THE UNIQUE AND INTERACTIVE EFFECTS OF PARENTING PROCESSES AND CHILD CHARACTERISTICS ON THE DEVELOPMENT OF RELATIONAL AND PHYSICAL AGGRESSION IN EARLY ELEMENTARY SCHOOL-AGED BOYS AND GIRLS

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ABSTRACT

The present study investigated convergent and divergent parenting antecedents and the unique and interactive effects of child verbal ability and impulsivity-inattention on the growth of relational and physical aggression. In an effort to eliminate sources of discrepant findings in the current relational aggression research, the present study employed the use of multiple methods of assessment, and simultaneously measured relational and physical aggression during the kindergarten school year, which represents a key point in development. Results suggest that child gender, verbal ability, and inattention-impulsivity all moderated the association of parenting with growth in aggression. Child characteristics moderated the relationship between parenting and aggression in a rather complex manner, and did so somewhat differently depending on the topography of the aggressive behavior. The findings of this study suggest that parenting interventions with both parent and child components may be more effective at reducing rates of child aggression than interventions focused on one of these components alone. While not assessed in this study, growth in relational aggression also appears to be influenced by the peer environment in addition to parent and child factors.
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CHAPTER 1
INTRODUCTION

Many theoretical and empirical models have been used to explain the parenting antecedents of childhood physical aggression. These models inform interventions that have proven useful in reducing children’s physical aggression. However, the degree to which these parenting antecedents contribute to children’s use of relational aggression remains under researched and unclear. While relational aggression is a prevalent and potentially harmful behavior that merits research attention, there remains a dearth of well-informed, research-based intervention programs aimed at reducing this form of aggression.

The consistently high to moderate correlations that have been found between relational and physical aggression suggest that these two different forms of aggression may be functionally similar and may, therefore, share similar etiologies. Developmental models of aggression also suggest a pattern of heterotypic continuity of relational and physical aggression, providing further support for their functional equivalence. Accordingly, models of the parenting antecedents of physical aggression may provide a useful starting point from which to begin studying the parenting antecedents of relational aggression. Social interaction learning theories, and their derivative, the coercion model, provide an account of the development of physical aggression that emphasizes the role of parental modeling and reinforcement.

Another important consideration is the degree to which child characteristics may interact with parenting processes in the development of physical and relational aggression. Research on physical aggression has documented the influence of child verbal capacity,
impulsivity, and hyperactivity on the development of physical aggression. While the literature is beginning to address the impact of these child characteristics on the development of relational aggression, much less is known about this potential relationship. Further, the potential interactive effects of parenting processes and child characteristics, both in the development of physical aggression and relational aggression, also remain unclear. Accordingly, the current study aimed to investigate convergent and divergent parenting antecedents of relational and physical aggression, as well as the unique and interactive association of child verbal ability and impulsivity-inattention with these forms of aggression.
CHAPTER 2

THE UNIQUE AND INTERACTIVE EFFECTS OF PARENTING PROCESSES AND CHILD CHARACTERISTICS ON THE DEVELOPMENT OF RELATIONAL AND PHYSICAL AGGRESSION IN EARLY ELEMENTARY SCHOOL AGED BOYS AND GIRLS

The parenting processes that predict children’s physical aggression have been thoroughly discussed in prior research (Casas et al., 2006; Côté, Vaillancourt, LeBlanc, Nagin, & Tremblay, 2006; Patterson, Reid, & Dishion, 1992; Stormshack, Bierman, McMahon, & Lengua, 2000). This information has contributed to a wealth of prevention and intervention programs that are effective in curbing youths’ display of physical aggression. Considering the morbidity and mortality associated with the life-course persistent pathway of aggression and antisocial behavior (Moffit, Caspi, Harrington, & Milne, 2002), this focus on physical aggression has been well-warranted. However, while researchers have focused their efforts on the etiology of physical aggression, particularly by boys, our understanding of other forms of aggressive behavior, including relational aggression, is limited.

In recent decades, the terms relational aggression (Crick & Grotpeter, 1995), indirect aggression (Feshbach, 1969; Lagerspetz, Björkqvist, & Peltonen, 1988), and social aggression (Cairns, Cairns, Neckerman, Ferguson, & Gariepy, 1989; Galen & Underwood, 1997) have been used to describe a nonphysical form of aggression that is typically entails manipulating relationships. While specific definitions differ, convergence between these terms can be found in a common theme that involves attacks against the victims’ social status that is often, but not always, employed without direct confrontation (Card, Stucky, Sawalani, & Little, 2008).
Common examples of relational aggression include non-direct attacks such as spreading false rumors about an individual, befriending another peer as a form of revenge, ignoring or excluding a peer from conversation, and convincing peers not to like another peer (Underwood, 2003). More directly aggressive acts that have also been included in this form of aggression include rolling one’s eyes at a peer or threatening to withdraw from a friendship for failing to do as one says (Underwood, 2003). For the purposes of this paper, the term relational aggression is used to describe this construct. Similarly, a number of terms have been used to describe non-relational forms of aggression, including physical, direct, and physical aggression. The term physical aggression is used to describe this construct.

Recent research has confirmed the need to continue investigating relational aggression. Relational aggression is displayed by children as young as preschool age (Crick, Casas, & Mosher, 1997; Stauffacher & Dehart, 2005), and compared to physical aggression that usually decreases as children mature, relational aggression seems to increase with age (Côté, Vaillancourt, Barker, Nagin, & Tremblay, 2007). Paquette and Underwood (1999) have also reported that 89.2% of girls and 56.4% of boys stated personal experiences in which they were the target of relational aggression. It has also been estimated that approximately 60% of aggressive girls (Henington, Hughes, Cavell, & Thompson, 1998) and 71.4% of girls who are victims of aggression (Crick and Nelson, 2002) would not be targeted by interventions if relational aggression is excluded from program targets. Considering that relational aggression has been proposed as a factor in the development of conduct disorder in girls (Crick et al., 2006; Werner & Crick, 2004), inclusion of relational aggression in these prevention programs may be vitally important.
Research also suggests that relational aggression can be harmful, can potentially lead to maladjustment, and that girls may be at particular risk. In several studies, children (especially girls) reported victimization by relational aggression to be equally, or even more emotionally upsetting than physical aggression (Crick, 1995; Paquette & Underwood, 1999). Victimization by relational aggression has also been linked to increased risk for peer rejection (for girls) during middle childhood (Crick, 1996). In adolescence, relational aggression victimization was found to significantly predict concurrent indices of adjustment including self-esteem, loneliness, and depression in girls and boys (Prinstein, Boergers, & Vernberg, 2001). In these two studies, the association between relational aggression and maladjustment held true even after controlling for variance accounted for by physical aggression (Crick, 1996; Prinstein et al., 2001).

Research shows that perpetrators of relational aggression tend to suffer as well. Perpetration of relational aggression significantly predicts future peer rejection for girls during preschool (Crick et al., 2006), middle childhood (Crick, 1996), and concurrent externalizing behavior in adolescence (Prinstein et al. 2001). In the Crick (1996) and Prinstein et al. (2001) studies, this association held true even after controlling for variance accounted for by physical aggression (Crick, 1996; Prinstein et al., 2001). In a preschool sample, this relationship approached significance for girls after controlling for physical aggression (Crick et al., 2006). In a sample of third through sixth graders, girls’ but not boys’ relational aggression was also found to be negatively related to social preference scores 3 years later (Zimmer-Gembeck, Geiger, & Crick, 2005).

Relational aggression has not, however, been unequivocally associated with negative outcomes and child characteristics. Relational aggression has been hypothesized to be
positively related to advanced social intelligence and empathy (Kaukiainen et al., 1999). Other researchers have hypothesized that relationally aggressive children may be more advanced in cognitive capacities such as verbal abilities (Björkqvist, Lagerspetz, & Kaukiainen, 1992; Björkqvist, Österman, & Kaukiainen, 1992). Some studies have also shown relational aggression to be associated with high peer status. For example, relationally aggressive children have been found to be central members of their social network (Xie, Cairns, & Cairns, 2002), and longitudinal studies of relational aggression indicate prosocial behavior is a predictor for girls on an “increased user” pathway of relational aggression (Vaillancourt, Miller, Fagbemi, Côté, & Tremblay, 2007). Nelson, Robinson, and Hart (2005) found that some preschoolers who were rated by their peers as more relationally aggressive were also rated as having greater peer status. It also appears that this trend continues on through middle childhood. In one sample of third through sixth grade children, Crick and Grotpeter (1995) found a sociometric “controversial” group (those who received high peer nomination scores as both liked and disliked) of children who were also rated as the highest on relational aggression. Another study found that both rejected and controversial children were rated high on relational aggression; however, only rejected children reported more victimization by relational aggression (Putallaz et al., 2007).

These combined findings indicate a complex relationship between relational aggression perpetration, victimization and adjustment. Gaining a clear understanding of the environmental etiology (parenting, in particular) of relational aggression remains an important next step in informing programs that may perhaps need to differentially target these subgroups of aggressors and victims. Until recently, though, few hypotheses have been made about the
etiology of relational aggression. The moderate to high correlations that have consistently been found between relational and physical aggression (Card et al., 2008) may have important implications for etiological studies of relational aggression. These findings suggest that relational and physical aggression may be functionally similar and have overlapping, but likely not identical etiologies. As such, perhaps a logical starting point for developmental models of relational aggression would be to draw from what is already known about the early developmental pathways and predictors of physical aggression. Gaining an understanding of sources of common and unique variance associated with physical and relational aggression would further illuminate how to best prevent harm caused by victimization or perpetration of relational aggression.

Developmental Trajectories

To this end, Björkqvist and colleagues have hypothesized a pattern of heterotypic continuity in relational and physical aggression Björkqvist, Lagerspetz, & Kaukiainen, 1992; Björkqvist, Österman, & Kaukiainen, 1992). This theory asserts that maturation of verbal and social intelligence precedes the use of relationally aggressive tactics, and that relationally aggressive strategies are a more sophisticated means to obtain a desired outcome while minimizing risk of negative consequences (Björkqvist, Österman, & Lagerspetz, 1994). Accordingly, physical aggression is most predominately seen in young children who have not yet developed the skills required for deployment of relationally aggressive tactics. As verbal skills develop and social interests increase, children learn that these skills can be used for aggressive purposes. Further, relational aggression becomes the predominant form of aggression during middle childhood when social networks become even more important, and
children learn to perpetrate aggressively via social manipulation (Björkqvist, Lagerspetz, & Kaukiainen, 1992; Björkqvist, Österman, & Kaukiainen, 1992).

Cross-sectional studies conducted by Björkqvist and colleagues have supported this theory. These studies employed the use of peer and self-reports of relational and physical aggression measured at ages 8, 11, and 15 years (Björkqvist, Lagerspetz, & Kaukiainen, 1992; Björkqvist, Österman, & Kaukiainen, 1992; Lagerspetz, Björkqvist, & Peltonen, 1988). Findings indicate that while relational aggression was observed among 8 year olds, it was not the preferred means of conflict resolution. It also appeared that the social structure of the group did not support high rates of relational aggression, as the majority (54%) of boys and girls were not rated as belonging to any specific peer group. When children did use relational aggression at this age, girls were more likely to use it than boys. Results also indicated that aggressive behavior peaked at age 11. Girls continued to prefer relational aggression while boys preferred physical forms. At 15, aggression in general declined; however, when aggressive strategies were used, relational aggression was still the preferred method used by girls, while boys preferred physical aggression (Björkqvist, Lagerspetz, & Kaukiainen, 1992; Björkqvist, Österman, & Kaukiainen, 1992; Lagerspetz, Björkqvist, & Peltonen, 1988). These findings certainly suggest a developmental shift from physical aggression to relational aggression. However, there are also important limitations to this research, including cross-sectional design and the absence of direct comparison of the developmental trajectories of relational and physical aggression using the same sample.

In a more rigorous test of this developmental hypothesis, Vaillancourt, Brendgen, Boivin, and Tremblay (2003) conducted a longitudinal study of relational and physical
aggression. The study spanned 4 years, and included three different cohorts ranging in age from 4-7 years at first assessment. In this study which used path analysis to investigate predictive links between person most knowledgeable reports of relational and physical aggression, stability coefficients for both forms of aggression were high over a 2 year time frame. When tested over a four-year period, stability coefficients were low, yet remained significant (Vaillancourt et al., 2003). While the authors assert that this disconfirms the notion of heterotypic continuity, the low 4 year stability coefficients suggest some change in rate or form of aggression over this time frame. Further, the design of this study only allowed analysis at the group level and did not account for trajectories of aggression within specific subgroups of children (i.e., normative vs. atypical aggressors).

Adding to this research, Côté, Vaillancourt, Barker, Nagin, and Tremblay (2007) conducted a longitudinal investigation of the joint development of relational and physical aggression from ages 2-8 years as rated by the person most knowledgeable (89% mothers). In contrast to the assertion of Vaillancourt and colleagues (2003), findings of this investigation suggest that children do not “specialize” in one form of aggression, as groups of children who were high on one form and low on the other were found to be essentially nonexistent (Côté et al., 2007). Other findings from this study provide mixed support for Brokqvist and colleagues’ theory (Björkqvist, Lagerspetz, & Kaukiainen, 1992; Björkqvist, Österman, & Kaukiainen, 1992). For example, results suggested that most children do not follow the trajectory hypothesized by Björkqvist and colleagues, as the majority of the sample (62%) displayed decreasing rates of physical aggression and low, stable rates of relational aggression. However, a small but significant percentage (14.2%) of children were found to follow a path of moderately desisting
physical aggression and increasing relational aggression. Another group of children (13.5%) was found to follow a trajectory of high rates of both relational and physical aggression (Côté et al., 2007).

Conditional probability analyses indicated that children who followed the high and rising relational aggression trajectory were the children most likely to be moderately desisting in physical aggression trajectory, and analyses of gender differences indicated that girls were significantly more likely to be in this group (Côté et al., 2007). It is also interesting to note that the moderate desister path of physical aggression was found to have the most heterogeneity in terms of likelihood to display relational aggression. Specifically, children in this group had a 67.6% probability of also following the low relational aggression trajectory and a 32.4% probability of following the high and rising relational aggression trajectory (Côté et al., 2007).

Underwood and colleagues also conducted a longitudinal investigation of the joint development of relational and physical aggression (Underwood, Beron, & Rosen, 2009) using a sample of older children (9-13 year-olds). This study used teacher rather than parent ratings of aggressive behavior, which provides a different perspective on children’s use of aggressive strategies. Descriptive statistics indicated the only gender differences in relational aggression were found at the initial assessment point, when girls were rated higher than boys (Underwood et al., 2009). Conversely, boys were rated higher on physical aggression at all points of assessment except the initial assessment. Growth curve models revealed that, on average, rates of relational aggression decreased with age. However, wide variability in individual scores indicated different trajectories for subgroups of children. Similar results were found in the
physical aggression analysis, which indicated a flat trajectory with high variability among individual scores (Underwood et al., 2009).

Mixture models were also fit to these data and identified two relational aggression subgroups; stable low (55%), and high and decreasing (45%) relational aggression. The model also identified three physical aggression subgroups; stable low (28%), high and slightly decreasing (53%), and high stable (19%) physical aggression. Results of gender analyses indicated a nonsignificant trend for higher female relational aggression at third grade, while boys were found to be significantly more physically aggressive at this time (Underwood et al., 2009).

Similar to the Côté, et al. (2007) study, the authors also constructed a model that accounted for the joint development of both forms of aggression. Results were similar, although not equivalent to those reported by Côté et al. (2007). Specifically, six joint trajectory groups emerged; 24% of the children were stable low users of relational and physical aggression; 13% were low increasers; 14% were included in a medium increaser group; 24% were medium desisters; 12% were included in a high desister group; and 12% were high increasers (Underwood et al., 2009). In contrast to Côté et al., (2007), no subgroup was found to be decreasing in one form of aggression and increasing in the other form. Results of joint trajectory analyses also indicated gender differences, with girls being marginally more likely to be relationally aggressive and boys being significantly more likely to be physically aggressive (Underwood et al., 2009).

Cumulatively, the findings of cross-sectional research indicated decreasing physical and increasing relational aggression from mid-childhood to preadolescence, and decreasing rates of
both forms from pre- to mid-adolescence. This research supports the notion of heterotypic continuity in aggressive strategies. However, there are critical methodological issues with cross-sectional design; specifically, aggression was not measured at different points throughout development in the same sample of children. Therefore, direct inferences pertaining to intra-individual change in aggressive strategies cannot be drawn.

Longitudinal research provides some support for the developmental hypothesis, although some inconsistencies exist between studies. Specifically, some research indicates stable use of aggressive strategies (Vaillancourt et al., 2003) while other studies have found that children do not “specialize” in one form of aggression (Côté et al., 2007). While these findings included only mean level analyses and, therefore, do not illuminate differences between specific subgroups of aggressors, other findings have spoken to this issue. Subgroup findings revealed that children normatively follow a path of low rates of both relational and physical aggression (Côté, et al., 2007; Underwood, et al., 2009). Joint estimates of relational and physical aggression by children from early to middle childhood (Côté et al., 2007) and from middle childhood to preadolescence (Underwood et al., 2009) have also revealed a subgroup of children who display higher rates of both forms of aggression. However, Côté et al. (2007) found a small subgroup of children who displayed high rates of physical aggression with either increasing or decreasing relational aggression, although this finding was not replicated in the Underwood et al. (2009) study. There were also inconsistencies in displays of aggression by gender, as some studies indicate gender differences while others do not.

One source of discrepant findings may be related to methodological differences between studies. Parent, teacher, and self-reports, as well as peer nominations and behavioral
observations have all been used to measure physical and relational aggression. Each of these methods provides unique information about displays of aggression while also including biases in estimates of behavior. For example, parents may report lower levels of relational aggression simply because they are not privy to the peer social interactions that provide the context for this form of aggression. On the other hand, teachers may inflate girl’s rates of relational aggression due to preconceived notions that girls are more relationally aggressive than boys. Behavior observations eliminate some bias by employing the use of trained observers, but this rating system also has its own limitations such as reactivity to observers, and an inability to gain a true estimate of rates due to sampling inadequacy. Therefore, studying relational and physical aggression using multiple methods is necessary to eliminate biases associated with the use of any one measure of aggression. The use of multiple methods also decreases shared method variance that arises when one reporting method is used to measure multiple constructs. Unfortunately, the majority of research examining the development of relational aggression has employed only one or two of the available measurement methods at a time.

Another source of discrepant findings can be attributed to the differences in the ages of the children assessed in these studies; one study spanned school entry through middle elementary school (Côté et al., 2007), while the other assessed the transition to middle school (Underwood et al. 2009). Developmental transitions may affect displays of aggression in different ways. For example, the transition to elementary school represents one of the first systematic exposures to the larger peer group for many children. This provides the opportunity to learn about peer relationships, to learn different aggressive strategies from peers, and the opportunity to integrate newly learned strategies into one’s own behavioral repertoire. Prior
research has articulated a process called peer deviancy training through which peers model and reinforce displays of antisocial behavior, operating as early as the transition to elementary school (Snyder et al., 2010). Additionally, this relationship was moderated by other factors including ineffective parenting, indicating that not all children are at equal risk (Snyder et al., 2010). This demonstrates the potency of peer influence on the development of antisocial behaviors, as well as the moderating effect of other important factors such as parenting. Unfortunately, it remains unclear how this process may or may not pertain to the development of relational aggression. Therefore, it is important for research to clearly delineate how the transition to elementary school impacts the development of relational aggression, especially in the context of other risk factors including parenting.

Heterogeneity in rates of relational aggression also suggests that developmental differences in relational and physical aggression are not completely due to cognitive and verbal maturation. Rather, it seems that cognitive and verbal abilities give children the capacity needed to deploy relationally aggressive tactics, while a combination of other factors contribute to children’s actual propensity to display relational aggression. These factors include child characteristics such as reactivity, impulsivity, and gender. Environmental influences such as parents and peers are also important as they provide the models from which to learn relational aggressions and provide the social context and contingencies that maintain it. Accordingly, investigating these etiological factors may usefully inform prevention and intervention programs.

Parents appear to be the first social agents contributing to the acquisition of aggressive behavior. Relational aggression has been observed in children as young as preschool age (Crick
et al., 1997) while physical aggression is displayed at even younger ages (Keenan & Shaw, 1994). Investigations of preschool-aged children also suggest that children enter the peer environment equipped with at least rudimentary skills to relationally aggress (Stauffacher & Dehart, 2005) and going to school may provide an early social context for children to “try out” relational aggression on peers. Previous research has also documented differences in girls’ and boys’ aggression beginning at about this age, as well as differences in the socialization experienced by girls and boys that may contribute to and/or interact with these differences to further exacerbate maladjustment (Keenan & Shaw, 1997). Therefore, investigations of the parenting processes that contribute to relational and physical aggression and examination of how these processes may differentially affect the development of girls and boys seem to be a logical starting point.

Environmental Models of Physical Aggression

Empirical and theoretical models of psychopathology have long acknowledged the contribution of early relationships to children’s maladaptive behavior, including the development of physical aggression (for review see Maccoby & Martin, 1983). While these models differ in their accounts, most if not all models of the environmental antecedents of aggression emphasize the role of parenting processes and parent-child interactions in the development of physical aggression. A basic assumption of all of these models is that children learn how to behave socially and interpersonally through repeated interactions with their parents (Hartup, 1979). Several environmental models of physical aggression have been used to describe the development of relational aggression, including Diana Baumrind’s parenting
typologies (Baumrind, 1967, 1971), Bowlby’s attachment theory (Bowlby, 1988), and social interaction learning theory (SIL; Bandura, 1977).

Diana Baumrind (Baumrind, 1967; Baumrind, 1971) asserted that discernable parenting typologies are differentially associated with specific child outcomes. According to Baumrind (1967, 1971), authoritarian parents employ coercive strategies to compel their children to behave. Authoritarian parents often use harsh, physical, arbitrary/inconsistent discipline strategies, verbal criticism, and attempt to control their children through psychological means. Permissive parenting is characterized by overly lenient parents who make few demands on their children, set few limits on behavior, and who generally comply with their children’s wishes and impulses (Baumrind, 1967, 1971). This body of literature has consistently identified authoritarian and permissive parenting to be associated with psychological and social maladjustment (Maccoby & Martin, 1983).

Bowlby's (1988) theory of attachment also accounts for the contribution of parenting processes to the development of aggressive behavior. From this perspective, the early parent-child bond serves as the foundation from which the child constructs an internal working model of social relationships. This theory asserts that attachment patterns established during very early parent-infant interactions are enduring, and the nature of the attachment determines the quality and style of future relationships the child establishes with others (Prior & Glaser, 2006). Attachment theorists posit that parental insensitivity and unresponsiveness precede child problem behavior including physical aggression (Ainsworth, Blehar, Waters, & Wall, 1978).

Social interaction learning theory (Bandura, 1977) emphasizes the role of parental modeling and reinforcement of desired behaviors in efforts to promote prosocial development.
A derivative of SIL theory, the coercion model (Patterson, 1982), has been frequently used to describe the development of aggression and antisocial behavior. From this perspective, aggression and noncompliance are inadvertently reinforced when caregivers “give in” to their child’s aversive actions and/or do not follow through with directives (Patterson, 1982; Patterson, Reid, & Dishion, 1992). Reinforcement of aversive behavior is also accompanied by ineffective discipline strategies which fail to reduce noncompliance and aggression. Through this process of negative reinforcement and absence of effective punishment, children fail to learn how to suppress their impulses, while also learning that aggression is an effective strategy to obtain desired outcomes. Consequently, the odds are that aggression and disobedience will continue or perhaps escalate.

The coercion model is also comprised of five positive parenting dimensions such as skill encouragement, limit setting, monitoring, problem solving, and positive involvement. According to this model, parents who use specific skills described by these five domains increase positive interactions with their child, promote the development of child prosocial behavior, and limit the child’s involvement in other social contexts that reinforce aversive behaviors (Forgather & Patterson, 2010). Generally speaking, the skills involved in positive parenting strengthen children’s displays of prosocial, non-aversive behaviors while, also decreasing aversive and/or antisocial behaviors.

All of these models have been frequently and successfully applied to study the development of and to guide the treatment of physical aggression. While some tentative hypotheses have been made regarding their applicability to relational aggression, a cohesive and comprehensive model has yet to be developed. However, the relevance of these models to
the development and maintenance of relational aggression has been investigated in the existing research to varying degrees.

**Parenting and Relational Aggression**

*Cross-sectional studies.* In one of the first investigations of parenting contributions to relational aggression, Hart, Nelson, Robinson, Olsen, and McNeilly-Choque (1998) investigated linkages between parenting styles and relational and physical aggression in a sample of preschool-aged Russian children. The authors used two dimensions of Diana Baumrind’s parenting styles, which they labeled coercion and responsiveness. The authors also included a measure of parental psychological control, citing research that hypothesized such control contributes to the development of relational aggression via modeling of manipulative behavior (Crick et al., 2006) and by manipulating the attachment relationship (Barber, 1996). The results indicated that parents who reported more coercive interactions with their children had sons and daughters who were rated by teachers to be more physically aggressive with peers (Hart et al., 1998). Similarly, teacher-reported relational aggression by girls, but not boys, was associated with maternal coercive parenting, while paternal responsiveness was associated with less relational aggression by boys. Parental psychological control was not associated with relational aggression by girls or boys. Regression analyses also indicated that maternal coercion and lack of paternal responsiveness continued to be significant contributors to physical and relational aggression after controlling for other parenting practices and contextual variables such as marital hostility and conflict (Hart et al., 1998).

Casas and colleagues (2006) replicated the Hart et al. (1998) study using a sample of American preschoolers, and also included a measure of insecure attachment. Results indicated
a positive relationship between parent self-reports of authoritarian and permissive parenting and parental reports of children’s relational aggression, while physical aggression was related to mothers’ and fathers’ permissive parenting. Analyses by gender indicated that girls’ relational aggression was associated with authoritarian parenting by fathers and permissive parenting by mothers, while the associations between boys’ relational aggression and any parenting style did not reach significance (Casas et al., 2006). A similar relationship was found for physical aggression, as mother and father reports of permissive parenting predicted girls’, but not boys’, physical aggression. Teacher reports of relational aggression, as used in the Hart, et al. (1998) study, were not significantly associated with parenting for either girls or boys (Casas et al., 2006). Exploratory analyses of the relationship between attachment and relational aggression suggested that same-gender attachment relationships may be important in parents’ contributions to the development of relational aggression. Specifically, mother-reported relationally aggressive girls were more likely to have an insecure attachment relationship with their mother, while father-reported relationally aggressive boys were more likely to have an insecure attachment relationship with their father. Opposite gender parent-child attachment relationships were not associated with relational aggression for girls or boys (Casas et al., 2006). Girls’, but not boys’ physical aggression as rated by mothers, was positively correlated with mother-reports of insecure attachment. Father reports of physical aggression were not significantly correlated with father reports of insecure attachment for boys or girls (Casas et al., 2006).

Other results reported by Casas et al. (2006) were inconsistent with previous research related to physical aggression. Boys’ physical aggression was not positively related to any
parenting style measured, and the only significant correlations for physical aggression with parenting were in a direction opposite of that expected. Findings related to psychological control were also inconsistent with Hart et al. (1998), as mother and father self-reports of psychological control were positively related to girls’ relational aggression as reported by mothers and fathers, while fathers’ use of psychological control was negatively related to boys relational aggression as reported by teachers (Casas et al., 2006). Self-reported psychological control by mothers was positively related to girls’ physical aggression as reported by fathers and boys’ physical aggression as reported by mothers. Mothers’ self-reported psychological control was also negatively related to boys’ displays of physical aggression as rated by teachers. Fathers’ self-reported psychological control was positively related to teacher reports of girls’ physical aggression and negatively related to mother reports of boys’ physical aggression (Casas et al., 2006). Mothers did not report any association between psychological control and girls’ physical aggression, and fathers did not report any such association with boys’ physical aggression. These inconsistent and often contradictory results point to the need for additional research using stronger measures of parenting processes.

Using a sample of 9-11 year-old youth, Sandstrom (2007) investigated the relationship between peer nominations of relational and physical aggression and mother reports of Baumrind’s authoritative, authoritarian, and permissive parenting strategies. A major goal of this study was to identify common and unique parenting styles associated with relational and physical aggression. Results indicated a positive association between authoritarian parenting and physical and relational aggression, indicating this parenting style may similarly contribute to the development of both forms of aggression. An interaction between parenting style and
gender in predicting aggressive behavior was also found; mothers’ permissive parenting was positively associated with relational aggression by girls, but not by boys. This association was found to hold true after controlling for variance accounted for by girls’ physical aggression. Gender was also found to moderate the effect of parenting style on physical aggression; a positive association was found between authoritarian parenting and boys’, but not girls’ physical aggression, and between permissive parenting and girls’, but not boys’ physical aggression (Sandstrom, 2007). It is also interesting that the association between boys’ physical aggression and authoritarian parenting held true after controlling for variance accounted for by relational aggression, but the association between girls’ physical aggression and permissive parenting fell short of significance after controlling for relational aggression (Sandstrom, 2007).

Nelson, Hart, Yang, Olsen, and Jin (2006) investigated the association of parental physical coercion and psychological control with relational and physical aggression. In this study of Chinese preschoolers, spouse reports were used to measure parenting variables and peer reports were used to measure physical and relational aggression. The authors utilized a latent sum and difference model to account for combined and differential influence of maternal and paternal parenting processes as unique predictors of concurrent displays of aggression (Nelson et al., 2006). Girls’ relational aggression was predicted by combined maternal and paternal psychological control, but was not predicted by combined physical coercion. Girls’ relational aggression was also predicted by the extent to which fathers displayed more psychological control compared to mothers, and more displays of physical coercion by mothers as compared to fathers. Combined parental psychological control was the only latent parenting variable to predict girls’ physical aggression, while the only latent parenting variable to significantly predict
boys’ aggression was the combined effect of parental physical coercion on boys’ physical aggression. The combined effect of parental physical coercion and mothers’ use of higher levels of psychological control on boys’ relational aggression approached, but did not reach significance (Nelson et al., 2006).

The association between parental psychological control, parental physical punishment, and relational and physical aggression has also been investigated in a sample of fourth grade (8-10 year-old) Flemish children (Kuppens, Grietens, Onghena, & Michiels, 2009). In this multi-informant study, child, parent, and teacher reports were used to assess relational aggression. Parental psychological control was assessed using child reports and parental self- and spouse-reports, while parental physical punishment was assessed using child and parent self-reports. There was a positive relationship between parental psychological control and relational aggression at home, but not at school (Kuppens, et al., 2009). There was also a positive relationship between parental physical punishment and child physical aggression. Parental psychological control was also related to child physical aggression, although indirectly through parental physical punishment. Likewise, parental physical punishment was related to relational aggression at home indirectly through parental psychological control (Kuppens et al., 2009). The authors also investigated the moderating effects of child gender on direct associations and found that gender did not moderate any association between parenting and relational aggression at home or at school. However, gender did moderate the association between child physical aggression and maternal physical punishment; this relationship was stronger for boys (Kuppens et al., 2009).
This study also investigated the combined and differential effects of maternal and paternal parenting on aggressive behaviors using a latent sum and difference model. Results of these analyses indicated a positive association between relational aggression and psychologically-controlling parenting. There was also a positive association between physical aggression and parent-combined physical punishment (Kuppens et al., 2009). An investigation of the moderating effects of gender showed that the relationship between combined parental physical punishment and child physical aggression was moderated by male gender (Kuppens et al., 2009). Cumulatively, the studies summarized to this point provide information about the association of parenting with concurrent levels of aggression. However, longitudinal studies are needed to more clearly identify the antecedents of aggressive behavior.

Longitudinal studies. In one of the first longitudinal studies of relational aggression, Vaillancourt et al. (2007) investigated the predictors of stable and frequent use of relational aggression from ages 2-10 years. The person most knowledgeable was asked to rate children on relational and physical aggression, and was also asked to complete a 12-item measure that included aspects of family functioning, including problem solving, communication, affective involvement and responsiveness, and behavioral control. Parenting practices including positive interactions, hostile/ineffective parenting, and consistency were also assessed using person most knowledgeable report. Results indicated that inconsistent and hostile/ineffective parenting at age 2 years were correlated with higher rates of relational aggression at ages 4-10 years, and these associations were generally greater for girls than for boys (Vaillancourt et al., 2007). Regression analyses also revealed that lower family functioning at age 2 years predicted relational aggression for girls and boys at age 10 years; however, this association was negative
for girls and positive for boys. None of the parenting practices assessed at age 2 years significantly predicted relational aggression at age 10 years (Vaillancourt et al., 2007).

The authors also used logistic regression to predict trajectory group membership of relational aggression. Results indicated that children in the increased user pathway of relational aggression were more likely to have parents who used hostile or ineffective parenting strategies. Gender-specific results indicated that boys in the increased user group were more likely to have less positive and consistent interactions with their parents, while no parenting measures were associated with girls in this group (Vaillancourt et al., 2007).

Côté et al. (2007) longitudinally investigated family process variables (positive, hostile/ineffective, and consistent parenting) as predictor of the joint development of relational and physical aggressive. Given that relational and physical aggression are highly correlated constructs, research of this nature is important in understanding whether parenting variables differentially predict relational, physical, and combined trajectories of relational and physical aggression. Mother-reported hostile parenting at age 2 years predicted membership in mother-reported high relational and physical aggression trajectory groups at age 8 years, as well as an aggressive subgroup characterized by moderately desisting physical aggression and low relational aggression (Côté et al., 2007). Being female was the only characteristic to distinguish the moderate desisters of physical aggression, who also display high rates of relational aggression, from those who display low rates of relational aggression.

Underwood and colleagues (2009) provide an important extension of the Côté et al. (2007) study by using an adolescent sample. Specifically, Underwood et al. (2009) conducted a longitudinal investigation of the association of parenting styles (Baumrind’s authoritative,
authoritarian, and permissive parenting) with the joint development of relational and physical aggression in a sample of 9-13 year-olds. Children’s relational and physical aggression were measured using teacher reports, while one participating parent (83% mothers) completed a self and spousal report of parenting style. Joint trajectory analyses indicated four contrast groups of aggressors, and analyses were then conducted using parenting styles and gender to predict membership in these groups. The first contrast group analyses, predicting the odds of being a high increaser of both forms of aggression versus a low user of both, revealed that maternal authoritarian and permissive parenting increased children’s odds of being in the high increaser group. The second analyses, comparing high increasers on both to high desisters on both forms of aggression indicated that maternal authoritarian parenting increased the odds that children would be in the high increaser group. The third analysis compared medium increasers of both forms of aggression versus stable low users of both, and revealed that permissive parenting predicted increased odds of being in the medium increaser group. The fourth analysis examined low increasers of both forms of aggression compared to stable low users of both, and revealed no significant predictors for parenting or gender variables (Underwood et al., 2009).

It is difficult to compile these findings into a cohesive account of the parenting antecedents of relational aggression. However, some themes do emerge from this research. First, several parenting processes that have been previously associated with physical aggression were also linked to relational aggression. These processes included parental coercion, psychological control, and permissive and authoritarian parenting. Similar to its relationship with physical aggression, responsive parenting was also found to be negatively related to children’s use of relational aggression. This suggests that parenting interventions that address
physical aggression may have a similar impact on relational aggression. It also appears that gender of both parent and child may play an important role in the development of relational aggression. These findings were especially true in findings pertaining to attachment relationship, and in relation to the impact of psychologically-controlling parents on relational aggression. Information of this nature offers a preliminary idea of the importance of parent-child interactions and parental modeling in the development of relational aggression. However, research that examines how and when these processes are most influential is critical to the development of effective interventions. Unfortunately, a solid theory that informs when parenting processes are most critical to the development of relational aggression during child developmental has yet to be developed.

Previous research is also limited by the inconsistencies in findings between different studies, as the degree to which parenting processes and relational aggression covaried differed across investigations. Considering that different studies used different informants to rate aggression, these inconsistencies are likely related to variations in measurement methodology. Accordingly, differences in findings across studies may indicate that children vary in their use of relational aggression depending on the context in which the informant observed the child’s behavior. It is also likely that variability in findings reflects specific biases and sources of information that are unique to each informant (parents, peers, teachers, etc.). Some studies also relied on the same informant to measure both parenting and aggression, which can create overestimation of relationships due to shared method variance. Due to these weaknesses in previous efforts, future research should study relational and direct aggression together using
multiple methods. This is necessary to eliminate informant bias and overestimation due to shared method variance.

There are also other important considerations in accurately articulating the development of relational aggression. Previous studies suggest specific parenting processes may influence the development of aggressive behaviors in distinct ways. However, the degree to which child characteristics may interact with parenting processes in the development of aggression is also important. These characteristics include verbal capacity, impulsivity, and hyperactivity. Accordingly, research on relational aggression has begun to consider hypotheses about how these child characteristics might be related to the development of relational aggression.

**Child Characteristics**

**Verbal ability.** The acquisition of verbal skills has been posited as an important factor in the development of relational aggression. While children with low verbal abilities have been found to display higher rates of physical aggression, advanced verbal capacity has been hypothesized to contribute to higher rates of relational aggression (Björkqvist, Lagerspetz, & Kaukiainen, 1992; Björkqvist, Österman, & Kaukiainen, 1992). In an investigation of this hypothesis, Côté et al. (2007) examined the impact of child verbal ability in predicting membership in relational and physical aggressive subgroups. Relational and physical aggression were measured using person most knowledgeable reports (89% mothers), while the Peabody Picture Vocabulary Test-Revised (Dunn & Dunn, 1981) as a measure of child verbal ability at age 4 years was used to predict aggressive trajectory subgroups calculated at age 10 years. Contrary to Björkqvist and colleagues’ (Björkqvist, Lagerspetz, & Kaukiainen, 1992; Björkqvist, Österman,
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& Kaukiainen, 1992) hypothesis, child verbal abilities did not distinguish any subgroup of relational and/or physical aggressors from the others (Côté et al., 2007).

Bonica, Arnold, Fisher, and Zeljo, (2003) also assessed the association of verbal capacity with relational aggression in a sample of preschool aged children. This study used teacher ratings to assess relational aggression, and employed multiple measures to capture different aspects of language development. Specifically, the Expressive One-Word Picture Vocabulary Test (Gardner, 1981) was used to measure expressive vocabulary skills, the Peabody Picture Vocabulary Test-Revised (PPVTR-R; Dunn & Dunn, 1981), measured receptive language, and the Illinois Test of Psycholinguistic Abilities (Kirk, McCarthy, & Kirk, 1968) provided an index of verbal fluency (Bonica et al., 2003). Results indicated that relational aggression was positively correlated with all indices of verbal development (Bonica et al., 2003). Regression analyses were then conducted that used language development to predict relational aggression after controlling for age. This accounted for the possibility that these relationships might be an artifact of the effect of age on both verbal skills and relational aggression. Measures of language development were not significantly associated with age and relational aggression was substantially predicted by language development (Bonica et al., 2003). Gender was assessed as a moderator of the relationship between language and relational aggression; the relationship tended to be stronger for boys but only for the PPVT-R (Bonica et al. 2003).

**Attention deficit and hyperactivity.** Vaillancourt et al. (2007) investigated child hyperactivity and inattention as predictors of relational aggression. Similar to its role in the development of physical aggression, one idea about its relationship to relational aggression is that hyperactive and inattentive children lack the ability to suppress impulses. Therefore, these
children may have an increased tendency to react to conflict using aggressive strategies rather than taking the time to develop more constructive means of resolving conflict. The possibility of an inverse relationship between relational aggression and hyperactivity and inattention also exists. That is, the more manipulative strategies needed to deploy relational aggression may require children to inhibit their initial responses to conflict (Vaillancourt et al., 2007). Results revealed a positive correlation between person most knowledgeable ratings of hyperactivity/inattention at age 2 years and person most knowledgeable ratings of relational aggression at all assessment points between ages 4-10 years. Subsequent analyses of gender indicated that this association was stronger for girls at all points of assessment (Vaillancourt et al., 2007).

Ostrov and Godleski (2009) also investigated the association between impulsivity/hyperactivity and relational and physical aggression in a sample of preschool aged children. This study, which used a short-term longitudinal design that spanned the duration of a school year, provides a unique contribution to the literature by concurrently assessing relational and physical aggression. This allows for the relationship between one form of aggression and impulsivity/hyperactivity to be examined while removing variance accounted for by the other form. In this study, observations were used to measure relational and physical aggression, while observations and teacher ratings were used to measure impulsivity/hyperactivity. Results indicated that teacher-reported impulsivity/hyperactivity was positively correlated with concurrent relational and physical aggression. Relational and physical aggressive behaviors were both also found to predict future impulsivity/hyperactivity. Hierarchical multiple regression models were also used to investigate prospective associations between impulsivity/
hyperactivity and observed relational and physical aggression. Results of these analyses indicated that impulsivity/hyperactivity predicted observed physical aggression after controlling for variance related to relational aggression and gender. A prospective association between impulsivity/hyperactivity and relational aggression was not found (Ostrov & Godleski, 2009).

These results suggest that inattention and hyperactivity may contribute to relational aggression in a manner similar to that of physical aggression. Findings related to the differential effects of gender on the relationship between impulsivity/hyperactivity and aggression were mixed. Hyperactive and inattentive boys have been shown to be more at risk to display higher rates of physical aggression. Results of the Vaillancourt et al. (2007) study indicated this may also be true for girls with regard to relational aggression. However, these findings stand in contrast to the Ostrov and Godleski (2009) results which indicated no moderating effect of gender on impulsivity/hyperactivity in the prediction of relational or physical aggression.

**Interaction of Parenting and Child Characteristics**

Very little research has investigated the moderating role of child characteristics such as verbal capacity and inattention/hyperactivity on the relationship between parenting and child relational aggression. Morris and colleagues (2002) have studied child inhibitory control and attention focus as moderators of the relationship of maternal hostility and psychological control with child physical aggression (Morris et al., 2002). In this study, effortful control was measured using mother’s rating of their child on the inhibitory control and attention focus scales of the Child Behavior Questionnaire (Goldsmith & Rothbart, 1991), while children provided ratings of maternal hostility and maternal psychological control using the Child Puppet Interview-Parenting Scales (Sessa, Avenevoli, Steinbert, & Morris, 2001). Teacher reports were
used to measure physical aggression, using the Ontario Child health Study Scales (Boyle, Offord, Racine, Szatmari, & Sanford, 1993). The sample for this study included 40 first- and second-grade children and their mothers and teachers. Results of regression analyses indicated that teacher reported physical aggression was significantly predicted by the interaction between maternal hostile parenting and child-effortful control. For children higher in effortful control, however, maternal hostile parenting was not related to child physical aggression. Additionally, when an interaction between maternal hostility and child effortful control was entered into the regression equation, the amount of variance in physical aggression accounted for was significantly increased. Interestingly, no significant interactions were found between maternal psychological control and child effortful control in predicting child physical aggression (Morris et al., 2002). This study suggests that children with inattention or limited inhibitory control may be especially vulnerable to developing physical aggression when exposed to mothers who use hostile parenting practices.

Research that addresses the interaction of parenting styles and child characteristics as a contributor to aggressive behavior is critical to understanding the development of aggression, and has direct implications for early intervention and prevention efforts. Information that specifically delineates which child and parenting characteristics place a child at risk for aggression will inform the targets of intervention. Information that delineates what combinations of these variables place children at risk will inform which children might most benefit from intervention. Unfortunately, no existing research was located that investigated child characteristics such as inattentiveness, hyperactivity, or verbal capacity as possible moderators between parenting style and child relational aggression.
Summary and Goals

Current research has described relational aggression as a relevant concern for intervention. This form of aggression has been shown to be displayed by children as young as preschool age (Crick et al., 1997; Stauffacher & Dehart, 2005), has been estimated to be deployed as an aggressive tactic against 89.2% of girls and 56.4% of boys (Paquette & Underwood, 1999), and has been associated with a host of negative outcomes for both victims (Crick, 1996; Prinstein et al., 2001) and perpetrators (Crick, 1996; Crick et al., 2006; Prinstein et al., 2001; Zimmer-Gembeck et al., 2005). The impact of relational aggression on adjustment appears to be more complicated than that of physical aggression; relational aggression has also been associated with indices of positive adjustment (e.g., Björkqvist, Lagerspetz, & Kaukiainen, 1992; Björkqvist, Österman, & Kaukiainen, 1992; Xie et al., 2002).

Recent research has begun to address questions pertaining to the etiology of relational aggression, with one consistent finding being that relational and physical aggression are moderately correlated (Card, et al., 2008). This finding suggests that these two forms of aggression may share a similar function and may therefore be addressed with similar interventions. Accordingly, research on relational aggression has drawn on environmental models of physical aggression in an effort to better understand the etiology of relational aggression. Unfortunately, this research has resulted in a number of disparate findings. This is likely due to differences in methodology employed across studies. Studies employing multiple methods are needed to eliminate biases associated with any one form of measurement. To date, studies investigating relational aggression have only employed one or two different informants, which make it difficult to draw comparisons across findings of different studies. The
use of multiple methods is also necessary to eliminate shared method variance that arises when one method is used to measure several variables, thus increasing the potential for inflated estimates of relationships among constructs.

Other discrepancies likely arise from the different ages at which children have been assessed. Previous studies include samples of children as young as preschool, while some studies assessed children during early adolescence. Research that investigates children’s use of aggressive strategies during key points in development are necessary to gain a better understanding of the development of aggressive behaviors. The transition to elementary school represents a key transition, as it provides children’s first systematic and extended exposure to the larger peer group and an opportunity to systematically “try out” previously learned aggressive strategies on peers.

It is also important to consider children’s use of aggression in the context of other influential factors as well. This includes exposure to specific parenting styles, and child characteristics that may contribute to the development of physical and relational aggression. Studies examining the interactive effects of parenting and gender also suggest that boys’ and girls’ propensity to engage in physical and relational aggression may be differentially influenced by parenting style (Casas et al., 2006; Hart et al., 1998; Sandstrom, 2007; Nelson et al., 2006). However, these findings have not been consistent and have therefore not yet led to a solid theory that informs which parenting processes are most critical to the development of aggressive behavior.

Similarly, prior research suggests an interaction effect between hostile parenting practices and child inattention and limited inhibitory control in the development of physical
aggression (Sessa et al., 2002). However, there is no similar research on relational aggression. Research that investigates the moderating roles of parenting and child characteristics is important to clarify which combinations of these factors place children at increased risk for developing relational aggression, and what role gender may play in this relationship.

The goal of this study was to extend the research on parenting and child factors associated with the development of relational aggression in several important ways. Specifically, the unique and interactive effects of parenting and child characteristics were assessed to clarify which combinations of these factors place children at increased risk for developing relational aggression. Additionally, children were assessed during the transition to elementary school, which is a key point in development. For many children, this transition provides children an early systematic exposure to the large peer group, and presents the opportunity to use aggressive tactics learned in the home and to learn new aggressive strategies from peers. Additionally, relational and physical aggression were measured simultaneously, and multiple informant methodology was employed in order to eliminate sources of discrepancies due to informant biases, as well as shared method variance that arises when one method is used to measure several variables.
CHAPTER 3

METHOD

Participants

Participants were 134 boys and 133 girls recruited at kindergarten entry (267 children total). The mean age was 5.3 years at first data collection (fall of kindergarten), and 6.0 years at final data collection (spring of kindergarten). The community sample of kindergarten children and their parents were targeted for recruitment over 3 consecutive years, and was obtained from one elementary school in a neighborhood of low socioeconomic status. Participants in this study comprised 76% of the total pool of potential participants who completed informed parental consent and child assent. A total of $10 an hour was provided to participants as reimbursement for participation. The median per capita family income (as measured in 1998) was $8,300, and 28% of the families lived below the poverty threshold. The self-reported ethnicity of the sample was reflective of the population of the city in which the sample was drawn; seventy-one percent of the sample reported being of European American ethnicity, 19% reported African American descent, 5% were Hispanic/Latino, 3% were Native American, and 2% were Asian American. Parental education was as follows: 34% of parents reported completing some education beyond high school, 46% reported they had obtained a high school diploma, and 20% reported completion of less than a high school diploma. Forty-three percent of children lived with two biological parents at the beginning of data collection, while the remaining children lived in single parent families, blended families, or with other family members.
Procedures for Parenting Measures

Two videotaped samples of parent-child interaction, each of which lasted 2 hours, were collected on two different occasions during the fall of the kindergarten school year. Observations of parent-child interactions occurred in a room with a one-way mirror, in which an assortment of games and materials were available. A series of structured tasks were used to obtain a sample of parent-child interactions, and included the following activities: reading, practicing academic tasks, reviewing the child’s school day, having a snack, picking-up toys, planning a fun activity, problem solving a parent- and child-identified problem, and free play.

Interactions were coded using the Specific Affect Coding System (SPAFF; Gottman, McCoy, Coan, & Collier, 1996) and The Family Peer Process code (FPP; Stubbs, Crosby, Forgatch, & Capaldi, 1998). Both of these coding systems provide global ratings of a range of parenting behaviors, as rated by coders every 15 minutes. Moment to moment changes in observed parent behavior are also recorded. The SPAFF is used to code parental emotional displays during ongoing parent-child interactions. SPAFF codes parents’ emotional displays into 19 mutually exclusive and exhaustive categories. The FPP is used to code parental social behaviors directed toward the child, and codes behaviors into 24 mutually exclusive and exhaustive categories.

All coders were required to reach 80% agreement prior to coding data in this study, and weekly training, feedback and recalibration were provided throughout the coding period to promote ongoing reliability. Inter-coder reliability was assessed on 10% of samples of parent-child interaction. The reliability achieved for each of the respective measures is discussed in the following sections corresponding to each measure. Constructs hypothesized in the parent
model of antisocial development were defined by several measures derived from the SPAFF and FPP coding and ratings. Parents also completed a parent social information processing assessment (P-SIP) in a face-to-face interview during the kindergarten year. In this assessment, verbal vignettes are used to describe common child misbehaviors. Parents are presented with the vignettes, and asked to verbally indicate (a) what happened in this situation, and (b) why the behavior occurred. Parents were also asked to evaluate the degree to which harsh discipline tactics were effective responses to the child behavior using a Likert-scale rating system in which (1) was labeled very ineffective and (5) was labeled highly effective. For example, if presented with a scenario in which a child refused to eat a disliked food for dinner to which the parent responded by stating the child could eat or go hungry in response to food refusal, parents were asked to rate on a 1-5 scale the degree to which they supported this response as one they would endorse.

**Parenting Measures**

*Parent skilled teaching.* (See Table 1 for parenting measures). Coders completed rating items of parent skilled teaching including: (a) parent only provided as much assistance as the child required, (b) parent’s approach included using a lot of directives (reverse scored), (c) parent motivated child by threatening punishment (reverse scored), (d) parent did the task for the child (reverse scored), (e) approach included positive reinforcement, and (f) consistent approach. Alphas for these items ranged from .59 to .72 across sessions for SPAFF and FPP.

*Parent skilled discipline.* The following seven rating items were completed by coders to measure parent skilled discipline: (a) parent was firm and used an evenhanded approach, (b) parent praises and rewards child for positive behavior, (c) parent reasons with child, (d) parent
offers acceptable alternatives, (e) parent redirects child’s attention, (f) parent uses touch to redirect the child, and (g) use of time-out or other non-coercive punishment. Alphas ranged from .55 to .79 for SPAFF and FPP across sessions.

**Positive parenting.** The following four items were completed by coders to measure positive parenting: (a) parent was affectionate and warm, (b) parent was attentive and focused, (c) parent was happy and excited, and (d) parent was respectful and caring. Alphas for these items ranged from .65 to .86 for SPAFF and FPP across sessions.

**Parent tracking.** The following five rating items completed by coders were used to measure parent tracking: (a) parent was disengaged (reverse scored), (b) parent was cold or distant (reverse scored), (c) parent was attentive and focused, (d) parent was attached to the child, and (e) parent’s attention was consistent. Alphas ranged from .82 to .91 for these items for SPAFF and FPP. Parent responses to P-SIP questions were also coded to identify two facets of parent tracking. The first question, labeled cue detection, assessed parents’ ability to accurately identify important information regarding child misbehavior described in the vignettes. Fully relevant answers received a score of 3, partially relevant answers received a score of 2, and if the parent did not identify any relevant information, the answer was scored as 1. The second question, labeled attribution, assessed parent’s attribution about the child behavior described in the vignettes as either hostile or benign. Coder agreement for cue detection and attributions was .67 and .69, respectively.

**Parent positive emotion.** Calculations of the observed rate per minute (rpm) at which the parent showed humor, joy, validation, interest, and enthusiasm as coded in the SPAFF were
used to measure parent positive emotion. The intra-class correlation of the rpm of observed parent positive emotion displays across coders (coder reliability) was .77.

**Parent positive interaction.** The following parent behavior categories were observed and coded in the FPP: (a) parent uses touch to redirect the child, (b) positive interpersonal interactions, (c) parent agrees with child, (d) positive talk, (e) positive nonverbal displays, and (f) endearment. Observed rate per minute of these categories served to define parent positive interaction. Alphas across coding categories were .62 for the first session and .53 for the second session. The intra-class correlation of the rpm of observed parent positive interaction across coders (coder reliability) was .73.

**Parent harsh discipline.** FPP and SPAFF coders rated the following seven items: (a) parent is erratic or inconsistent; (b) parent uses ridicule and sarcasm; (c) parent relies on negative affect, (d) parent threatens negative consequences, (e) parent is overly strict, and (f) parent grabs, hits, or pinches child. These items were used to measure Parent Harsh Discipline. The intra-class correlation of the ratings of parent harsh discipline across coders (coder reliability) was .81. Alphas ranged from .77 to .81 for these items across sessions for both the SPAFF and FPP coders.

**Parent nattering and aversive behavior.** Rate per minute calculations of parents’ observed direct aversive behavior toward the child were used to measure parent nattering and aversive behavior. The following FPP coding categories were used to define aversive behavior: (a) coercion, (b) physical attack, (c) negative nonverbal behavior, (d) physical aggression, and (e) verbal attack. The intra-class correlation of the rpm of observed parent nattering and aversive behavior across coders (coder reliability) was .87.
Parent negative reinforcement. The rate at which parents gave in to a child’s aversive behavior during conflict or discipline episodes represents parental negative reinforcement of child aversive behavior. An odds ratio from FPP codes of observed parent-child interactions was calculated in order to provide an estimate of the probability of parental negative reinforcement of child aversive behavior in conflict episodes.

Parent anger. SPAFF codes of the rates per minute at which parents were observed to direct anger or contempt toward their child were used to assess parent anger. Coder agreement on parental anger and contempt was 83% (kappa = .73).

Child Measures

Impulsivity-inattention. Multiple measures and informants were used to define the construct of impulsivity-inattention. Assessments were collected during the fall of the kindergarten year. Four measures were used to define the construct. The first measure is the Child Behavior Checklist-parent report (CBCL; Achenbach & Rescorla, 2001). A 7-item scale was derived from the CBCL, with items being selected in order to non-exhaustively reflect the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR; American Psychiatric Association, 2000) symptoms for Attention Deficit Hyperactivity Disorder. Examples of these items include “can't concentrate,” “can’t sit sill,” and “impulsive.” Factor loadings for each item on the scale were all greater than .35, and the alpha for the scale was .74. The second measure included the Trail Making Test Trails B time and Trails B error (TMT; Reitan, 1955), and the Digit Span from the Wechsler Intelligence Scale for Children WISC-III-Third Edition (WISC-III; Wechsler, 1991). The TMT is an assessment of children’s capacity to inhibit prepotent responses, and Digit Span assesses attentional capacity (Kindlon, Mezzacappa, & Earls, 1995).
The correlations among scores on these tests ranged from .28-.47 (p’s < .05). Alpha was .60 (lowest item-total correlation = .30) for the four test scores. The third measure was comprised of classroom observations of children’s academic engaged time (AET), as defined by observed time on-task during multiple 5-minute segments of academic work. Observer agreement as indicated by intra-class correlations of total time on-task during the 5-minute segments was .72. The range for the occasion-to-occasion correlations of the AET was .20-.25 (p’s < .05). The multi-occasion AET alpha was .52 (lowest item-total correlation = .40). The fourth measure was comprised of ratings on two items made by assessors during each of the three occasions of each child’s individual assessment. These items included: (a) was inattentive, and (b) needed frequent redirection. Across the three occasions, correlations among assessor ratings ranged from .30-.50 (p’s < .01). The assessor impression alpha was .76 (lowest item-total correlation = .40).

**Verbal ability.** The Peabody Picture Vocabulary Test – Revised (PPVT – R; Dunn & Dunn, 1981) was used to measure the verbal ability of each child during the fall of the kindergarten year. The PPVT – R provides a reliable and valid measure of children’s receptive vocabulary. Each child was administered the PPVT-R individually, and child verbal ability was defined by the age-adjusted scale score ($M = 90.8$, $SD = 13.7$).

**Playground observations of relational and physical aggression.** Playground observations were collected on 4 to 6 separate occasions each during the fall and spring semesters of the kindergarten school year. On each observation occasion, coders observed a child’s behavior on the school playground using an adaptation of the coding system described by Weiss, Dodge, Bates, and Pettit (1992). Coder training was completed before data collection began. Training
consisted of instruction and testing on both modeled and verbal examples of all behaviors included in the coding system. Coders were also required to code videotapes with rapid recording of behavioral categories so as to represent roughly continuous coding intervals (Snyder et al., 2003). Each observation occasion consisted of a total of 5 minutes, which was broken down into 30 consecutive 10 second intervals. The type of behavior the child engaged in was recorded by coders after each interval using six hierarchical, collectively exhaustive categories, with physical and relational aggression as hierarchically primary. For all coding categories, the overall Kappa observer agreement was .70.

Relational aggression was recorded when a child engaged in behaviors that were directed toward a third party that verbally denigrated another child’s behavior or characteristics. This consisted of behaviors including spreading rumors, encouraging others to ignore or exclude a child from the group, and tattling. Physical aggression was recorded when a child engaged in behaviors directed at peers that caused or could cause physical pain or harm. This consisted of behaviors including pushing, hitting, and kicking. Due to the low base-rates of relational and overt aggression, the rate per minute (rpm) of each of these behaviors across all observation occasions was used to calculate an intra-class correlation coefficient for independent coder pairs. The intra-class correlations were .79 and .91 for relational and physical aggression, respectively (p’s < .001).

Peer nominations of relational and physical aggression. Peer nominations for participating students were collected using a picture sociometric procedure described and validated by Asher, Singleton, Tinsley, and Hymel (1979). Nominations were obtained from each child in a private location. After pictures of participating classmates were placed in front of the
child, the child was asked to point to the pictures of three children who engage in physically aggressive behaviors including: “pushes or hits others,” “throw things at other kids when they don’t get their way,” “say they will push someone off a toy if they don’t get to play with it too,” and “say they will knock somebody’s stuff over or mess it up if they don’t get to play with it too.” Children were also asked to point to the pictures of three children who engage in relationally aggressive behaviors, including: “say they won’t invite somebody to their birthday party if they can’t have their own way,” “won’t listen to someone if they are mad at them – they might even cover their ears,” “won’t let a kid play in a group if they are mad at the kid – they might tell the kid to go away,” and “tell other kids they can’t play with the group unless they do what the group wants them to do.” Similar to the procedure described by Coie and Dodge (1983), the number of physical and relational aggression nominations received by each child were summed separately and standardized by classroom.
CHAPTER 4

RESULTS

Preliminary Analyses and Construct Building

Descriptive statistics were calculated for each of the composite measures (Table 2). Data screening for convenience assumptions indicated variables for playground observations of relational and physical aggression were significantly skewed. Log transformations were therefore conducted on these variables. No other variables were significantly skewed or kurtotic. Standard deviations indicated significant variability among all indicators of each composite construct (positive parenting, negative parenting, child verbal ability, child impulsivity-inattention, child verbal ability, peer nominations of relational and physical aggression, and playground observations of relational and physical aggression). Correlations among measures were then examined before developing each construct. Analyses revealed that peer nominations and playground observations of relational and physical aggression were not consistently correlated ($r’s = .06 -.51$); therefore, separate constructs were created for each of these measures, and models were tested separately for each. All other measures were then transformed into z-scores, and a mean of the standardized variables was then calculated and used to create the constructs.

Correlations among measures used to define the parenting constructs (Table 3) ranged from .01 to .88. Analyses indicated that correlations among measures used to define the negative parenting construct (harsh discipline, nattering, anger, negative reinforcement of aversive behavior) were all reliable with the occasional exception of nattering and negative reinforcement (.06). Correlations among measures used to define the positive parenting
construct (skilled teaching, effective discipline, positive parenting, positive emotions, positive interactions, tracking) were all reliable (.22 to .66) with the exception of P-SIP tracking, which was therefore not used to define this construct. Prior to testing the hypothesized models, each measure used to define the positive and negative parenting constructs were z-scored and then averaged to create two composite parenting constructs for positive and negative parenting. Correlations (Table 3) indicated that each measures of the composite positive and of the negative parenting constructs correlated well with the total score of the construct they defined ($r'$'s = .54 - .72, $p$'s < .001 for negative parenting; $r'$'s = .64 - .89 $p$'s < .001 for positive parenting), with some modest discriminant validity between constructs. The positive and negative parenting constructs were negatively correlated with one another ($r$ = -.46, $p$ < .001), and the distribution of neither construct was significantly skewed or kurtotic.

Correlations among measures used to define the impulsivity-inattention construct (Table 4) ranged from .02 to .60. While the correlations of trail making test completion time and errors were not consistently correlated with the other non-test measures of the construct, the trail making scores were retained in order to develop a multi-method construct including tests. These measures were used to define the construct by standardizing each and then taking their mean. Only one variable (PPVT-R) was used to define the child verbal ability construct.

Correlations among observation and peer nominations for physical and relational aggression are shown in Table 5. The correlations over assessment points from fall to spring kindergarten for both peer nominations of relational and of physical aggression were substantial ($r$'s = .61 and .77 respectively), and for observations was modest in size for physical aggression ($r$ = .49) and small for relational aggression ($r$ = .18). Relational and physical
aggression as assessed by observations were relatively distinct at the fall and spring assessment points, with correlations of .16 and .19 respectively. Relational and physical aggression as assessed by peer nominations were strongly correlated at the fall and spring assessment points, with correlations of .85 and .78, respectively. Thus temporal continuity in physical and relational aggression based on observations was quite modest, but for those based on nominations was quite sizable. There was considerable discriminant validity when relational and physical aggression was measured by observations, but not when they were measured by peer nominations.

The associations of family socioeconomic status and the number of siblings in the home with physical and relational aggression, parenting, and child verbal ability and impulsivity-inattention were initially assessed using bivariate correlations (Table 6). Most of these correlations were not statistically reliable, with three exceptions. Socioeconomic status was positively correlated with positive parenting ($r = .25, p < .001$) and the number of siblings was negatively correlated with peer nominations for relational aggression in the spring of kindergarten ($r = -.44, p < .001$), and with playground observations of physical aggression in the fall of kindergarten ($r = -.12, p < .01$). Given the relative lack of consistent relationships and the need to test SEM models separately for nominations and observations of aggression, positive and negative parenting, and child sex, SES and number of siblings were not included in the subsequent structural equation models (SEM).

In order to assess the interactive effects of parenting and child verbal ability and impulsivity-inattention on relational and physical aggression, interaction terms were created from these variables. To create the interaction terms, the parenting and child constructs were
first centered, and then multiplied. This resulted in four different interaction terms that were used to assess their respective influence on the development of relational and physical aggression. Interaction terms included negative parenting by child verbal ability, negative parenting by child inattention-inhibition, positive parenting by child verbal ability, and positive parenting by child inattention-inhibition. SEM was then used to examine the unique and interactive association of parent processes and child verbal ability and impulsivity-inattention with the development of relational and physical aggression.

**SEM Tests of the Parent-Child Characteristic Model of Relational and Physical Aggression**

Sixteen multi-group (by child sex) structural equation models examining the hypothesized parent-child models of the development of relational and physical aggression were tested using Amos (Arbuckle & Worthke, 1999). See Table 7 for a summary of findings from the SEM analyses.

Positive parenting, child impulsivity-inattention, and observed physical and relational aggression. The results of the model examining the relationship of positive parenting, child impulsivity-inattention, and their interaction with playground observations of physical aggression are shown in the top, left quadrant of Table 7, located on page 94 (above the dotted line). Indices indicated the model fit the data well ($\chi^2(8) = 5.23, p = .73, \text{CFI} = 1.00, \text{RMSEA} = .00$). The model indicated the autoregressive path for observed physical aggression from fall to spring of kindergarten was significant for both girls ($\beta = .55, p < .001$) and boys ($\beta = .26, p < .001$). The path from positive parenting to spring physical aggression was not significant for girls or for boys. Impulsivity-inattention was not a significant predictor of physical aggression for girls ($\beta = .07$), but was for boys ($\beta = .39, p < .001$), and this gender difference was significant
(C.R. = 3.77, p < .001). The interaction of positive parenting and child impulsivity-inattention was not a significant predictor of physical aggression for girls (β = .08), but was for boys (β = .22, p < .05), and there was no significant gender difference in this path. The interaction indicated that observed physical aggression was very modestly associated with positive parenting for boys high on impulsivity-inattention (½ SD above the mean: r = .17) but more strongly inversely associated with positive parenting for boys low on impulsivity-inattention (½ SD below the mean: r = -.41).

The results of the model examining the relationship of positive parenting, child impulsivity-inattention, and their interaction with playground observations of relational aggression are shown in the upper, right quadrant of Table 7, located on page 94 (above the dotted line). Indices indicated the model fit the data well ($\chi^2_{(6)} = 5.83$, $p = .44$, $CFI = 1.00$, $RMSEA = .00$). The autoregressive path from fall to spring kindergarten relational aggression was significant for both girls (β = .17, p < .05), and for boys (β = .19, p = .05), and there was not a significant gender difference in this relationship. The paths from positive parenting and from the interaction of positive parenting and child impulsivity were not significant for girls or for boys. Child impulsivity-inattention was reliably associated with spring kindergarten relational aggression for girls (β = .20, p < .05), but not for boys (β = .15, p < .10), and this gender difference was not significant.

Negative parenting, child impulsivity-inattention, and observed physical and relational aggression. The results of the model examining the relationship of negative parenting, child impulsivity-inattention, and their interaction with playground observations of physical aggression are shown in the upper, left quadrant of Table 7, located on page 94 (below the
The model fit the data well ($\chi^2_{(4)} = 4.16, p = .38$, CFI = 1.00, RMSEA = .01). The autoregressive path for physical aggression was significant for girls ($\beta = .53, p < .001$) and boys ($\beta = .27, p < .001$). The path from negative parenting to spring kindergarten observed physical aggression was not significant for girls or boys. The association of child impulsivity-inattention with spring kindergarten observed physical aggression was significantly different from zero for boys ($\beta = .40, p < .001$) but not for girls ($\beta = -.06$), and this gender difference was significant (C.R. = 3.57). The interaction of negative parenting and child impulsivity was not associated with spring kindergarten observed physical aggression.

The results of the model examining the relationship of negative parenting, child impulsivity-inattention, and their interaction with playground observations of relational aggression are shown located in the upper, right quadrant of Table 7, located on page 94 (below the dotted line). Indices indicated the model fit the data well ($\chi^2_{(8)} = 3.45, p = .90$, CFI = 1.00, RMSEA = .00). The autoregressive path for observed relational aggression was significant for girls ($\beta = .17, p < .05$), and for boys ($\beta = .18, p = .06$). The path from negative parenting to spring kindergarten observed relational aggression was not significant for girls or for boys. The model indicated that the association of child impulsivity-inattention with spring kindergarten observed relational aggression was significantly different from zero for girls ($\beta = .20, p < .05$), but not for boys ($\beta = .17, p < .10$), and there was no significant gender difference. The association of the interaction of child impulsivity-inattention and negative parenting with spring kindergarten observed relational aggression was also significantly different from zero for boys ($\beta = .25, p < .01$), but not for girls ($\beta = -.15$), and this gender difference was significant (C.R. = 2.87, $p < .01$). The interaction indicated that observed relational aggression was not associated
(r = -.04) with negative parenting for boys low on impulsivity (½ SD below the mean) but modestly associated with negative parenting for boys high on impulsivity (½ SD above the mean: r = .15).

Positive parenting, child verbal ability, and observed physical and relational aggression.

The results of the model examining positive parenting, child verbal ability, and playground observations of physical aggression are shown in the lower, left hand quadrant of Table 7, located on page 94 (above the dotted line). The model fit the data well ($\chi^2_{10} = 9.21, p = .51, \text{CFI} = 1.00, \text{RMSEA} = .00$). The autoregressive path for observed physical aggression was significant for girls ($\beta = .56, p < .001$), and boys ($\beta = .35, p < .001$). The model indicated that positive parenting was negatively associated with spring kindergarten observed physical aggression for girls ($\beta = -.26, p < .01$), but not for boys ($\beta = -.05$), and this gender difference was not significant. Child verbal skills and the interaction of positive parenting and child verbal skills were not significantly associated with spring kindergarten observed physical aggression for girls or for boys.

The results of the model examining positive parenting, child verbal ability, and observed relational aggression are shown in the lower, right quadrant of Table 7, located on page 94 (above the dotted line). The model fit the data well ($\chi^2_{4} = 3.71, p = .45, \text{CFI} = 1.00, \text{RMSEA} = .00$). The autoregressive path for observed relational aggression was significant for girls ($\beta = .16, p = .05$) and marginally significant for boys ($\beta = .16, p < .10$). The associations of positive parenting and the interaction of positive parenting and child verbal skills were not significant for girls or for boys. Child verbal skills were associated with spring kindergarten relational
aggression for boys ($\beta = .20, p < .05$), but not for girls ($\beta = .02$), with no significant gender difference.

**Negative parenting, child verbal ability, and observed physical and relational aggression.**

The results of the model examining negative parenting, child verbal ability, and playground observations of physical aggression are shown in the lower, left quadrant of Table 7, located on page 94 (below the dotted line). Indices indicated that the model fit the data well ($\chi^2 (8) = 8.21, p = .41, \text{CFI} = 1.00, \text{RMSEA} = .00$). The autoregressive path for observed physical aggression was significant for girls ($\beta = .54, p < .001$), and for boys ($\beta = .37, p < .001$). The model indicated that negative parenting, child verbal skills and their interaction were not significantly associated with spring kindergarten observed physical aggression for girls or for boys.

The results of the model examining negative parenting, child verbal ability, and playground observations of relational aggression are shown in the lower, right quadrant of Table 7, located on page 94 (below the dotted line). Indices indicated that the model fit the data well ($\chi^2 (4) = 2.86, p = .58, \text{CFI} = 1.00, \text{RMSEA} = .00$). The autoregressive path for relational aggression was significant for girls ($\beta = .16 p < .05$), and marginally significant for boys ($\beta = .18, p = .06$). The model indicated that negative parenting was not associated with spring kindergarten observed relational aggression. Child verbal ability was associated with spring kindergarten observed relational aggression for boys ($\beta = .19, p < .05$) and not for girls ($\beta = .03$), and there was no significant gender difference in this relationship. The model also indicated that the interaction of negative parenting and child verbal ability was associated with spring kindergarten observed relational aggression for boys ($\beta = .19, p = .05$) but not girls ($\beta = .08$), and there was no significant gender difference. The interaction indicated that observed
relational aggression was not associated with negative parenting for boys low on verbal skills (½ SD below the mean: $r = -.08$) but was modestly associated with negative parenting for boys high on verbal skills (½ SD above the mean: $r = .23$).

Positive parenting, child impulsivity-inattention, and peer nominations of physical and relational aggression. The results of the model examining positive parenting, child impulsivity-inattention, and peer nominations of physical aggression are shown in the upper, left quadrant of Table 7, located on page 95 (above the dotted line). Indices indicated the model fit the data well ($\chi^2(8) = 6.83, p = .55$, CFI = 1.00, RMSEA = .00. The model indicated there was substantial cross-time continuity in peer nominations for physical aggression for girls ($\beta = .68$, $p < .001$) and boys ($\beta = .62$, $p < .001$). Positive parenting and the interaction of positive parenting and child impulsivity-inattention were not associated with spring kindergarten peer nominated physical aggression for boys or for girls. Child impulsivity-inattention was positively associated with peer nominated physical aggression in the spring of kindergarten for both girls ($\beta = .14$, $p = .05$), and for boys ($\beta = .24$, $p < .001$). There was no significant gender difference in this relationship.

The results of the model examining positive parenting, child impulsivity-inattention, and peer nominations of peer nominations of relational aggression are shown in the upper, right quadrant of Table 7, located on page 95 (above the dotted line). The model fit the data well ($\chi^2(4) = 4.78, p = .31$, CFI = .99, RMSEA = .03). The model indicated substantial cross-time continuity in peer nominations of relational aggression for girls ($\beta = .47$, $p < .001$) and boys ($\beta = .60$, $p < .001$). Positive parenting was not associated with peer-nominated relational aggression. Child impulsivity-inattention was associated with peer nominations for relational
aggression for girls ($\beta = .22, p < .05$), but not boys ($\beta = .11$), and there was no significant
gender difference in this relationship. The interaction of positive parenting and child
impulsivity-inattention was associated with spring kindergarten peer nominated relational
aggression for boys ($\beta = .20, p < .05$), but not for girls ($\beta = .13$), with no significant gender
difference. The interaction indicated that peer nominations for relational aggression were
positively associated with positive parenting for boys high on impulsivity-inattention ($\frac{1}{2}$ SD
below the mean: $r = .21$) and negatively associated with positive parenting for boys low on
impulsivity-inattention ($\frac{1}{2}$ SD above the mean: $r = -.18$).

**Negative parenting, child impulsivity-inattention, and peer nominations of physical and
relational aggression.** The results of the model examining negative parenting, child impulsivity-
inattention, and peer nominations of physical aggression are shown in the upper, left quadrant
of Table 7, located on page 95 (below the dotted line). The model fit the data well ($\chi^2 (4) = 1.69, p
= .79$, CFI = 1.00, RMSEA = .00). The model indicated substantial cross time continuity in peer
nominations of physical aggression for girls ($\beta = .66, p < .001$) and boys ($\beta = .58, p < .001$). The
model indicated that, negative parenting and the interaction of negative parenting and child
impulsivity-inattention, were not associated with peer nominations of physical aggression in
the spring of Kindergarten for boys or for girls. Child impulsivity-inattention was positively
associated with peer nominations of physical aggression in the spring of kindergarten for both
girls ($\beta = .19, p < .05$), and for boys ($\beta = .24, p < .001$), and there was no gender difference in
this relationship.

The results of the model examining negative parenting, child impulsivity-inattention,
and peer nominations of relational aggression are shown in the upper, right quadrant of Table
located on page 95 (below the dotted line). The model fit the data well ($\chi^2 (2) = 1.23, p = .54, CFI = 1.00, \text{RMSEA} = .00$). The model indicated substantial cross-time continuity in peer nominations of relational aggression for girls ($\beta = .42, p < .001$) and boys ($\beta = .59, p < .001$). Negative parenting and the interaction of negative parenting and impulsivity-inattention were not associated with peer nominated relational aggression for boys or for girls. Child impulsivity-inattention was associated with peer nominations of relational aggression in the spring of kindergarten for girls ($\beta = .28, p < .001$), but not for boys ($\beta = .11$), with no significant gender differences.

Positive parenting, verbal ability and peer nominations of physical and relational aggression. The results of the model examining positive parenting, child verbal ability, and peer nominations of physical aggression are shown in the lower, left quadrant of Table 7, located on page 95 (above the dotted line). The model fit the data well ($\chi^2 (8) = 7.34, p = .50, CFI = 1.00, \text{RMSEA} = .00$). The model indicated substantial cross-time continuity in peer nominations of relational aggression for girls ($\beta = .73, p < .001$) and boys ($\beta = .70, p < .001$). Positive parenting, child verbal ability, and the interaction of positive parenting and child verbal ability, were not associated with peer nominations of physical aggression in the spring of kindergarten for boys, or for girls.

The results of the model examining positive parenting, child verbal ability, and peer nominations of relational aggression are shown in the lower, right quadrant of Table 7, located on page 95 (above the dotted line). Indices indicated the model fit the data well ($\chi^2 (4) = 4.95, p = .29, CFI = .99, \text{RMSEA} = .03$). The model indicated substantial cross-time continuity in peer nominations of relational aggression for girls ($\beta = .51, p < .001$) and boys ($\beta = .68, p < .001$).
Positive parenting and the interaction of positive parenting and child verbal ability were not associated with peer nominations of relational aggression. Child verbal ability was associated with peer nominations for relational aggression for boys ($\beta = .14$, $p = .05$) but not girls ($\beta = -.10$), and there was a significant gender difference in this relationship (C.R. = 2.29).

Negative parenting, child verbal ability, and peer nominations of physical and relational aggression. The results of the model examining negative parenting, child verbal ability, and peer nominations of physical aggression are shown in the lower, left quadrant of Table 7, located on page 95 (below the dotted line). The model fit the data well ($\chi^2(4) = 4.54$, $p = .34$, CFI = 1.00, RMSEA = .02). The model indicated substantial cross time continuity in peer nominations of relational aggression for girls ($\beta = .74$, $p < .001$) and boys ($\beta = .69$, $p < .001$). The model indicated negative parenting, child verbal ability, and the interaction of negative parenting and child verbal ability were not associated with peer nominations of physical aggression in the spring of kindergarten for boys or for girls.

The results of the model examining negative parenting, child verbal ability, and peer nominations of relational aggression are shown in the lower, right quadrant of Table 7, located on page 95 (below the dotted line). Indices of model fit indicated the model fit the data well ($\chi^2(4) = 4.38$, $p = .36$, CFI = .99, RMSEA = .02). The model indicated substantial cross time continuity in peer nominations of relational aggression for girls ($\beta = .54$, $p < .001$) and boys ($\beta = .68$, $p < .001$). The model indicated that negative parenting and child verbal ability were not associated with peer nominations of relational aggression in spring of kindergarten. The interaction of negative parenting and child verbal ability was associated with peer nominations for relational aggression for boys ($\beta = .20$, $p < .01$), but not for girls ($\beta = .06$), and there was no
significant gender difference in this relationship. The interaction indicated that peer
nominations for relational aggression were strongly associated with negative parenting for boys
high on verbal skills (½ SD above the mean: \( r = .34 \)) and less so for boys low on verbal skills (½
SD below the mean: \( r = .13 \)).

**Gender differences in mean levels parenting, child impulsivity-inattention and verbal
ability, and physical and relational aggression.** A summary of mean-level gender differences in
the constructs is presented in Table 8. Results of these analyses indicated a mean level
difference in impulsivity-inattention. Specifically, boys (\( M = .15 \)) were higher than girls (\( M =
-.18 \)), and this difference was significant (C.R. = 2.39, \( p < .001 \)). No gender differences were
found in child verbal ability or in the positive and negative parenting constructs.

Results also indicated mean level differences in rates of playground observations of
physical aggression in both the fall and spring semesters. Boys (\( M = .76 \)) engaged in significantly
more physical aggression than girls (\( M = .43 \)) in both the fall (C.R. = 6.94 \( p < .001 \)) and in the
spring (C.R. = 6.22, \( p < .001 \)). Similarly, results indicated mean level gender differences in peer
nominations of physical aggression in both the fall and spring semesters. Boys (\( M = .44 \)) were
significantly more often nominated for physical aggression than girls (\( M = -.44 \)) in the fall, and
this difference was significant by gender (C.R. = 7.90, \( p < .001 \)). Boys (\( M = .44 \)) were also
nominated more often for physical aggression than girls (\( M = -.43 \)) in the spring (C.R. = 7.76, \( p <
.001 \)). Boys (\( M = .34 \)) were significantly more often nominated for relational aggression than
girls (\( M = -.36 \)) in the fall (C.R. = 5.49, \( p < .001 \)). Boys (\( M = .27 \)) were also nominated significantly
more often for relational aggression than girls (\( M = -.27 \)) in the spring (C.R. = 4.43, \( p < .001 \)).
CHAPTER 5

DISCUSSION

This study examined the influence of parenting process and child characteristics on the development of relational and physical aggression during early elementary school. Prior research has documented the influence parents have on the development of physical aggression (Casas et al., 2006; Côté et al., 2006; Patterson et al., 1992; Stormshack, et al., 2000). Child characteristics, such as verbal capacity, and impulsivity and hyperactivity also play an important role in determining a child’s propensity for engaging in aggressive behaviors (Bonica et al, 2003; Côté et al., 2007; Ostrov & Godleski, 2009; Morris et al., 2002; Vaillancourt et al., 2007). Based on findings such as these, effective interventions have been developed to address both the parent and child factors that contribute to the development of physical aggression (Kazdin, Siegal, & Bass, 1992; Webster-Stratton, Reid, & Hammond, 2004).

Research that examines how parenting and child characteristics contribute to growth in aggression has focused primarily on its physical forms, but has largely overlooked other forms such as relational aggression. There has also been a tradition in research on physical aggression of utilizing samples of youth who are primarily boys. Therefore, this extensive research base has neglected information about how the development of aggression by girls may be similar to or different from that by boys. The compilation of research findings indicates this state of affairs must change in order to adequately address the negative outcomes both boys and girls experience due to various forms of aggressive behavior. For example, recent studies indicate relational aggression is damaging (Crick, 1995; Crick, 1996; Paquette & Underwood, 1999;
Prinstein, et al., 2001), but over half of victims and perpetrators of aggression would be missed if relational aggression were excluded from intervention targets (Crick & Nelson, 2002; Henington et al., 1998). Recent research also suggests that relational aggression may share an etiology similar to physical aggression (Card et al., 2008). Therefore, current research has begun to draw upon models of physical aggression in an effort to understand the origins of relational aggression and to develop effective interventions to address that form of aggression. This study aimed to contribute to extant research by studying the unique and interactive association of parenting processes and child characteristics with the development of relational and physical aggression, and to do so comparing boys and girls.

**Parenting Processes**

Results of this study indicated only one instance in which parenting was directly associated with child aggression at school. The negative parenting construct was not associated with levels of relational or physical aggression in the spring semester of kindergarten over and above fall kindergarten levels of aggression. Positive parenting was negatively associated only with observed physical aggression by girls; girls who have parents who utilized positive parenting strategies were at reduced risk for physical aggression in the spring of kindergarten.

This relative lack of reliable relationships between parenting and aggression, at first glance, appears to be inconsistent with previous research on the importance of parenting, especially pertaining to the impact of negative or coercive parenting on the development of physical aggression. However, three factors reduce this seeming inconsistency. The first is that the models were tested in an autoregressive model predicting aggression at the end of a roughly 6 month period (spring kindergarten) while controlling for aggression at the beginning
of that period (fall kindergarten). In the case of peer nominations, this autoregressive path indicates fall rates of aggression were very powerful predictors of spring rates of aggression so that parenting was less likely to serve as a predictor over and above early levels of aggression. Second, these models were very stringent tests of the influence of parenting on aggression, as aggression was predicted in a different setting (school) than that in which parenting operates (home). Third, and perhaps most important, the association of parenting with child aggression at school was more apparent in the moderator models. Specifically, the addition of interaction terms for parenting and child characteristics diminished the direct association (or main effect) of parenting with child aggression. It appears that the degree to which parenting contributes to risk for child aggression depends on the characteristics of the child.

**Child Characteristics**

**Impulsivity-inattention.** The child impulsivity-inattention construct was significantly associated, as a main effect, with spring kindergarten aggression in all eight of the models in which it was tested. For boys, it was reliably and strongly associated with physical aggression, whether assessed by observations or peer nominations. For girls, impulsivity-inattention was less strongly associated with physical aggression, and only reliably associated in the case of peer nominations of physical aggression. The stronger effect for boys was apparent in gender differences in the association of impulsivity-inattention with observed physical aggression, but not with peer nominations of physical aggression. This finding is not surprising, given that the relationship between impulsivity-inattention and physical aggression has been repeatedly documented in previous research (Nagin & Tremblay, 2001). This study suggests that the association of impulsivity-inattention with aggression extends to girls. It should also be noted
that boys displayed higher levels of impulsivity-inattention than girls, and this may account for its stronger and more consistent association with physical aggression for boys compared to girls.

The broader research on physical aggression and impulsivity-inattention provides an additional context for the results in this study. Impulsivity has been consistently found to be a significant predictor of physical aggression (Nagin & Tremblay, 2001). This is likely because impulsive-inattentive children tend to be less capable than their normative peers to inhibit initial responses to provocation and emotional stimuli. Impulsive-inattentive children also tend to be motivated by immediate rewards, whether by positive reinforcement (obtaining a desired object), or negative reinforcement (fending off aversive behaviors of others) associated with aggressive behavior. While impulsivity-inattention provides a predisposition to aggress, the topography of the attack may differ by gender. Higher rates of physical aggression are higher for boys than for girls (American Psychiatric Association, 2000), increasing the probability that impulsive-inattentive boys will aggress in physical ways. Conversely, girls tend to display more relational aggression (Card et al., 2008), which increases the likelihood that impulsive-inattentive girls will aggress using relationally aggressive means.

Previous investigations of the relationship of impulsivity-inattention and relational aggression have posed two competing hypotheses. Some have hypothesized that impulsivity-inattention would have an inverse relationship with relational aggression based on the idea that one must carefully plan and perhaps be surreptitious to successfully deploy relational aggression (Vaillancourt et al., 2007). This hypothesis has not been supported in previous research (Ostrov & Godleski, 2009) or by results of this study. Rather, results indicated
impulsivity-inattention positively predicted spring levels of relational aggression, in some ways similar to physical aggression. However, in contrast to physical aggression, the association of impulsivity-inattention with relational aggression tended to be more consistently apparent for girls than for boys, although gender differences in these associations were not significant. These findings on gender differences are congruent with those reported by Vaillancourt et al. (2007), but not with those reported by Ostrov and Godleski (2009). This provides modest support for the notion that impulsivity-inattention may increment risk for aggression, but may do so in gender-specific and prototypic ways – for physical aggression by boys and relational aggression by girls.

**Verbal ability.** Child verbal ability was significantly associated with spring kindergarten aggression in three of the eight models in which it was tested. In no case was it directly related (as a main effect) to physical aggression. With regard to relational aggression, verbal ability was reliably associated with spring kindergarten levels of observed and peer nominated relational aggression by boys, but not by girls, with a significant gender difference in the association of verbal ability with peer nominated relational aggression. This finding is similar to that of Bonica and colleagues (2003) who found a stronger effect for verbal ability on the development of relational aggression in preschool-aged boys. This gender difference was particularly distinct in Bonica’s study when verbal ability was measured by the PPVT-R, as used in this study. In a longitudinal study conducted by Côté and colleagues (2007), no relationship was found between verbal ability and relational aggression. The difference between these findings may be due to differences in reporting methodology. The Côté (2007) study relied on person most knowledgeable reports of relational aggression, while the present study and that of Bonica et
al. (2003) relied on information that was gathered in the peer context, a place where relational aggression is more likely to occur. Further, in the Côté et al. (2007) study, verbal ability at age 4 years was used to predict relational aggression at age 10 years. This required verbal ability to have predictive power on relational aggression 6 years later in order to show a significant effect.

The absence of a reliable relationship between verbal abilities and physical aggression in this study is consistent with the notion that verbal abilities are not required to deploy physically aggressive strategies, whereas relational aggression may require more sophisticated planning and the use of more subtle social strategies. The relationship between boys’ verbal ability and increased rates of relational aggression may, on the surface, be unexpected because the positive relationship between verbal ability and relational aggression has been more commonly associated with girls. However, the accumulation of the relational aggression research suggests that, while gender differences in rates of relational aggression may not be as pronounced as those pertaining to physical aggression, girls tend to use relational aggression more frequently than boys (Card et al., 2008), which may therefore less uniquely link relational aggression to girls’ verbal ability.

Gender differences in the association of verbal skills with peer nominations for relational aggression may be a byproduct of measurement methodology. Peers who have been victimized by one type of aggression may develop negative expectations of the perpetrator, and therefore globally rate the perpetrator’s behavior as negative regardless of the form of aggression. Because boys tend to be more aggressive in general, peers’ negative perceptions of physically aggressive boys could result in over-reporting of boys’ relational aggression.
However, the Card et al. (2008) meta-analysis of relational and physical aggression indicated that measurement method was not a moderator of gender-specific relational aggression.

Bonica and colleagues (2003) have also hypothesized that the lack of a significant relationship between verbal ability and girls’ relational aggression may be because relational aggression is more common among girls. Increased exposure to relational aggression among girls may make the expression of relationally aggressive tactics less dependent on verbal abilities and more related to learning opportunities. The significant relationship between verbal ability and relational aggression for boys, and absence of this relationship for girls, may also be related to gender differences in maturational process. Girls develop verbal skills earlier than boys, and this difference is particularly apparent during the preschool years (Maccoby & Jacklin, 1974). Accordingly, the maturation of verbal skills requisite to relational aggression may have already occurred in girls so that the association between verbal skills and relational aggression was less apparent in this sample. Conversely, the development of boys’ verbal skills requisite to relational aggression may still be developing during early elementary school. Therefore, individual differences in boys’ verbal abilities may be more powerfully associated with rates of relational aggression during kindergarten.

**Parenting By Child Characteristics Interaction Effects**

**Parenting processes and child impulsivity-inattention.** Results indicated a modest positive relationship between positive parenting and growth of observed physical aggression for boys high on impulsivity-inattention, and a strong negative relationship between positive parenting and growth of observed physical aggression for boys low on impulsivity-inattention. There were no significant effects for the interaction of negative parenting and impulsivity-inattention.
inattention on the growth of observed physical aggression. This suggests that positive parenting has a protective effect for physical aggression by boys who are at low risk in terms of impulsivity-inattention, but little protective effect for those high on impulsivity-inattention. Considering that boys also showed higher mean levels of impulsivity-inattention, the interaction effect only for boys indicates that parenting may only moderate the risk posed by somewhat higher levels of impulsivity-inattention. Research has indicated that negative and coercive parenting exacerbates physical aggression for children high on impulsivity-inattention (Kaiser, McBurnett, & Pfiffner, 2011); however, there was no support for this hypothesis in this study. These findings, along with the strong predictive power of impulsivity-inattention on growth of physical aggression, point to the importance of child impulsivity-inattention as a risk factor for physical aggression that can be mitigated only to a degree by effective parenting.

The manner in which the relationship of parenting with relational aggression was moderated by child impulsivity-inattention was complicated. Negative parenting was associated with growth in observed relational aggression for boys high on impulsivity-inattention, but this same effect was not found for peer nominations for relational aggression. Significant gender differences also indicated this relationship did not operate in a similar fashion for girls. For peer-nominated relational aggression, positive parenting was associated with higher levels of relational aggression for highly impulsive-inattentive boys, and negatively related to peer-nominated relational aggression for boys low on impulsivity-inattention. This moderated association was in the same direction for girls, but not statistically reliable or different from that of boys.
These rather complicated and seemingly inconsistent results are difficult to reconcile. The moderation of parenting on relational aggression by impulsivity-inattention was observed only for boys, suggesting that their higher mean levels of impulsivity-inattention relative to girls may present more challenges to parenting. This finding is consistent with current findings from the physical aggression literature that suggest impulsivity-inattention moderates the impact of parenting on rates of physical aggression (Morris et al., 2002), and extends this relationship to the development of relational aggression. However, negative parenting increased risk for observed relational aggression, but positive parenting increased risk for peer-nominated relational aggression for boys high on impulsivity-inattention. This inconsistency may reflect measurement method specific effects.

In terms of observed relational aggression, the gender difference in the moderation of negative parenting by high impulsivity-inattention might be the opposite of that expected. One might expect that girls, more than boys, would learn to express aggression in a more subtle, relationally aggressive form when involved in a relatively negative and coercive disciplinary environment. Results of this study suggest this is not the case. The absence of this relationship for girls may be a reflection of the manifestation of impulsivity-inattention in girls. Kaiser et al. (2011) point out a range of socially inept behaviors may be displayed by children with impulsivity-inattention, from intruding on others and dominating conversations to being “spacey” and “tuned out” socially. Further, Hinshaw and Blachman (2005) found that girls are more likely to display the socially inattentive forms of impulsive-inattentive behaviors. One may reason that, impulsive-inattentive girls would not be as skillful in their attempts to launch relationally aggressive attacks, and when exposed to a negative and coercive parenting
environment, these behaviors may be quickly extinguished. This also appears to be consistent with the findings of Vaillancourt et al. (2007) in that lower family functioning at age 2 years (defined as problem solving, communication, affective involvement, responsiveness, and behavioral control) was negatively related to rates of relational aggression in girls at age 10 years. While impulsivity-inattention was not included in the Vaillancourt et al. (2007) analyses, exposure to negative parenting may suppress rates of relational aggression in girls. However, this logic contrasts with the finding that positive parenting was associated with higher levels of peer nominated relational aggression for boys higher on inattention-impulsivity (and, while not significant, in the same direction for girls). Consistent with research suggesting that relationally aggressive children may be quite socially skilled (Kaukiainen et al., 1999), this finding suggests that parental efforts to teach skills to impulsive-inattentive children may actually promote their capacity for relational aggression.

There are no previous research reports examining the interaction of parenting processes and impulsivity-inattention on the growth of relational aggression to which the results in this report can be compared. One study was located which investigated interaction of parenting process and impulsivity-inattention on the growth of physical aggression. Morris and colleagues (2002) found that the interaction between maternal hostile parenting and child-effortful control significantly predicted concurrent rates of physical aggression in a sample of second grade children. For children higher in effortful control (lower in impulsivity-inattention), maternal hostile parenting was not related to physical aggression. However, this moderator effect was not replicated in this study using observed or peer nominated physical aggression. The results in this study clearly indicate that, consistent with previous research, risk for the
development of aggressive behavior is influenced by parenting more so for boys higher on inattention-impulsivity. However, generally speaking, the association of impulsivity-inattention with aggression in girls appears to be less sensitive to the influence of parenting.

**Parenting processes and verbal ability.** No significant effects were found for the interaction of positive parenting and child verbal ability on the growth of relational and physical aggression. Examination of the results for the interaction of negative parenting and child verbal ability indicated growth in neither boys nor girls’ physical aggression was predicted by this interaction. However, for boys higher versus lower in verbal ability, negative parenting was a modest predictor of higher levels of observed relational aggression, and a strong predictor of higher levels of boys’ peer-nominated relational aggression. While these paths were only significant for boys, gender differences were not significant, suggesting this process may operate similarly in boys and girls.

These results provide very modest evidence suggesting that, when subjected to high rates of negative parenting, children higher on verbal abilities increasingly use relational forms of aggression. It is logical to reason that if one is equipped with the necessary verbal abilities to utilize relational aggression, this form may be chosen over physical aggression in the face of direct aversive experiences, taking advantage of the more surreptitious and indirect nature of relational aggression. Björkqvist (1994) explains that, when contemplating aggressive strategies, one is most likely to choose the most effective strategy with the least likelihood of detection.

Previous research has not examined the moderating effect of verbal ability on the relationship between parenting and relational aggression. However, the notion that negative
parenting processes are related to relational aggression has been supported by the accumulation of the relational aggression research. Research has consistently found coercive interactions with parents to predict both concurrent (Casas et al., 2006; Hart et al., 1998; Sandstrom, 2007; Nelson et al., 2006) and future (Côté et al., 2007; Vaillancourt et al., 2007) relational aggression. However, in contrast to the current findings that this relationship is stronger for boys, findings from previous research indicate the relationship between coercive parenting and relational aggression is more strongly associated with girls’ than boys’ relational aggression, with the exception of one study that found no gender difference (Sandstrom, 2007).

The moderating effect of child verbal ability on the relationship of negative parenting and relational aggression may be explained by social learning and coercion theory. These theories state that children learn aggressive strategies during interactions with parents (Bandura, 1977; Patterson, 1982; Patterson, et al., 1992). Strategies characteristic of negative parenting involve verbal threats, serving as a model relationally aggressive strategies. Parents may also inadvertently reinforce relationally aggressive strategies. This process may be more likely to occur for children higher in verbal skills, as they may be more adept at learning and utilizing relationally aggressive strategies modeled by their parents. The reason why this may be more characteristic of boys than girls is not clear; there was no significant gender difference in mean levels of negative parenting or child verbal skills.

Summary

The cumulative findings in this study indicate that, consistent with the extant research on physical aggression, boys relative to girls displayed higher mean rates of peer-nominated and observed physical aggression. Boys also received more nominations for relational
aggression than girls, different than previous research which suggests that girls tend to display more relational aggression than boys (Card et al., 2008). However, this finding for peer-nominated aggression may be related to reputation bias rather than true rates of aggression. This, along with the strong temporal continuity of aggression as assessed by peer nominations suggests that once a child has developed a reputation as being aggressive –either relation or physical, there may be little this child can do to influence peers’ opinion. This raises questions about the validity of peer ratings of aggression, as this information may be highly influenced by generalized perceptions rather than a providing a measure of a child’s actual rate of aggression.

The data in this study also indicated that child impulsivity-inattention was more powerfully associated with physical and relational aggression than was verbal ability. This provides important direction for future research, especially concerning relational aggression. Research on relational aggression has devoted a significant effort in examining the relationship between child verbal abilities and relational aggression (Björkqvist, Lagerspetz, & Kaukiainen, 1992; Björkqvist, Österman, & Kaukiainen, 1992; Bonica et al., 2003; Côté et al., 2007). Results of this study suggest that, while verbal abilities may facilitate rates at which relational aggression is deployed during peer interaction, impulsivity-inattention makes a more direct and consistent contribution to children’s actual propensity to utilize relationally aggressive tactics. It also appears that impulsivity-inattention places children similarly at risk for engaging in relational and physical aggression. Gender differences in the association of impulsivity-inattention with aggression in this study suggest impulsivity-inattention facilitates manifestations of aggression in gender prototypical ways. Specifically, inattention-impulsivity has been more consistently associated with physical aggression by boys (Nagin & Tremblay,
2001), whereas recent research connects impulsivity-inattention with relational aggression by girls (Vaillancourt et al., 2007). The association of inattention-impulsivity with both forms of aggression provides support for the notion that, while topographically different, relational and physical aggression seem to share functional commonalities.

Findings from this study also suggest greater sensitivity of boys than girls to parenting processes in terms of the development of aggression. There are several explanations for why this might be the case. First, boys tend to be more aggressive than girls and are also socialized in same-gender (male peer) environments characterized by greater conflict and aggression. As such, small variations in parenting may lead to large individual differences in boys’ aggression in the peer environment. The high rates of aggressive behavior displayed by boys may also negatively influence parenting so that positive parenting strategies are reduced and coercive strategies are increased. This is consistent with results reported by Vaillancourt et al. (2007), who found that fewer positive interactions with parents and less consistent parenting were associated with growth in relational aggression for boys, but not for girls. Similarly, Kuppens et al. (2009) found that exposure to physical punishment incremented risk for physical aggression more strongly for boys than for girls. There is also evidence to suggest that boys evidence higher average levels of impulsivity-inattention (American Psychiatric Association, 2000) and slower verbal development relative to girls during early childhood (Maccoby & Jacklin, 1974). The kindergarten school year may therefore represent a time in which boys are more sensitive to perturbations in socialization in home and peer settings.

The results suggest that the manner and degree to which parenting processes influence the development of aggressive behavior depends on child characteristics, rather than providing
a direct influence. Extant research on relational aggression indicates that negative parenting behaviors such as anger, harsh discipline, nattering and aversive parenting, and negative reinforcement of child aversive behaviors, increment risk for children’s displays of aggression, but the data in this study indicate such associations are conditional on the child’s inattention-impulsivity and gender.

This study adds to the small body of research investigating the moderating role of child characteristics in the relationship between parenting and child aggression. Consistent with this research, this study suggests that child gender, verbal ability, and inattention-impulsivity all moderated the association of parenting with growth in aggression. The manner in which child characteristics moderated this relationship was rather complex, and did so somewhat differently depending on the topography of the aggressive behavior.

**Implications for Intervention**

The results of this study have implications for interventions aimed at reducing children’s aggressive behavior. The data indicate suggest that interventions with both parent and child components may be more effective at reducing rates of child aggression than interventions focused on one of these components alone. Though not assessed in this study, growth in relational aggression is also influenced by the peer environment in addition to parent and child factors. For example, a process of peer deviancy training described by Snyder et al. (2010) has been found to facilitate growth of antisocial behaviors. Through the process of peer deviancy training, peers model and reinforce displays of antisocial behavior, while factors such as ineffective parenting moderate this relationship. Accordingly, relational aggression
interventions that target both the parent and child skills along with the peer environment may result in additional reductions in rates of relational aggression.

While there are few interventions that directly focus on reducing relational aggression, results of this study indicate impulsivity-inattention is a salient risk factor for both physical and relational aggression. Accordingly, interventions intended to address impulsivity-inattention may also influence rates of associated physical and relational aggression. Pelham and Fabiano (2008) conducted a review of evidence-based treatments for attention-deficit/hyperactivity disorder (ADHD), which encompassed studies published between 1997 and 2006 that investigated the effects of behavioral treatment as a stand-alone treatment, or in comparison to another treatment. Results of this review indicate behavioral parent training interventions (BPT) meet criteria for a well-established treatment for ADHD. Interestingly, there were no significant differences in ADHD symptoms between behavioral parent training groups and medication groups. However, parents participating in behavioral parent training reported perceived improvements in child problem behaviors, observed parenting skills, and higher treatment satisfaction. This suggests that behavioral parent training may provide additional support for parents’ whose positive parenting skills may wear thin from the challenges of managing a child with ADHD symptoms, and that intervention-induced reductions in child inattention and impulsivity may indirectly reduce rates of relational as well as physical aggression. This review also found substantial support for the efficacy of behavioral classroom interventions utilizing contingency management and daily report card communication to parents about their child’s behavior at school. Results also indicated summer treatment programs utilizing contingency management procedures to improve children’s functioning
during peer interactions are a well-established treatment for ADHD symptoms (Pelham & Fabiano, 2008). This suggests that contingency management interventions reduce ADHD symptoms and improve children’s social interactions. Decreases in ADHD behaviors, and improved ability to effectively relate to peers may in turn decrease rates of physical and relational aggression. Equally important, results also suggest behavioral parent training may support parents’ efforts to implement positive parenting practices when faced with the challenges of difficult to manage ADHD related behaviors.

Classroom-based interventions that address relational aggression within a broader context of promoting prosocial behavior and reducing aggression and other disruptive behavior have been suggested as a best-practice intervention (Merrell, Buchanan & Tran, 2006). Classroom based interventions such as the Good Behavior Game promote prosocial development and reduce rates of aggression at school through the modification of peer contingencies for overt, physical aggression. The Good Behavior Game has been shown to be effective at reducing rates of hyperactive and oppositional behavior within the classroom (Leflot, van Lier, Onghena, & Coplin, 2010). The Good Behavior Game may indirectly diminish children’s risk for relational aggression by reducing associated overt aggressive behavior, but it would be possible to further reduce relational aggression by explicitly modifying peer contingencies for relational as well as direct aggression.

Efforts to apply and adapt the Good Behavior Game and parenting interventions to reduce relational aggression may be facilitated by attention to several issues. First, the covert nature of relational aggression may make this form of aggression more difficult for teachers and parents to detect and therefore adequately modify through contingency management.
Increasing parents’ and teachers’ awareness by providing a description of relational aggression, its behavioral manifestations, and associated antecedents and outcomes may facilitate efforts to intervene on relational aggression in the home or at the classroom level (Merrell et al., 2006). Second, the Good Behavior Game in part operates by reinforcing prosocial behaviors and by increasing positive interactions between teachers and students. Attempts to enhance positive parenting practices in the home similarly focus on promoting child skills. However, previous research on relational aggression and data from this study suggest some relationally aggressive children may be quite socially skilled (Kaukiainen et al., 1999). As such, efforts to simply promote socially skilled behavior in the absence of tracking and contingencies to reduce relational aggressive behavior may be insufficient.

**Strengths and Limitations**

This study has several strengths. First, utilizing multiple informants to define the composite constructs of parenting and inattention-impulsivity reduced measurement error. The multi-informant design eliminated sources of discrepancy due to biases that are inherent to each informant method, and sources of shared method variance that can inflate results when the same informant is used to measure several variables. Second, the etiology of relational and physical aggression was assessed simultaneously, and this is the only way to make direct comparisons between these two topographically different, but perhaps functionally similar constructs. Third, because relational and physical aggression are hypothesized to unfold on different developmental time tables and to do so differently for boys and girls, it is important to assess differences in rates and origins of relational and physical aggression at key points in development, such as the transition to elementary school which was the focus of this study.
Fourth, the inclusion of both positive and negative parenting constructs provided a more complete account of the role of parenting processes in the development of relational and physical aggression. In addition to identifying undesirable, ineffective and coercive parenting behaviors which are often found to promote growth and persistence of aggression, the focus on positive, skilled parenting may provide information on protective factors. Fifth, the inclusion of child characteristics allowed for the investigation of how these variables might moderate the impact of parenting on the development of relational and physical aggression, and indicate which children are most at risk and need to be targeted in selective interventions. Finally, including separate models for boys and girls illustrated how parent and child characteristics may differentially affect rates of relational and physical aggression among boys and girls.

The results in this study must also be interpreted in light of several limitations. First, data for this study were collected over the span of approximately one school year, which restricts the ability to adequately reflect longer-term developmental changes in rates or forms of aggressive behavior. Future investigations that span longer periods of childhood through adolescence would provide a more accurate estimation of the influence of parent processes and child characteristics on relational and physical aggression. Including preschool aged children in future samples may provide more insight into the relationship between verbal ability and relational aggression for girls. Second, inferences about the causal status of associations observed in this study must be made with care given the use of a passive longitudinal design. Third, the children included in this sample were primarily from lower-middle class families from one geographic area so that the generalization of the results to children and families from other socioeconomic classes and geographic areas must be made with caution. Though not an
inherent limitation, the lack of convergence between observed rates of aggression and peer nominations for aggression, and the substantial difference in estimates of their continuity over the kindergarten year raise the question about measurement methods. These questions are relatively unresolved in the research literature, and are complicated in that different measurement methods may be better for the assessment of relational and physical aggression. For example, physical aggression is quite apparent to external observers so that observation may be the measure of choice. In contrast, relational aggression may be much more subtle and subject to greater reactivity so that peer nominations may be the measure of choice.

**Conclusion and Future Directions**

The results of this study point to the salience of impulsivity-inattention in the development of aggressive behavior in early elementary school aged boys and girls. Given the inconsistencies in positive and negative outcomes associated with perpetration of relational aggression, examining individual differences among perpetrators may provide some explanation for this relationship within the context of child development. Kindergarten may represent a point in development in which children are more willing to experiment with new forms of aggression, while later in development children may be less willing to utilize tactics that have not been successful in the past. Thus, during the kindergarten transition, impulsive-inattentive children may frequently use unskilled relationally aggressive tactics. The impulsive, reactive nature of impulsive-inattentive children’s efforts may, however, be experienced as annoying or aversive by peers, and these children may also lack the social collateral needed to successfully deploy relational aggression. Thus, unskilled relational aggression is likely to be extinguished by peer contingencies, and their aversive nature may also lead the perpetrator to
become socially marginalized. Conversely, perpetrators with advanced social intelligence and social collateral may deploy relational aggression more skillfully. Indirect relationally aggressive strategies such as spreading rumors or convincing others to dislike the victim may also allow the perpetrator to avoid detection and obtain reinforcement when social status or relationships are successfully manipulated.

The observed association of impulsivity-inattention with relational and physical aggression suggests that these two forms of aggression may share similar functions. However, interpretation of research on relational and physical aggression is complicated by the differences in results due to the measurement source of aggression. In the present study, peers were not able to discriminate between relational and physical aggression, while trained observers were. Resolving these issues may require a more refined definition of aggression more broadly speaking, specifically focusing on how relational and physical aggression represent functionally and topographically separate subsets of aggressive behavior. It will be important for future research to address this issue, which in itself may be gender specific. For example, while relational aggression is deployed by both boys and girls, research suggests that girls perceive relational aggression to be more hurtful than boys (Crick, 1995; Paquette & Underwood, 1999), perhaps indicating gender specific functional properties. Research also indicates that girls are more at risk for the negative outcomes associated with relational aggression as compared to boys (Crick, 1996; Crick et al., 2006; Prinstein et al., 2001). Further clarification of these relationships may help inform interventions that address relational aggression victimization and perpetration.
REFERENCES
REFERENCES


APPENDIX
Table 1

*Parent and Child Measures*

<table>
<thead>
<tr>
<th>Positive Parenting Measures</th>
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<tbody>
<tr>
<td>Parent Skilled Teaching (FPP and SPAFF observation)</td>
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<tr>
<td>Parent Skilled Discipline (FPP and SPAFF Observations)</td>
</tr>
<tr>
<td>Positive Parenting (FPP and SPAFF observations)</td>
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<tr>
<td>Parent Tracking (FPPP and SPAFF observations, P-SIP vignettes)</td>
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<tr>
<td>Parent Positive Emotions (rpm SPAFF observations)</td>
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<td>Parent Positive Interaction (rpm FPP observations)</td>
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<td>Parent Harsh Discipline (FPP and SPAFF observations)</td>
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<td>Parent Nattering and Aversive Behavior (rpm FPP observations)</td>
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<td>Parent Negative Reinforcement (odds ratio from FPP observations)</td>
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<td>Parent Anger (rpm SPAFF observations)</td>
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<tr>
<th>Child Measures</th>
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<tr>
<td>Impulsivity-Inattention (CBCL, TMT, WISC-III digit span, AET, observer impressions)</td>
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<tr>
<td>Verbal ability (PPVT-R)</td>
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<td>Physical aggression (playground observations, peer sociometric ratings)</td>
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<td>Relational aggression (playground observations, peer sociometric ratings)</td>
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<table>
<thead>
<tr>
<th>Measure</th>
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<th>Standard Deviation</th>
<th>Skewness</th>
<th>Kurtosis</th>
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<td>RPM parent natter</td>
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<td>.64</td>
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<td>Positive parenting</td>
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<td>Parent tracking</td>
<td>2.08</td>
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<td>-.69</td>
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</table>

Note. K = kindergarten, FK = fall of kindergarten, SK = spring kindergarten, PA = physical aggression, RA = relational aggression, CBCL = Child Behavior Checklist (parent), Obs = observed, AET = academic engaged time, TMT= trail making test, PPVT-R = Peabody Picture Vocabulary Test-Revised.
Table 2 (continued)

**Descriptive Statistics for Parent and Child Measures**

<table>
<thead>
<tr>
<th>Measure</th>
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<th>Skewness</th>
<th>Kurtosis</th>
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*Note.* K = kindergarten, FK = fall of kindergarten, SK = spring kindergarten, PA = physical aggression, RA = relational aggression, CBCL = Child Behavior Checklist (parent), Obs = observed, AET = academic engaged time, TMT = trail making test, PPVT-R = Peabody Picture Vocabulary Test-Revised.
Table 2 (continued)

**Descriptive Statistics for Parent and Child Measures**

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Note. K = kindergarten, FK = fall of kindergarten, SK = spring kindergarten, PA = physical aggression, RA = relational aggression, CBCL = Child Behavior Checklist (parent), Obs = observed, AET = academic engaged time, TMT= trail making test, PPVT-R = Peabody Picture Vocabulary Test-Revised.
Table 3

Correlations Among Parenting Measures

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<th>Par anger</th>
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<th>Skilled teach</th>
<th>Effect disc</th>
<th>Pos par</th>
<th>Pos emo</th>
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Note. *p < .05, **p < .01.
### Table 4

**Correlations Among Impulsivity-Inattention Measures**

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<th>WISC-III digits reversed</th>
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<th>Observer impressions inattention</th>
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*Note. *p < .05, **p < .01.*
Table 5

**Correlations Among Measures of Aggression**

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*Note.* Obs = Observations, Nom = Nominations.
*p < .05, **p < .01.
**TABLE 6**

*Correlations Between Family SES and Number of Siblings and SEM Constructs*

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<th>Noms RA FK</th>
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<td>.01</td>
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*p < .01, **p < .001.
### TABLE 7

*Summary of Structural Equation Models*

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<td>.08</td>
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<td>.53***</td>
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Note. PA = Physical Aggression, RA = Relational Aggression, *p < .10; *p < .05; **p < .01; ***p < .001.
TABLE 7 (continued)

Summary of Structural Equation Models

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<th>RA Nominations</th>
<th>Sex Diff.</th>
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*p < .10; *p < .05; **p < .01; ***p < .001.
**TABLE 8**

*Gender Differences in SEM Constructs*

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Note. FK = Fall Kindergarten, SK = Spring Kindergarten, Obs = Playground Observations, Nom = nominations, PA = Physical Aggression, RA = Relational Aggression C.R. = Critical Ratio, **p < .01; ***p < .001.