Social Competence as a Moderator of the Aggression-Victimization link in Elementary School Children

by

Naomi Sklar
B.A., University of Western Ontario, 2008

A Thesis Submitted in Partial Fulfillment
of the Requirements for the Degree of

MASTER OF SCIENCE

in the Department of Psychology

Supervisory Committee

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Abstract

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Childhood aggression is a pervasive problem that has serious consequences for peer relationships. The relation between aggression and peer victimization has been studied extensively. Research suggests that these two constructs become intertwined in a maladaptive cycle as children age. Yet, not all aggressive children are victimized by their peers nor does aggression have the same consequences for all children. The current study seeks to investigate under what circumstances aggression leads to peer victimization and suggests that social competence is a critical moderator of this relationship. Previous research has found that levels of social competence vary among aggressive children. However, the consequences of aggression (i.e., peer victimization) at varying levels of social competence has not been previously studied. In a sample of 369 children in grades 2 through 5, the short-term longitudinal relations between physical aggression and peer victimization, and the moderating effects of social competence were examined over two time points. Social competence moderated the relation between aggression and peer victimization: At low levels of social competence, the relation between aggression and peer victimization was not significant. At moderate and high levels of social competence, a relation between aggression and peer victimization was significant. Findings demonstrate the importance of fostering social competence and prosocial conflict

resolution strategies among aggressive children and intervening early in development in order to prevent the occurrence and consequences of childhood aggression.

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Acknowledgments

I would like to thank the many individuals that have supported me and helped me through this challenging task. First of all, my greatest of thanks and appreciation goes to my supervisor, Dr. Bonnie Leadbeater, whose persistence, dedication, wisdom, guidance, and support has truly contributed to my development as a researcher. I would also like to thank my committee member, Dr. Marsha Runtz, whose constructive feedback and advice has been invaluable to this thesis. Many thanks as well to my research lab, whose advice and guidance have truly helped me attain this challenging goal. Additionally, I would like to thank my dear family and friends for their continual support and words of encouragement throughout this process. Without all of you, this thesis would not be possible.

Introduction

Over the past few decades, the study of childhood aggression has received widespread attention. Research indicates that levels of aggression are highest among toddlers, where as many as 50% of peer-interactions involve conflict and hostility (Cairns & Cairns, 1994). Levels of aggressive behaviour typically decrease before school entry, as children acquire new interpersonal skills and coping strategies for managing peer conflicts (Cairns & Cairns, 1994; Degnan, Calkins, Keane, & Hill-Soderlund, 2008; Tremblay, Nagin, Séguin, Zoccolio, Zelazo, Boivin, et al., 2004). However, 3% to 6% of children continue to exhibit aggressive behaviour upon entry to elementary school and into adolescence and adulthood (Cairns & Cairns, 1994; Moffit, 1993). Peer relationships form the basis for social development throughout childhood and consequences of these relationships are fundamental to understanding the intraindividual differences among aggressive children (Campbell, Hansen, & Nangle, 2010).

Considerable research has also linked aggression with subsequent peer victimization (Giesbrecht, Leadbeater, & MacDonald, 2011; Kochenderfer-Ladd, 2003; Leadbeater & Hoglund, 2009; Ostrov, 2010). Peer victimization is defined as the receipt of behaviours by peers that are intended to inflict harm on a child (Card & Hodges, 2008). Children who exhibit aggressive behaviour are (in turn) often victimized by their peers as a consequence of this antisocial behaviour (Barker, Boivin, Brendgen, Fontaine, Arseneault, & Vitaro et al., 2008). In fact, peer victimization appears to be increasingly stable over time (Hodges & Perry, 1999), with aggressive children showing different patterns of victimization than their nonaggressive peers (Dhami, Hoglund, Leadbeater, &

Boone, 2005; Peeters, Cillessen, & Scholte, 2010; Schwartz, 2000). For example, Schwartz (2000) found that whereas children who were both aggressive and victimized demonstrated high levels of behavioural dysregulation, thus rewarding provocation with displays of anger and distress, nonaggressive victims demonstrated more withdrawn behaviours, and were characterized by low rates of socially skilled behaviour. Additionally, Schwartz found that aggressive victims were more likely to be persistent targets of peer victimization as compared with nonaggressive victims.

Both victims and perpetrators of peer aggression and victimization are at risk for emotional, behavioural, and social adjustment problems including depression, anxiety, social withdrawal, and behavioural problems (Hawker & Boulton, 2000). Aggression and victimization also have consequences for peer relationships such as peer rejection, conflict, and a lack of social and emotional support (Ladd, 1999). However, for some children, social competence may mitigate the risks associated with aggression and peer victimization. Therefore, the current study investigates aggression and peer victimization at three levels of social competence over a 6-month period with a sample of grades 2 to 5 children.

Types of Aggression

Aggression involves an intention to harm another individual (Salmivalli & Peets, 2008), and can be conceptualized along a continuum of confrontational behaviour. Physical aggression is the most overt behaviour (Underwood, Beron, & Rosen, 2009; Xie, Cairns, & Cairns, 2005), and involves the use of physical force to inflict harm on the victim (e.g., beating up someone, hitting, or throwing a chair at someone). Importantly, frequencies, types, and functions of aggressive behaviours change with development, as

social-cognitive skills become more developed (Campbell et al., 2010). Damaging peer relationships can also become a means of exercising harm to others and disrupting social status (Underwood et al., 2009). As children age, their use of verbal aggression increases (Xie et al., 2005). Verbal aggression entails the use of negative words to insult, threat, curse, or yell at the victim (Xie et al., 2002). Both physical and verbal aggression are prototypic types of aggression common in childhood and are related to concurrent and prospective maladjustment problems (Xie, Cairns, & Cairns, 2002).

Although many different types of aggression are examined in the literature, the present study focuses on physical and verbal aggression, as confrontational types of behaviour. Specifically, the behaviours that characterize physical and verbal aggression include hitting others, teasing others, and being cruel to others through name calling, verbal threats, and arguing. The current study uses the term aggression to refer to both physical and verbal forms of aggression against others.

Past research suggests that not all aggressive children are aggressive for the same reasons, nor does aggression have the same consequences for all children. Some children use aggression to solve conflict in non-normative ways and are penalized for such behaviour (i.e., they are victimized by their peers; Giesbrecht et al., 2011), whereas other children who utilize their aggression in sophisticated and skilful ways are perceived as leaders and popular in their social network (Palmen, Vermande, Dekovic, & van Aken, 2011). The development of social understanding and social competence begins in early childhood, and the use of social behaviours in combination with aggression may become more intertwined over time. Therefore, the aim of the current study is to investigate how levels of social competence link aggression with peer victimization. I examine how levels

of social competence moderate the relation between aggression and peer victimization. This model is depicted as a path diagram in Figure 1.

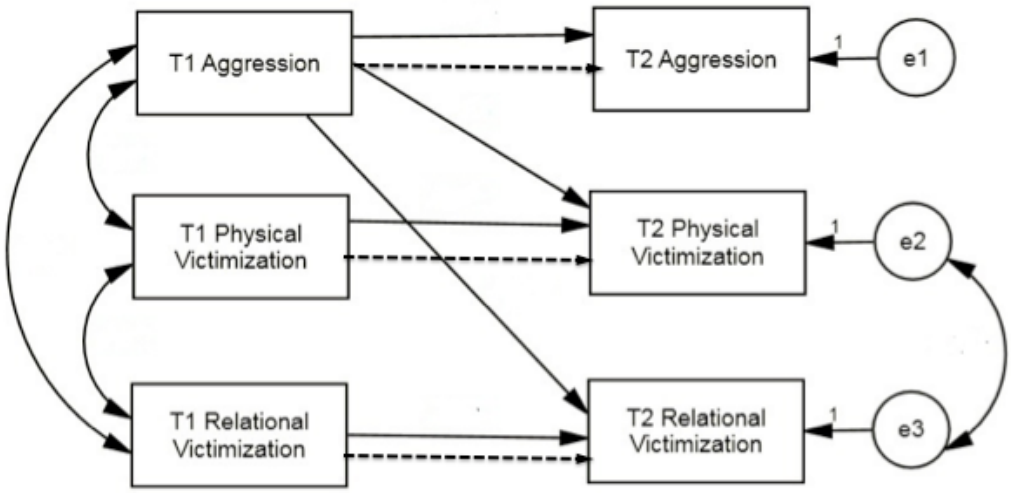


Figure 1. Hypothesized conceptual model of the moderating effect of social competence on prospective relations between aggression and peer victimization. Solid lines represent the hypothesized effect of low social competence on the relation between aggression and peer victimization, and the dotted lines represent the hypothesized relation for high social competence. In the context of high social competence, aggression and victimization are unlikely to be linked. In the context of low social competence, aggression is expected to predict increases in peer victimization over time. The double headed arrow represents a correlation.

Aggression and Peer Victimization

Previous research has focused on two forms of peer victimization: physical victimization, which includes experiencing being hit, beat up, or pushed, and relational victimization, which includes experiencing acts intended to cause harm to the victim's social status and relationships (Crick & Grotpeter, 1996). Although these forms of victimization are typically moderately to highly correlated (Crick et al., 1999; Crick &

Grotpeter, 1995; Giesbrecht et al., 2011), previous research emphasizes that each uniquely contributes to our understanding of adjustment problems and informs prevention and intervention efforts (Giesbrecht et al., 2011; Leadbeater & Hoglund, 2009; Ostrov, 2010). Specifically, in a study of grade 3 to 6 children, Crick and Grotpeter (1996) found that relational and physical victimization were differentially associated with maladjustment. Although both forms of victimization were associated with depressive symptoms, relational victimization was also linked with symptoms of anxiety and loneliness. These findings have been replicated across studies (Crick & Bigbee, 1998; Leadbeater et al., 2006). Additionally, Crick and Grotpeter (1996) found that a majority of children reported experiencing either physical or relational victimization, but not both, suggesting that different characteristics of children can make them vulnerable to either form of victimization. Clearly, these two types of victimization represent overlapping but distinct constructs and research should focus on both the antecedents and consequences of relational and physical victimization.

Past research shows relations between interpersonal forms of aggression and peer victimization both concurrently and over time in children (Barker et al., 2008; Card & Hodges, 2008; Giesbrecht et al., 2011; Leadbeater, Boone, Sangster, & Mathieson, 2006; Leadbeater & Hoglund, 2009; Ostrov, 2010; Snyder, Brooker, Patrick, Snyder, Schrepferman, & Stoolmiller, 2003). Barker and colleagues (2008) found that physical aggression in preschool children predicted peer victimization in grade one; such that children who displayed aggressive behaviours at 17 months were more likely than their nonaggressive peers to be victimized at school entry. However, the authors did not differentiate between physical and relational victimization. In a similar study with

preschool children, Ostrov (2008) found that high levels of physical aggression observed at 17 months predicted increases in levels of teacher-reported physical and relational victimization in grade one. Dhami and colleagues (2005) reported similar findings, such that children who exhibited aggressive behaviour in grade one, were more likely to be both relationally and physically victimized by their peers in grade 2, compared to their nonaggressive peers. Giesbrecht and colleagues (2011) also found that children who were rated as physically aggressive by their teachers in grade 1, showed increases in both relational and physical victimization by grade 3. A prospective relation between physical aggression and increases in both relational and physical victimization among early elementary school children has also been found (Kochenderfer-Ladd, 2003; Leadbeater & Hoglund, 2009) Therefore, one objective of the present study is to replicate the prospective relations between aggression and increases in the two subtypes of victimization. I also extend this research by examining aggression and peer victimization in children with varying levels of social competence.

In addition to studies investigating the prospective relation between aggression and peer victimization, research has also investigated victimization as a predictor of later aggression. For example, Ostrov (2010) assessed aggression as an outcome of peer victimization among preschool children and found that teacher-reported physical victimization was associated with increases in observed physical aggression over time. Although this finding is important and fundamental to our understanding of the association between aggression and peer victimization, the current study seeks to determine whether aggression predicts peer victimization. In order to ensure that the data

supports the unidirectional association between these two constructs, the relation between peer victimization and subsequent levels of aggression are examined.

Importantly, not all aggressive children are victimized by their peers. Schwartz (2000) investigated the association between aggression and peer victimization using peer nominations among children in grades four through six. Sub-types of relational and physical aggression and victimization were combined in this study. Victimization reflected both relational and physical forms (i.e., “kids who get teased” and “kids who get hit or pushed”). Children nominated up to three peers who were aggressive and three who were victimized. Aggression descriptions encompassed both physical and verbal forms (i.e., “kids who hit or push other kids” and “kids who tease or bully other kids”). Findings revealed a group of nonvictimized aggressors who were rated by their peers as aggressive, but were not rejected or victimized and were rated low on teacher ratings of emotional and behavioural dysregulation. Schwartz suggested that these children who were aggressive but not victimized used their aggression in order to attain specific goals. Rodkin, Farmer, Pearl, and Van Acker (2000) also investigated subtypes of popular boys in grades four through six. Both peer nominations and teacher ratings of children’s social reputations and behaviours similarly revealed a group of popular and aggressive boys who were identified by their peers as cool, athletic, and disruptive. Hawley (2003) also identified a group of children in grades 5 to 10 who exhibited aggressive behaviour but were not rejected or victimized by their peers: These children had high levels of social skills and were viewed as popular and well-liked by their peers. Clearly there is a need to understand under what circumstances childhood aggression leads to increases in peer victimization in middle childhood.

Aggression and Social Competence

The current study proposes that differences in levels of social competence moderate the association between aggression and peer victimization in childhood. Definitions of social competence vary widely (Stump, Ratliff, Wu, & Hawley, 2009), and past studies have used multiple social behaviours to characterize the construct including social skills (Hubbard & Coie, 1994), communication, problem solving (Haynie, Nansel, Eitel, Crump, Saylor, Yu, & Simons-Morton, 2001), and popularity with peers (Stump et al., 2009). With respect to the current study, social competence is defined in terms of adaptive behaviours and broadly consists of possessing social skills, being cooperative, adapting to change and difficulties, and possessing leadership skills.

In early research it was thought that aggressive behaviour and social skills were at opposite ends of a competence continuum, with aggressive behaviour representing impairments in social information processing and possessing social skills indicating higher levels of social competence (Hawley, Little, & Pasupathi, 2002). Crick and Dodge (1994) proposed that behaviourally aggressive children had lower levels of social competence because they lack the social cognitive capacities of their nonaggressive peers. Using a model of social information processing, which focused on children's cognitions when navigating social situations, Crick and Dodge (1994) suggested that aggression results from deficits in understanding and responding to social cues. Proponents of this view suggest that aggressive behaviour is indicative of atypical encoding of social cues in addition to deficits in social skills for responding to conflict. The view that aggressive behaviour reflects poor social skills was also supported in a meta-analytic review of sociometric status of elementary school children (Newcomb,

Bukowski, & Pattee, 1993). Newcomb and colleagues reported that rejected children exhibited higher levels of aggression and lower social competence, compared to their popular and neglected peers.

However, recent studies that examine the relation between aggression and social competence demonstrate children can be both aggressive and have high levels of social competence. Sutton, Smith, and Swettenham (1999) suggested that some children who are aggressive possess superior social skills, resulting in Machiavellian behaviours that include deceptive and manipulative behaviours. Sutton and colleagues (1999) investigated the social cognition of children (aged 7 to 10 years) and found that some aggressive children possessed high levels of social cognition. Similarly, in a study of grade 8 students, Peeters, Cillessen and Scholte (2010) found that some children who are aggressive towards their peers possess high levels of social intelligence and an ability to manipulate their peer group in order to gain dominance and control. Similar profiles were found for boys and girls. Aggressive children clustered in two groups: a socially intelligent and powerful group who use their skills in order to gain dominance, and a less socially intelligent and unpopular group who were often rejected and victimized by their peers (Peeters et al., 2010). Palmen and colleagues (2011) also found that children in grades 1 to 5 who exhibited Machiavellian behaviours (i.e., were manipulative and socially dominant) were more socially adjusted (defined in terms of academic achievement, social preference, degree of loneliness, and aggression) than their aggressive and socially incompetent peers.

Hawley investigated the aggressive behaviour of socially dominant children and adolescents and suggested that aggressive behaviour may be an adaptive means of

attaining resources, which broadly include material (i.e., food), social (i.e., friendships and mates), and informational (i.e., acquisition of both material and social resources). (Hawley, 1999; Hawley, 2002; Hawley, 2003; Hawley, 2007; Hawley, Little, & Card, 2008). Furthermore, Hawley suggests that aggression as a means of attaining social dominance can be considered socially competent behaviour, even though it involves the use of coercive behaviours (Hawley, 2002). According to Hawley, social competence can be broadly defined in terms of social outcomes and successes, and individuals can engage in both prosocial and antisocial means in order to attain a particular social goal. Using resource control theory, she suggests that children use both aggression and prosocial means in order to attain resources. To investigate social dominance and the strategies children employ in order to control resources, Hawley (2002) observed the interactions of dominant and subordinate preschool children (aged 3 to 6 years), as rated by their teachers. A block design was used to categorize children into groups of dominant and subordinate peers. Findings suggest that children employed specific strategies in order to attain resources in their environment (Hawley, 1999). Hawley (2007) found that children either employ coercive or prosocial strategies, neither of these strategies, or a combination of both. The classification of these four types of strategies was based upon where individuals fell on a distribution of coercive and prosocial behaviours. The first group, “prosocial controllers”, showed highly skilled behaviour and low aggression and their behaviour was viewed among their peers as socially acceptable. This group comprised the socially competent, popular, non-aggressive child. The second group, “coercive controllers”, were more threatening, hostile, and aggressive. They demonstrated high levels of conflict within their friendships and are comparable to

aggressors low in social competence as seen in earlier studies of aggressive behaviour (Crick and Dodge, 1994). The third group, the "bistrategic controllers", identified as Machiavellian schemers, showed high levels of prosocial behaviour but were also highly coercive and aggressive. This group of individuals were very effective at resource control and had high status ranking among their peers. The final group, the "noncontrollers", were the least effective controllers of resources. These individuals lacked adaptive social skills and scored low on measures of aggression and hostility. They were often rejected by their peers and are at risk for depressive and anxious symptoms.

Empirical evidence for Hawley's theoretical categorization of resource controllers has been found with children and adolescents (Hawley, 2003; Hawley et al., 2008). For instance, Hawley (2003) found support for these subgroups in a sample of children in grades 5 to 10 using peer ratings of aggression and peer regard (e.g., likeability and popularity), self-reported use of coercive and prosocial strategies, and teacher ratings of aggression and social acceptance. In another study, Hawley and colleagues (2008) examined sex differences in social dominance (i.e., effective at controlling resources) in children in grades 5 through 10 and found that in both boys and girls, highly socially dominant groups (i.e., prosocial and bistrategic controllers) were the most well-liked among their peers. There were no sex differences in representations of bistrategic controllers, although coercive controllers were predominantly male. Hawley's work highlights the need to view aggression as a heterogeneous concept, as not all aggressive children have low social competence and/or are rejected by their peers. Although these studies support the existence of such subtypes in preschool and older childhood, research on the manifestation of these subtypes in elementary school age children is needed.

Additionally, sex differences across these categories of resource control need further explanation.

Importantly, Hawley's definition of social competence includes the use of both coercive and prosocial behaviours in order to attain a specific goal or outcome (i.e., attaining resources). The current study, however, defines social competence in terms of adaptive behaviours (i.e., exhibiting leadership skills, being cooperative, adaptive to change and difficulties, and possessing social skills). Nevertheless, Hawley's inclusion of both coercive and prosocial behaviours in her definition of social competence demonstrates the importance of investigating the heterogeneity of aggressive behaviour and the consequences of engaging in both prosocial and antisocial behaviours in the context of peer relationships.

Peer Victimization and Social Competence

Few studies have examined the relation between social competence and peer victimization over time. Existing literature suggests that children who are socially competent or acquire social skills over time are less likely to be victimized (Boivin et al., 2010; Browning et al., 2003; Dhami et al., 2005; Garner & Lemerise, 2007). In a 4-year longitudinal study of children in grades 3 through 6, Boivin and colleagues (2010) found that children who were frequently victimized by their peers exhibited low social competence (defined in terms of social behaviours: social withdrawal, anxiety and emotional vulnerability in social situations) and aggressive behaviours (fighting and picking on other children). Unfortunately, the study did not assess social competence and aggression separately, making it difficult to understand their distinct effects on

victimization. Additionally, the authors did not distinguish between relational and physical forms of victimization.

Similarly, in a short-term longitudinal study, Browning and colleagues (2003) investigated the effects of self-reported levels of social competence (defined as peer standing and self-esteem) on rates of victimization among children in grades 3 through 5 over two time points. They found that children who were victimized at time one, but not one year later, had higher levels of social competence and preference by their peers. This suggests that social competence can act as a protective factor for peer victimization. Again, however, the definition of social competence as an index of self-esteem and peer standing did not include specific skills in peer relationships. These authors also did not differentiate between relational and physical victimization.

The association between social competence and victimization was also shown in a short-term longitudinal study of first grade children (Hoglund & Leadbeater, 2004) using teacher reports of social competence (defined as interpersonal skills and leadership abilities) and self-reported levels of physical and relational victimization measured at the beginning and end of first grade. Findings indicated that compared to boys, girls had greater increases in levels of social competence and greater decreases in behavioural problems in grade one. Additionally, classroom levels of physical and relational victimization predicted increases in levels of social competence in grade one, which the authors suggest is consistent with research highlighting the use of prosocial and coercive strategies in some children in order to attain their goals. With the same sample, Dhami and colleagues (2005) found that low levels of social competence at school entry were associated with an increased risk for physical victimization among boys, but not for girls.

The authors found that changes in relational victimization were not related to differences in levels of social competence for either sex. These sex differences in victimization and social competence require further investigation in order to determine whether sex influences the propensity to be victimized, given different levels of aggression and social competence.

Sex Differences in Aggression, Peer Victimization, and Social Competence

Research examining aggressive behaviour in childhood shows sex differences in rates of aggression. Overall, during early childhood boys are more physically aggressive than girls (Crick & Grotpeter, 1995; Crick, Ostrov, Burr, Cullerton-Sen, Jansen-Yeh, & Ralston, 2006), and girls are more relationally aggressive than boys (Crick & Grotpeter, 1995; Ostrov, Massetti, Stauffacher, Godleski, Hart, Karch, et al., 2009). Additionally, sex differences in physical aggression are most pronounced in early childhood (Pepler & Craig, 2005).

Dhami and colleagues (2005) found that aggression at school entry predicted increases in levels of physical victimization in first grade for girls only. The authors suggest that girls engaging in this non-normative behaviour may be more likely to be targeted by their peers than boys. However, sex differences were not found in a follow up study of this sample (Leadbeater & Hoglund, 2009).

According to Pepler and Craig (2005), during infancy and early childhood, there are few sex differences in rates and frequency of aggressive behaviour. However, by age 4, girls show a faster decrease in physically aggressive behaviours than boys and by school entry, sex differences in aggressive behaviour problems are stabilized, with girls being 2-4 times less likely than boys to be aggressive throughout childhood and

adolescence. In a meta-analytic review of sex differences in aggression, Archer (2004) suggested that some research has found that sex differences in physical aggression emerge prior to age 2, and differences in verbal aggression appear later in childhood.

Research has also found sex differences in levels of social competence among elementary school children (Maccoby, 2002). With first graders, Dhami and colleagues (2005) found that higher levels of social competence (i.e., skills in social situations, awareness of others' feelings, possessing leadership skills) in young girls compared to boys, and low levels of social competence at school entry were associated with increased risk for peer victimization in grade 1 for boys only. They also found that high levels of social competence was associated with lower levels of both relational and physical victimization for boys in grade 1, again suggesting that social competence may have a protective effect against the experience of peer victimization.

Hawley and colleagues (2008), on the other hand, found that when studying social competence from a resource control perspective, sex differences in aggression are not apparent. Specifically, the authors investigated social dominance and aggression among children in grades 5 through 10. Hawley and colleagues suggest that earlier models of aggression and social behaviour propose that physical aggression (which is more common among boys) is a common means of attaining social dominance, and that sex differences in social dominance and aggression were due to these earlier conceptualizations of what constitutes aggressive, socially dominant behaviour. However, the authors found that other forms of aggressive behaviour are used to attain social dominance (such as relational and verbal forms of aggression), that may be as common in boys as it is in girls. Although the authors found sex differences in strategies

employed to deal with conflict, they did not find sex differences in levels of social dominance or aggression. Following from these conflicting findings, it seems that the role of sex in socially competent behaviour may depend on conceptualizations of competence and warrants further research.

Findings for sex differences in aggression, peer victimization, and social competence are inconsistent, and there is a need to further elucidate these differences in early childhood. Sex differences in the relations between social competence and aggression are expected in the current study.

The Current Study

The current short-term longitudinal study examines whether levels of social competence moderate the relation between aggression and peer victimization. No known study to date has empirically examined these relations, although studies of the bivariate combinations of these variables demonstrate that these constructs are related in elementary school children. Specifically, I examine the following research questions: (a) Are aggression and peer victimization (i.e., physical and relational) related across a 6-month interval? (b) Do initial levels of aggression predict later levels of peer victimization? (c) Does social competence moderate the relation between aggression and peer victimization? and (d) Are there sex differences in these relations?

There are three specific hypotheses for this study: (a) Initial levels of aggression predict levels of peer victimization 6-months later. This is consistent with prior research indicating that childhood physical and verbal aggression at entry to elementary school is related to increases in peer victimization over time (Barker et al., 2008; Dhami et al., 2005; Giesbrecht et al., 2011; Ostrov, 2008). Research has also supported the opposite

direction, with peer victimization predicting physical aggression (Ostrov, 2010). Hence, I also test this directional effect.

(b) Social competence is associated with lower levels of peer victimization and aggression both concurrently and over time, and moderates the effect of childhood aggression on current and prospective levels of peer victimization in childhood. Based on previous conceptualizations of the socially competent aggressor who is perceived as well-liked and popular by their peers (Hawley, 2007; Hawley et al., 2008; Palmen et al., 2011; Sutton et al., 1999), I expect the relation between aggression and victimization to be significant at low levels of social competence, but not at high levels of social competence.

(c) Levels of aggression are higher in boys than girls. This hypothesis is consistent with previous research suggesting that boys are more physically aggressive than girls during the early elementary school years (Crick & Grotpeter, 1995; Crick et al., 2006; Pepler & Craig, 2005). Research has also documented that boys experience higher rates of physical victimization than girls, with both sexes showing equivalent levels of relational victimization (Card, Stucky, Sawalani, & Little, 2008). Therefore, I also expect that sex differences in levels of physical and relational victimization, with boys in this age group experiencing higher levels of physical victimization than girls. Consistent with previous research, girls are expected to have higher levels of social competence than boys (Dhami et al., 2005; Maccoby, 2002); however, the relation between aggression and social competence is expected to be more robust for boys given previous research has found that it is more generally accepted among peers that boys engage in socially

dominant and physically aggressive behaviour in order to accomplish their goals (Stump et al., 2009).

Method

Participants

Participants were first- to fifth-grade children from 67 classrooms in 11 schools from Western Canada. These children were part of a three-year longitudinal study evaluating the *WITS Primary Program* (Leadbeater, Hoglund, & Woods, 2003) with baseline data collected in the fall of 2006. The total sample consisted of 1160 children (501 control, 659 program). Only control participants (n = 501, 234 males) were included in the current study in order to examine the relations among aggression, social competence, and peer victimization, without the influence of the WITS program (which has been shown to decrease experiences of aggression and peer victimization; see Giesbrecht et al., 2011; Leadbeater & Hoglund, 2009). Time 1 (T1) data was collected in the fall of 2007 from 369 children (181 males) who ranged from 6 to 11 years (M = 8.39, SD = 1.26), and Time 2 (T2) data was collected from 301 children (148 males) in the spring of 2008, who ranged in age from 6 to 12 years (M = 8.76, SD = 1.24). Baseline data did not include assessments of aggression and social competence, hence these are not used in this study.

Informed consent and demographic information were collected at baseline in the fall of 2006. At T1, reports indicated that 79% of children in the control group lived in a two-parent household. Fifty-seven percent of mothers and 50% of fathers had completed "some college or technical training" beyond high school, and 18% of mothers and 12% of fathers earned a bachelor's degree. Eight percent of children lived in a household with a

total annual income of less than $30,000, whereas 26% of children lived in a household with a total annual income of $91,000 or more (range was less than $10,000 per annum to $91,000 or more per annum). The majority of children (55%) lived in a household with a total annual income between $31,000 and $90,000. However, 11% of parents did not indicate their annual income. Ninety-one percent of the children had attended a maximum of two schools in their lifetime, and 8% had attended three or more schools.

Procedure

Parent consent forms were sent home to children in grades 1 to 4 at baseline (fall of 2006). Demographic questionnaires were completed by parents who provided written permission for their child to participate. These forms were returned to the school in a sealed envelope to be picked up by a research assistant. Self-report peer victimization data were collected from children in their respective classrooms. Either teachers or a research assistant read the items out loud to groups of children, ranging from five to twenty individuals. Children were instructed to follow along using a solid coloured paper to cover up the items appearing below the question to be answered. It took approximately 30 minutes per classroom in order to complete the questionnaire. Parents completed questionnaires rating child behaviours, including aggression and social competence at T1 and T2.

Measures

Peer victimization was assessed at each time point using an adapted version (Desjardins, Yeung, Sukhawathanakul, Leadbeater, & MacDonald, 2011) of the Social Experiences Questionnaire (SEQ; Crick & Grotpeter, 1996) (see Appendix A). Children were told “Here is a list of things that sometimes happen to kids your age at school” and

asked “How often do they happen to you?” Children were provided with two practice items in order to help them understand the response scale. Subscales that tap relational and physical victimization each had five items that asked children how often they experienced physical victimization (e.g., “How often do you get pushed or shoved by another kid at school?”) and relational victimization (e.g., “How often does another kid tell lies about you to make others not like you anymore?”). Items were rated on a three-point Likert scale depicted pictorially (☐ = *never*, ☐ = *sometimes*, ☐ = *almost all the time*). This was adapted from the original 5-point scale in order to reduce difficulty for this age group. Prior research has found that the SEQ is an appropriate measure for assessing self-reported experiences of peer victimization in elementary school children (Desjardins et al., 2011). Desjardins and colleagues reported adquate reliabiaties for the revised version of the SEQ with this sample of young children (Cronbach’s $\alpha = .77$ for relational victimization and $\alpha = .80$ for physical victimization) and also found the factor structure of the SEQ to be invariant across time of assessment and sex.

Aggression and social competence were rated from parent reports on a revised version of the Behaviour Assessment System for Children, Second Edition (BASC-2; Reynolds & Kamphaus, 2004) at T1 and T2 (see Appendix B). The BASC-2 demonstrates good psychometric properties with internal consistency estimates in the .80s to middle .90s range (Tan, 2007) and construct validity estimates in the .70s to .80s range (Reynolds & Kamhaus, 2004).

Parent’s were provided with a list of 73 behaviours typical of elementary school children, and were asked to rate how the given behaviour describes their child on a four-point Likert scale (0 = *never*, 1 = *sometimes,* 2 = *often,* 3 = *always*). See Table 1 for a

complete list of the items. Eleven items measure aggressive behaviour in childhood and include a range of physically and verbally aggressive behaviour (e.g., “teases others”, “hits other children”, “threatens to hurt others”) and yielded a single aggression score.

To measure social competence, three of the adaptive scales on the BASC-2 (social skills, adaptability, and leadership) were used. According to Reynolds and Kamphaus (2004), these adaptive scales measure positive behaviours in the context of social situations. The social skills scale refers to behaviours in social situations. Eight items represented social skills (e.g., “congratulates others when good things happen to them”, “encourages others to do their best”, “offers help to other children”). With respect to leadership, this scale measures various competencies that are related to both community and school scenarios and assesses behaviours that have leadership potential. There are 8 items for this construct (e.g., “is good at getting people to work together”, “will speak up if the situation calls for it”, “makes decisions easily”). Lastly, adaptability, according to Reynolds and Kamphaus (2004) is based on temperament research and is correlated to early school achievement. Low scores are associated with a tendency toward poor emotional self-control. Seven items represent adaptability (e.g., “shares toys or possessions with other children”, “recovers quickly after a setback”, “adjusts well to changes in routine”). Although factor loading cut-offs are somewhat arbitrary, the general rule of thumb is with a large sample size, factor loadings should be greater than .35 (Hair Anderson, Tatham, & Black, 1998). Therefore, one item (“is stubborn”, item loading = -.34) was excluded from this analysis as its factor loading was less than .35. Additionally, it is the only negative loading of all items, suggesting it relates to adaptability differently than the other 7 items.

Results

Plan of Analysis

In order to examine the factor structure of the victimization subtypes and the distinctiveness of the social competence constructs, confirmatory factor analysis (CFA), which is a special case of structural equation modeling (SEM) was used to test the fit of the measurement model of each of the constructs: social skills, leadership, and adaptability. Total scores for each variable at each time point were created and used in subsequent analyses. SEM is a factor analytic approach that is used to investigate relationships between hypothetical constructs and observed variables (Raykov & Marcoulides, 2006). SEM is founded in theory rather than statistical considerations and is used in order to confirm prior beliefs about the relationships among variables. Descriptive analyses then followed showing the means and correlations of observed variables. Next, path models were constructed testing the hypothesized relations between aggression and peer victimization, using SEM (AMOS 18.0 Software; Arbuckle, 2009). The moderating effect of social competence on these models was tested by employing a multisample approach for moderation (Rigdon, Schumacker, & Wothke, 1998). In this approach, two models are computed: one in which the parameters are constrained to be equal across the groups and the other where the parameters are allowed to differ. Subsequently, a chi-square difference test was computed to determine whether the models differ. A significant chi-square suggests that there is a moderation effect

Data Preparation

Missing values. Prior to analysis, all items measuring peer victimization, aggression, and social competence were examined for missing data, univariate and

multivariate outliers, and degree of normality. Missing values were identified through SPSS 17.0 Missing Value Analysis. At each time point, < 5% of data were missing on key study variables. Therefore, missing values were imputed using the regression substitution method in SYSTAT (Roth, Switzer, & Switzer, 1999). Regression substitution replaces the unobserved score by a regression-generated value, thus retaining the original sample size. This approach is superior to mean substitution in that the imputed value is conditional on all data available for each participant, rather than assuming the missing value is the mean of all participants in the sample (Roth et al., 1999).

According to Tabachnick and Fidell (2007), univariate outliers are those cases with standardized scores greater than 3.29. Eighty-nine univariate outliers at T1 and 58 univariate outlier at T2 were identified on items measuring aggression (8 items at T1 and 6 items at T2), social competence (1 item at both T1 and T2), relational victimization (1 item at T2) and physical victimization (2 items at both T1 and T2). However, as Cook's distance values of the cases with univariate outliers are all within the acceptable range of < 1, the decision was made to retain these outliers (Stevens, 1984). With respect to multivariate outliers, 20 outliers at T1 and 13 outliers at T2 were identified through Mahalanobis distance with $p < .001$ (Tabachnick & Fidell, 2007). However, given that peer victimization and aggression are relatively uncommon phenomena in a normal sample of elementary school children, it is expected that some participants will obtain extreme scores on a number of variables. Additionally, the cases with multivariate outliers did not significantly differ from those cases without outliers on demographic

variables (sex, family income, and education). Following these analyses, the decision was made to retain all outliers at T1 and T2.

Skewness. Given the nature of the study questions, and the expected low instances of high levels of victimization and aggression in a normal sample, scores on these measures were not normally distributed. In particular, a number of individual items measuring physical victimization and aggression were positively skewed (i.e., skewness values > 2.0; Curan, West, & Finch, 1996; Lei & Lomax, 2005). To improve linearity and reduce skewness and kurtosis, a bootstrapping procedure was employed using AMOS 18.0 Software (Byrne, 2010; Arbuckle, 2009). Bootstrapping is a resampling procedure whereby the original sample is considered to be representative of the population (Byrne, 2010). With bootstrapping, a set of data is randomly resampled repeatedly with replacement in order to generate new data sets that represent the original population (Henderson, 2005). According to Byrne, bootstrapping provides a mechanism for conducting complex analyses in SEM, whereby assumptions of multivariate normality may not hold.

Preliminary Analyses

Two separate confirmatory factor analyses (CFA) were conducted to evaluate the hypothesized fit of the relational and physical victimization items and of social competence constructs. Consistent with guidelines for reporting SEM results (Byrne, 2008; McDonald & Ho, 2002; Thompson, 2001), I used the following indices to evaluate model fit: the chi-square goodness-of-fit test (χ^2; Loehlin, 1998), the comparative fit index (CFI; Bentler, 1990), the root mean square error of approximation (RMSEA; Steiger, 1990), and the ratio of chi-square to degrees of freedom or parsimony index

(χ^2/df; Bollen, 1989). The chi-square goodness-of-fit test assumes a perfect fit and is very sensitive to large sample sizes (Byrne, 2008). Desirable chi-square indices are non-significant ($p > .05$). However, given the large number of participants in the current sample, it is expected that the chi-square value will be significant. Thus, it is important to also examine other fit indices. The parsimony index is an index of model fit given the number of parameters estimated. It is desirable to have a low ratio with fewer degrees of freedom. Values less than 5 represent adequate fit, although some researchers prefer more conservative estimates of less than 3 (Kaplan, 2000). The CFI is a comparison of the hypothesized model with the independence model matrix. Values above .90 are adequate; however, values of .95 or higher represent good fit (Kaplan, 2000). Lastly, the RMSEA estimates how well the model with good parameter estimates represents the population matrix. It considers model complexity and takes into account error of approximation. Values of .05 to .08 represent adequate fit (Byrne, 2001).

The hypothesized factor structures for the victimization and social competence constructs were analyzed separately using Amos 18.0 Software (Arbuckle, 2009) and maximum likelihood was used to estimate parameters. Bootstrapping was employed in order to account for the nonnormality of the data (Byrne, 2010; Kline, 2005). The two hypothesized factors for relational and physical victimization were tested. Standardized regression weights for items loading on physical (βs = .60 to .69 at T1 and .64 to .73 at T2) and relational victimization (βs = .56 to .73 at T1 and .59 to .68 at T2) were all significant ($p < .001$) at both time points. As the sample size of the current study is relatively large, the chi-square value was significant, $\chi^2(68) = 212.22$, $p < .001$. Other fit indices demonstrated adequate model fit (CFI = .94, RMSEA = .05, χ^2/df = 3.12). Total

scores were computed for physical and relational victimization by summing each child's scores for items on each scale separately (Crick & Grotpeter, 1996). Previous research with this sample found invariance in this measure across grade and sex (Desjardins, et al., 2011).

Consistent with Reynolds and Kamphaus' (2004) conceptualization of socially adaptive behaviours and previous research suggesting that social competence is made up of multiple social behaviours such as social skills (Hubbard & Coie, 1994), popularity and leadership among peers (Stump et al., 2009), as well as problem solving (Haynie et al., 2001) and forming adaptive and positive relationships (Hubbard & Coie, 1994; Rose-Krasnor, 1997), social competence was represented by three latent factors: social skills, leadership, and adaptability (see Figure 2). Item loadings for each social competence factor were all significant (*ps* < .05) and are shown in Table 1. The chi-square value was significant, $\chi^2(457) = 1407.62$, $p < .001$. Other fit indices demonstrated adequate model fit (CFI = .86, RMSEA = .05, $\chi^2/df = 3.12$). Total scores were computed for social skills, leadership, and adaptability, by summing each child's scores for the items within each scale. Overall social competence scores were created by totalling the scores from the three subscales (adaptability, social skills, and leadership).

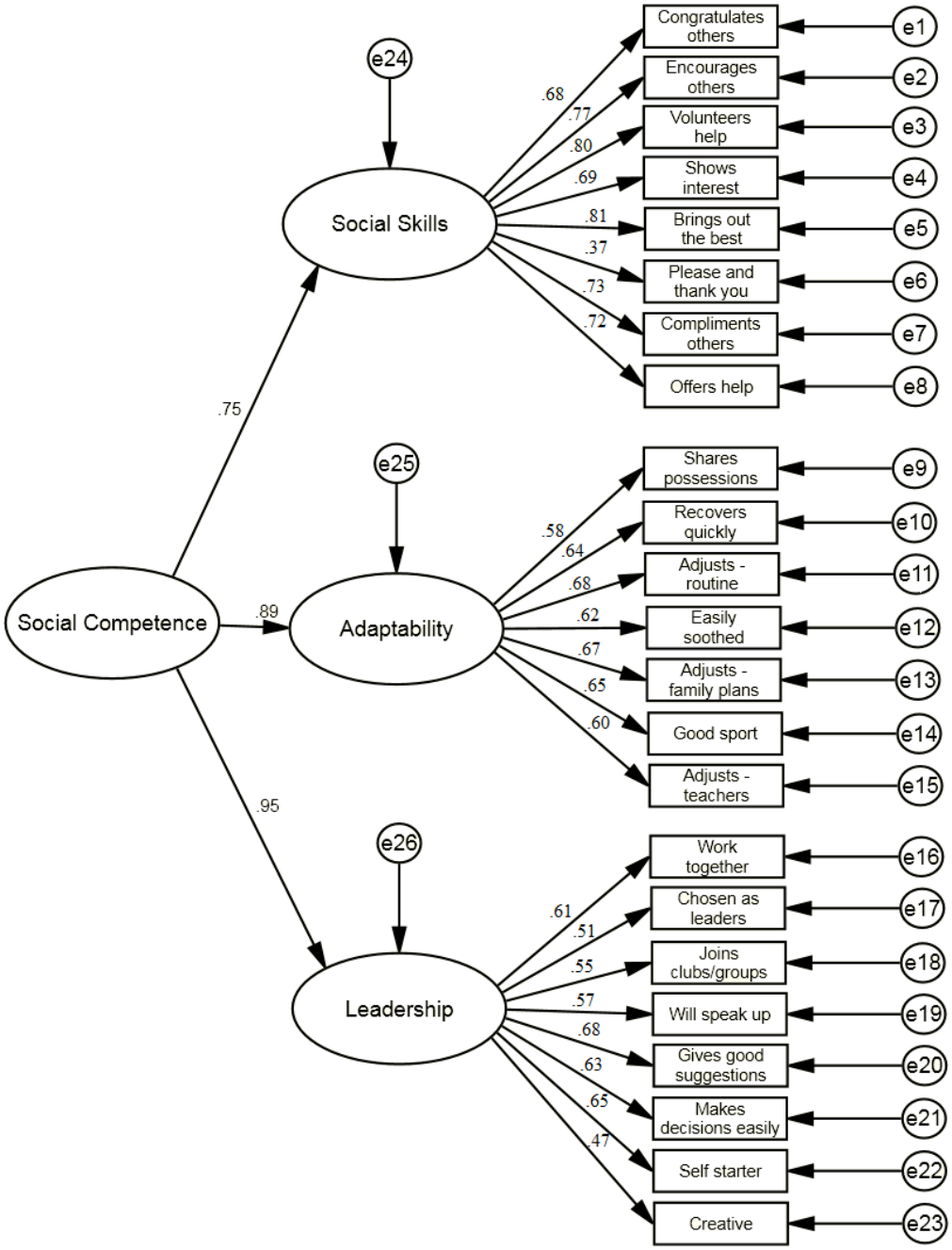


Figure 2: Higher order factor model for confirmatory factor analysis of the three factors (social skills, adaptability, and leadership) that make up the construct of social competence at Time 1. Standardized parameter estimates are shown.

Table 1

Standardized Item Loadings for CFA of Measures for Physical and Relational Victimization, Aggression, and Social Competence at T1 and T2

Variable	Item Loadings	
	T1	T2
Physical victimization		
Hit by another kid	.69	.73
Yell or call names	.68	.64
Pushed or shoved	.64	.68
Kick or pull hair	.60	.65
Beat up	.65	.56
Relational victimization		
Leave out on purpose	.56	.60
Get back at you	.65	.69
Tell lies about you	.73	.66
Won't like	.71	.63
Say mean things about you	.66	.67
Aggression		
Teases others	.60	.58
Hits other children	.54	.49
Bullies others	.67	.57
Argues when denied	.49	.61
Threatens to hurt others	.54	.59
Loses temper too easily	.58	.68
Argues with parents	.50	.62
Seeks revenge	.45	.58
Annoys others on purpose	.51	.54
Cruel to others	.53	.60
Calls other children names	.49	.54
Social competence		
Social skills	.75	.71
Congratulates others	.68	.69
Encourages others	.77	.83
Volunteers help	.60	.61
Shows interest	.69	.68
Brings out the best	.81	.83
Says please and thank you	.37	.35
Compliments others	.73	.79
Offers help	.72	.75
Leadership	.95	.93
Work together	.61	.64
Chosen as leader	.51	.61
Joins clubs/groups	.55	.57
Will speak up	.57	.52
Gives good suggestions	.68	.67

Table 1

Standardized Item Loadings for CFA of Measures for Physical and Relational Victimization, Aggression, and Social Competence at T1 and T2

Variable	Item Loadings	
	T1	T2
Leadership		
Makes decisions easily	.63	.60
Self starter	.65	.64
Creative	.47	.35
Adaptability	.89	.92
Shares possessions	.59	.57
Recovers quickly	.64	.65
Adjusts - routine	.68	.62
Easily soothed	.62	.60
Adjusts – family plans	.67	.65
Good sport	.65	.66
Adjusts – teachers	.60	.62

Descriptive Statistics

Means, standard deviations, and reliabilities for all variables at each time point are presented in Table 2. According to Gliem and Gliem (2003), the closer the coefficient is to 1.0, the greater the internal consistency. They suggest that values greater than .70 represent an acceptable value. Therefore, the constructs in the current study have strong reliabilities, with internal consistency estimates ranging from .78 to .88.

Table 2

Reliabilities, Means, and Standard Deviations of Observed Variables at T1 and T2

		T1			T2	
Variable (range)	α	M	SD	α	M	SD
Physical victimization (0-10)	.78	1.80	1.97	.78	1.62	1.65
Relational victimization (0-10)	.79	1.92	2.11	.78	1.71	1.79
Aggression (0-17)	.79	4.58	3.12	.82	4.62	3.04
Social competence (18-69)	.83	45.50	10.39	.84	46.33	9.55
Social skills (0-24)	.88	16.38	4.30	.90	16.68	4.05
Leadership (0-24)	.81	14.67	4.06	.80	14.61	3.30
Adaptability (0-24)	.81	14.45	3.58	.80	14.61	3.30

Note. Means and standard deviations are based on total scores.

Bivariate correlations were examined for all of the study variables at each time point and are summarized in Table 3. Additionally, to examine sex differences among the study variables, separate bivariate correlation analyses were conducted for females (see Table 4) and males (see Table 5). Most variables were significantly correlated with each other over time for the combined sample (range = .38 to .69, $p < .01$). As expected, for the combined sample aggression was significantly correlated with social competence (r = -.43 at T1, r = -.46 at T2) and physical (r = .20 at T1, r = .16 at T2) and relational victimization (r = .18 at T1, r =.26 at T2) ($ps < .01$). Additionally, for both females and males, aggression was significantly correlated with the majority of variables over time. Both relational and physical victimization did not appear to be significantly correlated with social competence scores for males or females; however, for the combined sample, subscales of social competence were significantly correlated (range = -.11 to -.44). With respect to age, only social skills at T1 was significantly correlated with age at T1 (r = .12,

$p < .05$) in the full sample. Age was not significantly correlated with any variables for males; however, for females age at T1 was significantly correlated with physical victimization at T1 ($r = -.17$, $p < .05$), social competence at T1 ($r = .17$, $p < .05$), social skills T1 ($r = .20$, $p < .05$), and adaptability at T1 ($r = -.16$, $p < .05$). Age at T2 was significantly correlated with social skills at T1 ($r = .16$, $p < .05$) and adaptability at T1 ($r = .19$, $p < .05$). Given these age differences across sexes, age was added as a covariate to the final model. However, given that age was not a significant predictor across levels of social competence, it was not included in the final model.

Table 3

Zero-Order Correlations of Latent Variables (full sample)

	Correlations														
Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. T1 PV	---														
2. T1 RV	.69**	---													
3. T1 Aggression	.20**	.18**	---												
4. T1 Social competence total	-.10*	-.12*	-.43**	---											
5. T1 Social skills	-.07	-.11*	-.41**	.87**	---										
6. T1 Leadership	-.08	-.09	-.27**	.89*	.66**	---									
7. T1 Adaptability	-.12*	-.11*	-.44**	.85**	.58**	.67**	---								
8. T2 PV	.38**	.28**	.16**	-.14**	-.16**	-.09	-.12*	---							
9. T2 RV	.32**	.40**	.21**	-.19**	-.17**	-.14**	-.11*	.57**	---						
10. T2 Aggression	.18**	.19**	.67**	-.39**	-.36**	-.27**	-.39**	.16**	.26**	---					
11. T2 Social competence total	-.13*	-.11*	-.36**	.73**	.64**	.65**	.61**	-.13*	-.20**	-.46**	---				
12. T2 Social skills	-.10	-.11*	-.36**	.63**	.68**	.50**	.46**	-.11*	-.14**	-.42**	.88**	---			
13. T2 Leadership	-.10	-.09	-.24**	.66**	.52**	.69**	.50**	-.10*	-.17**	-.31**	.88**	.64**	---		
14. T2 Adaptability	-.14**	-.09	-.35**	.61**	.45**	.49**	.67**	-.14**	-.21**	-.47**	.85**	.61**	.66**	---	
15. T1 Age	-.06	-.03	-.03	.08	.12*	.04	.07	-.08	-.01	-.05	.04	.08	-.04	.05	---
16. T2 Age	-.01	.00	-.01	.04	.08	-.01	.05	-.06	.01	-.01	.01	.04	-.06	.04	.84**

Note. PV = Physical Victimization, RV = Relational Victimization; T = time point; * $p < .05$. ** $p < .01$.

Table 4

Zero-Order Correlations of Latent Variables (Females Only)

	Correlations														
Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. T1 PV	---														
2. T1 RV	.58**	---													
3. T1 Aggression	.18*	.18*	---												
4. T1 Social competence total	-.12	-.16*	-.43**	---											
5. T1 Social skills	-.11	-.19**	-.42**	.86**	---										
6. T1 Leadership	-.11	-.14	-.24**	.89**	.63**	---									
7. T1 Adaptability	-.08	-.08	-.47**	.84**	.56**	.67**	---								
8. T2 PV	.41**	.27**	.13	-.12	-.08	-.10	-.13	---							
9. T2 RV	.28**	.45**	.27**	-.15*	-.15*	-.16*	-.16*	.46**	---						
10. T2 Aggression	.15*	.27**	.66**	-.40**	-.37**	-.28**	-.41**	.20**	.34**	---					
11. T2 Social competence total	-.08	-.04	-.43**	.68**	.60**	.59**	.56**	-.12	-.18*	-.47*	---				
12. T2 Social skills	-.09	-.08	-.38**	.62**	.67**	.47**	.44**	-.08	-.25*	-.44**	.88**	---			
13. T2 Leadership	-.07	-.03	-.20**	.58**	.45**	.63**	.42**	-.19	-.16*	-.32**	.87**	.63**	---		
14. T2 Adaptability	-.05	.02	-.33**	.56**	.43**	.44**	.60**	-.13	-.16*	-.44**	.86**	.61**	.66**	---	
15. T1 Age	-.17*	-.10	-.09	.17*	.20*	.12	.12	-.16*	-.06	-.09	.07	.10	.03	.04	---
16. T2 Age	-.10	-.02	-.05	.12	.16*	.07	.08	-.19*	-.05	-.04	.03	.05	.02	.00	.84**

Note. PV = Physical Victimization, RV = Relational Victimization; T = time point; * $p < .05$. ** $p < .01$.

Table 5

Zero-Order Correlations of Latent Variables (Males Only)

	Correlations														
Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. T1 PV	---														
2. T1 RV	.78**	---													
3. T1 Aggression	.17*	.18*	---												
4. T1 Social competence total	-.07	-.08	-.41**	---											
5. T1 Social skills	-.00	-.03	-.39**	.87**	---										
6. T1 Leadership	-.05	-.05	-.29**	.90**	.68**	---									
7. T1 Adaptability	-.14	-.13	-.40**	.85**	.59**	.67**	---								
8. T2 PV	.35**	.29**	.16*	-.15	-.17*	-.07	-.23**	---							
9. T2 RV	.36**	.36**	.16*	-.23**	-.20**	-.17*	-.14	.67**	---						
10. T2 Aggression	.16*	.13	.67**	-.36**	-.33**	-.25**	-.37**	.10	.20**	---					
11. T2 Social competence total	-.14	-.17*	-.35**	-.35**	.67**	.69**	.66**	-.13	-.22**	-.44**	---				
12. T2 Social skills	-.09	-.13	-.33**	.64**	.68**	.52**	.46**	-.11	-.14	-.38**	.88**	---			
13. T2 Leadership	-.10	-.13	-.25**	.73**	.59**	.75**	.57**	-.10	-.18*	-.29**	.89**	.65**	---		
14. T2 Adaptability	-.19**	-.18*	-.35**	.65**	.46**	.54**	.73**	-.13	-.25**	-.49**	.85**	.60**	.66**	---	
15. T1 Age	.05	.03	.06	-.02	.02	-.06	.00	.01	.03	.02	-.01	.04	-.12	.05	---
16. T2 Age	.10	.03	.08	-.05	-.03	-.10	.00	.07	.07	.05	-.03	.02	-.14	.05	.84**

Note. PV = Physical Victimization, RV = Relational Victimization; T = time point; * $p < .05$. ** $p < .01$.

A series of ANOVAs (Analysis of Variance) were conducted in order to examine mean sex differences in levels of aggression, victimization, and social competence (see Table 6). Further analyses were conducted using a series of ANOVAs to examine sex differences among social competence constructs (see Table 7).

Table 6

Sex Differences in Mean Levels of Aggression, Physical and Relational Victimization, and Social Competence at T1 and T2

	T1			T2		
	Males	Females		Males	Females	
Variable	M (SD)	M (SD)	*F* (2, 366)	M (SD)	M (SD)	*F* (2, 366)
Aggression	5.11 (3.17)	4.07 (3.00)	5.38**	5.09 (3.16)	4.17 (2.85)	4.34*
Relational victimization	2.00 (2.29)	1.86 (1.93)	.64	1.69 (1.84)	1.74 (1.75)	.04
Physical victimization	2.18 (2.21)	1.44 (1.64)	7.02**	1.78 (1.76)	1.47 (1.53)	1.67
Social competence	44.61 (10.58)	46.37 (10.19)	1.36	45.47 (9.78)	47.16 (9.30)	1.45

Note. M = mean, SD = standard deviation; * $p < .05$. ** $p < .01$.

Table 7

Sex Differences in Mean Levels of Social Skills, Leadership, and Adaptability at T1 and T2

	T1			T2		
	Males	Females		Males	Females	
Variable	M (SD)	M (SD)	*F* (2, 366)	M (SD)	M (SD)	*F* (2, 366)
Social Skills	15.94 (4.25)	16.80 (4.33)	1.88	16.29 (4.11)	17.06 (3.97)	1.69
Leadership	14.45 (4.17)	14.90 (3.94)	.98	14.82 (3.80)	15.25 (3.44)	.67
Adaptability	14.22 (3.67)	14.67 (3.49)	.99	14.37 (3.31)	14.85 (3.29)	.99

Note. M = mean, SD = standard deviation; * $p < .05$. ** $p < .01$.

At both time points, boys were significantly more aggressive than girls [$F(2, 366) = 5.38$, $p < .01$ at T1, and $F(2, 366) = 4.34$, $p < .05$ at T2] and at T1, boys were significantly more physically victimized than girls [$F(2, 366) = 7.02$, $p < .01$]. No significant sex differences were found for relational victimization or social competence at either time point, and there were no significant differences between sexes in levels of physical victimization at T2. Across time, rates of physical victimization significantly decreased for boys [$F(1, 180) = 5.44$, $p < .05$]. Rates of aggression, relational victimization, and social competence were not significantly different across time for boys, and there were no significant differences across time for any construct for girls. Social competence constructs (i.e., social skills, leadership, and adaptability) did not significantly differ across sexes at either time point.

Social competence scores were split into three groups using a tertile split: low ($n = 123$), moderate ($n = 120$), and high ($n = 126$). The tertile split distinguished between high and low social competence and allowed for an approximately equal number of participants in each group, thus increasing power for analyses. Additionally, a tertile split has advantages over a median split in that a tertile split maximizes the variance explained and ensures that each group represents a distinct category (Kerlinger, 1973). The three groups were then compared on demographic variables, aggression, social competence variables, and physical and relational victimization (see Table 5).

Table 8

Means (and Standard Deviations) of Initial Levels of Key Variables on Levels of Social Competence

Variable	Low Social Competence	Moderate Social Competence	High Social Competence	*F* (2, 366)
Income	5.56 (2.49)	6.36 (2.46)	6.63 (2.15)	6.87*
Maternal education	2.99 (.91)	3.05 (.78)	3.11 (1.02)	.56
Age	8.27 (1.28)	8.48 (1.27)	8.54 (1.22)	1.50
Grade	3.41 (1.15)	3.57 (1.20)	3.60 (1.14)	.86
Aggression	6.00 (3.56)	4.56 (2.81)	3.21 (2.23)	28.46**
Physical victimization	1.95 (1.95)	1.99 (1.97)	1.47 (1.97)	2.77
Relational victimization	2.21 (2.15)	1.97 (2.09)	1.60 (2.06)	2.68

Note. * $p < .01$. ** $p < .001$.

There were no significant sex differences in the percent of males and females in each of the social competence groups (low: males = 72, 39.8%; moderate: males = 53, 29.3%; high: males = 56, 30.9%; $\chi^2(4) = 8.56$, *ns*). A multivariate analysis of variance (MANOVA) was used to compare low, moderate, and high levels of social competence on levels of aggression, physical and relational victimization, and other demographic variables. Demographic differences were significant for levels of income only, so income was included as a covariate but was nonsignificant so was not presented in the final models. However, there was a lot of missing data for income (11%), which may account for the significant differences. As expected, aggression was highest in the low social competence group and lowest in the high social competence group. Additionally, social skills [$F(2, 366) = 324.05$, $p < .001$], adaptability [$F(2, 366) = 246.21$, $p < .001$], and leadership [$F(2, 366) = 320.46$, $p < .001$] significantly differed across group, which is expected given the tertile split.

Path Analyses

Hypothesis 1: Initial levels of aggression predict levels of victimization 6-months later. Prior to conducting the moderation analyses, the concurrent and across time relations between aggression and physical and relational victimization were assessed to examine whether initial levels of aggression predict peer victimization over time. An initial path model was constructed in AMOS using total scores for aggression and relational and physical victimization (see Figure 1). First, all paths were estimated between constructs measuring auto-regressive associations from T1 to T2 for aggression and victimization (i.e., linear associations between T1 aggression and T2 aggression and between T1 victimization and T2 victimization), as well as cross-lag paths from T1 aggression to T2 physical and relational victimization (i.e., T1 aggression predicts T2 physical and relational victimization). Correlation paths were drawn among predictor T1 variables as initial Pearson correlations demonstrated that aggression, physical victimization, and relational victimization were significantly correlated. Additionally, the error terms of physical and relational victimization were correlated as these two variables are significantly correlated (see Table 3). The model fit was good, $\chi^2(6) = 13.27$, $p < .05$; CFI = .99, RMSEA = .06, $\chi^2/df = 2.21$.

Results revealed significant stability across time for aggression ($\beta = .67$, $p < .001$), and physical ($\beta = .35$, $p < .001$) and relational victimization ($\beta = .36$, $p < .001$). With respect to the expected predictive relations between aggression and victimization, only the path between aggression and relational victimization was significant ($\beta = .14$, $p < .05$). The reciprocal relations between initial levels of victimization and later levels of aggression was also tested. Paths from both physical and relational victimization to

aggression were not significant, confirming the hypothesis that initial levels of aggression predict later levels of peer victimization, rather than the reverse direction of effect.

Mean sex differences in aggression and victimization were found so sex differences in models were tested. Results revealed that the model with structural paths constrained as equal for boys and girls was not different from the model in which these paths were free to vary across sex, $\Delta\chi^2(5) = 7.77$, *ns*. Therefore, sex did not moderate the relations between aggression and peer victimization.

Hypothesis 2: Social competence moderates the relation between aggression and physical and relational victimization. To assess the moderating effects of social competence, a cross-lagged, moderation model was constructed in AMOS, distinguishing the three groups of social competence. The moderating effect of social competence on these models was tested by employing a multisample approach for moderation (Rigdon, Schumacker, & Wothke, 1998).

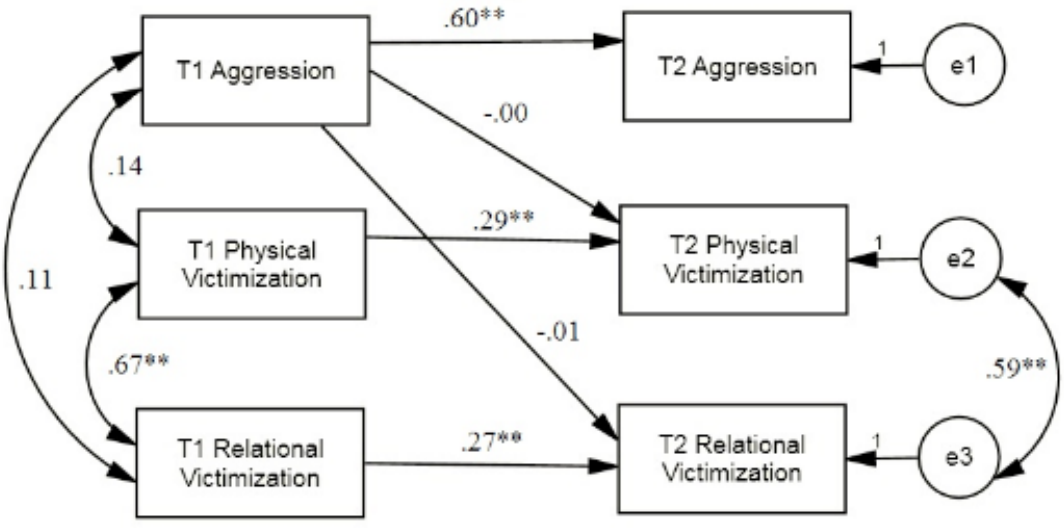
The model included auto-regressive pathways between T1 measures (aggression, physical victimization, and relational victimization) and the same T2 measures, as well as correlations between T1 measures and error terms of T2 physical and relational victimization. Error terms were correlated to account for the strong correlation between relational and physical victimization ($r = .57$, $p < .01$). Results revealed that the model provided good fit to the data, $\chi^2(18) = 23.91$, *ns*; CFI = .99, RMSEA = .03, $\chi^2/df = 1.33$.

To test whether the relations among aggression and peer victimization were different at the three levels of social competence, cross-lag paths (i.e., paths from aggression to physical and relational victimization) were constrained to be equal across groups. The results demonstrated that this model also fit the data well, $\chi^2(28) = 44.58$, *p*

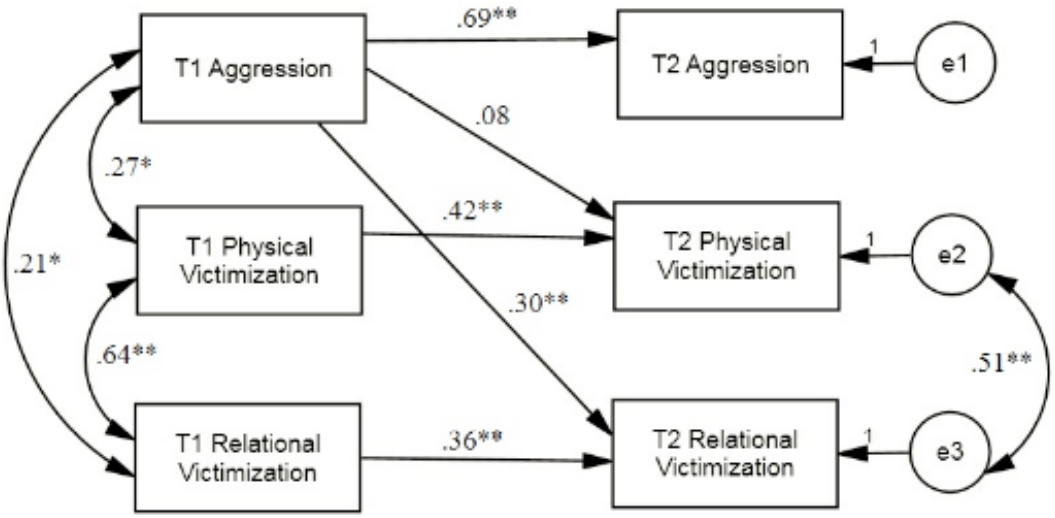
< .05; CFI = .98, RMSEA = .04, χ^2/df = 1.59. Moreover, this model resulted in a significant change of model fit ($\Delta\chi^2(10) = 20.67$, $p < .05$), indicating that social competence moderates the relation between aggression and victimization over time.

The hypothesized models were tested separately for each of the three groups (low, moderate, and high social competence) to assess the relation between aggression and peer victimization across levels of social competence. Final models, with standardized path loadings, are shown in Figure 3. At low levels of social competence, there was no significant relationship between aggression at T1 and physical (β = -.01, *ns*) or relational victimization at T2 (β = -.00, *ns*). At moderate levels of social competence, the relationship between T1 aggression and T2 relational victimization was significant (β = .30, $p < .001$). Lastly, at high levels of social competence, the relationship between T1 aggression and T2 physical victimization was significant (β = .17, $p < .05$).

a) Low social competence (n = 123)



b) Moderate social competence (n = 120)



c) High social competence (n = 126)

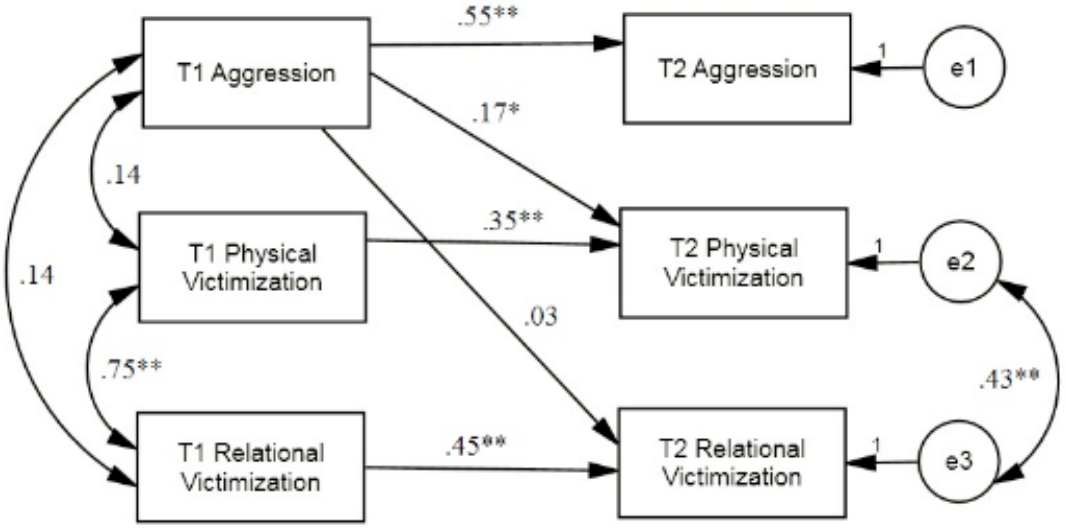


Figure 3: Structural model of longitudinal relations between aggression and physical and relational victimization at varying levels of social competence. Numbers represent standardized regression weights for the hypothesized pathways. Single headed arrows represent regression paths and double headed arrows represent correlations. e1, e2, and e3 are error variance terms. * $p < .05$. ** $p < .001$

Hypothesis 3: There will be sex differences in moderated models of the relations among aggression, physical and relational victimization, and social

competence. To determine whether sex influenced the moderating relation of social competence on aggression and peer victimization, sex was added as an additional moderator variable to the model with all three factors (see initial model in Figure 1). Subsequently, a multisample approach for moderation (Rigdon et al., 1998) was conducted to examine the moderating effect of social competence and sex on prospective relations between aggression and physical and relational victimization. There was no significant difference between the model with the constrained structural paths and the model in which these paths were free to vary across sex and social competence ($\Delta\chi^2(20) = 29.59$, *ns*). This finding suggests that sex does not moderate the relationship between aggression and victimization at varying levels of social competence.

Discussion

The goal of the current study was to test a model hypothesizing that different levels of social competence would moderate the longitudinal relation between aggression and physical and relational victimization in elementary school children (see Figure 1). There were three main hypotheses in this investigation. As expected, initial levels of aggression predicted increases in physical and relational victimization 6-months later and social competence moderated the longitudinal relation between aggression and peer victimization. The hypothesis that the relation between aggression and subsequent peer victimization would be significant at low levels of social competence was not supported. Past literature suggests that socially skilled children are well-liked by their peers (Hawley, 2003; Hawley et al., 2008), whereas less socially competent children are more likely to be victims of peer aggression (Crick & Dodge, 1994). However, I found that at high levels of social competence, aggression predicted peer victimization, whereas at low

levels of social competence, aggression did not predict peer victimization. Lastly, sex differences were found in aggression and physical victimization, whereas expected sex differences in levels of social competence were not found.

Consistent with previous research, overall initial levels of aggression predicted higher levels of victimization 6-months later, beyond auto-regressive effects. Social competence also moderated the relations between aggression and physical and relational victimization. However, aggression predicted peer victimization at high and moderate levels of social competence, but not at low levels. Findings also differed for physical and relational victimization, such that aggression predicted increases in relational victimization at moderate levels of social competence only and aggression predicted increases in physical victimization at high levels of social competence.

With respect to sex differences boys were more aggressive than girls at both time points and were more physically victimized at T1 only. There were no significant differences in levels of relational victimization at either time point. These findings are consistent with studies reporting that boys exhibit higher levels of aggression than girls (Crick & Grotpeter, 1995; Crick et al., 2006; Pepler & Craig, 2005), that boys experience higher levels of physical victimization than do girls (Card et al., 2008; Dhami et al., 2005), and that there are no sex differences in levels of relational victimization in early childhood (Archer, 2004; Card et al., 2008). Although it was expected that social competence would vary across sexes, the results indicated that there were no significant differences between boys and girls in mean levels of social competence. This may be due to the age of my sample, as previous research investigating sex differences in social competence sampled older youth and adolescents (i.e., with adolescents in grades 5

through 10; Hawley et al., 2008). These sex differences may be due to defining competence in terms of social dominance and competition for resources as opposed to prosocial behaviours. Much of the behaviours associated with dominance (such as a need for recognition and having instrumental goals in relationships) are more present in adolescence as opposed to early childhood (Hawley et al., 2008). Moreover, social competence in childhood is often associated with the skills required for initiating and maintaining friendships, while in adolescence, social competence increases in complexity and is associated with enhancing status and promoting adult-like social behaviour (Campbell et al., 2010). These discrepancies in social competence across development may account for the lack of sex difference in social competence in a sample of elementary school children.

Additionally, although results of a MANOVA revealed mean differences in physical victimization and aggression for boys and girls, sex did not moderate the overall relations between aggression and subtypes of peer victimization (without accounting for levels of social competence) and also did not moderate the relation between aggression and peer victimization at varying levels of social competence. These findings demonstrate that although variations in sex are present at the individual variable level (i.e., sex differences in levels of aggression and physical victimization), the prospective relation between aggression and peer victimization did not differ across sexes, suggesting that regardless of sex, children who are aggressive are at an increased risk of being victimized by their peers.

Cross-Lag Associations between Aggression and Peer Victimization

Consistent with previous research (Barker et al., 2008; Card & Hodges, 2008; Giesbrecht et al., 2011; Leadbeater et al., 2006; Leadbeater & Hoglund, 2009; Ostrov, 2010; Snyder et al., 2003), aggression predicted increases in relational victimization over time. Additionally, the effect of aggression on victimization was moderated by social competence. To confirm the hypothesized direction of effect of these relations, the reciprocal associations between initial levels of physical and relational victimization and later levels of aggression was also tested: In contrast to past studies (Leadbeater & Hoglund, 2009; Ostrov, 2010), physical and relational victimization did not significantly predict levels of aggression at T2. In the current study, only two waves of data were assessed at the primary level, which may explain why reciprocal relations were not found. Additional time points may be needed to assess the cyclical nature of aggression and peer victimization that has been found in more long-term longitudinal investigations (Leadbeater & Hoglund, 2009; Schwartz et al., 1993). However, this findings supports the hypothesis that aggression can lead to peer victimization.

Previous research also confirms that children who are aggressive are at an increased risk of being victimized by their peers (Barker et al., 2008; Dhami et al., 2005; Giesbrecht et al., 2011; Kochenderfer-Ladd, 2003; Ostrov, 2008). For example, Barker and colleagues (2008) found that aggression predicted increases in levels of peer victimization among preschool and grade one children. Similarly, Ostrov (2008) found that children who were aggressive in preschool, were more likely to be victimized upon entry to elementary school than their nonaggressive peers. Similar findings were reported in samples of children in grades 2 and 3 (Dhami et al., 2005; Giesbrecht et al., 2011; Kochenderfer-Ladd, 2003).

The Moderating Effect of Social Competence

Social competence moderated the relation between aggression and physical and relational victimization. However, it was expected that the relation between aggression and peer victimization would be significant only at low levels of social competence. Previous research has identified two different types of aggressors: The socially competent and manipulative aggressor (Hawley, 2007; Peeters et al., 2010; Sutton et al., 1999) and the aggressive child who has a social skills deficit and is low in social competence (Crick & Dodge, 1994). Consistent with research suggesting that aggressive and socially skilled children are accepted and well-liked by their peers (Hawley, 2003; Hawley et al., 2008), I expected that higher levels of social skills would protect children from negative peer experiences (i.e., peer victimization). On the other hand, I expected that aggressive children with low social competence would elicit peer aggression. Previous research suggests that aggressive children with low levels of social competence (assessed as social-cognitive skills) may perceive peer aggression as hostile, and therefore react aggressively to conflict, which may in turn lead to retaliatory victimization (Crick & Dodge, 1994). Therefore, I hypothesized that children with a social skills deficit or low levels of overall social competence would be more vulnerable to peer victimization.

The results revealed that children's aggression rated by parents was not significantly related to their own reports of peer victimization when their levels of social competence were low. Rather, the relation between aggression and physical victimization was significant only at high levels of social competence, whereas the relation between aggression and relational victimization was significant at moderate levels of social competence.

Low social competence. Contrary to the hypothesis and expectations from the literature (Crick & Dodge, 1994; Newcomb et al., 1993; Peeters et al., 2010), at low levels of social competence, aggression did not significantly predict changes in peer victimization. In the current study, the addition of aggression into the model may explain why the relation between low social competence and peer victimization was not supported. In a sample of elementary school children, Schwartz (2000) found evidence for a group of victimized children who evinced high rates of aggressive behaviour but also had low levels of social skills. However, they differed from children who were both aggressive and victimized in that they had lower ratings on behavioural dysregulation and did not have difficulties with emotional reactivity. It may be that in the current study, children who were aggressive and had low social competence exuded a behavioural profile that does not invite friendships or relationships among their peers. Previous research suggests that children with low levels of social competence are more likely than their socially competent peers to have smaller networks of friends (Ladd, 1999) or interact with similar children who have low social skills and engage in withdrawn and avoidant coping strategies (Rubin, Bowker, & Kennedy, 2009). Additionally, aggressive children with low levels of social competence are often isolated by their peers and relegated to the fringes of the peer group (Bornstein, Hahn, & Haynes, 2010). This lack of close friendships and the use of avoidant coping strategies in the face of conflict may be the reason for the non-significant association between low social competence and victimization: Aggressive and socially incompetent children may have difficulty maintaining friends and socializing and are thus avoided or neglected by their peers.

The behaviours in the current study that characterized low social competence were related to a lack of social skills, a lack of social status (or a lack of leadership), and difficulties sharing possessions and adjusting to changes in routine. Children with difficulties in the domains of social skills, leadership, and adaptability may not have the necessary skills to initiate and/or maintain adaptive and protective friendships and may not be engaging in as much cooperative and adaptive play as other children. Therefore, these children may be neglected and avoided as opposed to being victimized. Future studies should assess the effects of peer neglect and avoidance on relations between social competence and peer victimization. Research studying neglected children often focuses on levels of physical or verbal aggression (Newcomb et al., 1993; Perry, Kusel, & Perry, 1988). In the current study, various aspects of aggression (i.e., including both physical and verbal forms of aggression) were assessed (see Table 1). The combination of low social competence and more interpersonal aspects of aggressive behaviour may lead to more withdrawn and avoidant behaviour as opposed to engaging in outwardly hostile and aversive behaviour. Importantly, aspects of relational aggression, which include covert ways of manipulating and damaging peer relationships (Crick & Grotpeter, 1995) were not directly assessed in the current study. Future research should focus on assessing social competence and peer victimization in the context of physical, verbal, and relational forms of aggression.

It may also be that in the current sample, children with low social competence were in classrooms with other children that also had low levels of social competence and aggressive behaviour, and were therefore not penalized for their behaviour from their more socially competent and less aggressive counterparts. Previous research has found

that classroom ecological factors such as prosocial behaviours and number of friends within the classroom environment, influence children's behaviours (Hoglund & Leadbeater, 2004; Ladd, Kochenderfer, & Colemann, 1997; Leadbeater et al, 2003). Future studies should measure classroom effects of aggression and social competence in order to further understand the association among aggressive behaviour, social competence, and peer victimization.

Moderate and high social competence. The hypothesis that the relation between aggression and physical and relational victimization would not be significant at high levels of social competence was not supported. However, results revealed that among children with moderate levels of social competence, aggression led to increases in relational victimization, whereas aggressive children with high social competence were more likely to be physically victimized. There are many possible explanations for this pattern of findings.

Firstly, previous research has found that children who are both aggressive and socially competent have high levels of social intelligence and are able to manipulate their peers in order to gain control and access to resources (Hawley, 2003; Peeters et al., 2010; Sutton et a., 1999). Hawley (2003) called these children "bistrategic controllers", as they use their aggression and high social competence in order to attain specific goals and resources. Social competence, according to Hawley, is defined according to social outcomes and successes (Hawley, 1999; Hawley, 2002; Hawley, 2003; Hawley, 2007; Hawley, et al., 2008). Hawley suggests that bistrategic controllers use a combination of prosocial and aggressive strategies in order to attain a social goal. In the current study, social competence referred to a combination of adaptive behaviours (social skills,

leadership, and adaptability) and had no specific relation to goal attainment, but rather focused on potentially negative outcomes for aggressive competent children – namely peer victimization. These differing outcomes of social competence may be one reason why the results differed from what was expected based on Hawley's conceptualization of bistrategic controllers. A limitation of Hawley's studies of bistrategic controllers is that, although group dynamics are observed among children, the behaviour of their peers towards the target child is not assessed (e.g., victimization). Methodological differences in the assessment of aggression may also be important. In Hawley's research, peer nominations of aggression were used to identify both preschool and older children (grades 5 to 10) who were both physically and relationally aggressive (Hawley, 2002; Hawley et al., 2008) whereas the current study used parent reports of aggressive and competent behaviour and self-reports of victimization experiences.

Another possible explanation for the finding that aggressive children with moderate and high levels of social competence were victimized in the current study may be due to the level of engagement in peer socialization experiences. The skills that characterize social competence in the current study require involvement in the peer group. These skills include helping and complimenting others, joining clubs and social groups, working with others, being chosen as a leader, and sharing possessions and toys with other children. Clearly these skills are important for the development and maintenance of adaptive and functioning peer relationships, and the addition of aggressive behaviour may partially explain the instances of peer victimization. Whereas aggressive children who are low in social competence may disengage from their peer group and avoid conflict (Ladd, 1999; Rubin et al., 2009), aggressive children who are

both moderately and highly social competent may be actively involved with their peers (Rubin, Bukowski, & Parker, 1998; Toblin, Schwartz, Hopmeyer Gorman, & Abou-ezzeddin, 2005). The combination of children's aggressive behaviour and involvement in the peer group, can increase their vulnerability to peer victimization (Bukowski, 2003; Toblin et al., 2005).

Socially competent and aggressive children may be victimized due to an overall lack of acceptance by their peers. Though these children may be perceived as popular and leaders with high status (as rated by their parents), they may not be well-liked by their peers and/or may be rejected as a consequence of their aggressive behaviour. Peer rejection refers to a child's overall negative association with members of the peer group and is largely synonymous with disliking (Bukowski, Sippola, Hoza & Newcomb, 2000). According to Buhs and Ladd (2006), peer rejection can be manifested in the form of peer neglect or victimization. Therefore, it is possible that these socially competent and aggressive children who are perceived as popular by their peers, may actually be rejected in their own social circles.

Importantly, much of the research with popular and high status children has been conducted with older children or adolescents. There is a need to explore the role of popularity among elementary school children and how aggression and social competence play a role in likeability and status. Nevertheless, the findings of studies with older samples provide insight into the findings of the current study. For example, Prinstein and Cillessen (2003) found that among adolescents in grade 10, aggression was associated with high status and low likeability among their peers. Similarly, Cillessen and Mayeux (2004) found that among a sample of children in grades 5 through 9, aggressive and

socially competent children had high social status but were disliked by their peers. Previous research suggests that these popular, aggressive, and disliked children are "sociometrically controversial" (Coie & Dodge, 1983), and may be at increased risk for being victimized by their peers (Prinstein & Cillessen, 2003). Again, it is important to investigate the role of popularity and likeability among elementary school children in order to replicate these findings in younger samples.

Finally, socially competent and aggressive children may endure peer victimization as a cost of their aggressive behaviour, particularly if they perceive that they are popular. According to Leadbeater and colleagues (2006), the relation between aggression and peer victimization is related to both the benefits and costs of being aggressive among youth in grades 8 to 10: The benefit of popularity may be limited by the cost of victimization. Therefore, whereas socially competent and aggressive children may be adept at manipulating their peers (Hawley, 2003; Peeters et al., 2010; Sutton et al., 1999), their aggressive behaviour does not go without costs (i.e., peer victimization). Importantly, Leadbeater and colleagues (2006) found that the popularity and prosocial attention from peers was associated with relational aggression, whereas physical aggression was related to self-reported ratings of peer acceptance. In the current study, physical (e.g., hitting others) and verbal (e.g., verbal threats) forms of aggression were combined into one construct of aggression. Future studies should aim to disentangle these constructs as well as measure relational aggression in elementary school children and determine whether aggressive behaviour in socially competent children is associated with benefits (i.e., popularity) and/or costs (i.e., victimization).

Importantly, the results of the current study differed in terms of how moderate and high levels of social competence were related to physical and relational victimization. Whereas moderate levels of social competence in aggressive children predicted relational victimization, the combination of aggression and high social competence was associated with physical victimization. It may be that children who were moderately social competent and aggressive were relationally victimized (i.e., were excluded, ignored, or rejected) because they possessed moderate social skill deficits and were not as adept at manipulating their peers like their more socially competent counterparts (Hawley, 2003; Sutton et al., 1999). For the highly socially competent and aggressive children, their behaviour may elicit reactive aggression (an angry, hostile, retaliatory response to perceived threats and provocation; Hubbard et al., 2001; Toblin et al., 2005). Peers may be unable to appropriately respond to the social manipulation of these "bistrategic controllers". These reactive behaviours may comprise an emotionally dysregulated, aversive, and frustrated response that is more emotionally and physically charged (Card & Little, 2006). There is a need for future research to investigate the differential outcomes (i.e., physical and relational victimization) associated with varying levels of social competence in combination with aggressive behaviour in order to understand the complex interplay among social competence, aggression, and peer victimization.

Limitations

Although this study contributes to the literature on the relation between physical aggression and peer victimization, there are several limitations. First, this was a short-term investigation of the effects of social competence and aggression on predicting victimization. The time points were closely spaced (6-months apart), which may have

hindered the assessment of longitudinal developmental change. Additional time points would allow for the examination of growth trajectories in the development of aggression and victimization. Longer-term follow-ups are needed in order to examine consequences of differences in socially competent aggressive behaviours and how they interact over time to predict increases or decreases in peer victimization. Also, with additional waves of data, pathways from victimization to aggression could be tested to assess the effect of social competence on the intertwining of aggression and victimization over time (Hodges & Perry, 1999; Leadbeater & Hoglund, 2009; Synder et al., 2003).

Second, the study relied on parent-reported measures of both aggression and social competence. Although the CFA results supported the model of social competence, these ratings are limited to parent's perceptions of their children, which are susceptible to bias related to their own behaviours (i.e., a parent who is aggressive may view their child's aggression as socially competent). Parent reports are limited by what they can observe in the home environment, which may not represent children's behaviours within the school environment where peer victimization is at its peak. According to Ladd & Kochenderfer-Ladd, (2002), parent reports may be obfuscated by the shared history and experiences with their children. Additionally, parent reports could be influenced by their own abilities or by social desirability (Bornstein et al., 2010). For these reasons, aggression may be under-reported in the current study and social competence may be over-reported. The inclusion of data from peer reports may be important. For example, parents may see their child's aggressive behaviour as competent, whereas peers may perceive this behaviour as non-normative and threatening.

Additionally, victimization experiences were limited to child self-reported experiences. Some studies suggest the use of both parent and peer nominations and ratings in order to obtain a bigger picture of children's victimization experiences in school (Ladd, 1999; Ostrov, 2010). Nonetheless, previous research has supported the use of self-reported experiences of physical and relational victimization using the Social Experiences Questionnaire in young children (Cullerton-Sen & Crick, 2005; Desjardins et al., 2011).

Future studies should include multi-method, multi-informant approaches in order to ensure measures of aggression and social competence are more robust. It would be worthwhile to obtain aggression and social competence ratings from teachers in order to create latent variables that tap these constructs in multiple contexts. Research supports the use of multi-informants in order to validate responses on levels of aggression, peer victimization, and social competence (Yeung & Leadbeater, 2007). Notwithstanding these limitations, the involvement of parents and children to gather information regarding aggression, social competence, and victimization, respectively reduces the likelihood of shared method variance. It would strengthen the findings to have multi-informants complete reports of all three constructs in order to compare reports and validate the findings.

Another limitation to the study involves the measure of aggression as the study did not distinguish between verbal and physical forms of aggression and also did not specifically measure aspects of relational aggression (i.e., spreading rumours, gossiping, and purposefully excluding others from the peer group; Crick & Grotpeter, 1996). Recent research has emphasized the need to examine relational aggression separately from

physical aggression in similar samples of young children (Crick & Grotpeter, 1995; Ostrov, 2008; Ostrov, 2010). Investigating distinct subtypes of aggression (physical, verbal, and relational) may help elucidate sex differences as well as further understand the distinct relations among aggression, social competence, and peer victimization.

Similarly, there are limitations to the measure of social competence used in the current study. Firstly, the definition of social competence used in the current study differs from Hawley's framework of understanding social competence and aggression. While the current study focuses on prosocial and adaptive behaviours (i.e., social skills, leadership, and adaptability), Hawley's conceptualization of social competence is specific to social outcomes and is related to social dominance and the attainment of resources (Hawley, 2002; Hawley, 2007). This mismatch between definitions of social competence may have posed a methodological and design problem for the current study. Future studies should aim to investigate Hawley's conceptualization of social competence in relation to peer victimization in order to replicate the findings of this study.

Additionally, whereas the three factors that measure social competence (social skills, leadership, and adaptability) all significantly loaded onto a single factor and had good model fit, the zero-order correlations demonstrated differences in how these individual constructs were related to aggression and victimization. For example, social competence as a whole appeared to be protective, in that it was significantly negatively correlated with both physical and relational victimization; however, on an individual level, the composites differed in how strongly and significantly correlated they were with physical and relational victimization (e.g., adaptability was the only construct that was significantly negatively correlated with physical victimization, and leadership was not

significantly correlated with relational victimization; see Table 3). It is important to disentangle these effects in future studies in order to determine whether the individual measures of social competence contributed to changes in peer victimization over time.

The current study is generalizable to Canadian children from an urban, mid-size city. Research suggests that geographic location influences reports of victimization experiences (Leadbeater, Sukhawathanakul, Smith, Yeung Thompson, Gladstone, & Sklar, 2011). Future studies should investigate both rural and urban centres in order to determine whether reports of aggression, social competence, and victimization differ across varying contexts. Generalizability was also limited by the characteristics of the sample: The majority of the sample came from educated households (with 79% of mothers and 70% of fathers having at least or more than a college degree) with less than 9% of the sample making less than $30 000 a year. Collecting data from more diverse samples would increase external validity of the findings.

Lastly, although SEM is a comprehensive and flexible approach that permits testing of structural relationships between latent factors while reducing measurement error, it is limited in many respects. First of all, SEM is best suited to research with large samples. Although the original sample size of the current study was adequate for structural equation modeling procedures, it would be helpful to have more participants for subsequent analyses of sex differences. Once the analyses were separated across levels of social competence and compared across sexes, the sample size dramatically decreased, which reduced the amount of power in the study. With SEM, it is necessary to have large sample sizes as small samples can bias parameter estimates and lead to inaccurate standard errors (Hox & Mass, 2001). Future studies investigating these

constructs should consider using larger samples in order to increase accuracy of parameter estimates and improve the utility of maximum likelihood estimations.

SEM is also limited by its assumptions of univariate and multivariate normality. It was not surprising that the data in the current study were not normally distributed, as is the case with most psychological data in non-clinical samples. To deal with violations of normality in the current study, bootstrapping procedures were employed. Although bootstrapping increases statistical accuracy and derives estimates of standard errors and confidence intervals without assuming normality, it is subject to overfitting the models (Byrne, 2010; Tomarken & Waller, 2005). Increasing the sample size and obtaining data from more diverse samples may help attenuate problems with normality in future studies.

Notwithstanding these limitations, SEM is an appropriate means of testing the theoretical assumptions of the current study. Both reliability and construct validity are improved by using multiple indicators in order to attain estimates of the unique sources of variance between indicators and factors because error has been estimated and removed (Tabachnick & Fidell, 2007; Tomarken & Waller, 2005). Additionally, SEM allows for the testing of hypothetical constructs (latent variables such as aggression, social competence, and victimization), which are often difficult to measure with one variable. Using latent variables, questions regarding regression analyses of multiple indicators can be answered without threats to validity or collinearity (Tabachnick & Fidell, 2007).

Conclusions and Implications

The current study contributes to existing literature by finding that social competence does in fact moderate the relation between aggression and peer victimization. Additionally, the results suggesting that aggression is significantly associated with peer

victimization at moderate and high levels of social competence demonstrates the need for future research to revise the understanding of relations between aggression and social competence. This study also extends previous findings that aggression predicts peer victimization and demonstrates the importance of studying these constructs in relation to children's social competence.

The findings of this study have many implications for the understanding of developmental psychopathology as well as clinical practice. Previous research suggests that both aggressors and victims of aggression are at risk for a variety of psychological maladjustment problems including depression, anxiety, and externalizing behaviours (Hawker & Boutlon, 2000). The findings of this study demonstrate the importance of problematic peer relationships for the psychosocial development of young children. Although previous studies have found that aggression and social competence may be adaptive in attaining goals and resources (Hawley, 2003; Hawley et al., 2008), the current study suggests that there are consequences for peer relationships that are associated with aggressive and socially competent behaviour (i.e., peer victimization). These consequences often begin in the elementary school years, when aggressive behaviour is viewed as non-normative by peers (Degnan et al., 2008; Tremblay et al., 2004). Early intervention (i.e., before entry into elementary school or early on in school entry) is crucial in facilitating adaptive development among young children as well as preventing instances of aggression and peer victimization. During the preschool years, children typically learn how to regulate their use of aggression. However, there is a small percentage of children whose aggression persists into elementary school (Cairns & Cairns, 1994; Tremblay et al., 2004). According to Tremblay and colleagues (2004),

children who are at the highest risk of continued aggressive behaviour into childhood and adolescence are exposed to a variety of familial risk-factors such as early pregnancy, a history of anti-social behaviour, and prenatal smoking. It is important for clinicians and educators alike to educate parents and families on the consequences of engaging in such high-risk behaviour to prevent the escalation of aggressive behaviour problems.

However, sometimes aggressive behaviour occurs beyond the familial environment, leaving children vulnerable to a variety of adjustment difficulties and behaviour problems. For instance, aggressive children often report difficulties with internalizing and externalizing behaviours and often have difficulties with self-regulation and conflict resolution strategies (Cambell et al., 2006). Therefore, it is important to intervene early in order to teach children effective coping strategies in the face of conflict as well as subsequent peer attacks and instances of provocation (Bierman, Coie, Dodge, Greenberg, Lochman, McMahon et al., 1999; Hunter & Boyle, 2002; Eron, Huesmann, Spindler, Guerra, Henry, Tolan et al., 2002). Developmental research suggests that high-risk children (i.e., those with aggressive behaviour problems) can be identified early in development, across multiple settings including the home and school (Bierman et al., 1999; Eron et al., 2002). Results from a comprehensive intervention that targeted aggressive behaviour among elementary school students demonstrated that the highest reductions in aggressive behaviour occurred during the early school years (Eron et al., 2002). This intervention focused on social cognition, behaviour management, as well as norms about aggression. It included both peer and family issues and was delivered in an inner-city neighbourhood with high rates of poverty. Eron and colleauges found that the intervention was not effective in preventing aggressive behaviour among older

elementary school children, emphasizing the need to target aggressive behaviour early in development.

Intervention programs that promote prosocial behaviour and conflict resolution skills can foster positive outcomes and decrease aggressive behaviour (Gordon, 2003; Greenberg, Kushce, Cook, & Quamma, 1995; Kelly, Longbottom, Potts, & Williamson, 2004). For example, school programs such as the "Roots of Empathy" (Gordon, 2003) and "Promoting Alternative Thinking Strategies curriculum" (PATHS; Greenberg et al., 1995; Kelly et al., 2004) teaches elementary school children social, emotional, and behavioural skills for daily living and is effective in reducing aggression, increasing prosocial behaviour, and fostering emotional and behavioural regulation skills. Additionally, previous research supports the use of whole-school prevention programs that target reductions in peer victimization while enabling children to develop the necessary skills to deal with conflict (Giesbrecht et al., 2011; Greenberg, Weissberg, O'Brien, Zins, Fredericks, Resnik, et al., 2003). For example, the WITS® program is a whole school peer victimization prevention program that targets not only individual children's behaviours, but also the classroom, school, and greater community. It has demonstrated effectiveness in reducing peer victimization and provides children with the resources and skills to effectively deal with peer conflict (Giesbrecht et al., 2011; Leadbeater et al., 2003).

In addition to intervention programs, there are also a variety of empirically supported treatments and protocols that target aggressive behaviour in children (for a review, see Brestan & Eyberg, 1998). For example, parent training programs have demonstrated effectiveness in reducing aggressive behaviour (Wells & Egan, 1988). Parent training programs are based on operant principles of behaviour change and teach

parents to monitor and ignore or punish deviant behaviours, while rewarding incompatible and positive behaviours. Wells and Egan demonstrated that such an approach led to improvements in the behaviour of aggressive children and also improved parents' abilities to attend to their child's behaviours. Other programs that have demonstrated effectiveness in treating aggressive behaviour in children include Anger Coping Therapy (Lochman, Lampron, Gemmer, & Harris, 1989) and Assertiveness Training (Huey & Rank, 1984), as well as a variety of therapy modalities including Parent-Child Interaction Therapy (Eyberg, Boggs, & Algina, 1995), Multisystemic Therapy (Borduin, Mann, Cone, Henggeler, Fucci, Blaske, et al., 1995), and Rational-Emotive Therapy (Block, 1978). Taken together, these psychosocial protocols are mostly cognitive-behavioural in nature and directly involve the child and his or her parent (Brestan & Eyberg, 1998).

The findings of the current study demonstrates that social competence is a critical component in the aggression-victimization link, highlighting the need for interventions to focus on fostering prosocial conflict resolution strategies among aggressive children. Similarly, consistent with previous research, aggression is a risk factor for peer victimization, even at high levels of social competence. Therefore, interventions should focus on addressing Machiavellian aspects of aggression (i.e., manipulative, hostile) in combination with social competence in order to mitigate the risk of being victimized by one's peers. Interventions such as the "Roots of Empathy", "PATHS", and "WITS", demonstrate the effectiveness in reducing peer victimization and aggressive behaviour by promoting positive relationships and skills among children. Moreover, psychosocial

treatment protocols that target both the child and their family have demonstrated effectiveness in reducing aggressive behaviour.

Taken together, the results of the study highlight the importance of considering the effects of social competence and aggression on peer victimization. The findings suggest that the current understanding and theory regarding aggression and social competence needs to be revisited to include the consequences for peer relationships. Future studies should consider using larger more diverse samples as well as investigate relational and physical aggression separately in order to understand the complexity associated with aggressive behaviour in elementary school children.

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Appendix A

THINGS THAT HAPPEN TO ME

Directions to teachers for administering this confidential questionnaire:
1. Ensure each student has privacy for his or her answers.
2. Please say: "Here is a list of things that sometimes happen to kids your age at school. How often do they happen to <u>you</u> at school?"
3. So they understand what 'confidential' means, have students place their own completed questionnaires in the envelope provided by circulating it around the class, seal the envelope in front of them, and have it sent to the school office for pick-up by a UVic researcher.

A and B are practice questions to teach students how to respond. Explain that they should only check one box for their answer. Younger students should use a blank sheet of paper to isolate the question that they are answering, and then move it down before answering the next question.

A: How often do you eat lunch at school?

NEVER ☐ **SOMETIMES** ☐ **ALMOST ALL THE TIME** ☐

B: How often does your class go outside to play?

NEVER ☐ **SOMETIMES** ☐ **ALMOST ALL THE TIME** ☐

Please check (✓) <u>ONE</u> answer that BEST describes what you do:

1. How often does another kid help you when you need it?

NEVER ☐ **SOMETIMES** ☐ **ALMOST ALL THE TIME** ☐

2. How often are you hit by another kid at school?

NEVER ☐ **SOMETIMES** ☐ **ALMOST ALL THE TIME** ☐

3. How often do other kids leave you out on purpose when it is time to play or do an activity?

NEVER ☐ **SOMETIMES** ☐ **ALMOST ALL THE TIME** ☐

4. How often does another kid yell at you or call you mean names?

NEVER ☐ **SOMETIMES** ☐ **ALMOST ALL THE TIME** ☐

5. How often does another kid try to cheer you up when you feel sad or upset?

NEVER ☐ **SOMETIMES** ☐ **ALMOST ALL THE TIME** ☐

6. How often does a kid who is mad at you try to get back at you by not letting you be in their group anymore?

NEVER ☐ **SOMETIMES** ☐ **ALMOST ALL THE TIME** ☐

7. How often do you get pushed or shoved by another kid at school?

NEVER ☐ **SOMETIMES** ☐ **ALMOST ALL THE TIME** ☐

8. How often does another kid do something that makes you feel happy?

NEVER ☐ **SOMETIMES** ☐ **ALMOST ALL THE TIME** ☐

9. How often does another kid make fun of you because of the way you look?

NEVER ☐ **SOMETIMES** ☐ **ALMOST ALL THE TIME** ☐

10. How often does another kid tell lies about you to make other kids not like you anymore?

NEVER ☐ **SOMETIMES** ☐ **ALMOST ALL THE TIME** ☐

11. How often does another kid kick you or pull your hair?

NEVER ☐ **SOMETIMES** ☐ **ALMOST ALL THE TIME** ☐

12. How often does another kid say they won't like you unless you do what they want you to do?

NEVER ☐ **SOMETIMES** ☐ **ALMOST ALL THE TIME** ☐

13. How often does another kid say something nice to you?

NEVER ☐ **SOMETIMES** ☐ **ALMOST ALL THE TIME** ☐

14. How often does a kid try to keep others from liking you by saying mean things about you?

NEVER ☐ **SOMETIMES** ☐ **ALMOST ALL THE TIME** ☐

15. How often does another kid make fun of you because of the way you speak?

NEVER ☐ **SOMETIMES** ☐ **ALMOST ALL THE TIME** ☐

16. How often does another kid say they will beat you up if you don't do what they want you to do?

NEVER ☐ **SOMETIMES** ☐ **ALMOST ALL THE TIME** ☐

17. How often do other kids let you know that they care about you?

NEVER ☐ **SOMETIMES** ☐ **ALMOST ALL THE TIME** ☐

Appendix B

What Your Child Is Like

Directions: The phrases below describe how children may act. Please read each phrase and mark the response that describes how this child behaved recently (in the last several months).
Circle **N** if the behaviour **never** occurs.
Circle **S** if the behaviour **sometimes** occurs.
Circle **O** if the behaviour **often** occurs.
Circle **A** if the behaviour **almost always** occurs.

1. Shares toys or possessions with other children.	**N**	**S**	**O**	**A**	15. Teases others.	**N**	**S**	**O**	**A**
2. Worries.	**N**	**S**	**O**	**A**	16. Hits other children.	**N**	**S**	**O**	**A**
3. Is negative about things.	**N**	**S**	**O**	**A**	17. Cries easily.	**N**	**S**	**O**	**A**
4. Worries about what teachers think.	**N**	**S**	**O**	**A**	18. Bullies others.	**N**	**S**	**O**	**A**
5. Is good at getting people to work together.	**N**	**S**	**O**	**A**	19. Congratulates others when good things happen to them.	**N**	**S**	**O**	**A**
6. Will change direction to avoid having to greet someone.	**N**	**S**	**O**	**A**	20. Recovers quickly after a setback.	**N**	**S**	**O**	**A**
7. Is too serious.	**N**	**S**	**O**	**A**	21. Is usually chosen as a leader.	**N**	**S**	**O**	**A**
8. Is sad.	**N**	**S**	**O**	**A**	22. Worries about schoolwork.	**N**	**S**	**O**	**A**
9. Avoids competing with other children.	**N**	**S**	**O**	**A**	23. Says, "Nobody understands me."	**N**	**S**	**O**	**A**
10. Makes friends easily.	**N**	**S**	**O**	**A**	24. Is fearful.	**N**	**S**	**O**	**A**
11. Complains about being teased.	**N**	**S**	**O**	**A**	25. Adjusts well to changes in routine.	**N**	**S**	**O**	**A**
12. Is easily upset.	**N**	**S**	**O**	**A**	26. Joins clubs or social groups.	**N**	**S**	**O**	**A**
13. Refuses to join group activities.	**N**	**S**	**O**	**A**	27. Complains about not having friends.	**N**	**S**	**O**	**A**
14. Is chosen last by other children for games.	**N**	**S**	**O**	**A**	28. Argues when denied own way.	**N**	**S**	**O**	**A**

29. Is shy with other children.	N	S	O	A
30. Will speak up if the situation calls for it.	N	S	O	A
31. Says, "Nobody likes me."	N	S	O	A
32. Threatens to hurt others.	N	S	O	A
33. Encourages others to do their best.	N	S	O	A
34. Loses temper too easily.	N	S	O	A
35. Argues with parents.	N	S	O	A
36. Shows fear of strangers.	N	S	O	A
37. Seeks revenge on others.	N	S	O	A
38. Says, "I'm afraid I will make a mistake."	N	S	O	A
39. Is easily soothed when angry.	N	S	O	A
40. Tries too hard to please others.	N	S	O	A
41. Annoys others on purpose.	N	S	O	A
42. Gives good suggestions for solving problems.	N	S	O	A
43. Quickly joins group activities.	N	S	O	A
44. Says, "I don't have any friends."	N	S	O	A
45. Says, "It's all my fault."	N	S	O	A
46. Volunteers to help with things.	N	S	O	A
47. Has trouble making new friends.	N	S	O	A
48. Prefers to be alone.	N	S	O	A
49. Makes decisions easily.	N	S	O	A
50. Worries about things that cannot be changed.	N	S	O	A
51. Adjusts well to changes in family plans.	N	S	O	A
52. Avoids other children.	N	S	O	A
53. Is cruel to others.	N	S	O	A
54. Is stubborn.	N	S	O	A
55. Worries about making mistakes.	N	S	O	A
56. Is a "self-starter."	N	S	O	A
57. Calls other children names.	N	S	O	A
58. Says, "I hate myself."	N	S	O	A
59. Is a "good sport."	N	S	O	A
60. Says, "I'm not very good at this."	N	S	O	A
61. Shows interest in others' ideas.	N	S	O	A
62. Tries to bring out the best in other people.	N	S	O	A
63. Seems lonely.	N	S	O	A
64. Is shy with adults.	N	S	O	A
65. Worries about what other children think.	N	S	O	A
66. Changes mood quickly.	N	S	O	A
67. Says, "please" and "thank you."	N	S	O	A
68. Is creative.	N	S	O	A

69. Is nervous.	**N**	**S**	**O**	**A**	72. Offers help to other children.	**N**	**S**	**O**	**A**
70. Compliments others.	**N**	**S**	**O**	**A**	73. Adjusts well to new teachers.	**N**	**S**	**O**	**A**
71. Worries about what parents think.	**N**	**S**	**O**	**A**					