

SELF-DISCLOSURE AS A FUNCTION
OF NEED FOR APPROVAL

by

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B. A., University of Victoria, 1969

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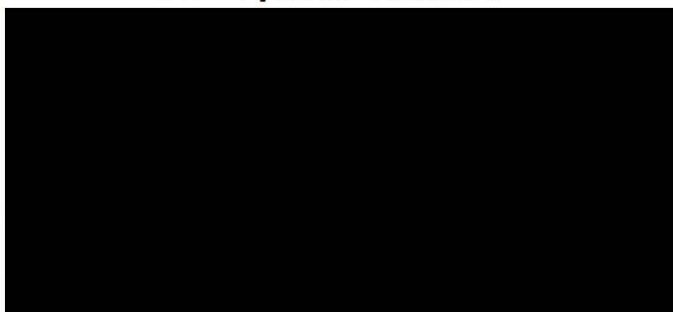
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ABSTRACT

The influence of Need for Approval as measured by the Marlowe-Crowne Social Desirability Scale upon openness of self-disclosure during a small group interaction was examined, using thirty-two female S's matched into eight groups of two High and two Low Need for Approval S's each. During the experimental session, the S's in half the groups were merely told to get to know one another. The remaining groups were given additional instructions equating openness with social desirability. Each group interacted for forty-five minutes with measures of openness taken at the fifteen, thirty, and forty-five minute marks. Each subject rated the openness of one High and one Low Need for Approval other.

High Need for Approval S's showed a significant increase in openness over the course of their interaction. This was the only significant finding. It was speculated that S's socially reinforced those who talked about themselves and that people with High Need for Approval were more responsive to this reinforcement than were people with Low Need for Approval. It was initially hypothesized that people with Low Need for Approval would be judged as more open than people with High Need for Approval, and that S's (especially those with High Need for Approval) would be more open when instructions equated openness with social desirability. These hypotheses were based on the assumption that S's would divulge socially undesirable information about themselves when instructed to reveal personal information about themselves to others. It was felt that a more adequate test of these hypotheses may have resulted had S's been explicitly told to reveal socially undesirable information about themselves to the other members of the group.



Linking Relational Victimization and Relational Aggression:
The Mediating Role of Hostile Attributional Bias in 4th and 5th Grade Children

by

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Abstract

Previous research on peer victimization and aggression has provided some insight into the development and maintenance of physical aggression, but less is known about the processes involved in relational aggression. This short-term longitudinal study examined the direct association between relational victimization and relational aggression over a five-month period, and proposed that hostile attributional bias for relational provocations was one mechanism linking relational victimization and relational aggression. Gender differences in the levels of relational victimization and aggression, hostile attributions, and physical victimization and aggression were explored. Participants included 140 elementary school children in grades four and five. Relational victimization and relational aggression were assessed from children's self-reports of how often they experienced relational victimization and how often they demonstrated relationally aggressive behaviors toward others respectively. Hostile intent attributions were measured from children's responses to five hypothetical peer provocation situations that depicted relational provocations (e.g., the child looks for a friend because they have an important secret to share with them, but finds that their friend is already playing with someone else that the child does not like very much). Concurrent and longitudinal findings revealed that more relationally victimized children were also more relationally aggressive toward their peers. Hierarchical regression analyses indicated that hostile attributions partially mediated the association between relational victimization and relational aggression concurrently, but the mediating effect was not stable over time. Boys reported significantly higher levels of physical victimization, physical aggression,

and relational aggression than girls. No significant gender differences for relational victimization or hostile attributions were revealed. Implications for the development of prevention programs are discussed.

Supervisor: Dr. B.J. Leadbeater, (Department of Psychology)

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Chapter I: Introduction

Aggression among school-aged children poses serious challenges for children's healthy development (Kan & Hanna, 2000). Previous studies have mainly focused on physical forms of aggression; however, current research offers support for the existence of relational forms of aggressive behavior among both boys and girls (Crick & Grotpeter, 1996). Findings indicate that the physically aggressive behaviors among boys and girls are less likely to be exhibited by older elementary school children (NICHD Early Child Care Network, 2004; Tremblay et al., 1999); however, relationally aggressive behaviors may become more prevalent among older children over time (Côté, Vaillancourt, & Barker, 2005; Craig, 1998).

There is growing evidence that peer victimization is associated with aggression in children. Previous work suggests that physically and relationally victimized children are at risk of becoming increasingly aggressive over time (Hanish & Guerra, 2002; Khatri, Kupersmidt & Patterson, 2000). Consistent with the social-psychological adjustment problems related to physical victimization, cross-sectional and longitudinal analyses indicate that relational victimization is also associated with correlates of later adjustment problems including loneliness, peer rejection, low self-esteem, anxiety, and depressive symptoms (Casey-Cannon, Hayward, & Gowen, 2001; Crick & Bigbee, 1998; Crick & Grotpeter, 1996; Kochenderfer-Ladd & Wardrop, 2001; Prinstein, Boergers, & Vernberg, 2001).

Previous research has provided some insight into the development and maintenance of physical aggression but less is known about the processes involved in the development and maintenance of relational aggression. Greater understanding of the

mechanisms that link relational victimization and relational aggression in children would provide avenues for the prevention and treatment of long-term negative outcomes. In this study, I argue that the work done on hostile attributional biases for relational provocations offers potential for increasing knowledge about the processes involved in the development of relational aggression. *Hostile Attributional Bias* is defined as the tendency to interpret a peer's behavior under ambiguous circumstances as intentionally harmful (Crick & Dodge, 1996). Research has established that physically and relationally aggressive children show a bias towards attributing hostile intent to a peer's behaviors in ambiguous situations, which in turn may lead them to bully others as a means of self-protection (Crick, 1995; Crick & Dodge, 1996; Crick, Grotpeter, & Bigbee, 2002; Erdley & Asher, 1996; Hazler, 2000). However, the relations among relational victimization, relational aggression, and hostile attributions for relational provocations have not been empirically assessed over time.

The present study examines the direct association between relational victimization and relational aggression among grades 4 and 5 children. The present study also proposes that hostile attributional biases for relational provocations will mediate the association between relational victimization and relational aggression concurrently and over a five-month period. Finally, gender differences in the levels of relational victimization and aggression, hostile attributions, and physical victimization and aggression are explored.

Definitions of the variables in the present study are introduced first. A review of literature on the relations between physical and relational victimization, aggression, and hostile attributional bias is presented in the following way. First, research on the direct

association between physical and relational forms of victimization and aggression is presented, followed by a brief introduction of the proposed mediation model. Next, Dodge's social information processing model and previous theory on the relation between hostile attributional bias and aggressive behavior are presented. Work on the relations between physical victimization, hostile attributional bias, and physical aggression is also introduced before a review of literature on the associations between relational victimization, hostile attributional bias, and relational aggression is presented. This is followed by a discussion on gender differences in aggression, victimization, and hostile attributional biases. The proposed mediation model and research questions are also discussed more thoroughly. Finally, findings and implications for the development of prevention programs are presented.

Chapter II: Literature Review

Defining Aggression and Victimization

Physical aggression involves actual harm or the threat of harm to others through physical damage, whereas *relational aggression* involves the manipulation of relationships through hurtful measures such as rumor spreading, intentional social exclusion, and the threat of withdrawing one's friendship if the friend does not comply with the instigator's demands (Crick & Bigbee, 1998; Foster, 2005). Findings from a longitudinal study revealed that bullies (i.e., those who aggress against their peers) became more predominant among boys and girls over time, where bullies represented 9.8% of the population in grade four and 15.1% in grade six (Hanish & Guerra, 2004).

Peer victimization is defined, "the experience among children of being a target of the aggressive behaviour of other children, who are not siblings and not necessarily age-

mates” (Hawker & Boulton, 2000, p.441). Research estimates that 15-27% of children are being victimized by their peers (Pepler, Craig, Yuile, & Connolly, 2004; Whitney & Smith, 1993), and approximately one tenth of children face severe or chronic victimization by peers (Hanish & Guerra, 2000). Two types of peer victimization have been identified (Crick & Bigbee, 1998; Hawker & Boulton, 2000). *Physical victimization* involves actual harm through physical damage by their peers (e.g., victims are kicked, pushed, hit, or have their belongings taken from them). *Relational victimization* involves the peer’s threat to damage the victim’s relationships through hurtful measures (e.g., victims are excluded or kept out from a group, are told that their peer won’t like them unless they do what the peer says).

Both physical and relational victimization predict social and psychological adjustment problems among victims such as low self-esteem and depression (Casey-Cannon et al., 2001; Goodman, Stormshak, & Dishion, 2001; Ladd & Kochenderfer-Ladd; 2002; Neary & Joseph, 1994). Increased levels of anxiety and reports of health problems such as general illness, somatic complaints, and suicidal ideation are more prevalent among physically and relationally victimized children when compared to their non-victimized peers (Rigby, 1996). Moreover, physically and relationally victimized children typically have fewer friends, are disengaged from school, and experience school adjustment difficulties (Hanish et al., 2004; Kochenderfer & Ladd, 1996). These effects are particularly strong among children who are frequently and chronically victimized by peers, and among victims who are aggressive toward others. One recent study revealed that physically and relationally victimized children reported more intense emotions such as anger when compared to non-victims, and this anger predicted revenge seeking that

was related to increases in physical and relational victimization for these children in a four-year period (Kochenderfer-Ladd, 2004). This has serious implications for the persistent use of aggressive revenge seeking behaviors as a solution to ambiguous peer provocations.

Do Victims Bully? Relations between Physical and Relational Victimization and Aggression

Longitudinal studies examining the relation between peer victimization and aggression demonstrate that victimized children become aggressive and bully. For instance, Schwartz, McFadyen-Ketchum, Dodge, Pettit, and Bates (1998) used peer nominations to assess the relation between peer victimization and aggression among third and fourth grade children over a 2-year period. Results from their longitudinal study revealed that peer victimization was concurrently and longitudinally associated with aggression. Persistent victimization also placed children at the disadvantage of becoming increasingly aggressive over time.

Surprisingly, few studies investigating the association between peer victimization and aggression have distinguished between physical and relational forms of victimization and aggression in their analyses (Crick & Bigbee, 1998; Leadbeater, Boone, Sangster, & Mathieson, in press; Yeung, Leadbeater, & Burrows, 2005). One study by Hanish and Guerra (2002) examined the effects of physical victimization on children's behavioral functioning among first, second, and fourth graders in their 2-year longitudinal study. Peer nominations were used to assess physical victimization and teacher-reports were used to measure physically aggressive behavior. Findings indicated that prior physical victimization predicted higher levels of physical aggression 2-years later. Leadbeater et

al. (in press) revealed that relationally aggressive youth reported more relational (but not physical) victimization, whereas physically aggressive youth reported more physical (but less relational) victimization.

Little research has examined the direct association between relational victimization and relational aggression. In a one-year longitudinal study, peer-reports of relational victimization predicted self-reported overall levels of aggression among fourth, fifth, and sixth graders (Khatri et al., 2000). Another study revealed that relationally victimized children in fourth and fifth grades also reported more self-restraint problems such as difficulty inhibiting anger, and suggested that they may be overwhelmed with retaliatory feelings from the experiences they encounter (Crick & Bigbee, 1998).

Longitudinal research indicates that there are long-term risks such as peer rejection, loneliness, low self-esteem, anxiety, and depressive symptoms among young children who are relationally or physically victimized by their peers (Casey-Cannon et al., 2001; Crick & Bigbee, 1998; Crick & Grotpeter, 1996; Hawker & Boulton, 2000; Kochenderfer-Ladd & Wardrop, 2001; Prinstein et al., 2001), and children who exhibit relationally or physically aggressive behaviors (Crick & Grotpeter, 1995; Ladd & Burgess, 2001; Rudolph & Clark, 2001; Rys & Bear, 1997). Little is known about the mechanisms that link these relations – particularly among relational forms of victimization and aggression. The first aim of the present study is to examine the direct association between relational victimization and relational aggression (see Figure 1, path 1). The second aim of the present study is to investigate the mediating effect of hostile attributional bias on the association between relational victimization and relational aggression, drawing from theory based on Dodge's social information processing model

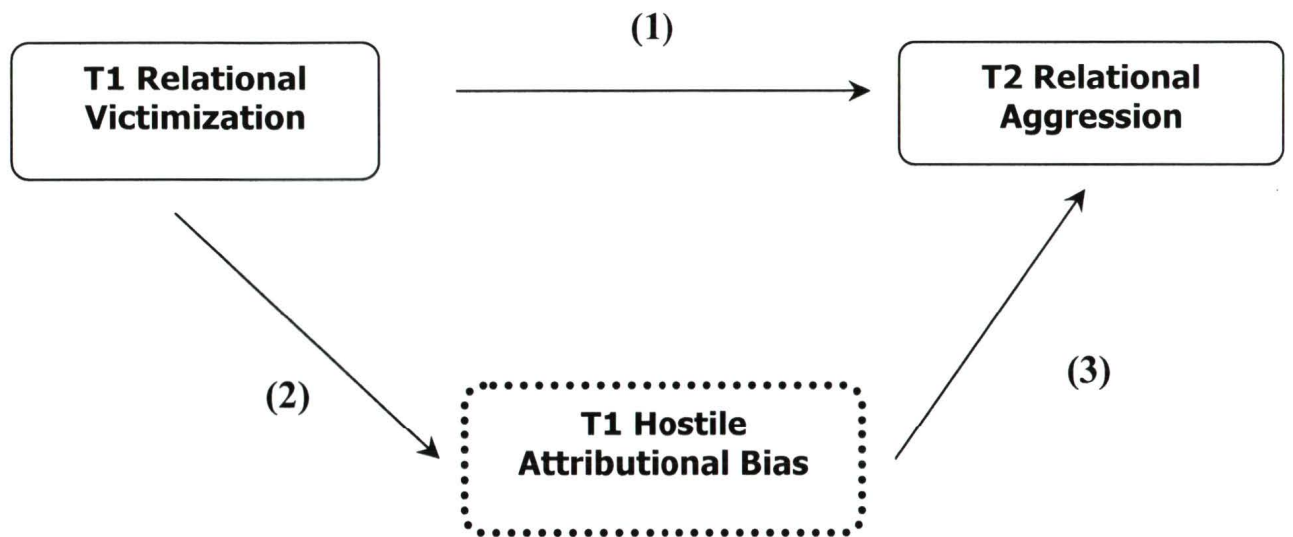


Figure 1. Proposed model of the associations between (1) T1 relational victimization, T2 relational aggression, and (2 & 3) the mediating effect of T1 hostile attributional bias.

(see Figure 1, paths 2 & 3). Both concurrent and longitudinal relations are investigated.

Dodge's Social Information Processing Model

Previous theory and research recognizes that children's representations of their relationships with others depend on their abilities to both understand themselves and accurately interpret the perspectives of others (Asendorpf, 2002; Asendorpf & Baudonnière, 1993; Crick & Dodge, 1996; Ladd & Troop-Gordon, 2003; Moretti, Holland, & McKay, 2001). *Hostile attributional bias* refers to the child's tendency to interpret a peer's behavior under ambiguous circumstances as intentionally harmful (Crick & Dodge, 1996).

Dodge's (1986) social information processing model presents five steps that explain how a child may misinterpret and respond inappropriately to others' behaviors within a social situation. According to the model, children come with predispositions such as memories of past experiences that influence the way they interpret and respond to a social situation. The child also receives social cues from the environment and processes these social cues according to five sequential steps. The first step requires the encoding of the social cues in the environment. Interpretation of the situation and another's motive is step two of the model. Cues from past experiences are also integrated to assist in the interpretation. Children who interpret ambiguous situations as hostile may have processing deficits at this stage (VanOostrum & Horvath, 1997). The third step involves the generation of possible responses to the situation. This step requires the child to use the meaningful information they have encoded to determine potential behavioral responses. For instance, if the child recognizes that they are a victim of a peer's provocation and interprets this behavior as intentional, the child may choose to respond

by retaliation. The fourth step is the evaluation of the responses that were previously generated, according to the effectiveness of the consequences. A child may recognize that one response may not be as effective in the current situation and decide that another response may be more suitable. In the final step of the model, the individual acts on the chosen response.

According to Dodge, a deficiency in any of the social information processing steps (e.g., deficiency in perceptions and encoding of environmental cues that lead to biased attributions about the intention of peers) can result in aggressive behavior exhibited by the child (Milich & Dodge, 1984). Specifically, if a child perceives that a peer has intentionally caused a negative or harmful result, the child may respond aggressively toward the peer. The child in this case believes that the peer has behaved with a hostile intent. On the other hand, if a child perceives that the peer did not intend to cause a negative or harmful outcome, the child would inhibit any aggressive responses. The child in this case believes that the peer behaved with a benign intent. Studies confirm that the level of aggressive responses is related to attributional biases among children (Katsurada & Sugawara, 1998), adolescents (VanOostrum & Horvath, 1997), and adults (Epps & Kendall, 1995).

The Bivariate Relations between Physical Victimization, Hostile Attributional Bias, and Physical Aggression

Physical Victimization and Hostile Attributional Bias

Schwartz, Dodge, et al. (1998) investigated the relation between overall levels of peer victimization and hostile attributional bias by observing play group interactions among elementary school-aged boys. Social-cognitive interviews were used to assess

hostile attributions in vignettes, which described ambiguous peer provocations. Overall levels of peer victimization (e.g., bully teased victim, physically abused victim, or controlled the victim's behavior with assertive but non-aggressive social behavior), were assessed through observations of playgroup interactions. Peer victimization was positively correlated with hostile attributional biases. Frequent victimization and rejection by peers may lead children to develop a social cognitive style where they consistently interpret peer intentions as hostile (Dodge et al., 2003). Physical and relational victimization were not examined separately in this study. Relations between peer victimization and hostile attributional bias were also not assessed with school-aged girls.

Studies on early child maltreatment may aid in the understanding of the relation between maltreatment by peers (i.e., peer victimization) and hostile attributional bias. Prior studies on child maltreatment have linked early physical abuse (i.e., an injury to a child by an adult that required medical attention or left visible bruises) to later aggression (Dodge, Bates, & Pettit, 1990; Rogosch, Cicchetti, & Aber, 1995; Weiss, Dodge, Bates, & Pettit, 1992) and conduct problems (Dodge, Pettit, Bates, & Valente, 1995) exhibited at school. Research on early child maltreatment and subsequent aggression has also examined social information processing patterns (including hostile attributional bias) as potential mechanisms that link these relations. One longitudinal study used multi-informants to investigate the association between early physical abuse and later aggressive behavior in children (Dodge et al., 1990). Parent reports were used as indicators of early physical abuse during the first 12 months following the child's birth, and children's hostile intent were assessed through their responses to eight hypothetical

ambiguous provocation stimuli when children were five-years old. Teacher ratings, peer nominations, and direct observations assessed children's aggressive behavior. Results of the study confirmed that children who experienced early physical abuse became more aggressive toward their peers when compared to those who were not abused. Physically abused children also had a bias for attributing hostile intent, were less attentive to significant social cues, and were unable to construct solutions to interpersonal problems. Furthermore, the relation between early abuse and later aggressive behavior was mediated by hostile attributional bias. Others studies also found similar results: hostile attributional bias mediated the relation between early harsh physical discipline and child aggression in kindergarten (Weiss et al., 1992), and partially mediated the effect of early physical abuse on later teacher-reports of conduct problems of third and fourth graders (Dodge et al., 1995).

Given that physically abused children have a bias for attributing hostile intent, and that hostile attributional bias mediates the relation between child maltreatment by parents and aggression, it is also likely that hostile attributional bias is a mechanism that links physical or relational maltreatment by peers and subsequent aggressive behavior.

Hostile Attributional Bias and Physical Aggression

There is strong evidence that physically aggressive children make hostile attributions more frequently than nonaggressive children when they experience actual ambiguous provocation incidents (Dodge, 1980; Steinberg & Dodge, 1983). Compared to their nonaggressive peers, physically aggressive children who demonstrate a hostile attributional bias are less likely to make decisions using benign cues (Dodge & Tomlin, 1987), are more likely to express that engaging in physically aggressive behaviors are

easier for them (Quiggle, Garber, Panak, & Dodge, 1992), and have a tendency to make inappropriate social decisions quickly that justify retaliatory aggressive behavior (Hudley & Friday, 1996). It may be that aggressive behavior is a response to the misperception of threat or the belief that a provocateur has intentionally caused harm (Berkowitz, 1990). Studies using hypothetical scenarios explain these physically aggressive behaviors by suggesting that physically aggressive children process ambiguous information in a qualitatively different way. For instance, physically aggressive children in grades 3 through 5 are significantly better at recognizing aggressive items in a story than their nonaggressive peers (Coleman & Kardash, 1999). Other studies indicate that differences in children's behavioral choices are strongly related to differences in social goals and perceptions of self-efficacy regarding their ability to accomplish goals. Specifically, physically aggressive children in fourth and fifth grades are more likely to use hostile social goals, are more likely to focus on punishing the provocateur than handling the situation in a nonaggressive manner, evaluate themselves as skilled at getting back at the provocateur and making them feel bad, and are less able to find peaceful solutions or cooperate with the provocateur (Erdly & Asher, 1996) when compared to nonaggressive children. Physically aggressive children who are also rejected by their peers have more hostile attributions and make more hostile responses to hypothetical scenarios than children who are not rejected (Waas, 1988). This suggests they may choose to bully others to defend themselves (Hazler, 2000).

Given the robust findings supporting the link between hostile attributional biases with physically aggressive behavior, some cognitive behavioral intervention programs seek to reduce levels of physical aggression by training physically aggressive children to

recognize that negative events in ambiguous peer provocations can be accidental and not of hostile intent (Hudley & Friday, 1996). Intervention programs aim to reduce hostile attributional bias to minimize physical aggression towards others, but few studies and programs have considered hostile attributional bias among relationally aggressive children. Moreover, few studies or programs have targeted the association between relational victimization and hostile attributional bias. Children who are relationally victimized may also be at risk of developing hostile attributions to ambiguous peer behaviors, which may lead them to respond aggressively towards others.

The Bivariate Associations between Relational Victimization, Hostile Attributional Bias, and Relational Aggression

Relational Victimization and Hostile Attributional Bias

No known study has focused on the association between relational forms of maltreatment by peers (i.e., relational victimization) and hostile attributional bias. However, parallel to the social information processing patterns of physically abused children, relationally victimized children may develop a bias for attributing hostile intentions to others.

The first two steps from Dodge's (1986) social information processing model offers one explanation to how a relationally victimized child may misinterpret others' behaviors within a social situation and later develop a hostile attributional bias. According to the model, children come with predispositions such as memories of past experiences that influence the way they interpret a social situation. The first step requires the encoding of the social cues in the environment. This is followed by an interpretation of the situation and another's motive where cues from past experiences are integrated to

assist in the interpretation. Children who interpret ambiguous situations as hostile may have processing deficits at this stage (VanOostrum & Horvath, 1997). Given that cues from past experiences (e.g., previous experiences of being relationally victimized by peers) are integrated to assist in the interpretation, relationally victimized children may develop a tendency to expect all peer provocations (including ambiguous peer provocations) to be intentional and harmful. Relationally victimized children may not be able to distinguish between intentional and harmful behaviors from accidental peer behaviors, and may misinterpret ambiguous peer behaviors as hostile. Therefore, the present study extends previous work by exploring the direct association between relational victimization and hostile attributional bias for relational provocations (see Figure 1, path 2).

Hostile Attributional Bias and Relational Aggression

While hostile attributional bias is found among physically aggressive children (Dodge & Tomlin, 1987; Katsurada & Sugawara, 1998), few studies have investigated the existence of hostile attributional biases among relationally aggressive children. One cross-sectional study explored the association between hostile attributional bias and relational aggression among third, fourth, and fifth graders using self-reports of hostile attributions and peer nominations of relational aggression (Crick, 1995). Results revealed that relationally aggressive children demonstrated a hostile attributional bias compared to their nonaggressive peers.

The final three steps from Dodge's (1986) social information processing model completes the framework of the proposed mediation model by offering an explanation to how a relationally victimized child with a hostile attributional bias may respond to others

with relationally aggressive behavior. After cues from past experiences are encoded (steps 1 and 2), the third step involves the generation of possible responses to the situation, and requires the child to use the meaningful information they have encoded to determine potential behavioral responses. If a relationally victimized child recognizes that they are a victim of a peer's relational provocation and interprets a peer's behavior as intentionally mean, the child may choose to respond by retaliation through relationally aggressive behavior. The fourth step is the evaluation of the responses that were previously generated, according to the effectiveness of the consequences. A relationally victimized child who continues to respond with relationally aggressive behavior may recognize that one response (e.g., ignoring) may not be as effective in the current situation and decide that another response (e.g., responding with relationally aggressive behavior) may be more suitable. In the final step of the model, the individual acts on the chosen response (i.e., relationally aggressive behavior).

Studies have primarily investigated hostile attributions for physical provocations (Camodeca, Goossens, Schuengel, & Terwogt, 2003; Crick & Dodge, 1996; Hudley & Friday, 1996; Katsurada & Sugawara, 1998; Steinberg & Dodge, 1983; Wass, 1988), but children's hostile attributional bias and aggressive behavior may be specific to the type of provocation scenario (i.e., physical or relational provocations). One recent study by Crick et al. (2002) used peer nominations to assess physical and relational aggression among third-grade children, and children's responses to physical and relational peer provocation scenarios to assess hostile intent attributions. Children were also asked rate how mad or upset they would be if the peer provocation scenarios really happened to them in order to assess their feelings of distress. Results revealed that relationally

aggressive children demonstrated more hostile attributional biases and reported greater distress for relational provocation scenarios compared to physical provocation scenarios. On the other hand, physically aggressive children demonstrated more hostile attributional biases and reported greater distress for physical provocation scenarios compared to relational provocation scenarios. Findings suggest that hostile attributional biases exist among both physically and relationally aggressive children, and that the type of aggressive response (i.e., physical or relational aggression) may be specific to the type of provocation scenario (i.e., physical or relational provocations).

The present study contributes to the existing literature by examining the relation between hostile attributional bias for relational provocation scenarios and relational aggression (see Figure 1, path 3). Parallel to the significant relation between hostile attributions for ambiguous physical provocations and physical aggression, it is expected that a significant association will also exist between hostile attributional bias for ambiguous relational provocation scenarios and relational aggression.

Furthermore, little is known about the potential mechanisms that link relational victimization and relational aggression. Previous research suggests that relationally victimized children develop subsequent aggressive behavior in later grades (Khatri et al., 2000), and relationally victimized children may be overwhelmed with retaliatory feelings from the hurtful experiences they encounter (Crick & Bigbee, 1998). The present study also explores the mediating effect of hostile attributional bias on relational victimization and relational aggression (see Figure 1, paths 2 & 3).

Gender Differences in Aggression, Victimization, and Hostile Attributional Bias

The literature demonstrates gender differences in physical forms of aggression with boys showing more physically aggressive behaviors than girls (Lahey et al., 2000). In contrast, research findings for relational aggression are mixed, and vary by methods used. For instance, a cross-sectional study used peer nominations of physical and relational aggression among children in grades 3 through 6 found that girls were significantly more relationally aggressive than boys, whereas boys were significantly more physically aggressive than girls (Crick & Grotpeter, 1995). Another cross-sectional study used peer nominations and self-reports to measure physical and relational aggression among three age cohorts: 8, 11, and 15 years (Björkqvist, Lagerspetz, & Kaukiainen, 1992). In all age groups, physical aggression was more prevalent among boys, whereas relational forms of aggression (including rumor spreading as revenge, gossiping, and intentional social exclusion) were more prevalent among girls at ages 11 and 15, but not at age 8. Other studies do not support gender specific findings. For example, peer- and teacher-based measures, used to investigate aggression among children in third and sixth grades, showed that older elementary girls – particularly those in sixth grade - who were high in relational aggression showed little physical aggression. However, boys who were high in physical aggression were also high in relational aggression (Rys & Bear, 1997).

Similar inconsistencies in gender differences were shown in studies of relational and physical victimization. Self-reports from children in grades three through six revealed that boys reported significantly more physical victimization than girls, but there were no significant gender differences for relational victimization (Crick & Grotpeter,

1996). Among grades 9 to 12 students, boys reported significantly higher levels of physical aggression and physical victimization than girls; however, there were no significant gender differences for relational forms of aggression or victimization. In fact, boys and girls reported similar levels of relational aggression and relational victimization (Prinstein et al., 2001). Overall, it appears that there is no significant gender difference in the levels of relational aggression and relational victimization, but boys are more likely to be physically aggressive and experience physical victimization than girls (Björkqvist et al., 1992; Crick & Grotpeter, 1996; Lahey et al., 2000; Prinstein et al., 2001).

The association between relational victimization and relational aggression is widely investigated in cross-sectional studies, but few longitudinal studies have examined gender differences among the association between relational victimization and relational aggression over time. The present study extends past results by exploring the association between relational aggression and relational victimization over a five-month period. It was expected that there would be no significant gender difference in the overall levels of relational victimization and aggression, but that girls would report lower levels of physical victimization and aggression than boys.

Furthermore, little research has explored gender differences in the processes that link relational aggression and relational victimization, specifically to hostile attributional bias. Previous research in this area has mainly focused on boys and on hostile attributional bias in relation to physical forms of conflict (Coleman & Kardash, 1999, Dodge, 1980; Hudley & Friday, 1996; Mayeux & Cillessen, 2003; VanOostrum & Horvath, 1997; Waas, 1988), and research that includes both boys and girls has only focused on physical forms of conflicts (Crick & Dodge, 1996; Steinberg & Dodge, 1983).

Few studies have looked at hostile attributional bias among girls and its association to relational conflicts (Crick, 1995; Crick et al., 2002). The present study examines hostile attributional bias for relational provocations among boys and girls. Given that girls reported significantly higher levels of distress due to perceived hostile intent for relational provocation scenarios than boys (Crick, 1995), it was hypothesized that girls would report higher levels of hostile attributional bias for relational provocations than boys.

Chapter III: Proposed Model and Research Questions

Summarizing, past research indicates strong relations between physical and relational forms of victimization and aggression (Crick & Grotpeter, 1995; Hanish & Guerra, 2002; Khatri et al., 2000; Prinstein et al., 2001; Schwartz et al., 1998), and between hostile attributional bias and physical aggression (Dodge, 1980; Dodge & Tomlin, 1987; Erdly & Asher, 1996; Hazler, 2000; Hudley & Friday, 1996; Steinberg & Dodge, 1983; Quiggle et al., 1992; Waas, 1988). Few studies have examined the associations between relational victimization, hostile attributional bias, and relational aggression (Crick, 1995; Crick et al., 2002), in particular, hostile attributional bias for relational provocations as a mediator of relational victimization and relational aggression. The present study builds on previous work by investigating the associations between relational victimization, hostile attributional bias for relational provocations, and relational aggression for the following reasons: 1) recent studies have suggested that physical aggression decreases with age (Côté et al., 2005; Craig, 1998; NICHD Early Child Care Network, 2004; Tremblay et al., 1999) whereas relationally aggressive situations appear to be common in older elementary school children, and 2) there is

increasing interest in the prevention of relational aggression and little research to inform it.

The present study investigates the association between self-reports of relational victimization and relationally aggressive behavior among a sample of fourth and fifth grade children, and the mediating effect of hostile attributional bias for relational provocations concurrently and longitudinally over a five-month period (see Figure 1). The study focuses particularly on relational forms of victimization and aggression, and explores the following research questions:

(1) Do relationally victimized children report higher levels of relational aggression five months later (see Figure 1, path 1)?

(2) Do hostile attributional biases for relational provocations mediate the relation between relational victimization and relational aggression (see Figure 1, paths 2 & 3)?

(3) Are there gender differences in mean levels of relational victimization, relational aggression, and hostile attributional bias for relational provocations? Gender differences in mean levels of physical forms of victimization and aggression are also examined.

Hypotheses. Consistent with past literature, it is predicted that:

(1) Early relational victimization predicts later relationally aggressive behavior among fourth and fifth grade children.

(2) Hostile attributional bias for relational provocations mediates the association between relational victimization and relational aggression in the following way: children who are persistently relationally victimized by their peers interpret peer intentions as hostile, and show relationally aggressive behaviors directed toward their peers.

(3) There are no significant gender differences in levels of relational victimization and aggression, and that girls report higher levels of hostile attributions for relational provocations than boys. Boys are expected to report higher levels of physical victimization and aggression than girls.

Chapter IV: Methods

Participants

The participants were drawn from a pilot study sample (i.e., the WITS LEADS Project) that worked to develop a peer victimization prevention program for children in fourth and fifth grade. WITS stands for Walk Away, Ignore, Talk it Out and Seek Help. LEADS stands for: Look and Listen, Explore points of view, Act, Did it Work, and Seek Help. The WIT LEADS program focused particularly on relational victimization and aimed to help children understand the inner emotional worlds of their peers and use prosocial leadership skills. One school was involved in the development of the “program” (i.e., program school), whereas a second school that was not participating in the development of the program acted as the “control” school. We worked with the children in the program school to identify their typical peer conflicts and their problem-solving approaches. Components being developed in the program school included: a *classroom curriculum* (i.e., based on books that teach and reinforce non-violent solutions to peer conflicts), *community visits from police officers* (i.e., to act as role models in reinforcing non-violent ways of handling peer conflicts), and a *play-ground leadership program* (i.e., involves student volunteers from the school to act as peer leaders for the primary children on the playground). Teachers in the program school received books related to the curriculum and posters with the WITS LEADS acronym to put in their

classrooms as a reminder to the students. These schools were chosen for the program development because both had worked extensively with the previously developed WITS program. The children and teachers understood the language, and the children were aware of and could articulate about bullying. No differences were expected between the program and control schools during this development phase; however, we also wished to pilot measures for the subsequent evaluation of the program. These data were used for this thesis.

Data for the present study were collected in the beginning of February (T1) of 2004 and at the end of the school term in June (T2) of 2004.¹ One hundred and forty-two children in grades four and five classes from two elementary schools participated at Time 1. Two children moved to a different city before the second wave of data collection and the total number of participants was 140 children at Time 2 (65 boys, 75 girls). The children ranged in age from 9 to 11 years ($M = 9.94$ years, $SD = .73$ years). Less than 10% of the students were on income assistance in both schools.

Demographic information for parent's marital status, employment, levels of education, ethnicity, and the number of schools the child has attended was gathered from parents at Time 1. Eighty-two percent of the parent questionnaires were completed by mothers, 15% were completed by fathers, and 2% were completed by other caregivers (e.g., stepmother, stepfather, or foster mother). Two parent questionnaires were not returned. Reports by mothers indicated that 80% of the children were living in a two-parent household and 77% of mothers were employed at a part time or full time job.

¹ Hierarchical regression analyses indicated that there were no significant program effects for relational victimization, relational aggression, and hostile attributional bias at either T1 or T2 so program was not included in subsequent analyses.

Thirty percent of the mothers completed “some college or technical training” after high school, and 28% of mothers earned a bachelor’s degree. Children’s ethnicity was identified as the following: 72% European Caucasian, 14% South East and East Asian, 4% Central Asian, 1% Hispanic, 1% African and Caribbean, 1% Aboriginal, 4% Other (e.g., First Nations-European, Indo-Fijian, Mixed race), and 2% reported no ethnicity. Seventy-nine percent of the children had attended a maximum of two schools in their lifetime, and 20% had attended three or more schools in their lifetime. One parent did not respond to this question.

Procedure

Parental consent forms were sent home with all children in grades 4 and 5. Parents who provided written permission for their child to participate completed a questionnaire for demographic information and returned it to the school in a sealed envelope for pick-up by a research assistant. The overall participation rate was approximately 64% for each school.

Data were collected at both time points in the classroom from the children. One researcher read the questionnaire to the children, as research assistants circulated the classroom to assist individual students when needed (e.g., answering and clarifying questions for students). The full questionnaire took 30 minutes. An additional research assistant was available to help those children who did not understand English well or who needed extra assistance. For example, the research assistant accompanied the student to another work area to administer and read the questionnaire at a pace that was comfortable for the student. Children who were not participating in the study were asked to work quietly on their school projects. Most of the teachers remained in the classroom as the

questionnaires were read to help monitor the children who were not participating in the study.

Measures

Relational Victimization was measured from children's self-reports using the Social Experiences Questionnaire (SEQ; Crick & Grotpeter, 1996). Peer victimization experiences were evaluated by three subscales of the SEQ: relational victimization, physical victimization, and receipt of prosocial peer acts (see Appendix A). Each subscale also contained five items. Children rated how often they experienced relational victimization (e.g., "How often does a classmate tell lies about you to make other kids not like you anymore?"), physical victimization (e.g., "How often do you get pushed or shoved by another kid at school?"), and receipt of prosocial peer acts (e.g., "How often does another kid try to cheer you up when you feel sad or upset?") on a 3-point Likert scale (never, sometimes, or almost all the time). For the purposes of this study, ratings for physical victimization were only used in the gender difference analyses. Ratings for receipt of prosocial peer acts were not used in the current analyses. Total scores were computed by summing each child's scores for the items within the relational victimization scale and the physical victimization scale respectively. Total scores could range from 0 to 10 for both scales. Average scores were also computed to compare children's scores across the two scales in the analyses. In past research, the reliability for the items on the SEQ was adequate for each of the two scales with Cronbach's alpha = .80 for relational victimization and .78 for physical victimization (Crick & Grotpeter, 1996). Reliabilities for each of the subscales were also adequate in the current study ($\alpha =$

.84 and .84 for relational victimization and physical victimization at T1 respectively, and $\alpha = .84$ and .85 for relational victimization and physical victimization at T2 respectively).

Relational Aggression was measured from children's self-reports using the Children's Peer Relations Scale (CPRS; Crick & Grotpeter, 1995) on three subscales each containing 5 items (see Appendix B). Children rated how often they demonstrated relationally aggressive behaviors toward others (e.g., "How often do you leave out other kids on purpose when it is time to play or do an activity?"), physically aggressive behaviors towards others (e.g., "How often do you hit another kid at school?"), and prosocial acts towards others (e.g., "How often do you help another kid when another kid needs it?") on a 3-point Likert scale (never, sometimes, or almost all the time). For the purposes of this study, ratings for physical aggression were only used in the gender difference analyses. Ratings for prosocial acts towards others were not used in the analyses. Total scores were computed by summing each child's scores for the items within the relational aggression scale and the physical aggression scale respectively. Total scores could range from 0 to 10 for both scales. Average scores were also computed to compare children's scores across the two scales in the analyses. Internal consistency on the relational and physical aggression scales were reliable with Cronbach's alpha = .73 and .82 for relational aggression and physical aggression respectively (Crick & Grotpeter, 1995). In the current sample, Cronbach's alphas for children's responses to the items were $\alpha = .64$ and .58 for relational aggression and physical aggression at T1 respectively, and $\alpha = .70$ and .74 for relational aggression and physical aggression at T2 respectively.

Hostile Intent Attributions (Hypothetical-Situation Instrument; Crick, Grotpeter, & Bigbee, 2002) were measured from children's responses to five hypothetical peer provocation situations that depict relational provocations (e.g., the child looks for a friend since they have an important secret to share with them, but finds that their friend is already playing with someone else that the child does not like very much). The provocateur's intent was ambiguous in all of the situations (see Appendix C). For each situation, children were presented with two questions that assessed children's intent attributions. The first question presented children with four possible reasons for the provocation and asked them to indicate the most likely reason. Two of the reasons portray benign intent (e.g., my friend didn't know that I wanted to play with them) and the other two portray hostile intent (e.g., my friend wanted to get back at me for something). Children received a score of 0 if they had reported a response that represented a benign intent, and a score of 1 if they had reported a response that represented a hostile intent. In the second question, children indicated whether the provocateur was trying to be mean (i.e., hostile intent) or not trying to be mean (i.e., benign intent). Similarly, children received a score of 0 if they had indicated a response that depicted a benign intent, and a score of 1 if they had indicated a response that depicted a hostile intent. Children's responses to the above two questions were summed within each story, and these scores were summed together to produce a total intent attribution score for relational provocations. Total scores could range from 0 to 10. Cronbach's alphas for children's responses to the hostile intent attribution scale ranged from .65 to .77 (Crick et al., 2002). Children's responses to the attribution scale for

relational provocation situations were reliable in the current study (Cronbach's $\alpha = .79$ at T1, and $.85$ at T2).

Chapter V: Results

Descriptive Statistics

The frequencies for the three key variables in the present study (i.e., relational victimization, relational aggression, hostile attributions) at Time 1 (T1) and Time 2 (T2) were examined. Subsequent analyses controlled for physical victimization and aggression, thus the descriptive statistics for physical victimization and aggression at T1 and T2 were also examined. No missing data were found in the data set. The distributions of the five variables were assessed by their skewness and kurtosis. A normal distribution was represented by skewness and kurtosis values ranging from -2 to +3.5 and a skewed distribution were represented by values that were lower than -2 or higher than +3.5 (Lei & Lomax, 2005; McHugh & Hudson-Barr, 2003). Most variables had a skewness between -2 and +3.5, except for T2 physical aggression (skewness = 3.89). Most variables also had a kurtosis between -2 and +3.5, except for T2 physical victimization (kurtosis = 3.54), T1 and T2 physical aggression (kurtosis = 6.88 and 18.16 respectively), and T1 and T2 relational aggression (kurtosis = 4.10 and 10.82 respectively). Potential outliers were investigated to determine whether they contributed to the abnormal distribution. Outliers were cases with standardized mean scores in excess of 3.29 (Tabachnick & Fidell, 2001). An examination of the standardized mean scores revealed seventeen outliers with z-scores greater than 3.29 for T2 physical victimization, and physical aggression and relational aggression at T1 and T2. Following the guidelines provided by Tabachnick and Fidell (2001), outliers were assigned a raw

score that was one unit smaller than the next most extreme score in the distribution to reduce the impact of the outlier. A re-examination of skewness and kurtosis revealed no abnormality.

The psychometric characteristics of the measures used in the present study are presented in Table 1. In the current sample, Cronbach's alphas for relational aggression and physical aggression measures at Time 1 (T1) were somewhat lower than expected ($\alpha = .64$ and $.58$ respectively), compared to Cronbach's alphas of $.73$ for relational aggression and $.82$ for physical aggression measures in previous research (Crick & Grotpeter, 1995). Confirmatory factor analysis was used to verify whether items within these measures significantly load onto the latent variables (i.e., relational and physical aggression respectively). Full models of relational and physical aggression (including all five items of relational aggression and five items of physical aggression) were compared to the reduced models of relational and physical aggression (including the three items of relational aggression and three items of physical aggression).² Cronbach's alphas indicated that the reliabilities did not improve after the removal of items in the 3-item scales for relational and physical aggression at T1 and T2 (see Appendix D for full analyses). The full 5-item scale was used for all of the analyses, to increase consistency in the measures across time and with measures used in the literature.

² The full 5-item models for relational aggression and physical aggression were adjusted to reflect a good fit, first by removing the item with the lowest loading in each model, then by removing two items with the lowest loadings in the model until the model produced adequate goodness-of-fit statistics.

Table 1

Psychometric characteristics of measures

Measure	N	Mean (SD)		Cronbach's Alpha	
		T1	T2	T1	T2
Relational Victimization	140	2.08 (2.39)	1.90 (2.22)	.84	.84
Relational Aggression	140	.82 (1.27)	.64 (1.25)	.64	.70
Hostile Attributions (R)	140	4.40 (2.60)	4.61 (2.97)	.79	.85
Physical Victimization	140	1.65 (2.21)	1.64 (2.17)	.84	.85
Physical Aggression	140	.41 (.88)	.51 (1.30)	.58	.74

Note. R = Hostile attributions for relational provocations.

Gender Differences in Relational Victimization and Aggression, Hostile Attributional Bias, and Physical Victimization and Aggression

Gender differences in mean scores and standard deviations are depicted in Table 2. Multivariate repeated measures were used to examine gender differences in relational victimization and aggression, hostile attributions, and physical victimization and aggression across T1 and T2. Findings revealed a significant main effect of Time for *relational aggression* [$F(1, 138) = 6.21, p < .05$], with children reporting significantly higher mean levels of relational aggression at T1 ($M = .78, SD = 1.15$) than T2 ($M = .59, SD = 1.02$). There was also a significant main effect of Gender for relational aggression [$F(1, 138) = 13.22, p < .001$], with boys reporting significantly higher mean levels of relational aggression than girls at both time points. There were no significant main effects of Time [$F(1, 138) = 1.15, p = .29$] and Gender [$F(1, 138) = 4.08, p = .05$] for *relational victimization*, or significant main effects of Time [$F(1, 138) = 1.02, p = .32$], and Gender [$F(1, 138) = .09, p = .76$] for *hostile attributions*.

For *physical victimization*, the main effect of Gender [$F(1, 138) = 11.91, p < .01$] was significant, with boys reporting significantly higher mean levels of physical victimization than girls at T1 and T2. For *physical aggression*, findings indicated a significant main effect of Gender [$F(1, 138) = 12.07, p < .01$], with boys reporting significantly higher mean levels of physical aggression than girls at T1 and T2. There was no significant main effect of Time for physical victimization [$F(1, 138) = .03, p = .85$] or physical aggression [$F(1, 138) = .04, p = .85$]. For all analyses, there were no significant Time X Gender interactions for relational victimization and aggression, hostile attributions, and physical victimization and aggression.

Table 2

Gender differences in mean scores (and standard deviations) on observed variables

	Time 1		Time 2		Time	Gender
	Boys (<i>n</i> = 65)	Girls (<i>n</i> = 75)	Boys (<i>n</i> = 65)	Girls (<i>n</i> = 75)		
Relational victimization	2.44 (2.43)	1.77 (2.32)	2.29 (2.35)	1.56 (2.05)		
Relational aggression	1.14 (1.36)	.47 (.83)	.84 (1.18)	.36 (.80)	*	***
Hostile intent attributions (R)	4.28 (2.39)	4.51 (2.79)	4.60 (3.00)	4.63 (2.96)		
Physical victimization	2.05 (2.14)	1.16 (1.73)	2.18 (2.32)	1.08 (1.57)		**
Physical aggression	.58 (.92)	.23 (.65)	.58 (.90)	.20 (.55)		**

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. Standard deviations are in parentheses. R = hostile attributional bias for relational provocations.

Intercorrelations of Predictor, Mediator, and Outcome Variables

Pearson's correlations among the predictor, mediator, and outcome variables for T1 and T2 data are shown in Table 3. Concurrent analyses revealed that both T1 relational and T1 physical victimization were modestly correlated with reports of T1 relational aggression ($r = .27$ and $.31$ respectively), and T1 physical aggression ($r = .22$ and $.43$ respectively). Similarly, T2 relational and T2 physical victimization were concurrently correlated with reports of T2 relational aggression ($r = .38$ and $.38$ respectively), and T2 physical aggression ($r = .38$ and $.52$ respectively). Hostile attributions at T1 and T2 were correlated with relational victimization at T1 ($r = .30$) and T2 ($r = .34$) respectively. Hostile attributions at T1 and T2 were also modestly correlated with relational aggression at T1 ($r = .26$) and T2 ($r = .20$) respectively.

Longitudinal analyses indicated significant correlations between T1 relational victimization and T2 relational aggression ($r = .27$). T1 hostile attributions were not significantly correlated with T2 relational aggression; hence the mediating effect of T1 hostile attributions for the longitudinal relation between T1 relational victimization and T2 relational aggression could not be examined further.

Pearson's correlations among the variables for T1 and T2 data were also conducted separately for boys and girls (see Table 4). Tests of significance of the difference between the correlations from boys and girls were performed for all variables using the z-score values of the Pearson's correlations. None of the tests of significance of the difference between the correlations were significant at the .05 level.

Table 3

Intercorrelations of predictor, mediator, and outcome variables at T1 and T2

Variable	1		2		3		4		5		6	
	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
1. Relational Victimization												
T1	--											
T2	.62**	--										
2. Physical Victimization												
T1	.69**	.56**	--									
T2	.47**	.76**	.56**	--								
3. Hostile Attributions (R)												
T1	.30**	.19*	.25**	.13	--							
T2	.24**	.34**	.19*	.29**	.58**	--						
4. Relational Aggression												
T1	.27**	.32**	.31**	.34**	.26**	.28**	--					
T2	.27**	.38**	.33**	.38**	.14	.20*	.61**	--				
5. Physical Aggression												
T1	.22**	.29**	.43**	.33**	.12	.03	.51**	.54**	--			
T2	.19*	.38**	.25**	.52**	.05	.23**	.40**	.59**	.42**	--		
6. Gender												
	-.14	-.17*	-.23**	-.27**	.04	.00	-.29**	-.24**	-.22**	-.26**	--	

Note. * $p < .05$, ** $p < .01$. R = Hostile attributions for relational provocations.

Table 4

Intercorrelations of variables at T1 and T2 for boys and girls

Variable	1		2		3		4		5	
	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
1. Relational Victimization										
T1	--	.72**	.73**	.55**	.28*	.28*	.26*	.29*	.16	.34**
T2	.51**	--	.56**	.72**	.24*	.32**	.21	.41**	.24*	.41**
2. Physical Victimization										
T1	.65**	.53**	--	.60**	.19	.20	.11	.16	.21	.28*
T2	.38**	.79**	.50**	--	.11	.18	.07	.22	.19	.47**
3. Hostile Attributions (R)										
T1	.35**	.15	.36**	.19	--	.63**	.24*	.12	.13	.04
T2	.20	.37**	.20	.40**	.52**	--	.19	.13	.05	.10
4. Relational Aggression										
T1	.24	.34**	.35**	.39**	.35**	.39**	--	.60**	.40**	.27*
T2	.22	.32*	.38**	.40**	.21	.28*	.58**	--	.52**	.58**
5. Physical Aggression										
T1	.23	.29*	.54**	.33**	.14	.03	.52**	.51**	--	.37**
T2	.05	.32**	.16	.50**	.10	.35**	.39**	.56**	.39**	--

Note. * $p < .05$, ** $p < .01$. R = Hostile attributions for relational provocations. Correlations for boys are depicted in the lower left quadrant of the table. Correlations for girls are presented in the upper right quadrant of the table.

The Mediation Model

The mediating effect of hostile attributional bias on the association between relational victimization and relational aggression was examined using the criteria of Baron and Kenny (1986). Three criteria must be met in order for hostile attributions to function as a mediator:

(1) There must be a significant relation between relational victimization and relational aggression in the first equation.

(2) There must be a significant relation between relational victimization and hostile attributions in the second equation.

(3) Hostile attributions must affect relational aggression in the third equation. The effect of relational victimization on relational aggression must be less in the third equation than in the first equation, with the strongest demonstration of mediation occurring when relational victimization has no effect when the hostile attributions is controlled.

Regression analyses examining the effects of relational victimization on relational aggression (first criterion) are presented in Tables 5 to 8. Regression analyses examining the effects of relational victimization on hostile attributions demonstrated support for the second criterion at T1 [$F(1, 139) = 13.70, p < .001$] and T2 [$F(1, 139) = 17.89, p < .001$]. Hierarchical regression analyses were used to examine the third criterion with relational victimization as the independent or predictor variable, hostile attributions for relational provocations as the mediator, and relational aggression as the dependent or outcome variable. Concurrent analyses were presented first for T1 followed by analyses

at T2. Given that gender differences in relational aggression were found, the effects of gender were controlled in each equation.

For the *concurrent analyses predicting T1 relational aggression*, gender was entered on the first step. On the second step, T1 relational victimization was entered. On the final step, T1 hostile attributions were entered to examine potential mediation between T1 relational victimization and T1 relational aggression. This order of entry was the same for *concurrent analyses predicting T2 relational aggression*.

Concurrent hierarchical regression analyses at T1 are depicted in Table 5. T1 Relational victimization was significantly associated with T1 relational aggression (step 2), but it did not remain significant after T1 hostile attributions was entered (step 3). T1 hostile attributions were significantly associated with T1 relational aggression (step 3) independent of T1 relational victimization, but not independent of gender. T1 hostile attributions met the criteria indicated by Baron and Kenny (1986) as a partial mediator between T1 relational victimization and T1 relational aggression.

Concurrent analyses at T2 are shown in Table 6. Gender and T2 relational victimization were significantly associated with T2 relational aggression in all steps. When T2 hostile attributions was included into the equation, the relation between T2 relational victimization and T2 relational aggression was reduced; however, it remained significant and T2 hostile attributions did not add significantly to the explained variance.

Given that physical and relational forms of aggression and victimization are moderately correlated with one another in past research (Crick & Bigbee, 1998; Crick & Grotpeter, 1996; Prinstein et al., 2001) and the present study (see Table 3), the mediating models were also examined while controlling for physical aggression and physical

Table 5

Mediational role of T1 hostile attributions in the prediction of T1 relational aggression

Step	Variables entered	β^a	R^2	F	df
1	Gender	-.29**	.08	12.59**	1, 139
2	Gender T1 Relational victimization	-.26** .23**	.14	10.81***	2, 139
3	Gender T1 Relational victimization T1 Hostile Attributions (R)	-.28** .16 .22*	.18	10.02***	3, 139

Note. ^a β are standardized values at the final step. * $p < .05$, ** $p < .01$, *** $p < .001$. R = Hostile attributions for relational provocations.

Table 6

Mediational role of T2 hostile attributions in the prediction of T2 relational aggression

Step	Variables entered	β^a	R^2	F	df
1	Gender	-.24**	.06	8.37**	1, 139
2	Gender T2 Relational victimization	-.18* .34***	.17	14.46***	2, 139
3	Gender T2 Relational victimization T2 Hostile Attributions (R)	-.19* .31*** .10	.18	10.12***	3, 139

Note. ^a β are standardized values at the final step. * $p < .05$, ** $p < .01$, *** $p < .001$. R = Hostile attributions for relational provocations.

victimization. Gender was entered into the equation first. In all mediation models, there were no significant gender interactions for relational victimization and aggression, hostile attributions, and physical victimization and aggression so these were eliminated from the analyses.

For the *concurrent analyses predicting T1 relational aggression*, gender was entered on the first step. On the second step, T1 physical aggression was entered. On the third step, T1 physical victimization and T1 relational victimization were entered simultaneously. On the final step, T1 hostile attributions were entered to examine potential mediation between T1 relational victimization and T1 relational aggression. Similar *concurrent analyses predicting T2 relational aggression* were also conducted.

As shown in Table 7, *findings at T1* revealed that gender and physical aggression were significantly associated with relational aggression in all steps. T1 relational victimization was not significantly associated with T1 relational aggression beyond the effects of physical aggression. Hostile attributions were significantly associated with relational aggression (step 4). Hostile attributions did not meet the criteria indicated by Baron and Kenny (1986) as a mediator between relational victimization and relational aggression at T1.

As shown in Table 8, *concurrent findings at T2* revealed that gender was significantly associated with relational aggression (step 1). However, gender was not significantly associated with relational aggression once physical aggression was entered into the model (step 2). Relational victimization at T2 significantly predicted T2 relational aggression, but not independent of T2 physical aggression (step 3). When hostile attributions at T2 was included into the equation, the relation between T2

Table 7

*Mediational role of T1 hostile attributions in the prediction of T1 relational aggression
(controlling for T1 physical victimization and aggression)*

Step	Variables entered	β^a	R²	F	df
1	Gender	-.29**	.08	12.59**	1, 139
2	Gender T1 Physical Aggression	-.18* .47***	.29	28.59***	2, 139
3	Gender T1 Physical Aggression T1 Physical Victimization T1 Relational Victimization	-.17* .46*** -.06 .18	.32	15.62***	4, 139
4	Gender T1 Physical Aggression T1 Physical Victimization T1 Relational Victimization T1 Hostile Attributions (R)	-.20** .45*** -.07 .14 .19*	.35	14.41***	5, 139

Note. ^a β are standardized values at the final step. * $p < .05$, ** $p < .01$, *** $p < .001$. R = Hostile attributions for relational provocations.

Table 8

*Mediational role of T2 hostile attributions in the prediction of T2 relational aggression
(controlling for T2 physical victimization and aggression)*

Step	Variables entered	β^a	R^2	F	df
1	Gender	-.24**	.06	8.37**	1, 139
2	Gender T2 Physical Aggression	-.09 .57***	.36	38.05***	2, 139
3	Gender T2 Physical Aggression T2 Physical Victimization T2 Relational Victimization	-.09 .53*** -.10 .24*	.39	21.26***	4, 139
4	Gender T2 Physical Aggression T2 Physical Victimization T2 Relational Victimization T2 Hostile Attributions (R)	-.10 .53*** -.10 .23* .03	.39	16.95***	5, 139

Note. ^a β are standardized values at the final step. ** $p < .01$, *** $p < .001$. R = Hostile attributions for relational provocations.

relational victimization and T2 relational aggression was reduced; however, it remained significant and T2 hostile attributions did not add significantly to the explained variance.

Chapter VI: Discussion

The present study builds on previous research by examining the association between relational victimization and relational aggression, and is among the first to investigate the mediating effects of hostile attributional bias for relational provocations as a mediator between relational victimization and relational aggression. Findings replicated previous work in showing a consistent association between relational victimization and relational aggression, with more relationally victimized children also being more relationally aggressive toward their peers. Relationally aggressive behaviors found among relationally victimized children may represent a destructive reaction to their experience of persistent peer maltreatment (Swartz et al., 1998). Similar to the reactions of physically victimized children (Erdley & Asher, 1996), relationally victimized children may react with relationally aggressive behaviors to punish the bully or to defend themselves, and may be less concerned about nonaggressive solutions to the conflict.

Concurrent findings at T1 also revealed that hostile attributional bias partially mediated the association between relational victimization and relational aggression. These results suggest that relationally victimized children have a tendency to interpret ambiguous behaviors for relational provocations as hostile, and that this may lead them to respond with relationally aggressive behaviors toward their peers. This is consistent with previous research for physically aggressive children. Physically aggressive children make more hostile attributions and make more hostile responses than nonaggressive children (Dodge, 1980). Relationally victimized children in the current sample may

believe that they are victims of peers' relational provocations and interpret their behaviors as intentional, and respond by self-defence or retaliation through relationally aggressive behavior. Persistent relational victimization by peers may lead children to misinterpret ambiguous peer provocations as hostile when some are in fact unintentional, and subsequently, use relationally aggressive behaviors as their primary response for all peer provocations.

While hostile attributional bias added to the explained variance and reduced the effects of relational victimization in the mediation model at T1, the criteria for mediation at T2 or across time were not met. Furthermore, the mediation hypothesis was not supported when physical aggression and victimization were controlled. On the other hand, the effects of relational victimization were somewhat reduced once hostile attributions were entered into the model in all the analyses suggesting consistency in the pattern of these relations. Differences in the mediation model at T1 and T2 may have been due to the difference obtained in the mean levels of relational aggression across time. Specifically, children reported significantly higher mean levels of relational aggression at T1 than T2, and it is possible that a reduction in the levels of relational aggression reported at T2 affected the findings. Several reasons may have accounted for a significant drop in reporting of relational aggression over the five month period of the study. First, method effects may have occurred between T1 and T2 data collection. Children were asked to answer questions that assessed relationally aggressive behaviors along with physically aggressive behaviors. Just as physical aggression is not a socially desirable behavior, there may have been a heightened awareness that relational aggression is also not a socially acceptable behavior. It is possible that children were

more reluctant to report relationally aggressive behaviors at T2. Second, teachers may have become more sensitive to reducing relationally aggressive behaviors among children in both schools, as they were aware of the program objectives. This knowledge may have influenced classroom practices and teacher responses to the conflicts among children. Consequently, the teachers in both schools may have also encouraged children to reduce relational aggression toward their peers over the five months. In addition, teacher effects may have influenced the gender differences in relational aggression in the present study. Teachers may have placed more attention on reducing relationally aggressive behaviors among girls and physically aggressive behaviours among boys. Higher mean levels of relational aggression in boys and declines in relational aggression among girls may have been due to the differential treatment by the teachers.

Further studies are needed to reveal whether stronger mediating effects of hostile attributions between relational victimization and relational aggression are demonstrated in the absence of such method and teacher effects. Levels of relational aggression were low initially and even lower in both schools at T2. The mediating effect of hostile attribution bias was seen only at time one. Future studies should be conducted in schools where relational aggression is more of a problem in order to examine mediating effects of hostile attributions. Furthermore, the inconsistent effects of hostile attributions over time suggest that other mechanisms may also be maintaining the association between relational victimization and relational aggression. Other potential mediators could provide for a more complete mediation model such as perspective-taking (Selman, 1980), and levels of social support among children (e.g., parent, teacher, and peer support). Future research that identify mechanisms sustaining and reducing relational victimization

and relational aggression are crucial in the prevention of the long-term harmful outcomes associated with relational victimization and aggression.

The present study also revealed that physical aggression was the variable with the strongest association with relational aggression. Findings replicated the modest magnitude of the correlation in previous research by Crick and Grotpeter (1995), showing evidence that these two constructs (i.e., relational and physical aggression) are different subtypes of the *same* general behavior of aggression. Results from Rys and Bear's (1997) study also show support that children who exhibit physically aggressive behaviors are also likely to exhibit relationally aggressive behaviors among boys but not girls. Gender differences found in the present study are discussed after the following sections.

The subsequent discussion addresses the implications for the development and maintenance of social relationships among relationally victimized children who make hostile attributional biases. Findings on the association between hostile attributional biases among relationally aggressive children, and gender differences are also discussed. Applications for the development of prevention programs are presented.

Implications for Social Relationships among Relationally Victimized Children with Hostile Attributional Biases

Interpreting peer provocations or conflicts as hostile may have serious implications for the development and maintenance of social relationships among relationally victimized children. Past research shows that friendships reduce children's risk for victimization by peers, and buffer against increases in internalizing and externalizing problems associated with peer victimization (Hodge, Boivin, Vitaro, Bukowski, 1999). Friendships also protect children from harsh and violent home

environments from becoming targets of peer victimization. The predictive relation between early harsh home environments and subsequent peer victimization was attenuated among kindergarten to grade four children with numerous friendships in a study by Schwartz, Dodge, Pettit, and Bates (2000). However, the protection offered from friendships may be strained and potentially damaged when the tendency to make hostile attributions among relationally victimized children is generalized to conflicts within friendships. Relationally victimized children may be predisposed to interpret their friend's accidental behavior as intentional and harmful behavior.

Illuminating the Relation between Hostile Attributional Bias and Relational Aggression

There is robust evidence that hostile attributional bias is found among physically aggressive children (Dodge, 1980; Dodge & Tomlin, 1987; Katsurada & Sugawara, 1998; Steinberg & Dodge, 1983), but little work has explored hostile attributional bias among relationally aggressive children (Crick, 1995). Children's hostile attributional bias and aggressive behavior may also be specific to either physical or relational provocations. Only two studies have investigated hostile attributions for relational provocations (Crick, 1995; Crick et al., 2002). The present study extends past work by examining hostile attributional bias for relational provocations among relationally aggressive children.

Consistent with the two previous studies, hostile attributions for relational provocations were correlated with relational aggression. Hostile attributions were associated with relational aggression concurrently at both T1 and T2, but longitudinal relations were not significant. However, significant longitudinal correlations were found between T1 relational aggression and T2 hostile attributions ($r = .28, p < .01$). This suggests an indication of the direction of these relations. Specifically, relationally

aggressive children may develop subsequent hostile attributions over time, rather than children's hostile attributions predicting later relationally aggressive behaviors. Future studies are necessary to clarify the direction of the associations between early hostile attributions and later relational aggression, and early relational aggression and later hostile attributions.

Present findings suggest that relationally aggressive children may be processing ambiguous information in a qualitatively different way, but it is not clear what contributes to the tendency to make hostile attributions among relationally aggressive children over time. It is possible that other social cognitive processing deficits related to hostile attributions are also present among relationally aggressive children. For instance, work on physical aggression indicate that physically aggressive children who make hostile attributions are also less likely to make decisions using benign cues (Dodge & Tomlin, 1987), and have a tendency to make inappropriate social decisions quickly that result in their justification of retaliatory aggressive behavior (Hudley & Friday, 1996) when compared to their nonaggressive peers. Physically aggressive children in fourth and fifth grades are also more likely to use hostile social goals, are more likely to focus on punishing the provocateur than handling the situation in a nonaggressive manner, evaluate themselves as skilled at getting back at the provocateur and making them feel bad, and less able to find peaceful solutions with the provocateur when compared to nonaggressive children (Erdly & Asher, 1996). Further research is needed to tap into the additional reasons as to why the relations between hostile attributions and relational aggression are maintained over time.

Gender Differences in Mean Levels of Relational Victimization and Aggression, Hostile Attributional Bias, and Physical Victimization and Aggression

The literature suggests gender differences in physical forms of victimization and aggression with boys reporting more physical victimization and aggression than girls (Lahey et al, 2000). On the other hand, findings for relational forms of victimization and aggression are less consistent. Some studies indicate that girls are significantly more relationally victimized and relationally aggressive than boys (Crick & Grotpeter, 1995), while others do not reveal significant gender differences (Crick & Grotpeter, 1996; Rys & Bear, 1997). In the present study, gender differences were found in mean levels of physical victimization, physical aggression, and relational aggression.

Physical victimization and aggression. Boys in the present study reported significantly higher mean levels of physical victimization and physical aggression than girls at T1 and T2. This supports previous work indicating that boys are more likely to be physically aggressive, experience physical victimization, and are more likely to interpret physical aggression as harmful behaviours than girls (Björkqvist et al., 1992; Craig, 1998; Crick & Bigbee, 1998; Crick et al., 1996; Crick & Grotpeter, 1996; Galen & Underwood, 1997; Prinstein et al., 2001). On the other hand, girls are less likely to exhibit physical forms of aggression and victimization (Whitney & Smith, 1993) and it may be that girls place greater value on their social relationships compared to boys (Casey-Cannon et al., 2001).

Relational victimization and aggression. Present results showed that in addition to being more physically aggressive, boys were also significantly more relationally aggressive than girls. No gender differences were found for relational victimization.

Findings are consistent with recent research revealing that boys who exhibit physically aggressive behaviors, also exhibit relationally aggressive behaviors (David & Kistner, 2000; Henington, Hughes, Cavell, & Thompson, 1998; Rys & Bear, 1997; Tomada & Schneider, 1997). Thus, the overall intention to harm others through aggressive behaviors may not be limited to a specific subtype of aggression among boys.

While boys reported significantly more relationally aggressive behaviors than girls, relational aggression was present among both genders. In general, older boys and girls may be more socially aware of the types of acceptable behaviors within the school context, with physical aggression being one that is not tolerated or socially accepted. Therefore, older children may be choosing to inflict harm on others through methods that are not as salient as physical means. Relationally aggressive behaviors may bring more success to instigators in harming others as these behaviors are less detectable by school authorities; however, are just as damaging to children's relationships.

Hostile attributional bias for relational provocations. Research on hostile attributional bias has mainly focused on boys and on hostile attributional bias in relation to physical forms of conflict (Coleman & Kardash, 1999, Dodge, 1980; Hudley & Friday, 1996; Mayeux & Cillessen, 2003; VanOostrum & Horvath, 1997; Waas, 1988), while hostile attributional bias in relational conflicts has not been widely studied (Crick, 1995; Crick et al., 2002). The present study extends past work by examining hostile attributional bias for relational provocations among boys and girls. No significant gender differences in hostile attributions for relational provocations were found in the present study. It was expected that girls would report more hostile attributions for relational provocations given that girls place greater value on their social relationships than boys

(Casey-Cannon et al., 2001), but it is possible that social relationships also become more important among boys in older elementary grades. As social relationships become more prevalent and valuable among older boys, conflicts may also become more relational in nature.

Limitations and Future Directions

Results of the present study revealed modest mediating effects of hostile attribution bias on the associations between relational victimization and aggression. Given that there is a decrease in physical aggression (Tremblay et al., 1999) and an increase in relational forms of victimization and aggression among older children (Côté et al., 2005; Craig, 1998), it is possible that stronger effects of hostile attributions for relational provocations will be shown for children in higher grades (i.e., junior grades of 6, 7, and 8). Future longitudinal research should consider the mediating effects of hostile attributions among older children and adolescents.

Data for the present study relied solely on self-reports of relational and physical victimization, hostile attributional bias, and relational and physical aggression. Multi-informant or multi-rater approaches that include self, peer, and teacher reports can be used to improve the validity of the mediation model. In past research, multi-informant measures produced better estimates of outcome variables (e.g., loneliness, peer-group rejection, social problems), than a single-informant measure (Ladd & Kochenderfer-Ladd, 2002). In the present study, children were asked to report on how often they directed aggression toward others, which are behaviors that are not socially acceptable, and it may be that children under-rated their behaviors to appear more socially desirable. Children were also asked to report on how often they were victimized by their peers, and

children may have over-rated the number of experiences. Future studies that draw from multi-informant or multi-rater sources, such as peer, parent, and teacher reports of victimization and aggression, can be used to validate children's responses.

Applications for the Development of Prevention Programs

Relational victimization and aggression is a growing concern in schools. Relational victimization and aggression predicts social, psychological, and school adjustment difficulties - negative effects are particularly strong among children who are chronically victimized by peers, and among victims who are also aggressive toward others (Goodman et al., 2001; Hanish et al., 2004; Ladd & Kochenderfer-Ladd; 2002; Neary & Joseph, 1994). The present study enhanced our understanding of the direct associations between peer relational victimization experiences and relationally aggressive behaviors among school-aged children, and identified hostile attributional bias as one potential mechanism linking this association.

Findings can provide a basis for the development of effective peer victimization prevention programs that aim to ameliorate the cycles of victimization and aggression. The present study suggests that peer victimization prevention programs may need to be tailored specifically to boys and girls. Given that boys were more physically and relationally aggressive than girls, curricula that offer non-aggressive approaches in handling peer conflicts among boys should include examples that represent both physical and relational aggression. On the other hand, curricula that offer strategies in handling peer conflicts among girls could place more emphasis on relational aggression. While gender differences in relational aggression were demonstrated the present study, relationally aggressive behaviors were exhibited in both genders.

Overall, prevention programs can include curricula that help elementary school children to recognize relational forms of victimization and aggression, in addition to physical forms of victimization and aggression. Prevention programs can also help children to develop an understanding of other's feelings, intentions, and points of view by encouraging children to carefully listen to others and observe nonverbal expressions and behaviors. With these skills, children may be able to better interpret peer's ambiguous behaviors correctly when faced with ambiguous relational and physical provocations. Building problem-solving skills and evaluating the consequences of actions can also help children to choose non-aggressive strategies in handling peer conflicts. Finally, children should be encouraged to seek help when faced with frequent relational victimization experiences, and adults need to be responsive to their concerns.

Bibliography

- Arbuckle, J.L. (2003). Amos 5.0 update to Amos user's guide. Chicago, IL: Smallwaters Corporation.
- Asendorpf, J.B. (2002). Self-awareness, other-awareness, and secondary representation. In A.N. Meltzoff & W. Prinz. (Eds.), *The imitative mind: Development, evolution, and brain bases* (pp. 63-73). New York: Cambridge University Press.
- Asendorpf, J.B., & Baudonnière, P.M. (1993). Self-awareness and other-awareness: Mirror self-recognition and synchronic imitation among unfamiliar peers. *Developmental Psychology, 29*(1), 88-95.
- Baron, R.M., & Kenny, D.A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*(6), 1173-1182.
- Beauducel, A., & Wittmann, W.W. (2005). Simulation study on fit indexes in CFA based on data with slightly distorted simple structure. *Structural Equation Modeling, 12*(1), 41-75.
- Berkowitz, L. (1990). On the formation and regulation of anger and aggression. *American Psychologist, 45*(4), 494-503.
- Björkqvist, K., Lagerspetz, K. M. J., & Kaukiainen, A. (1992). Do girls manipulate and boys fight? Developmental trends in regard to direct and indirect aggression. *Aggressive Behavior, 18*, 117-127.
- Camodeca, M., Goossens, F.A., Schuengel, C., & Terwogt, M.M. (2003). Links between social information processing in middle childhood and involvement in bullying. *Aggressive Behavior, 29*, 116-127.
- Casey-Cannon, S., Hayward, C., & Gowan, K. (2001). Middle-school girls' reports of peer victimization: Concerns, consequences, and implications. *Professional School Counseling, 5*(2), 138-147.
- Coleman, J.M., & Kardash, C.M. (1999). Encoding and retrieval of ambiguous and unambiguous information by aggressive and nonaggressive elementary boys. *Child Study Journal, 29*(2), 133-151.
- Côté, S., Vaillancourt, T., Barker, T. (2005, April). *The Joint Development of Physical and Indirect Aggression During Childhood: A Person-Oriented Approach*. Paper presented at the Biennial meeting of the Society for Research in Child Development, Atlanta, GA.

- Craig, W.M. (1998). The relationship among bullying, victimization, depression, anxiety, and aggression in elementary school children. *Personality & Individual Differences, 24*(1), 123-130.
- Crick, N.R. (1995). Relational aggression: The role of intent attributions, feelings of distress, and provocation type. *Development and Psychopathology, 7*, 313-322.
- Crick, N.R., & Bigbee, M.A. (1998). Relational and overt forms of peer victimization: A multiinformant approach. *Journal of Consulting and Clinical Psychology, 66*(2), 337-347.
- Crick, N.R., & Dodge, K.A. (1996). Social information-processing mechanisms in reactive and proactive aggression. *Child Development, 67*, 993-1002.
- Crick, N.R., & Grotpeter, J.K. (1995). Relational aggression, gender, and social-psychological adjustment. *Child Development, 66*, 710-722.
- Crick, N.R., & Grotpeter, J.K. (1996). Children's treatment by peers: Victims of relational and overt aggression. *Development and Psychopathology, 8*, 367-380.
- Crick, N.R., Grotpeter, J.K., & Bigbee, M.A. (2002). Relationally and physically aggressive children's intent attributions and feelings of distress for relational and instrumental peer provocations. *Child Development, 73*(4), 1134-1142.
- David, C.F., & Kistner, J.A. (2000). Do positive self-perceptions have a "dark side"? Examination of the link between perceptual bias and aggression. *Journal of Abnormal Child Psychology, 28*(4), 327-337.
- Dodge, K.A. (1980). Social cognition and children's aggressive behavior. *Child Development, 51*, 162-170.
- Dodge, K.A. (1986). A social information processing model of social competence in children. In M. Perlmutter (Ed.), *The Minnesota Symposia on Child Psychology: Vol 18. Cognitive perspectives on children's social and behavioral development* (pp. 77-125). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Dodge, K.A., Bates, J.E., & Pettit, G.S. (1990). Mechanisms in the cycle of violence. *Science, 250*, 1678-1683.
- Dodge, K.A., Lansford, J.E., Burks, V.S., Bates, J.E., Pettit, G.S., Fontaine, R., & Price, J.M. (2003). Peer rejection and social information-processing factors in the development of aggressive behavior problems in children. *Child Development, 74*(2), 374-393.

- Dodge, K.A., Pettit, G.S., Bates, J.E., & Valente, E. (1995). Social information-processing patterns partially mediate the effect of early physical abuse on later conduct problems. *Journal of Abnormal Psychology, 104*(4), 632-643.
- Dodge, K.A., & Tomlin, A.M. (1987). Utilization of self-schemas as a mechanism of interpretational bias in aggressive children. *Social Cognition, 5*(3), 280-300.
- Epps, J., & Kendall, P.C. (1995). Hostile attributional bias in adults. *Cognitive Therapy and Research, 19*(2), 159-178.
- Erdley, C.A., & Asher, S.R. (1996). Children's social goals and self-efficacy perceptions as influences on their responses to ambiguous provocation. *Child Development, 67*(4), 1329-1344.
- Foster, S.L. (2005). Aggression and antisocial behavior in girls. In D.J. Bell, S.L. Foster, & E.J. Mash (Eds.), *Handbook of Behavioral and Emotional Problems in Girls* (pp. 149-180). New York: Kluwer Academic/Plenum Publishers.
- Galen, B.R., & Underwood, M.K. (1997). A developmental investigation of social aggression among children. *Developmental Psychology, 33*(4), 589-600.
- Goodman, M.R., Stormshak, E.A., & Dishion, T.J. (2001). The significance of peer victimization at two points in development. *Applied Developmental Psychology, 22*, 507-526.
- Hanish, L.D., & Eisenberg, N., Fabes, R.A., Spinrad, T.L., Ryan, P., & Schmidt, S. (2004). The expression and regulation of negative emotions: Risk factors for young children's peer victimization. *Development and Psychopathology, 16*, 335-353.
- Hanish, L. D., & Guerra, N.G. (2000). The roles of ethnicity and school context in predicting children's victimization by peers. *American Journal of Community Psychology, 28*(2), 201-223.
- Hanish, L. D., & Guerra, N.G. (2002). A longitudinal analysis of patterns of adjustment following peer victimization. *Development & Psychopathology, 14*(1), 69-89.
- Hanish, L. D., & Guerra, N.G. (2004). Aggressive victims, passive victims, and bullies: Developmental continuity or developmental change? *Merrill-Palmer Quarterly, 50*(1), 17-38.
- Hawker, D.S., & Boulton, M.J. (2000). Twenty years' research on peer victimization and psychosocial maladjustment: A meta-analytic review of cross-sectional studies. *Journal of Child Psychology & Psychiatry, 41*(4), 441-455.

- Hazler, R. J. (2000). When victims turn aggressors: Factors in the development of deadly school violence. *Professional School Counseling, 4*(2), 105-115.
- Henington, C., Hughes, J.N., Cavell, T.A., & Thompson, B. (1998). The role of relational aggression in identifying aggressive boys and girls. *Journal of School Psychology, 36*(4), 457-477.
- Hodges, E.V.E., Boivin, M., Vitaro, F., Bukowski, W.M. (1999). The power of friendship: Protection against an escalating cycle of peer victimization. *Developmental Psychology, 35*(1), 94-101.
- Hoyle, R.H., & Panter, A.T. (1995). Writing about structural equation models. In R.H. Hoyle (Ed.), *Structural equation modeling: Concepts, issues, and applications* (pp. 158-176). Thousand Oaks, CA: SAGE publications.
- Hu, L., & Bentler, P. M. (1995). Evaluating model fit. In R.H. Hoyle (Ed.), *Structural equation modeling: Concepts, issues, and applications* (pp. 76-99). Thousand Oaks, CA: SAGE publications.
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*(1), 1-55.
- Hudley, C., & Friday, J. (1996). Attributional bias and reactive aggression. *American Journal of Preventative Medicine, 13*(5), 75-81.
- Kan, R.T., & Hanna, F.J. (2000). Disruptive behavior disorders in children and adolescents: How do girls differ from boys? *Journal of Counseling & Development, 78*(3), 267-274.
- Katsurada, E., & Sugawara, A.I. (1998). The relationship between hostile attributional bias and aggressive behavior in preschoolers. *Early Childhood Research Quarterly, 13*(4), 623-636.
- Khatri, P., Kupersmidt, J.B., & Patterson, C. (2000). Aggression and peer victimization as predictors of self-reported behavioral and emotional adjustment. *Aggressive Behavior, 26*, 345-358.
- Kline, R. B. (1998). *Principles and practice of structural equation modeling*. New York: The Guilford Press.
- Kochenderfer, B., & Ladd, G.W. (1996). Peer victimization: Cause or consequence of school maladjustment? *Child Development, 67*(4), 1305-1317.
- Kochenderfer-Ladd, B. (2004). Peer Victimization: The role of emotions in adaptive and maladaptive coping. *Social Development, 13*(3), 329-349.

- Kochenderfer-Ladd, B., & Wardrop, J.L. (2001). Chronicity and instability of children's peer victimization experiences as predictors of loneliness and social satisfaction trajectories. *Child Development, 72*(1), 134-151.
- Ladd, G.W., & Burgess, K.B. (2001). Do relational risks and protective factors moderate the linkages between childhood aggression and early psychological and school adjustment? *Child Development, 72*(5), 1579-1601.
- Ladd, G.W., & Kochenderfer-Ladd, B. (2002). Identifying victims of peer aggression from early to middle childhood: Analysis of cross-informant data for concordance, estimation of relational adjustment, prevalence of victimization, and characteristics of identified victims. *Psychological Assessment, 14*(1), 74-96.
- Ladd, G.W., & Troop-Gordon, W. (2003). The role of chronic peer difficulties in the development of children's psychological adjustment problems. *Child Development, 74*(5), 1344-1367.
- Lahey, B. B., Miller, T.L., Schwab-Stone, M., Goodman, S. H., Waldman, I. D., Canino, G., Rathouz, P. J., Dennis, K. D., Bird, H., & Jensen, P. S. (2000). Age and gender differences in oppositional behavior and conduct problems: A cross-sectional household study of middle childhood and adolescence. *Journal of Abnormal Psychology, 109*, 488-503.
- Leadbeater, B., Boone, E.M., Sangster, N.A., & Mathieson, L.C. (2004). Gender differences in the costs and benefits of relational and physical aggression in high school. Manuscript submitted.
- Lei, M., & Lomax, R.G. (2005). The effect of varying degrees of nonnormality in structural equation modeling. *Structural Equation Modeling, 12*(1), 1-27.
- Maruyama, G.M. (1998). *Basics of structural equation modeling*. Thousand Oaks, CA: Sage.
- Mayeux, L., & Cillessen, A.H.N. (2003). Development of social problem solving in early childhood: Stability, change, and associations with social competence. *The Journal of Genetic Psychology, 164*(2), 153-173.
- McHugh, M.L., & Hudson-Barr, D. (2003). Descriptive statistics, Part II: Most commonly used descriptive statistics. *Journal for Specialists in Pediatric Nursing, 8*(3), 111-116.
- Milich, R., & Dodge, K.A. (1984). Social information processing in child psychiatric populations. *Journal of Abnormal Child Psychology, 12*(3), 471-490.

- Moretti, M.M., Holland, R., & McKay, S. (2001). Self-other representations and relational and overt aggression in adolescent girls and boys. *Behavioral Sciences and the Law, 19*, 109-126.
- Neary, A., & Joseph, S. (1994). Peer victimization and its relationship to self-concept and depression among schoolgirls. *Personality and Individual Differences, 16*, 183-186.
- NICHD Early Child Care Network (2004). Trajectories of physical aggression from toddlerhood to middle childhood: Predictors, correlates, and outcomes. *Monographs of the Society for Research in Child Development, Serial No. 279*, 69.
- Olweus, D. (1999). Sweden. In P.K. Smith, Y. Morita, J. Junger-Tas, D. Olweus, R. Catalano, & P. Slee (Eds.), *The nature of school bullying: A cross-national perspective* (pp. 7-27). New York: Routledge.
- Pepler, D., Craig, W., Yuile, A., & Connolly, J. (2004). Girls who bully: A developmental and relational perspective. In M. Putallaz & K.L. Bierman. (Eds.), *Aggression, antisocial behavior, and violence among girls* (pp. 90-109). New York: The Guilford Press.
- Prinstein, M.J., Boergers, J., & Vernberg, E.M. (2001). Overt and relational aggression in adolescents: Social-psychological adjustment of aggressors and victims. *Journal of Clinical Child Psychology, 30*(4), 479-491.
- Quiggle, N.L., Garber, J., Panak, W.F., & Dodge, K.A. (1992). Social information processing in aggressive and depressed children. *Child Development, 63*, 1305-1320.
- Rigby, K. (1996). *Bullying in schools: What to do about it*. Melbourne, Victoria: The Australian Council for Educational Research.
- Rogosch, F.A., Cicchetti, D., & Aber, J.L. (1995). The role of child maltreatment in early deviations in cognitive and affective processing abilities and later peer relationship problems. *Development and Psychopathology, 7*, 591-609.
- Rudolph, K.D., & Clark, A.G. (2001). Conceptions of relationships in children with depressive and aggressive symptoms: Social-cognitive distortion or reality? *Journal of Abnormal Child Psychology, 29*, 41-56.
- Rys, G.S., & Bear, G.G. (1997). Relational aggression and peer relations: Gender and developmental issues. *Merrill-Palmer Quarterly, 43*, 87-106.

- Schwartz, D., Dodge, K.A., Coie, J.D., Hubbard, J.A., Cillessen, A.H., Lemerise, E.A., & Bateman, H. (1998). Social-cognitive and behavioral correlates of aggression and victimization in boys' play group. *Journal of Abnormal Child Psychology*, 26(6), 431-440.
- Schwartz, D., Dodge, K.A., Pettit, G.S., & Bates, J.E. (2000). Friendship as a moderating factor in the pathway between early harsh home environment and later victimization in the peer group. *Developmental Psychology*, 36(5), 646-662.
- Schwartz, D., McFadyen-Ketchum, S.A., Dodge, K.A., Pettit, G.S., & Bates, J.E. (1998). Peer group victimization as a predictor of children's behavior problems at home and in school. *Development and Psychopathology*, 10, 87-99.
- Selman, R.L. (1980). *The growth of interpersonal understanding. Clinical and developmental analyses*. New York: Academic Press.
- Steinberg, M.S., & Dodge, K.A. (1983). Attributional bias in aggressive adolescent boys and girls. *Journal of Social and Clinical Psychology*, 1(4), 312-321.
- Tabachnick, B.G., & Fidell, L.S. (2001). *Using multivariate statistics (4th ed.)*. Needham Heights, MA: Allyn & Bacon.
- Tomada, G., & Schneider, B.H. (1997). Relational aggression, gender, and peer acceptance: Invariance across culture, stability over time, and concordance among informants. *Developmental Psychology*, 33, 601-609.
- Tremblay, R.E., Japel, C., Perusse, D., McDuff, P., Boivin, M., Zoccolilo, M., et al. (1999). The search for the age of "onset" of physical aggression: Rousseau and Bandura revisited. *Criminal Behavior and Mental Health*, 9, 8-23.
- VanOostrum, N., & Horvath, P. (1997). The effects of hostile attribution on adolescents' aggressive responses to social situations. *Canadian Journal of School Psychology*, 13(1), 48-59.
- Waas, G.A. (1988). Social attributional biases of peer-rejected and aggressive children. *Child Development*, 59, 969-975.
- Weiss, B., Dodge, K.A., Bates, J.E., & Pettit, G.S. (1992). Some consequences of early harsh discipline: Child aggression and a maladaptive social information processing style. *Child Development*, 63, 1321-1335.
- Whitney, I., & Smith, P.K. (1993). A survey of the nature and extend of bullying in junior/middle and secondary schools. *Educational Research*, 35(1), 3-25.

Yeung, R.S., Leadbeater, B.J., & Burrows, M.S. (2005, April). Victimization and Aggression in 4th and 5th Graders: Do Bullies Become Victims or Do Victims Bully? Poster presented at the Biennial Meeting of the Society for Research in Child Development, Atlanta, GA.

Appendix A: Relational and Physical Victimization Questionnaire

THINGS THAT HAPPEN TO ME

Directions: Here is a list of things that sometimes happen to kids your age at school. How often do they happen to you at school?

Example:

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 (✓) ONE 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 do you get 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 a classmate 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: Relational and Physical Aggression Questionnaire

THINGS THAT I DO

Directions: Here is a list of things that kids your age sometimes do at school. How often do you do these things at school?

Example:

A: How often do you eat lunch at home?

NEVER SOMETIMES ALMOST ALL THE TIME

B: How often does your class go to the gym to play?

NEVER SOMETIMES ALMOST ALL THE TIME

Please check (✓) ONE answer that BEST describes what you do:

1. How often do you help another kid when another kid needs it?

NEVER SOMETIMES ALMOST ALL THE TIME

2. How often do you hit another kid at school?

NEVER SOMETIMES ALMOST ALL THE TIME

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

NEVER SOMETIMES ALMOST ALL THE TIME

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

NEVER SOMETIMES ALMOST ALL THE TIME

5. How often do you try to cheer up another kid when that kid feels sad or upset?
NEVER SOMETIMES ALMOST ALL THE TIME
6. When you are mad at a kid, how often do you try to get back at that kid by not letting him or her be in your group anymore?
NEVER SOMETIMES ALMOST ALL THE TIME
7. How often do you push or shove another kid around at school?
NEVER SOMETIMES ALMOST ALL THE TIME
8. How often do you do something that makes another kid feel happy?
NEVER SOMETIMES ALMOST ALL THE TIME
9. How often do you make fun of another kid because of the way that kid looks?
NEVER SOMETIMES ALMOST ALL THE TIME
10. How often do you tell lies about someone in your class to make other kids not like that person?
NEVER SOMETIMES ALMOST ALL THE TIME
11. How often do you kick another kid or pull another kid's hair?
NEVER SOMETIMES ALMOST ALL THE TIME
12. How often do you say that you won't like another kid unless they do what you want them to do?
NEVER SOMETIMES ALMOST ALL THE TIME

13. How often do you say something nice to another kid?
NEVER SOMETIMES ALMOST ALL THE TIME
14. How often do you try to keep others from liking another kid by saying mean things about that kid?
NEVER SOMETIMES ALMOST ALL THE TIME
15. How often do you make fun of another kid because of the way that kid speaks?
NEVER SOMETIMES ALMOST ALL THE TIME
16. How often do you say that you will beat up another kid if that kid doesn't do what you want them to do?
NEVER SOMETIMES ALMOST ALL THE TIME
17. How often do you let other kids know that you care about them?
NEVER SOMETIMES ALMOST ALL THE TIME

Appendix C: Hostile Attributional Bias (for Relational Provocations) Questionnaire

Why People Do Things

Directions: You will be reading several stories. Imagine that the things that are happening in each story are happening to you. Then choose (✓) the BEST answer after each story.

STORY #1: Playground Story

Imagine that you are looking for your friend in the hall before class. You can't wait to find your friend because you have an important secret to share. By the time you find your friend, your friend is already playing with someone else— a person you don't like very much.

1. Why did your friend hang out with someone else instead of you?

My friend...

was mad at me. <input type="checkbox"/>	didn't know that I wanted to play with them. <input type="checkbox"/>	wanted to get back at me for something. <input type="checkbox"/>	didn't see me in the hall. <input type="checkbox"/>
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2. In this story, do you think your friend was:

Trying to be mean?

OR

Not trying to be mean?

3. How upset or mad would you be if the things in this story really happened to you?

Not upset or mad at all

A little upset or mad

Very upset or mad

STORY #2: Hallway Story

Imagine that you are standing in the hallway one morning at school. As you are standing there, two classmates walk by. As they walk by you, the two kids look at you, whisper something to each other and then they laugh.

1. Why did the two classmates laugh when they walked by you?

The kids were...

making fun of me. <input type="checkbox"/>	laughing at a joke one of them told. <input type="checkbox"/>	just having fun. <input type="checkbox"/>	trying to make me mad. <input type="checkbox"/>
---	---	--	---

2. In this story, do you think your friend was:

Trying to be mean?

OR

Not trying to be mean?

3. How upset or mad would you be if the things in this story really happened to you?

Not upset or mad at all

A little upset or mad

Very upset or mad

Story #3: Party Story

Imagine that you are in the bathroom one day after lunch. While you are in there, two other classmates come in and start talking to each other. You hear one of them invite the other one to a birthday party. The kid says that there are going to be a lot of people at the party. You have not been invited to this party.

1. Why hasn't the kid invited you to the birthday party?

The kid...

doesn't want me to come to the party. <input type="checkbox"/>	hasn't had a chance to invite me yet. <input type="checkbox"/>	is trying to get back at me for something. <input type="checkbox"/>	was planning to invite me later. <input type="checkbox"/>
---	---	--	--

2. In this story, do you think your friend was:

Trying to be mean?

OR

Not trying to be mean?

3. How upset or mad would you be if the things in this story really happened to you?

Not upset or mad at all

A little upset or mad

Very upset or mad

STORY #4: Lunch Story

Imagine that you are at lunch one day and looking for a place to sit. You see some people you know at a table across the room. The kids are laughing and talking to each other and they look like they are having a good time. You walk over to their table. As soon as you sit down, the kids stop talking and no one says anything to you.

1. Why did the kids stop talking when you sat down?

The kids...

were waiting for me to say something first. <input type="checkbox"/>	didn't want to talk to me. <input type="checkbox"/>	were saying mean things about me before I got there. <input type="checkbox"/>	were finished talking. <input type="checkbox"/>
---	--	--	--

2. In this story, do you think your friend was:

Trying to be mean?

OR

Not trying to be mean?

3. How upset or mad would you be if the things in this story really happened to you?

Not upset or mad at all

A little upset or mad

Very upset or mad

STORY #5: Walk Story

Imagine that you are taking a walk in your neighborhood one day. After you walk a block or two, you see two people you know from your school. You walk over to the kids and say "hi". The two kids act as if you are not there--- they don't say anything to you. Then they say something to each other that you can't hear and they walk away.

1. Why didn't the two kids say hello to you?

The kids...

<p>didn't see me standing there.</p> <input type="checkbox"/>	<p>didn't hear me say hi first.</p> <input type="checkbox"/>	<p>were mad at me about something.</p> <input type="checkbox"/>	<p>don't like me.</p> <input type="checkbox"/>
---	--	---	--

2. In this story, do you think your friend was:

Trying to be mean?

OR

Not trying to be mean?

3. How upset or mad would you be if the things in this story really happened to you?

Not upset or mad at all

A little upset or mad

Very upset or mad

Appendix D: Establishing Measurement Invariance for Relational and Physical Aggression

The first goal in analysis was to understand the low Cronbach's alphas for the relational ($\alpha = .64$) and physical aggression ($\alpha = .58$) measures at T1. Using AMOS 5.0 Software (Arbuckle, 2003), confirmatory factor analysis (CFA) was conducted to compare the full models of relational and physical aggression (including all 5 items of relational aggression— leave, exclude, lies, like, mean; and 5 items of physical aggression – hit, yell, push, kick, beat) to the reduced models of relational and physical aggression (including 3 items of relational aggression – leave, exclude, mean; and 3 items of physical aggression – hit, yell, push) respectively.

As suggested by previous guidelines (Kline, 1998), the models were evaluated by using different fit indexes: χ^2 statistic, Comparative-Fit Index (CFI), and the Root Mean Squared Error of Approximation (RMSEA). The χ^2 statistic is an absolute fit index that assesses whether the residual (unexplained) variable after model fitting is appreciable, and in this case, a significant χ^2 statistic ($p < .05$) indicates a bad model fit (Kline, 1998; Maruyama, 1998). The CFI compares the absolute fit or the improvement of the specified model (i.e., 3-item reduced model) to the absolute fit of the null model (i.e., 5-item full model). CFI values greater than .90 are accepted as an indication of adequate fit (Beauducel & Wittmann, 2005; Hoyle & Panter, 1995; Hu & Bentler, 1995; Kline, 1998; Maruyama, 1998). The RMSEA fit index is an analysis of residuals that tests the overall model fit and values $< .06$ are considered the criterion for good fit (Beauducel & Wittmann, 2005; Hu & Bentler, 1999; Maruyama, 1998).

The reduced 3-item model of T1 relational aggression was determined by examining the CFA factor loadings on the full 5-item model. Figure 2 depicts the **full model for relational aggression at T1**. The coefficients depicted are all standardized. Most of the loadings were close to .50 or higher and all were significant at $p < .001$. The full 5-item model for T1 relational aggression produced poor goodness-of-fit statistics [$\chi^2 (df) = 18.95(9), p < .05$; CFI = .87; RMSEA = .09]. The full 5-item model was adjusted to reflect a good fit, first by removing the item with the lowest loading in the model (i.e., lies item), then by removing two items with the lowest loadings in the model (i.e., lies and like items) until the model produced adequate goodness-of-fit statistics.

Figure 3 depicts the final **reduced model with 3-items for relational aggression at T1**. As predicted, the reduced 3-item model revealed a better fit [$\chi^2 (df) = 4.00(2), p = .14$; CFI = .94; RMSEA = .09]. With respect to the goal of understanding the low Cronbach's alpha for T1 relational aggression, the Cronbach's alpha did not improve from the 5-item model for T1 relational aggression ($\alpha = .64$), but instead, the Cronbach's alpha was lower for the 3-item model ($\alpha = .58$). Thus, using the 3-item model did not improve the reliability of the measure for T1 relational aggression.

Figure 4 depicts the **full model for physical aggression at T1** with standardized coefficients shown. Loadings were all significant at $p < .001$, except for the item for beat, which was significant at $p < .05$. The full 5-item model for T1 physical aggression also revealed poor goodness-of-fit statistics [$\chi^2 (df) = 29.66(9), p < .01$; CFI = .72; RMSEA = .13]. To determine a model that would produce a good fit, the full 5-item model was adjusted first by removing the item with the lowest loading in the model (i.e.,

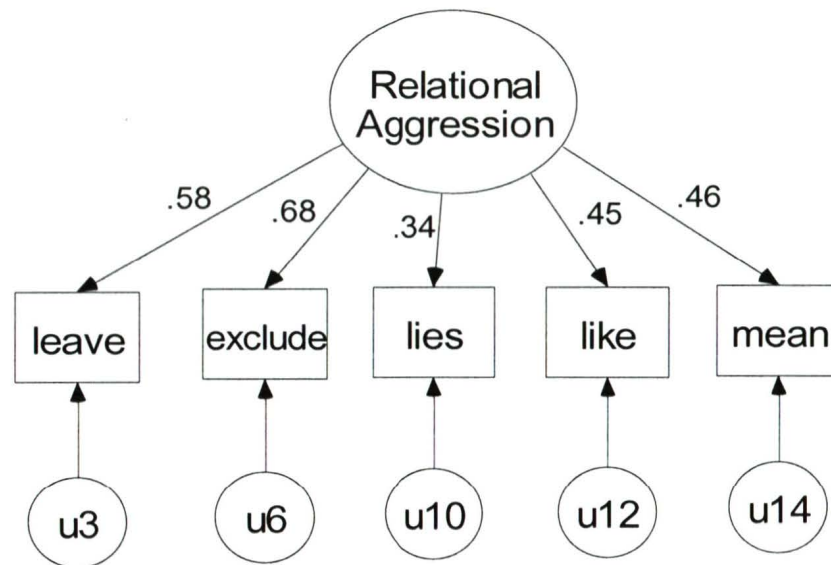


Figure 2. Confirmatory factor analysis results of the full 5-item model for **T1 relational aggression**. All coefficients are standardized.

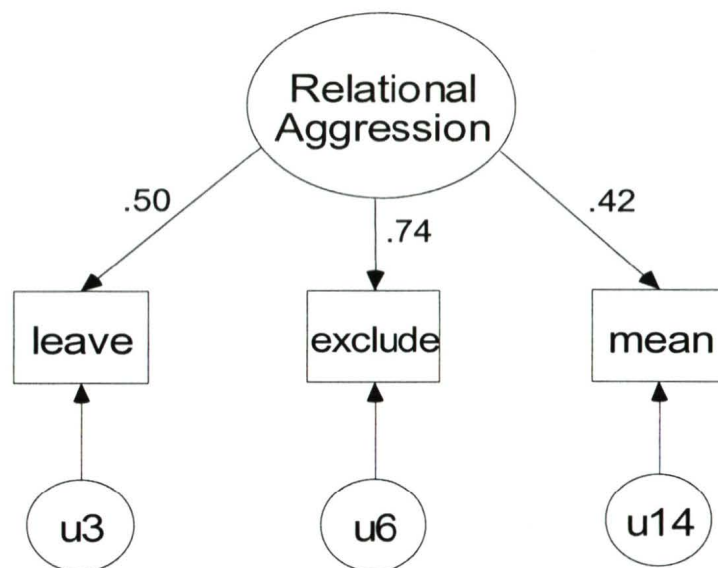


Figure 3. Confirmatory factor analysis results of the reduced 3-item model (with lies and like items removed) for **T1 relational aggression**. All coefficients are standardized.

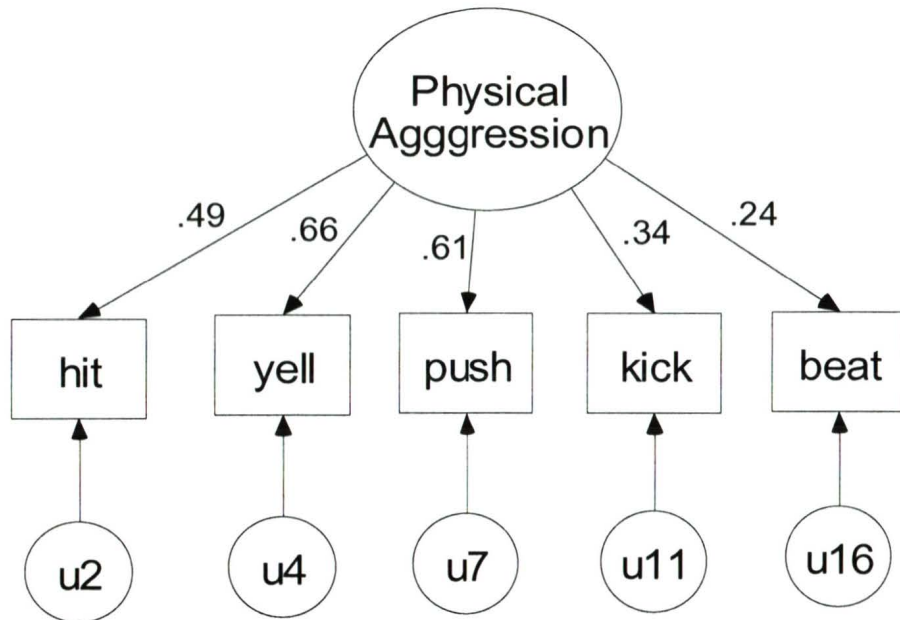


Figure 4. Confirmatory factor analysis results of the full 5-item model for **T1 physical aggression**. All coefficients are standardized.

beat item), then by removing two items with the lowest loadings in the model (i.e., beat and kick items) until the model produced adequate goodness-of-fit statistics.

Figure 5 depicts the **final reduced model with 3-items for physical aggression** at T1. All loadings were higher than .50 and significant at $p < .001$, with fit indexes suggesting a good fit [$\chi^2(df) = .15(2), p = .93$; CFI = 1.0; RMSEA = .00]. Results for the two T1 relational aggression models and the two T1 physical aggression models are depicted in Table 9. In addressing the low Cronbach's alpha for T1 physical aggression, the Cronbach's alpha did improve minimally for the 3-item model ($\alpha = .60$) from the 5-item model ($\alpha = .58$).

Given that longitudinal relations are examined in the present study, it is also important to look at the goodness-of-fit statistics for T2 relational and physical aggression to determine whether the 3-item models for relational and physical aggression are adequate at T2. The **full model for T2 relational aggression** is shown in Figure 6. Loadings were all significant at $p < .001$. CFA analysis indicated that the full 5-item model for T2 relational aggression produced poor goodness-of-fit statistics [$\chi^2(df) = 31.99(9), p < .001$; CFI = .83; RMSEA = .14]. Similar adjustments were made to the full 5-item model for relational aggression at T2 by removing two items with the lowest loadings in the model until the model produced adequate goodness-of-fit statistics. In this case, two different items had the lowest loadings at T2 (i.e., like and mean) when compared to the items with the lowest loadings at T1 (i.e., lies and like). However, for the purposes of maintaining the same items in the relational aggression model from T1 to T2, the same items that were removed from the full model at T1 (i.e., likes and like), were also removed from the full model at T2.

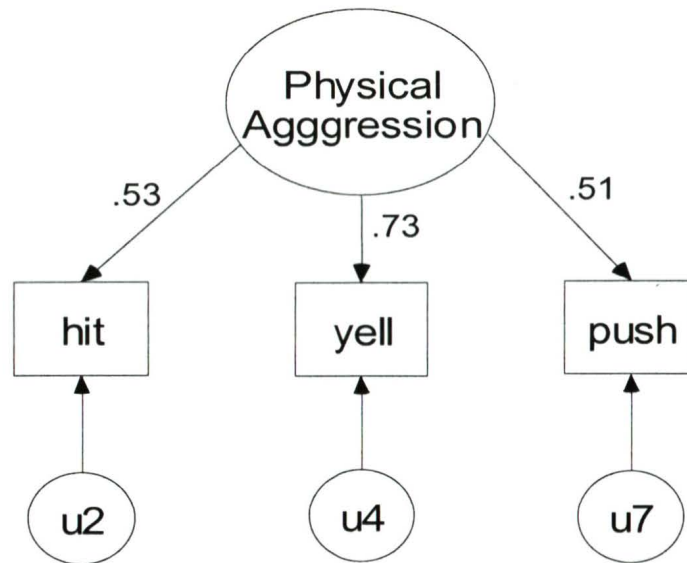


Figure 5. Confirmatory factor analysis results of the reduced 3-item model (with beat and kick items removed) for **T1 physical aggression**. All coefficients are standardized.

Table 9

Confirmatory factor analysis of relational aggression and physical aggression at T1

Type of Aggression	Measure	Full Model (5-items)	Reduced Model (3-items)
T1 Relational Aggression	χ^2 (<i>df</i>)	18.95(9)*	4.00(2)
	CFI	.87	.94
	RMSEA	.09	.09
	χ^2 difference (<i>df</i>) between models		14.95(7)*
T1 Physical Aggression	χ^2 (<i>df</i>)	29.66(9)**	.15(2)
	CFI	.72	1.00
	RMSEA	.13	.00
	χ^2 difference (<i>df</i>) between models		29.51(7)***

Note. CFI = Comparative Fit Index; RMSEA = Root Mean Squared Error of Approximation. * $p < .05$, ** $p < .01$, *** $p < .001$.

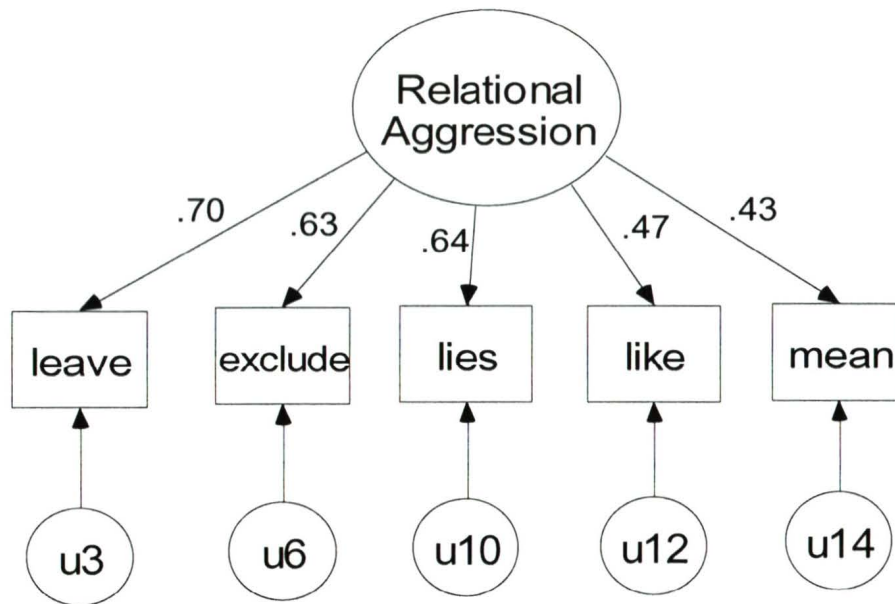


Figure 6. Confirmatory factor analysis results of the full 5-item model for **T2 relational aggression**. All coefficients are standardized.

Figure 7 depicts the **reduced model with 3-items for T2 relational aggression**.

Fit indexes revealed that the reduced 3-item model also produced a good fit at T2 [$\chi^2 (df) = .39(2), p = .82$; CFI = 1.0; RMSEA = .00]. The Cronbach's alpha for T2 relational aggression full 5-item model was adequate ($\alpha = .70$) prior to CFA and goodness-of-fit adjustments. However, the resulting reduced 3-item model revealed a much lower Cronbach's alpha of .58 for T2 relational aggression.

The **full model for T2 physical aggression** is shown in Figure 8 with standardized coefficients. All loadings were higher than .50 and all were significant at $p < .001$. The full 5-item model for T2 physical aggression also revealed overall poor goodness-of-fit statistics [$\chi^2 (df) = 32.99(9), p < .001$; CFI = .90; RMSEA = .14]. In this case, two different items had the lowest loadings at T2 (i.e., hit and kick) when compared to the items with the lowest loadings at T1 (i.e., kick and beat). For the purposes of maintaining the same items in the physical aggression model from T1 to T2, the same items that were removed from the full model at T1 (i.e., hit and kick) were also removed from the full model at T2.

Figure 9 depicts the **final reduced model with 3-items for physical aggression at T2**. All loadings were higher than .50 and significant at $p < .001$, with fit indexes suggesting a good fit [$\chi^2 (df) = .99(2), p = .61$; CFI = 1.0; RMSEA = .00]. Results for the two T2 relational aggression models and the two T2 physical aggression models are shown in Table 10. The Cronbach's alpha for T2 relational aggression full 5-item model was adequate ($\alpha = .74$) prior to CFA and goodness-of-fit adjustments. However, the resulting reduced 3-item model revealed a lower Cronbach's alpha of .72 for T2 relational aggression.

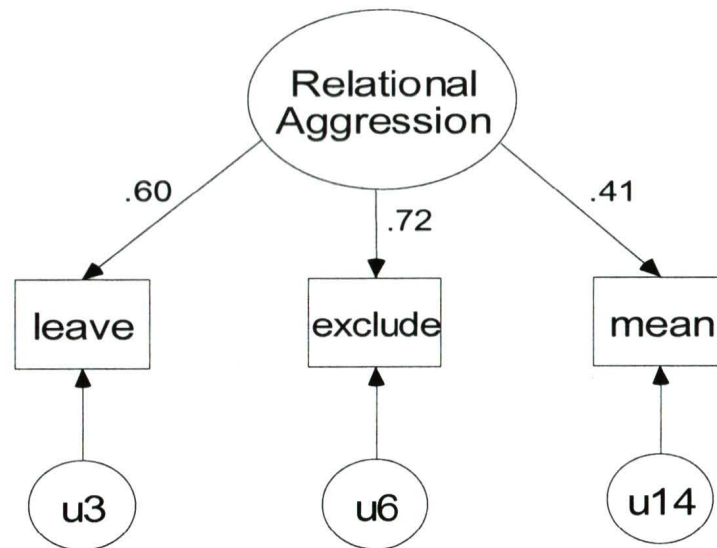


Figure 7. Confirmatory factor analysis results of the reduced 3-item model (with lies and like items removed) for **T2 relational aggression**. All coefficients are standardized.

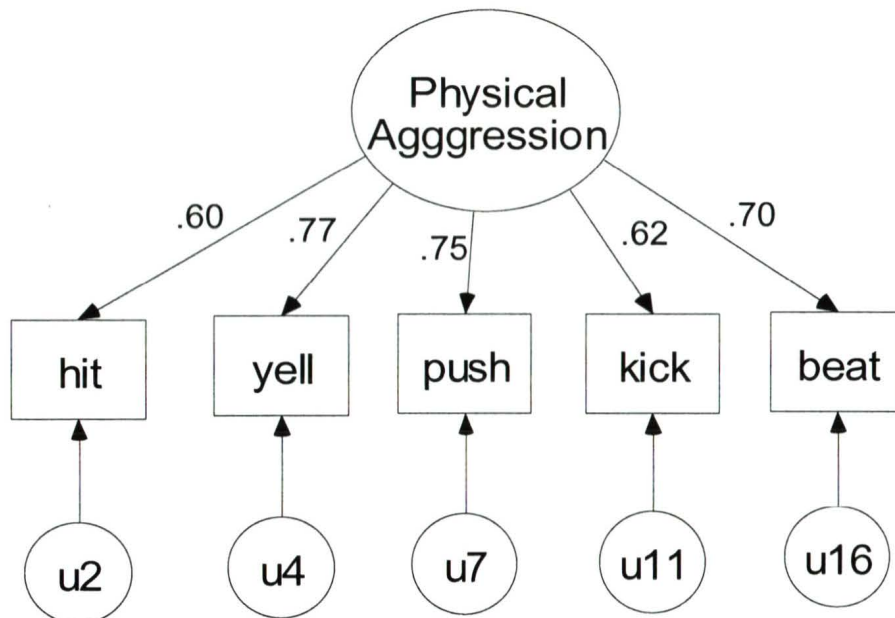


Figure 8. Confirmatory factor analysis results of the full 5-item model for **T2 physical aggression**. All coefficients are standardized.

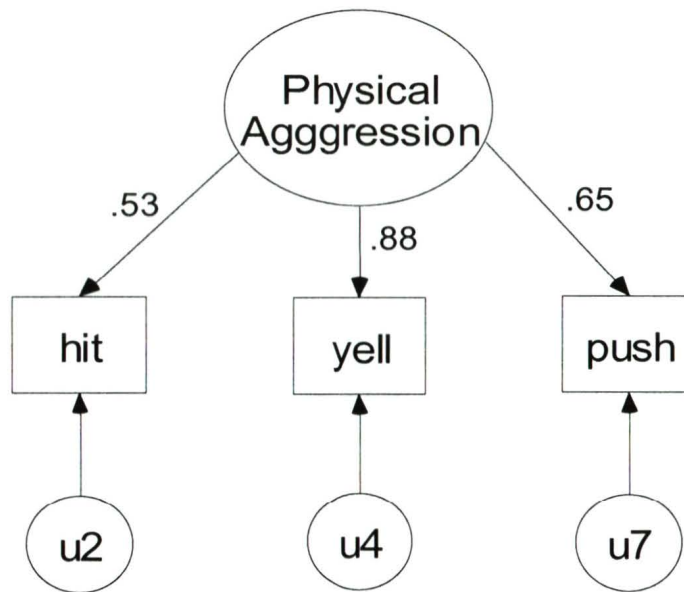


Figure 9. Confirmatory factor analysis results of the reduced 3-item model (with beat and kick items removed) for **T2 physical aggression**. All coefficients are standardized.

Table 10

Confirmatory factor analysis of relational aggression and physical aggression at T2

Type of Aggression	Measure	Full Model (5-items)	Reduced Model (3-items)
T2 Relational Aggression	χ^2 (<i>df</i>)	31.99(9)***	.39(2)
	CFI	.83	1.00
	RMSEA	.14	.00
	χ^2 difference (<i>df</i>) between models		31.60(2)**
T2 Physical Aggression	χ^2 (<i>df</i>)	32.99(9)***	.99(2)
	CFI	.90	1.00
	RMSEA	.14	.00
	χ^2 difference (<i>df</i>) between models		32.00(2)**

Note. CFI = Comparative Fit Index; RMSEA = Root Mean Squared Error of Approximation. * $p < .05$, ** $p < .01$, *** $p < .001$.

The first goal of the analysis was to understand the low Cronbach's alphas for relational and physical aggression at T1 using CFA and goodness-of-fit indexes. Findings showed that the reduced 3-item model demonstrated a minimal improvement in Cronbach's alpha for the T1 physical aggression scale, but showed no improvements for the T1 relational aggression scale. At T2, the full 5-item model produced adequate reliabilities for relational and physical aggression prior to CFA, but the resulting reduced 3-item models for both T2 relational and physical aggression scales revealed lower Cronbach's alphas when compared to the full 5-item models.

Given that the purpose of the study was to examine longitudinal relations with relational aggression (while controlling for physical aggression) as an outcome, it was imperative to maintain the same number of items in each scale for analyses. Moreover, Cronbach's alphas indicated that the reliabilities did not improve after the removal of items in the 3-item scales for relational and physical aggression at T1 and T2. Therefore, the full 5-item scale was used for all analyses to increase consistency in the measures across time and with measures used in the literature.