001). Whereas a friendship nomination by a peer whom the target child views positively (and perhaps who is viewed more positively by the collective peer group) could likely attenuate some of the risk associated with isolated behaviors, a friendship nomination from a peer who is less valued by the target child and who may be characterized less positively by the peer group may fail to buffer or even contribute to this increased risk. Such gradations in the both the quality and centrality of these relationships while potentially meaningful were unexplored in the present work. Likewise, variability in friendship quality and social network centrality may influence the social and emotional experience of the isolated child (e.g., the extent to which they feel lonely, socially anxious, or self-confident). For instance, an isolated child experience may not experience the same boost in confidence and reduction in anxiety and/or loneliness from a friendship with a child who is similarly excluded or neglected by others. Yet, we do not know this without explicitly having the child characterize their personal social-emotional experience. Without such an assessment the extent to which these isolated behaviors are associated with emotional distress remains somewhat crude. As such, further work assessing the emotional experience of the isolated child, in addition to these subtleties of friendship quality and social network centrality, would enhance our understanding of which isolated children are most at risk.

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A final important limitation to consider is the inability to consider the role of socioeconomic status (SES) in the vulnerability of SI children to psychosocial difficulties in this study. This question has received very little attention in this literature to date. There are a number of important ways in which SES could impact risk for maladjustment among these children. For example, consider the isolated child who comes from a family that is of a higher SES. This child may have more formalized opportunities for structured social interaction and more access to resources (e.g., therapy, skills groups) than a peer from a more disadvantaged background. However, a child from a less advantaged family may have a larger network of extended family, friends, and neighborhood peers with whom to socialize. Moreover, there is some work suggesting that children from lower SES families often have more extensive social networks in their neighborhood (e.g., DuBois & Hirsch, 1990; Way & Chen, 2000; Way & Robinson, 2003), and it is unclear whether isolation in their school classroom is similarly reflected in this setting. To the extent that children from lower SES may have a more extensive social network in their neighborhood it may be that SI behaviors in the classroom setting are not as strong a marker of maladjustment for these youth.

Additional cross-cultural work has shown that the correlates of SI behavior are sensitive to factors such as country of origin (Eisenberg et al., 2001, Eisenberg et al., 2004; Nelson, Rubin, & Fox, 2005). Previous research employing the RCP in Chinese samples has shown that higher scores on the SI scale in middle childhood are associated with greater peer acceptance for Chinese youth concurrently (Chen et al., 1992) and also predict better psychosocial functioning in adolescence (Chen, Rubin, Li, & Li, 1999). In this work, authors have speculated that this is a result of greater cultural encouragement of values related to self-restraint and deference. Also noteworthy are more recent findings from this research group that suggest changes in socio-

cultural context over time have influenced these associations (Chen, Cen, Li, & He, 2005). Whereas SI behavior was associated with social and academic achievement in the 1990 cohort, the associations became weaker or non-significant in the 1998 cohort. Furthermore, SI behavior was associated with peer rejection, school problems, and depression in the 2002 cohort. Again, such work highlights the likelihood that consideration of more nuanced socio-cultural aspects of a child's environment may lend further clarification to which children with SI behaviors are most at risk for dysfunction. In light of the similar span of time that elapsed between the initiation and completion of the current work (1990-2003) it is possible that cohort effects might be evident in this sample as well. Given some confounds between cohort effects and racial status in the present study (i.e., a majority of the data on Black children was concentrated during the early years of data collection) this question was not probed. However, such cohort effects would be an interesting avenue to pursue in future work, particularly given the rapidity of social change in peer relationships in the American culture.

4.4   IMPLICATIONS FOR INTERVENTION

Despite these limitations, the present study provides some interesting potential avenues for intervention, as well as some intriguing areas for additional research. Given the increased risk for peer rejection and friendlessness associated with extreme SI behaviors in middle childhood, particularly when these behaviors include comorbid aggression, the current study adds yet more evidence to the literature describing social difficulties for isolated children and underscores the need for timely identification and intervention with these children.

While little support was found for the targeting of specific age, gender, or racial groups of isolated children, results from the LCA would suggest that exploration of additional social behaviors (e.g., aggression, prosocial behaviors) expand our understanding of risk among these children. Specifically, co-occurring aggressive behaviors increase risk for peer rejection and friendlessness, whereas co-occurring prosocial behaviors attenuate this risk, at least in the case of peer rejection. Clinically, this highlights the need to channel the isolated and aggressive children into interventions that may reduce aggressive behaviors (e.g., anger management, bullying prevention, emotion regulation coaching) while perhaps increasing some of their prosocial behaviors (e.g., manners/social skills).

Notably, difficulties with emotion regulation have been documented for shy and socially isolated children (Gazelle & Druhen, 2009; Henderson, 2010; Strand, Cerna, & Downs, 2008). Likewise, shy and isolated children demonstrate specific difficulties with skills important for social interaction such as problem solving, attribution biases, attentional biases, emotion identification, assertiveness, and self-confidence (Brunet, Mondloch, & Schmidt, 2010; Colonnesi, Engelhard, & Bvagels, 2010; Gazelle & Druhen, 2009; Perez-Edgar et al., 2010; Schneider, 2009; Tuschen-Caffier, Kvhl, & Bender, 2011). Recent intervention research by Kvarme and colleagues (Kvarme et al., 2010) has begun to explore the efficacy of targeting specific social cognitive strategies for isolated children. In this work, 12-13 year old students in Norway identified as isolated by their teachers participated in 6 consecutive weekly meetings at school where they were instructed in a solution-focused approach to problem solving. This approach additionally emphasized building social skills and self-efficacy/assertiveness. Results revealed that children in the treatment group showed significant improvement in general self-efficacy and assertiveness. However, no da ta on improvements in social isolation or peer

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relationships were reported. While future work relating these improvements in social skills to peer acceptance and/or isolation is needed, this research represents a p romising step in developing interventions for socially isolated youth. Unfortunately, despite documented deficits in emotion regulation for isolated children, particularly in regulation of anger and aggression for the SI-Aggressive subtype, no studies could be identified that employ instruction in these tools or strategies for isolated children. Emotion regulation strategies are a core component of manualized outpatient (e.g., Segool & Carlson, 2008) and school-based (e.g., Aune & Stiles, 2009) interventions for youth with Social Anxiety Disorder (APA, 2000). Given the overlap between social anxiety and social isolation, particularly for the SI-Pure subtype of children, such interventions suggest that more focus on e motion regulation may be a helpful addition to interventions targeting the socially isolated child. Moreover, given that interventions focused on anger-management and emotion regulation have been shown to improve functioning for youths with externalizing behavior problems (Feindler & Engel, 2011; Izard, 2002; Izard, Fine, Mostow, Trentacosta, & Campbell, 2002; Lochman & Wells, 2002a, 2002b; Nelson-Gray et al., 2006) it may be that focusing more attention on t hese issues for isolated children with co-occurring aggressive behaviors could help improve impulse control and reduce the additional risk associated with the SI-Aggressive subtype.

When considering the intervention implications raised by the SI-Prosocial group to the extent that prosocial behaviors do not appear to attenuate risk for friendlessness in the present sample it seems important to facilitate positive dyadic peer interactions for all isolated children. This could take the form of coaching in specific social skills (e.g., assertiveness, initiating conversations) and emotion regulation, which are both necessary for successful dyadic peer relationships, as well as providing structured opportunities for these interactions under adult

supervision and guidance. Research has shown that shy children can be more successful in social interactions when an adult or older child is present (Morris & Greco, 2002). Relatedly, providing peer mentoring experiences for these children may help them observe and practice such skills within a supportive relationship (Morris & Greco, 2002). In the existing literature there are several interventions that appear to serve some of these purposes. Specifically, the Circle of Friends intervention (Barrett & Randall, 2004) is a recent intervention used to tackle social isolation in childhood. Its aim is to promote social inclusion by establishing a friendship group for an isolated child within their classroom at school. This occurs through structured small group interactions, some of which focus more globally on the importance of friendships and kindness to others, and some of which focus specifically on difficulties a target child might have in establishing friendships. While various permutations of this approach have been employed, all appear to show some efficacy in reducing the isolation of the target child after a relatively short intervention period.

Outside of fostering specific group interactions aimed at improving friendships researchers in Finland (Metsapelto, Pulkkinen, & Tolvanen, 2010) have investigated the socioemotional benefits of a more diffuse school-based intervention program called the Integrated School Day. This large-scale, state-sponsored initiative involved the restructuring of the school day by adding in extra-curricular activities that were available to all pupils, organized on school premises, and included a multitude of activities according to the wishes of the children. The longitudinal findings, based on hierarchical linear modeling, showed that the 9- to 10-year-old children who had participated in the program had lower levels of internalizing problem behaviors, both social anxiety and depressive symptoms, than the non-intervention comparison group. The difference was statistically significant in both genders. The results also

showed that the higher number of years of participation (but not the number of different activities or the regularity of participation) was related to lower internalizing problem behaviors, particularly to lower social anxiety, at the end of the program. While not specific to social isolation, the improvements in social anxiety demonstrated in this work point to the potential benefits of access to structured social activities within the school setting for children who are isolated. Similarly, recent work reported by Findlay and Coplan (2008) has demonstrated that participation in sports is associated with reductions in anxiety over time, especially for children who are initially described by their parents as shy. These reductions in social anxiety occurred in the context of increased self-esteem and improved social skills across for shy children participating in sports, compared to those who did not participate. Taken together, this work exploring facilitated social interactions for shy and/or isolated children appears to be a promising approach towards fostering better peer acceptance and inclusion for socially isolated children.

Separate from the above, it is interesting to note that academic and athletic abilities did not appear to add to risk associated with SI behaviors. However, main effects of these variables were demonstrated on both peer rejection and friendlessness across the SI and COMP groups. This provides an interesting avenue for future research for children experiencing social difficulties more broadly, and suggests that improving functioning within these domains may be a potential avenue for intervention.

4.5   CONCLUDING THOUGHTS

The combination of behaviors used to create behavioral classes of isolated children in this study was successful in identifying a large group of extreme SI children who appear to form subgroups

of isolated children who experienced significant differences in degree and type of peer adversity and prevalence of friendships. Associations between multifaceted behavioral profiles, peer rejection, and friendships support a person-oriented approach in which combinations of characteristics interact within a child and their social system, rather than as independent variables across populations (Bergman, Magnusson, & El-Khouri, 2003; Magnusson & Stattin, 2006). Nonetheless, there are tradeoffs between this person-oriented subgroup approach and variable-oriented approaches. Although variable-oriented approaches often lend more power to analyses by preserving large sample sizes, the current study was quite large and produced sufficient power to detect hypothesized associations, which were ultimately moderate to large in size. Also, while some investigators have argued that more fine-grained subgroups are likely to be less stable over time (Ladd, 2006), such stability is inherent in development according to systems perspectives (Lerner, Theokas, & Bobek, 2005). Thus, the increased precision in explaining heterogeneity in social adjustment among children with SI behaviors would seem to be worth some degree of tradeoff with stability, as such instability is inherent (and necessary) in the fluctuations of normal development.

Most importantly, these results highlight serious limitations of studying SI behaviors in isolation from other social behavioral characteristics. For children who possess relational skills that promote positive relationships (i.e., SI-Prosocial subtype), extreme SI behaviors may not have such a pronounced impact on s ocial functioning. However, for children without such relational skills, and particularly those with additional behavioral difficulties like aggression (i.e., SI-Aggressive subtype), SI behaviors carry true potential to adversely affect social interactions and relationships. Ultimately, this pattern of findings suggests that extreme SI behaviors are associated with peer rejection and friendlessness for most children, but less so for some,

depending on how SI behaviors combines with other child characteristics and environmental influences. It is only by examining all these elements together that we will best be able to determine the skills children bring to interactions and the adversities that may or may not result from social interaction.

The present findings also highlight the need for intervention efforts to focus on combinations of children's social behaviors rather than on a single isolated dimension. As this work continues to articulate these differentiated subgroups of SI children, attention to features of a child's environment that precipitate interpersonal strengths or weaknesses or that have played a role in the generation of individual characteristics may provide additional targets. The need for such a focus on environmental influences is highlighted in a recent intervention for socially anxious preschoolers that demonstrated that children's anxiety can be improved via parent training (Rapee, Kennedy, Ingram, Edwards, & Sweeney, 2005). Exploring such matches between the child's adaptation and their family/school environments may enable future research and interventions to best address the well-being of children facing these complex social challenges.

APPENDIX A

RCP ITEMS, LISTED BY DOMAIN OF SOCIAL BEHAVIOR

Popular–Leadership

1. Someone who is a good leader

4. Someone who has good ideas

9. Someone who has many friends

12. Someone who everyone listens to

16. Someone with a good sense of humor

20. Someone who makes new friends easily

25. Someone who everybody likes

26. Someone who can get things going

28. Someone who is usually happy

30. Someone who likes to play with others

Aggressive–Disruptive

2. Someone who fights a lot

5. Someone who loses his/her temper

6. Someone who shows off

8. Someone who interrupts

15. Someone who acts like a little kid

21. Someone who is bossy

27. Someone who teases others

29. Someone who picks on others

Sensitive–Isolated

3. Someone who plays alone

11. Someone whose feelings are easily hurt

14. Someone who has trouble making friends

17. Someone who can't get others to listen

18. Someone who is shy

22. Someone who is often left out

24. Someone who is sad

Prosocial

7. Someone who is trustworthy

10. Someone who waits his or her turn

13. Someone who plays fair

19. Someone who is polite

23. Someone who helps others

Supplemental Items

Physical Illness

    31. Someone who is sick a lot

    34. Someone who misses school often

    36. Someone who is tired a lot

Academic Ability

    32. Someone who has problems at school

    38. Someone who is good at school

Athletic Ability

    35. Someone who is not good at sports

    39. Someone who is good at sports

Physical Appearance

    33. Someone who is attractive

    37. Someone who is not attractive

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