Social-Cognitive and Emotion Processing in Children's Aggression:
Descriptors, Predictors, and Precursors

by

Lindsey Ann Combs-Ronto

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Doctoral Committee:

       Professor Sheryl L. Olson, Chair
       Professor Arnold J. Sameroff
       Professor Henry M. Wellman
       Assistant Professor Elizabeth T. Gershoff

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Dedication

To my mom, Lisa Ronto, who I hope is looking down on me with pride; my dad, Darrell Ronto, who tells anyone who will listen what a proud father he is; my boyfriend, James Gatherwright, who loves, supports, and reassures me – particularly when I am stressed; and my friends, especially Tanya Dierks, Christy Mercado, Leonard Noel, and Dave Stockton, who have supported and cheered for me as long as they have been in my life.

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Abstract

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Chair: Sheryl L. Olson

Components of boys' and girls' early social information and emotion processing
were investigated. The first study used narrative themes derived from the MacArthur
Story Stem Battery and measures of emotion understanding to examine how individual
differences in children's affective social-cognitive schemata related to hostile attribution
biases. Results revealed that distinct schemata related to physical and relational
aggression were uniquely associated with hostile attribution biases. Also, deficits in
emotion understanding were associated with hostile attribution biases only for girls.
These findings suggest that maladaptive affective social-cognitive schemata are present
early in development and are related to hostile attribution biases in gender-specific ways.

In the second study, individual differences in children's affective social-cognitive
schemata, hostile intent attributions, and skills in emotion regulation were examined in
relation to teacher reports of overt and relational aggression. Results indicated that
deficits and biases in social information and emotion processing contributed to the

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display of boys' overt aggression uniquely, but interacted to contribute to the display of

boys' relational aggression. However, deficits in emotion processing primarily

contributed to the display of girls' overt and relational aggression. Thus, findings suggest

distinct patterns in the development of overt and relational aggression during the

kindergarten period and underscore the importance of including measures of both social-

cognitive and emotion processes in investigations of children's aggression.

In the third study, mothers' parenting and discipline techniques, children's

emotion understanding, and children's susceptibility to anger during preschool were

examined in relation to children's affective social-cognitive schemata during

kindergarten. Results revealed that early deficits and biases in emotion processing

predicted less socially adaptive schemata for boys, whereas early deficits and biases in

emotion processing interacted with mothers' parenting to predict more skills in emotion

processing for girls. These findings suggest that antecedents to maladaptive affective

social-cognitive schemata differ for boys and girls and are present as early as the

preschool period.

Findings are integrated and discussed in relation to future research design, as well

as preventative and interventional measures in the development of children's physical

and relational aggression.

Chapter I

Introduction

Social cognition encompasses a variety of interpersonal domains including an individual's knowledge, perception, attitudes, and behavior in relation to social situations (Bennett, Farrington, & Huesmann, 2005). Effective use of social-cognitive strategies enables a child to navigate interpersonal relationships and social cues effectively. However, deficits in social cognition are linked with social maladjustment and to the development of psychopathology. High levels of peer aggression in particular have been linked with a broad range of deficits and biases in social cognition, specifically in the mechanism of social information processing (Burks, Laird, Dodge, Pettit, & Bates, 1999; Crain, Finch, & Foster, 2005; Crick & Dodge, 1994; Dodge & Pettit, 2003; Yoon, Hughes, Gaur, & Thompson, 1999). Social information processing has been defined as a mechanism underlying *how* differences in aggression arise and are theorized to reflect real-time, online brain processes that occur immediately before a behavior is enacted (e.g., Crick & Dodge, 1994; Dodge & Pettit, 2003; Dodge, 2006). Thus, individual differences in social information processing, as well as in the development of this mechanism, play a key role in the development of aggressive behavior.

Crick and Dodge's (1994) multi-step social information processing model describes how aggression is linked with particular deficits at each step and has found widespread empirical support (see Yoon et al., 1999, for a review). However, researchers

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have recently argued that Crick and Dodge's (1994) model of social information

processing is incomplete without the consideration of emotion processes (Denham et al.,

2002; Izard, 2001; Izard, Fine, Mostow, Trentacosta, & Campbell, 2002; Lemerise &

Arsenio, 2000). In particular, Lemerise and Arsenio (2000) noted that emotion processes

aid children in quickly organizing, prioritizing, and processing salient social information.

This is of particular importance during the initial step of interpretation because errors or

biases here set the foundation for subsequent deficits in social information processing.

Beginning at this step, children reference latent mental structures, or social knowledge, to

help guide processing of social cues (Crick & Dodge, 1994). These knowledge structures

act as implicit, automatic memories of past experiences (Bugental & Johnston, 2000;

Burks et al., 1999), which aid in social information processing by quickly filling in

missing information from an ambiguous or complex social cue (Burks et al., 1999; Crick

& Dodge, 1994). As researchers have recently noted, such knowledge structures contain

both affective and social-cognitive information due to increased connections between

emotional and cognitive systems over the course of development (Izard, 2001; Izard et

al., 2002). Thus, if a child is confronted with an ambiguous or complex social situation, a

knowledge structure containing both affective and social-cognitive information will be

referenced to help the child interpret situational cues and respond accordingly (e.g.,

Lemerise & Arsenio, 2000). As a result, deficiencies in emotional or social knowledge, as

well as maladaptive links between emotional and cognitive systems, would lead to errors

in interpretation.

A large body of research does suggest that children are more likely to attribute

hostile intent and respond in a hostile, aggressive manner in ambiguous social situations

when the referenced knowledge structure is hostile (Dodge, 1980; Dodge, 2006; Dodge & Pettit, 2003). Likewise, deficits in emotion understanding increase the probability that an angry, hostile emotion attribution bias will be exhibited (Izard, 2001; Schultz, Izard, & Bear, 2004). For example, research has indicated that repeated exposure to anger may lead a child to assume that peers will also express anger more often and subsequently will attribute anger and hostility to peers' actions in ambiguous situations (Schultz, Izard, & Bear, 2004). While there is evidence for a relationship between deficits in children's emotion understanding, social information processing, and the presence of aggressive behaviors, (e.g., Denham et al., 2002; Dodge, 2006; Hughes, Dunn, & White, 1998), relatively few studies have included emotion understanding deficits in investigations of social information processing, particularly during the preschool to school transition. Another limitation of existing studies is their focus on older elementary-school age and middle school children, boys, and physical aggression. This approach ignores early gender differences in the display of aggression, especially given that girls utilize relational aggression more often than boys (Crick et al., 2006; Ostrov & Keating, 2004). Thus, more research is needed to examine how maladaptive affective social-cognitive knowledge structures develop among young boys and girls in relation to different forms of aggression.

Improperly regulated emotions can also increase the likelihood that children will misinterpret social cues by accessing mood congruent information or knowledge structures (e.g., Denham et al., 2002; Izard, 2001; Lemerise & Arsenio, 2000). This inability to assess the situation from different cognitive and affective perspectives increases the probability that children will engage in preemptive processing, in which the

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child responds "automatically" with predetermined and inaccurate attributions and behaviors (Crick & Dodge, 1994; Dodge, 2006). Thus, the combination of poor regulatory abilities and deficient or maladaptive skills in emotion understanding would make the display of aggression more likely due to preemptive processing and the recall of deviant emotion-congruent knowledge structures. Again, few studies have included deficits in early emotion regulation in investigations of social information processing mechanisms. Available research reveals mixed findings regarding the role of emotion regulatory abilities in social information processing (e.g., Musher-Eizenman et al., 2004; Orobio de Castro, Merk, Koops, Veerman, & Bosch, 2005) despite evidence that children's inability to regulate their own emotions, especially in combination with intense negative emotional displays, is linked with higher levels of anger expressions, externalizing behavior, and aggression (e.g., Campbell, Shaw, & Gilliom, 2000; Eisenberg et al., 1996; Keenan, 2000). Further research is needed to understand how children's ability to regulate their own emotions, particularly during the preschool to school transition, influences social information processing mechanisms.

Further, even fewer studies have examined how early child and environmental characteristics influence the development of children's affective social-cognitive knowledge structures. This is a crucial area of investigation given that a number of studies have indicated that deficits in social information and emotion processing are found as early as the kindergarten years (e.g., Burks et al., 1999; Denham et al., 2002; Dodge, 2006; Hughes, Dunn, & White, 1998). A budding literature suggests that parenting practices and social information processing mechanisms are linked, particularly with respect to the display of harsh physical discipline (Criss, Pettit, Bates, Dodge, &

Lapp, 2002; Criss, Shaw, & Insgoldby, 2003; Haskett & Willoughby, 2007; Heidgerken, Hughes, Cavell, & Willson, 2004; Scaramella & Leve, 2004). For example, Heidgerken and colleagues (2004) examined a dual mediation model on the relationship among harsh parenting, social information processing, and child aggression in second through fourth graders. They found that harsh parenting, characterized by inconsistent and harsh discipline, increased the likelihood that children would endorse more hostile goals, which in turn increased children's tendency to attribute hostile intent in ambiguous social situations and choose more aggressive responses. These findings support a robust literature linking harsh parenting practices with the display of aggression (e.g., Bates, Pettit, Dodge, & Ridge, 1998; Dodge, Pettit, & Bates, 1994; Gershoff, 2002; NICHD Early Child Care Research Network [ECCRN], 2004; Patterson, 2002) and suggest that parenting practices may influence the development of aggression through social information processing mechanisms. A longitudinal examination of the relationship between early parenting practices and children's social information processing would help to elucidate one avenue through which aggression may develop.

Finally, an important limitation of studies conducted on the development of social information processing in children involves the methodology used to assess this mechanism. In particular, the majority of researchers have presented children with hypothetical vignettes that use verbal responses to index social information processing variables such as knowledge structures (e.g., Burks et al., 1999; Dodge, Laird, Lochman, Zelli & Conduct Problems Prevention Research Group [CPPRG], 2002; Zelli, Dodge, Lochman, Laird, & CPPRG, 1999). Although this method has demonstrated reliability and validity (Yoon et al., 1999; Dodge, 2006), it assumes that the child has developed the

cognitive skills to understand the written vignettes and also has the linguistic ability to provide an explicit, verbal answer. However, young children who are just beginning to grasp reading concepts and/or have limited linguistic abilities may have difficulty with this particular task or may simply provide a limited range of answers. Children may also be less emotionally invested in the vignettes because they are delivered in an interview format and do not require more active participation. This may give children more time to process the vignettes and provide more socially adaptive answers because they are not required to regulate their emotions at the same time that they are processing social information. Therefore, it is important to examine children's social information processing through a more interactive, hands-on approach in an effort to capture children's implicit mental representations as they occur during interpersonal exchanges in real time.

As a result, this dissertation will use a three-manuscript format designed to address each of the limitations listed above. Chapter II focuses on using themes derived from a narrative technique called the MacArthur Story Stem Battery (MSSB; Bretherton, Oppenheim, Buchsbaum, Emde, & the MacArthur Narrative Group, 1990) and scores derived from an emotion understanding task to develop an index of children's early affective social-cognitive knowledge structures during the kindergarten period and explores the relationship between this index and the presence of a hostile attribution bias. The MSSB was chosen as an index of social information processing because it is based on research involving internal working models, symbolic play, scripts, and schemas and uses an interactive, hands-on approach to capture children's internal mental representations of experience, as well as how children view themselves and others in that

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experience (Emde, 2003; Oppenheim, 2006). In this task, children are asked to make meaning out of an unresolved situation while effectively organizing emotions as they actively cope with the challenges of the story in their effort to address and resolve the conflict (Emde, 2003; Oppenheim, Nir, Warren, & Emde, 1997). This parallels ambiguous interpersonal contexts where children access knowledge structures as they actively process social and emotional information while coping with their own emotional processes; consequently, children's resolution to the conflicts likely reflect information contained in affective social-cognitive knowledge structures. Chapter III focuses on qualitative differences in children's affective social-cognitive schemata and skills in emotion regulation during the kindergarten period and investigates how differences relate to teacher reports of physical and relational forms of aggression. Chapter IV focuses on preschool predictors of kindergartners' affective social-cognitive schemata and examines how mothers' use of harsh and non-harsh discipline techniques, children's early emotion understanding, and early susceptibility to anger interact to predict children's future affective social-cognitive knowledge structures. Finally, Chapter V integrates the findings and discusses implications in relation to preventative and interventional measures in the development of children's physical and relational aggression.

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Chapter II

Assessing Affective Social-Cognitive Schemata of Aggression in Kindergarten:
The Utility of the MSSB

Social cognition encompasses a variety of interpersonal domains including an individual's knowledge, perception, attitudes, and behavior in relation to social situations (Bennett, Farrington, & Huesmann, 2005). Effective use of social-cognitive strategies is important for a number of functions in a child's life. A child must use components of social cognition to understand appropriate ways to introduce themselves into a play situation, understand facial expressions and nonverbal behaviors from a child who wants to be left alone, and respond appropriately in these interpersonal contexts. In other words, social cognition enables a child to navigate their social world effectively and maintain harmonious interpersonal relationships. On the other hand, deficits in social cognition are linked with social maladjustment and to the development of psychopathology. In particular, high levels of peer aggression have been linked with a broad range of deficits and biases in social cognition, specifically in the mechanism of social information processing (Burks, Laird, Dodge, Pettit, & Bates, 1999; Crain, Finch, & Foster, 2005; Crick & Dodge, 1994; Dodge & Pettit, 2003; Yoon, Hughes, Gaur, & Thompson, 1999). Social information processing has been defined as a mechanism underlying *how* differences in aggression arise and are theorized to reflect real-time, online brain processes that occur immediately before a behavior is enacted (Crick & Dodge, 1994; Dodge & Pettit, 2003; Dodge, 2006; Murray, Woolgar, Briers, & Hipwell, 1999; Shields,

Ryan, & Cicchetti, 2001). Thus, individual differences in social information processing, as well as in the development of this mechanism, play a key role in the development of aggressive behavior.

Social Information Processing

According to the model proposed by Crick and Dodge (1994), children must perform various cognitive tasks in order to respond appropriately to a given social situation. Crick and Dodge (1994) argued that children engage in the following six sequential steps: encoding of cues, interpretation of cues, clarification of goals, response access or construction, response decision, and behavior enactment. For example, consider the scenario where a boy is being teased by peers at school (Dodge & Pettit, 2003). According to the model, this boy must attend to and encode the relevant social cues (e.g., children are laughing at comments made about me) and interpret the meaning of these cues (e.g., I am being teased on purpose; there is hostile intent involved). The boy then would consider what he hopes to accomplish with a response (e.g., I will show them that I won't be teased!) and access potential responses to the situation (e.g., I could hit the others to make them stop; I could tell them it's not true; etc.). Finally, the boy selects a response (e.g., I am going to hit them to make them stop) and enacts the behavior. A large body of research has investigated each step of this process in relation to aggressive behavior and has found aggression to be linked with particular deficits at each step (see Yoon et al., 1999, for a review). However, the initial step of interpretation is of primary importance because errors or biases here influence subsequent steps. Consequently, numerous studies have investigated this step to determine what particular errors are made.

A robust literature indicates that the display of aggressive behaviors is associated with a hostile attribution bias at this step, particularly in ambiguous social situations (Crick & Dodge, 1994; Orobio de Castro, Veerman, Koops, Bosch, & Monshouwer, 2002; Dodge, 2006; Dodge & Pettit, 2003; Dodge, 1980; Feldman & Dodge, 1987; MacBrayer, Milich, & Hundley, 2003; Steinberg & Dodge, 1983; Yoon et al., 1999). In his pioneering study on third and fifth grade boys' reactions to their constructions being knocked over by a peer, Dodge (1980) found that both aggressive and nonaggressive boys responded appropriately when the peers' intent was clear. For example, when it was clear that the peer's action was accidental, both groups of boys responded in a benign manner; additionally, both groups responded in a hostile manner when it was clear the peer's action was intentional. However, when the peers' intent was ambiguous, aggressive boys responded as if the peers' intention had been hostile whereas nonaggressive boys responded as if the peers' intention had been benign. Dodge concluded that the aggressive boys displayed a hostile attribution bias and subsequent studies have replicated this finding across a wide range of ages and populations, as well as across gender (e.g., Crick & Dodge, 1996; Dodge & Tomlin, 1987; Dodge, 2006; Feldman & Dodge, 1987; Guerra & Slaby, 1990). Such findings underscore the importance of examining a child's attribution in the context of a given situation, but say little about how a hostile attribution bias develops and is maintained.

Dodge (2006) recently postulated that it is children's maladaptive knowledge structures that directly influence the tendency to attribute benign versus hostile intent in ambiguous situations. As Crick and Dodge (1994) noted, children reference latent mental structures, or social knowledge, to help guide processing of social cues in each step of the

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social information processing model. These latent mental structures have also been referred to as schematic cognitions (Bugental & Johnston, 2000), internal working models (Bowlby, 1980; 1982), scripts (Huesmann, 1988), and knowledge structures (Cervone & Shoda, 1999; Burks et al., 1999; Lemerise & Arsenio, 2000). Knowledge structures act as implicit, automatic memories of past experiences (Bugental & Johnston, 2000; Burks et al., 1999), which aid in social information processing by quickly filling in missing information from an ambiguous or complex social cue (Burks et al., 1999; Crick & Dodge, 1994; Higgins, 1990). Thus, if a child is confronted with an ambiguous situation, a knowledge structure will be referenced to help the child interpret and decide on the appropriate course of action. If that knowledge structure is hostile, then the child will be more likely to attribute hostile intent, which then increases the likelihood that a child will choose a hostile, aggressive response (Dodge, 2006). In turn, future experiences modify children's knowledge structures so that if an aggressive response is reinforced, its representation is further strengthened in the knowledge structure and it becomes more likely to be accessed again (Crick & Dodge, 1994; Dodge & Pettit, 2003). Thus, one would expect aggressive children to exhibit hostile knowledge structures more often than nonaggressive children.

In fact, a large body of research has linked aggressive and externalizing behaviors with more aggressive knowledge structures (e.g., Burks et al., 1999; Crick, 1995; Dodge, 2006; Dodge & Pettit, 2003; Zelli, Dodge, Lochman, Laird, & Conduct Problems Prevention Research Group [CPPRG], 1999). For example, Burks and colleagues (1999) investigated the longitudinal association among knowledge structures, intent attribution, and externalizing behavior problems in children followed from kindergarten to the eighth

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grade. They found that children's hostile knowledge structures uniquely and strongly

predicted later externalizing problems. Further, Dodge, Laird, Lochman, Zelli, and

CPPRG (2002) found that measures of social knowledge structures predicted hostile

attributions and hostile attributions mediated the effect of knowledge structures on

aggressive behavior. Taken together, these findings support Dodge's (2006) assertion that

knowledge structures help guide children's social information processing, specifically by

influencing the tendency to attribute hostile versus benign intent. However, studies to

date have focused primarily on older school-age children when it is likely that such

knowledge structures have already been formed and reinforced by experiences prior to

school entry. Understanding how such knowledge structures are developed and

maintained prior to school entry, then, is a much needed avenue of investigation.

Emotion Understanding and Social Information Processing

Despite the robust findings between Crick and Dodge's (1994) model of social

information processing and aggressive behaviors, researchers have recently argued that

this model is incomplete without the consideration of emotion processes (Denham et al.,

2002; Izard, 2001; Izard, Fine, Mostow, Trentacosta, & Campbell, 2002; Lemerise &

Arsenio, 2000). Drawing from theories of emotion across a range of disciplines, Lemerise

and Arsenio (2000) noted that emotion processes serve various functions in social

information processing, such as organizing cognitions and behaviors, motivating children

to process certain information while ignoring others, as well as helping children to

quickly prioritize and process salient social information. Izard and colleagues (2002)

further argued that increased connections between emotional and cognitive systems over

the course of development enable the formation of affective-cognitive structures that are

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stored in memory. These affective-cognitive structures act to facilitate children's interpretation of emotional and social cues by providing a schema of particular affective-cognitive links that quickly fills in relevant emotion information, which is then used to interpret a given social situation (Arsenio & Lover, 1995; Izard, 2001; Izard et al., 2002). In other words, the referencing of knowledge structures containing both affective and social-cognitive information guides each step of the social information processing model (e.g., Lemerise & Arsenio, 2000) and provides the child with valuable information.

As an example, suppose a preschooler witnesses an angry peer trying to pick up a fallen tricycle (Denham et al., 2002). If the preschooler appropriately identifies the peer's anger and its source, then the preschooler can use the anger to gather information about the peer's circumstances (e.g., she is trying to do something that isn't working), goals/intentions (e.g., she wants to ride the bike), and subsequent behavior (e.g., she might hit me out of frustration if she is unable to pick up the tricycle). The preschooler accomplishes this by accessing affective social-cognitive knowledge structures that contain knowledge about both social and emotional cues to help process not only the emotions involved, but the intent and behavior being witnessed. This is especially likely in complex social situations since knowledge structures facilitate social information processing (Crick & Dodge, 1994; Dodge, 2006; Dodge & Pettit, 2003). However, if the preschooler were unable to label the peer's anger, or misidentified the anger as another emotion, a deviant or different affective social-cognitive knowledge structure would have been referenced, subsequently altering the preschooler's interpretation of the situation and the peer's behaviors. Thus, it is children's ability to accurately identify and label emotions, or emotion understanding, that sets the foundation for accessing appropriate

affective social-cognitive knowledge structures that aid in later interpretation, response selection, and behavioral enactment (Izard, 2001; Schultz, Izard, & Bear, 2004).

As noted above, children's knowledge structures influence the interpretation of intent such that hostile knowledge structures increase the likelihood that children will attribute hostile intent in ambiguous social situations, which increases the probability that a child will display aggressive behaviors (Crick & Dodge, 1994; Dodge & Pettit, 2003; Lemerise & Arsenio, 2000; Izard, 2001). Similarly, deficits in emotion understanding are theorized to contribute to the display of aggression through deficits in the affective social-cognitive knowledge structure (e.g., the child has not made the appropriate connections between certain emotion feelings and labels and so has not formed an affective-cognitive link) or through the formation of maladaptive affective social-cognitive knowledge structures (Izard et al., 2002). For example, Izard (1977; 2001) asserted that repeated exposure to a particular emotion strengthens children's affective-cognitive structures related to that emotion, which increases the probability that an emotion attribution bias will be exhibited in subsequent ambiguous or complex interactions. In particular, research has indicated that repeated exposure to anger may lead a child to assume that peers will also express anger more often and subsequently will attribute anger and hostility to peers' actions in ambiguous situations (Schultz, Izard, & Bear, 2004). Thus, it is important to explore how early deficits in emotion understanding contribute to the formation of deficient or maladaptive affective social-cognitive knowledge structures.

Prior research has linked deficits in children's emotion understanding with the presence of aggressive and externalizing behaviors beginning as early as the preschool

years (Arsenio, Cooperman, & Lover, 2000; Denham et al., 2002; Hughes, Dunn, &

White, 1998). For instance, a recent study conducted by Denham and colleagues (2002)

focused on the relationship between preschooler's early emotion understanding, display

of observed anger and antisocial behavior with peers, and trajectories of aggression

charted from preschool to kindergarten. They found that both early and concurrent

deficits in emotion understanding predicted membership in aggressive trajectories over

time, as well as predicted the display of observed anger and antisocial behavior with

peers. These findings suggest that emotion understanding skills precede angry and

antisocial behavior, as well as contribute to their development. Further, specific emotion

understanding deficits for boys and girls were linked with aggression. Specifically,

deficits in early equivocal and unequivocal emotion knowledge were risk factors for girls,

whereas deficits in understanding basic and mixed emotions and display rules were risk

factors for boys. These findings highlight the robust role that deficits in early emotion

understanding play in the development of aggression and suggest that unique deficits

influence the development of aggression in boys and girls.

    To date, relatively few studies have included early emotion understanding deficits

in investigations of social information processing mechanisms and aggression. However,

a recent study conducted by Lemerise, Gregory, and Fredstrom (2004) found that first

through fourth graders who were asked about provocateur's emotions exhibited fewer

hostile attributions than when they were not asked about provocateur's emotions. Thus,

increasing children's sensitivity to emotional cues increased their social competence,

which is in line with previous research noting the importance of emotion processes in

social competence (e.g., Denham, 1998; Saarni, 1999). Understanding how deficient or

maladaptive skills in emotion understanding develop and influence affective social-cognitive knowledge structures is an important area to explore.

Physical vs. Relational Aggression

The majority of studies investigating the role of social information processing in the development of aggression have focused predominantly on overt forms of aggression such as kicking, punching, or biting (Crick, Ostrov, & Werner, 2006; Yoon et al., 1999). This focus on more overt forms of aggression may obscure gender differences in social information processing, as well as emotion processes, given that research has shown that girls tend to demonstrate more relational forms of aggression such as excluding others and whispering about them (Crick & Grotpeter, 1995; Crick, Ostrov, Burr, et al., 2006; Ostrov & Keating, 2004; Ostrov, Woods, Jansen, Casas, & Crick, 2004). Although relatively few studies have examined social information processing mechanisms in the development of relational aggression, a growing body of research has found that relationally aggressive school-age boys and girls exhibit a hostile attribution bias in relationally interpersonal situations (Crick, 1995; Crick, Grotpeter, & Bigbee, 2002). In addition, research investigating social goals of relationally aggressive school-age children has found that the endorsement of goals such as self-interest, personal control, and revenge increase the likelihood that relational aggression will be seen as an acceptable response in interpersonal contexts (Delveaux & Daniels, 2000). However, other research indicates that there is not a connection between social information processing variables such as attribution intent, response selection, and outcome expectancies and the display of relational aggression in fourth through sixth grade girls (Crain, Finch, & Foster, 2005). Taken together, these findings reveal a mixed picture and highlight the need for more

studies examining social information processes underlying the development and use of relational aggression.

Methodological Issues

Finally, an important limitation of studies conducted on the development of social information processing in children involves the methodology used to assess this mechanism. In particular, the majority of researchers have presented children with hypothetical vignettes and have used verbal responses to index social information processing variables such as knowledge structures (e.g., Burks et al., 1999; Dodge et al., 2002; Laird, Lochman, Zelli & CPPRG, 2002; Zelli et al., 1999), and response generation and selection (e.g., Crain, Finch, & Foster, 2005; Crick & Dodge, 1996; Crick & Werner, 1998; Mayeux & Cillesen, 2003). Although this method has demonstrated reliability and validity (Yoon et al., 1999; Dodge, 2006), it assumes that the child has developed the cognitive skills to understand the written vignettes and also has the linguistic ability to provide an explicit, verbal answer. However, young children who are just beginning to grasp reading concepts and/or have limited linguistic abilities may have difficulty with this particular task or may simply provide a limited range of answers. In addition, children may be less emotionally invested in the vignettes because they are delivered in an interview format and do not require more active participation. This may give children more time to process the vignettes and provide more socially adaptive answers because they are not required to regulate their emotions at the same time that they are processing social information. Therefore, it is important to examine children's social information processing through a more interactive, hands-on approach in an effort to capture

children's implicit mental representations as they occur during interpersonal exchanges in real time.

As a result, the current study will use a narrative technique called the MacArthur Story Stem Battery (MSSB; Bretherton, Oppenheim, Buchsbaum, Emde, & the MacArthur Narrative Group, 1990) to index social and emotional components of young children's social information processing. The MSSB was chosen as an index of social information processing because it is based on research involving internal working models, symbolic play, scripts, and schemas and uses an interactive, hands-on approach to capture children's internal mental representations of experience, as well as how children view themselves and others in that experience (Emde, 2003; Oppenheim, 2006). For example, children are presented with a standard set of dolls and props that are used to tell a story (Bretherton & Oppenheim, 2003). The examiner provides the beginning of a story, but ends at the narrative "high point" in which there is a conflict or dilemma for the child to address and resolve. The examiner then asks the child to "Show me and tell me what happens next" and the child completes the story stem using words and play. Thus, children are asked to make meaning out of an unresolved situation while effectively organizing emotions as they actively cope with the challenges of the story in their effort to address and resolve the conflict (Emde, 2003; Oppenheim, Nir, Warren, & Emde, 1997). This parallels ambiguous interpersonal contexts where children access knowledge structures as they actively process social and emotional information while coping with their own emotional processes; consequently, children's resolution to the conflicts likely reflect information contained in affective social-cognitive knowledge structures. In fact, Murray, Woolgar, Briers, and Hipwell (1999) found evidence for children's narratives

reflecting real-life experiences, which suggests that children are referencing knowledge gained from previous experience. Consequently, the MSSB appears to be a promising method to measure young children's implicit affective social-cognitive knowledge structures as they actively work to regulate their own emotions.

While social information processing has not been specifically investigated with the MSSB, researchers have used this technique to study the development of aggression in preschool and kindergarten children (see Warren, 2003, for a review). Research has found significant positive correlations between aggressive themes in children's narratives and parent and teacher reports of externalizing behavior, as well as among narrative coherence and parent and teacher reports of externalizing behavior (Oppenheim, Emde, & Warren, 1997; Oppenheim, Nir, et al., 1997; von Klitzing, Kelsay, Emde, Robinson, & Schmidt, 2000; Warren, 2003; Warren, Oppenheim, & Emde, 1996; Zahn-Waxler et al., 2008). For instance, Warren, Oppenheim, and Emde (1996) conducted one of the first studies aimed at examining the longitudinal relationship between aspects of children's narratives and parent report of externalizing problems at ages 3, 4, and 5, and teacher reports of externalizing problems at age 5. They found that distress and destructive/aggressive themes in children's narratives positively correlated with externalizing behaviors concurrently and longitudinally at ages 4 and 5. Subsequent studies have supported this finding in longitudinal investigations involving 4-5 year old children (Oppenheim, Nir, et al., 1997), 5-7 year old twins (von Klitzing et al., 2000), and 4-5 and 7 year old children (Zahn-Waxler et al., 2008). In addition, studies have found that children rated as having higher levels of externalizing behavior also have less coherent narratives with fewer prosocial themes and more negative themes (Oppenheim,

Emde, & Warren, 1997; Oppenheim, Nir, et al., 1997; von Klitzing et al., 2000). These findings suggest that specific narrative characteristics are linked with externalizing behaviors and may reflect processes underlying maladaptive behaviors (Murray et al., 1999).

Studies have also found significant gender differences in children's narratives. Specifically, a growing body of evidence suggests that narratives provided by boys contain more aggressive themes, fewer prosocial themes, and are less coherent than those provided by girls (Oppenheim, Nir, et al., 1997; von Klitzing et al., 2000; Woolgar, Steele, Steele, Yabsley, & Fonagy, 2001; Zahn-Waxler et al., 2008). This finding is similar to the gender difference found in the overt aggression literature and may reflect early differences in social information processing between boys and girls. However, studies have predominantly focused on the relationship between narrative themes and overt forms of aggression or externalizing behavior, so it is unclear how narrative themes would correspond with relational aggression. Therefore, using the MSSB may reveal specific narrative characteristics linked to the development of overt physical and relational aggression and provide more information about qualitatively distinct affective social-cognitive knowledge structures.

Current Study

To review, there are a number of limitations in the social information processing literature as it relates to the development of aggression over time. The majority of studies have focused on middle- to late-elementary school age and middle school children, with most of the research focused on boys and overt aggression. There is a paucity of research examining the early development of affective and social-cognitive information

processing and how such processes relate to the development of overt and relational aggression in both girls and boys. In addition, few studies on social information processing have included the examination of emotion processes and all of the studies conducted have relied on children's verbal responses to hypothetical vignettes to index social information processing variables. As a result, the current study used the MSSB to assess the early development of affective and social-cognitive components of children's schemata and how qualitative differences in affective social-cognitive knowledge structures relate to the development of a hostile attribution bias in boys and girls.

The research questions and hypotheses encompassed three main issues. First, specific themes and narrative coherence were derived from children's MSSB narratives and combined with laboratory measures of children's emotion understanding in order to provide an overall index of the social and emotional components of children's knowledge structures. Themes of physical aggression, relational aggression, and empathic/prosocial relations were of particular interest given that the social information processing literature has linked more hostile, less prosocial knowledge structures with later deficits in social information processing, as well as physical and relational aggression. These analyses were more exploratory in nature given that no studies to date have used the MSSB to examine social information processing mechanisms. Second, individual differences in narrative themes, narrative coherence, and emotion understanding were examined in relation to the presence of a hostile attribution bias. Based on previous research, I hypothesized that more physical and relational aggression themes, more narrative incoherence, and lower levels of emotion understanding would be correlated with a hostile attribution bias. Likewise, I hypothesized that more empathic/prosocial themes,

higher narrative coherence, and higher levels of emotion understanding would not be correlated with a hostile attribution bias. Finally, gender differences in these relationships were explored to illuminate potential differences in the development of affective social-cognitive knowledge structures and a hostile attribution bias.

Method

Participants

Participants were 173 children (73 girls) who were recruited to be part of an ongoing longitudinal study investigating the correlates and antecedents of externalizing behavior problems (Olson, Sameroff, Kerr, Lopez, & Wellman, 2005). Children were assessed at two time points during the study: first at approximately age 3 (age range = 27 to 45 months, $M = 37.7$, $SD = 2.7$ months), and again at age 5 ½ (age range = 52 to 71 months, $M = 63.4$, $SD = 2.7$ months). However, only data from the second time point of the study was used in the present study. Children represented the full range of externalizing symptom severity on the Child Behavior Checklist/2-3 (Achenbach, 1992) at age 3, with an oversampling of toddlers in the upper range of the Externalizing Problems scale ($T > 60$; 44%). Families were recruited from newspaper ads, local and regional preschools, and pediatrician referrals. Children were excluded from participation if they had serious chronic health problems, mental retardation and/or pervasive developmental disorders, if they had parents who were going through the final stages of divorce, and/or were part of families who were experiencing severe economic hardship. Families were paid for their participation.

Families were representative of the local population. According to mother's reports, the majority of children were of European American heritage (91%). Other

children were of African American (5.5%), Hispanic American (2.5%), or Asian American (1%) ethnic backgrounds. Eighty-eight percent of children came from two-parent households. Of the remaining households, 5.3% came from single (never married) households and 6.8% from single (divorced) households. Fifty-five percent of mothers worked outside the home. Four percent of mothers and 10% of fathers had received high school educations with no further educational attainment; 42.5% of mothers and 32% of fathers had completed four years of college with no further training; and 39% of mothers and 46% of fathers had completed some additional graduate or professional training. The annual family income ranged from $20,000 to $100,000, with a median income of $52,000. Families had mean scores of 7.58 (range = 2-9, *SD* = 1.49) on Hollingshead's (1975) occupational scale, indicating that the majority of parents' occupations fell into the minor professional category.

Laboratory examiners were doctoral students in clinical or developmental psychology, master's degree students in social work, and second through fourth year undergraduate psychology majors.

Procedures

Children participated in a 4-hour laboratory assessment held at a local preschool on a Saturday morning (*N*= 228 at time 1; *N*= 199 at time 2). Some children did not complete this assessment because of scheduling conflicts or pronounced difficulty with parental separation. After building rapport with the children, graduate student examiners administered a battery of social, cognitive, and emotion tests. A more detailed description of the laboratory assessments used in this dissertation will be described below. Children provided assent and received small gifts for their participation.

Measures

  Social information processing: Affective social-cognitive knowledge structures.

Children's affective social-cognitive knowledge structures were assessed during time 2

using the MacArthur Story Stem Battery (MSSB; Bretherton, Oppenheim, Buchsbaum,

Emde, & the MacArthur Narrative Group, 1990). In this task, the examiner presents the

child with a standard set of dolls and props after rapport is established. The examiner

introduces the child to the MSSB through a warm-up story stem and then proceeds to

administer a series of standardized story stems designed to elicit particular themes and

emotions. The examiner provides the beginning of each story stem, but ends at the

narrative "high point," which is characterized by a conflict or dilemma that the child is

asked to address and resolve. The examiner asks the child to "Show me and tell me what

happens next" and the child completes the story stem using words and play. The

following eight story stems were used in this task, presented in random order to each

child (see Appendix A for full descriptions of each story stem): The Lost Keys, Bedtime,

New Bike, Cookie Dilemma, Departure from Parents, Reunion, Friends Fighting, and

Mom's Hurt Knee. The child was given unlimited time to complete this task and all story

stem presentations were videotaped.

  Undergraduate research assistants were trained to code the MSSB using The

MacArthur Story Stem Narrative Coding System (Robinson, Mantz-Simmons, MacFie,

Kelsay, Holmberg, & the MacArthur Narrative Group, 1992; 2004; see Appendix B). In

this system, specific content themes are coded as present/absent in each story stem and

the coherence of each narrative is rated on a 4 point scale, with 0 = *Conflict not handled;*

1 = *Conflict handled by changing constraints*; 2 = *Incoherent narrative*; and 3 =

Coherent narrative. Reliability of coding was assessed using the Kappa statistic calculated from 15% of the total sample ($n = 30$). Kappas for individual content themes ranged from .76 to .99, while Kappas for coherence ranged from .70 to .84.

Aggregate scores for each content theme measure were created by summing scores across all eight story stems and an overall narrative coherence measure was created by averaging the coherence scores across stories. The specific content themes used in the present study are described more fully in the Results section.

Of the 199 children who participated in the laboratory assessment during time 2, five children refused to participate in the MSSB and data from four other children were unable to be used due to poor visual and sound quality on the videotapes. In addition, 91% of the MSSB data had been coded at the time of the present study. Thus, the current study utilized available data from 173 children to examine affective social-cognitive knowledge structures.

Social information processing: Hostile attribution bias. Children's intent attributions were measured using Webster-Stratton and Lindsay's (1999) hostile attribution bias interview. In this interview, the examiner presents the child with four different scenarios that are familiar to the child, but where the intent of the protagonist is ambiguous. After each scenario, the child is asked to choose between two explanations for the scenario; one explanation attributes aggressive intent to the protagonist and one characterizes the situation as an accident. The child receives 1 point each time s/he chooses the aggressive intent explanation and a total aggressive attribution score was created by summing across the four scenarios.

Emotion understanding. Children's emotion understanding at time 2 was assessed using an appearance-reality emotion understanding task developed by Harris, Donnelly, Guz, and Pitt-Watson (1986). This task was used instead of the Denham (1986) task because many 5.5-year-olds reach ceiling on the Denham task. In the appearance-reality emotion understanding task, children are tested on their ability to understand the difference between outward facial expressions of emotion and how people may actually feel inside. Children are first asked to label line drawings of facial expressions of happy, sad, and OK emotions in order to assess basic emotion identification. Next, children are read a story about a boy who wants to receive a toy as a present, but gets a book instead. Children are asked to explain how the boy would feel inside and why he would feel that way, as well as how the boy would try to look on his face and why he would look that way. A composite emotion understanding score was calculated for the appearance-reality emotion tasks by summing the children's correct responses on the emotion labeling portion of the task with their correct judgments of the protagonists' real and apparent emotion. This score was then divided by a total possible score of 18.

Control variable: Child IQ. An index of children's intelligence was used as a control variable in all analyses. Children's intelligence was assessed using the Vocabulary and Block design subtests of the Wechsler Intelligence Scale for Children-3rd Edition-Revised (WISC-III-R; Wechsler, 1992) during time 2. Children's intelligence scores were created from the summed scores of the Vocabulary and Block design subtests.

Control variable: Theory of mind. Children's theory of mind was assessed by the Bartsch and Wellman (1989) Belief-Desire reasoning tasks. These frequently used tasks

were designed to measure children's understanding that people's actions are based on their thoughts and desires about the outside world and focus on false-belief understanding. For example, in the Bartsch and Wellman tasks children are asked to both predict and explain story characters' behavior. In the four false-belief prediction tasks, the child is asked to predict where a doll character will look for a desired object based on that character's beliefs about that object's location. For instance, the experimenter shows a crayon box and an unmarked box to the child. The experimenter then suggests that they play a "trick" on the story character and takes the crayons out of the crayon box and puts them in the unmarked box. While doing this, the experimenter emphasizes to the child that the story character cannot see them play this trick. Afterwards, the experimenter asks the child to predict where the story character will look for the crayons. Similarly, desired objects are moved in order to "trick" the story character in the four false-belief tasks. For example, the experimenter moves raisins from a raisin box and places them inside an unmarked box. The experimenter then has the story character look for the desired object in the original location (e.g., the raisin box) and asks the child to explain why the story character looked for the raisins in that location. Since correct answers must include a reference to the story character's mental state (e.g., "he thinks the raisins are in the raisin box"), the child is explicitly asked "What does (the character) think?" if he/she does not spontaneously include this reference in their answer.

Children received a score of 2 for a false-belief explanation item if they correctly answered the control question (e.g., "Where are the crayons really?") and spontaneously provided a mental state explanation for the story character's search behavior (e.g. "because he *thinks* there are crayons in there"). Children received a score of 1 for any

false-belief explanation item if they correctly answered the control question, but provided a mental state explanation for the story characters' behavior only when prompted by the examiner. Children received a score of 2 on any false-belief prediction item if they correctly answered the control question and correctly predicted where the story character would search for the item. All other responses for the false-belief prediction items received a score of 0. Scores were summed across the prediction and explanatory belief-desire tasks and then divided by the total possible score of 12 in order to obtain an overall theory of mind score.

<div align="center">Results</div>

Preliminary Analyses

Table 2.1 provides the means and standard deviations of all study variables, presented separately by child gender. The data reduction strategies for the variables of theory of mind, emotion understanding, and narrative coherence were employed as indicated previously, while those for the MSSB themes are described in detail below.

Specific content themes from the MSSB were chosen on theoretical relevance to construct scales representing physical aggression, relational aggression, and empathic/prosocial relations. Previous research indicated that the content themes of physical aggression, escalation of interpersonal conflict, personal injury, and atypical negative response represent an overall physical aggression theme, while the content themes of sharing, empathy/help, and affiliation represent an overall empathic relations theme (Oppenheim, Nir, et al., 1997; von Klitzing et al., 2000; Warren, Oppenheim, & Emde, 1996). As a result, these variables were chosen to represent each theme as indicated. The construction of an overall relational aggression theme was more

exploratory given that prior studies have not examined the presence of relational aggression using the MSSB. Based on the relational aggression literature (e.g., Crick & Grotpeter, 1995; Ostrov & Keating, 2004), the content themes of exclusion of other, refusing empathy/help, and teasing/taunting were chosen to represent an overall relational aggression theme.

Table 2.2 shows the results of each reliability analysis. The physical aggression items demonstrated good reliability while the empathic relations items demonstrated modest reliability. However, the relational aggression items did not achieve adequate reliability despite attempts to do so using the whole sample and dividing the sample into boy and girl subgroups. Consequently, the content themes of exclusion of other, refuse empathy/help, and teasing/taunting were used as separate items in subsequent analyses.

As shown in Table 2.1, gender differences in study variables were examined using a multivariate analysis of variance (MANOVA). Child gender was entered as the between subjects factor, while child IQ, theory of mind, level of emotion understanding, narrative measures, and hostile attribution bias were dependent variables. Results indicated significant main effects for gender in the physical aggression scale, empathic/prosocial scale, and teasing/taunting theme ($F(10, 134)=3.52$, $p<.001$). Univariate tests indicated that boys' narratives included more physical aggression than girls ($F(1, 143)=8.82$, $p<.01$), whereas girls' narratives included more empathic/prosocial relations ($F(1, 143)=10.17$, $p<.01$) and more teasing/taunting themes than boys ($F(1, 143)=5.31$, $p<.05$). No other significant group differences were found.

Correlations among Study Variables

Based on evidence linking children's intellectual functioning and theory of mind skills with social information and emotion processing (e.g., Hughes, Dunn, & White, 1998) and narrative skills (e.g., Fiorentino & Howe, 2004), preliminary zero-order correlations were conducted to determine if the hypothesized relationships were present. As shown in Table 2.3, results revealed significant positive correlations between child IQ and emotion understanding, child IQ and narrative coherence, theory of mind and emotion understanding, as well as theory of mind and the empathic/prosocial relations scale. In addition, significant negative correlations also were obtained between child IQ and the exclusion of other theme and between child IQ and hostile attribution bias. As a result, child IQ and theory of mind skills were used as control variables in all analyses.

Table 2.4 presents the results of partial correlations, controlling for child IQ and theory of mind skills, among all study variables. The physical aggression scale was modestly positively correlated with children's levels of emotion understanding and hostile attribution bias, and negatively correlated with narrative coherence. Also, the physical aggression scale was positively correlated with the teasing/taunting theme. Conversely, children who displayed empathic/prosocial themes tended to tell stories with high levels of narrative coherence. The exclusion of other theme demonstrated a modest positive correlation with level of hostile attribution bias, while the theme of refusing empathy/help showed a strong positive correlation with the teasing/taunting theme and a modest negative correlation with narrative coherence. No other significant correlations were obtained although a few correlations approached significance. Positive correlations between emotion understanding and the teasing/taunting theme, and between the exclusion of other theme and narrative coherence approached significance, as did a

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negative correlation between emotion understanding and the empathic/prosocial relations scale.

Predictors of a Hostile Attribution Bias

Figure 2.1 depicts a diagram of the relationship Dodge (2006) hypothesized to exist between children's affective social-cognitive schemata and hostile attribution biases. A negative binomial regression analysis was performed to elucidate unique and interactive contributions of child gender, level of emotion understanding, and social-cognitive knowledge structures to the presence of a hostile attribution bias. A negative binomial regression was performed because the measure of the dependent variable, hostile attribution bias, reflected non-negative integers that were positively skewed. This violates two assumptions required to perform a typical OLS regression; thus, a negative binomial regression was chosen for this analysis because it is based upon a probability distribution for non-negative integers and allows for non-normality, non-linearity, and skew in the data (Atkins & Gallop, 2007). In this type of regression, a natural logarithmic transformation is used to connect predictor variables with the outcome and uses maximum likelihood estimation to describe the probability of observing the data as a function of a set of parameters (2007). This ensures that the results accurately reflect the distribution of the data, as well as describe variables that have most likely contributed to the outcome. In addition, most of the tools used to assess OLS regression can also be used to examine a negative binomial regression (see Cohen, Cohen, West, & Aiken, 2003). Following Aiken and West (1991), all predictor variables were centered prior to analyses. Hostile attribution bias was used as the dependent variable and child gender, level of emotion understanding, narrative themes, narrative coherence, and interaction

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terms were used as independent variables. Child IQ and theory of mind were included as control variables given their associations with many of the predictor variables.

The predictive model of hostile attribution bias was constructed in several steps. First, child IQ, theory of mind, child gender, level of emotion understanding, narrative themes, narrative coherence, and interaction terms among these variables were entered as predictors. Second, all predictor variables with p-values greater than .30 were excluded from the model and the negative binomial regression analysis was re-run using the remaining predictor variables. This process was repeated until all the predictor variables in the model achieved a p-value of .30 or less. Thus, the final negative binomial regression model reflected the predictor variables that best explained the variance in hostile attribution bias.

Results of the final negative binomial regression predicting hostile attribution bias are shown in Table 2.5. Tests of deviance and goodness of fit revealed that the final model predicting hostile attribution bias fit the data well ($\chi^2(1, 146)=.86$, for deviance, $\chi^2(1, 146)=.69$, for goodness of fit) and the omnibus test for the final model also was significant ($\chi^2(11, 134)=22.17$, $p<.05$). Results revealed a significant main effect for the exclusion of other theme and a marginally significant main effect for the physical aggression scale. The significant positive beta for the exclusion of other theme indicates that more narrative themes of excluding others were linked with a hostile attribution bias. Likewise, the significant positive beta for the physical aggression scale suggests that more narrative themes of physical aggression may be related to a hostile attribution bias. While there was not a significant model effect for emotion understanding ($\chi^2(1, 134)=1.13$, $p=$n.s.), parameter estimates revealed a significant main effect for emotion

understanding. However, results also revealed a significant interaction between gender and emotion understanding and a marginally significant interaction between emotion understanding and the teasing/taunting theme. Given this, the significant main effect for emotion understanding must be interpreted in the context of these interactions. As shown in Figure 2.2, results of post-hoc simple slopes analyses revealed that higher levels of emotion understanding were inversely related to a hostile attribution bias (χ^2(1, 146)=4.91, p<.05). Specifically, higher levels of emotion understanding decreased the likelihood that a hostile attribution bias would be displayed for girls (B=-.09, p<.05), but did not do so for boys (B=.04, p= n.s.). Post-hoc simple slopes analyses did not detect a significant difference in slopes between emotion understanding and the teasing/taunting theme (χ^2(1, 146)=.76, p=n.s.); thus, it appears that children's level of emotion understanding is associated with a decreased likelihood of displaying a hostile attribution bias regardless of the number of teasing/taunting narrative themes.

Discussion

A large body of research has linked deficits and biases in social information processing mechanisms with the display of overt and relational aggression in children (e.g., Burks et al., 1999; Crain, Finch, & Foster, 2005; Crick & Dodge, 1994; Crick, Grotpeter, & Bigbee, 2002; Dodge & Pettit, 2003; Yoon et al., 1999). Specifically, hostile social-cognitive knowledge structures have been linked with a hostile attribution bias, which in turn has been linked with the display of aggressive behavior (e.g., Crick & Dodge, 1994; Dodge, 2006; Dodge & Pettit, 2003; Orobio de Castro et al., 2002). However, a number of researchers have noted that emotion processes need to be included in examinations of social information processing in children (Denham et al., 2002; Izard,

2001; Izard et al., 2002; Lemerise & Arsenio, 2000) and have pointed to a large body of research within the emotion literature that has linked deficits in emotion understanding with the development of aggression (Arsenio, Cooperman, & Lover, 2000; Denham et al., 2002; Hughes, Dunn, & White, 1998). While few studies have investigated both social information and emotion processes, research suggests that deficits in emotion understanding contribute to the display of aggression through cognitive-affective links within children's knowledge structures (Izard, 1977; 2001; Izard et al., 2002; Lemerise, Gregory, & Fredstrom, 2004). However, limitations in the research, such as the focus on school age children, overt aggression, and boys, make it difficult to generalize findings to younger children, relational aggression, and girls. In addition, all of the studies conducted have relied on children's verbal responses to hypothetical vignettes to index social information processing mechanisms. As a result, the current study used the MSSB to assess the early development of affective and social-cognitive components of children's schemata and how qualitative differences in affective social-cognitive knowledge structures relate to the development of a hostile attribution bias in boys and girls.

MSSB themes

As hypothesized, individual content themes from the MSSB were correlated and represented key constructs of interest. Specifically, the content themes of physical aggression, escalation of interpersonal conflict, personal injury, and atypical negative response were found to represent an overall physical aggression theme, while the content themes of sharing, empathy/help, and affiliation were found to represent an overall empathic/prosocial relations theme. This supports previous research (Oppenheim, Nir, et al., 1997; von Klitzing et al., 2000; Warren, Oppenheim, & Emde, 1996) and provides

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evidence for the validity of aggregating these particular content themes to index physical aggression and empathic/prosocial relations within children's narratives. However, it was not possible to derive an index of relational aggression from the combination of the exclusion of other, refuse empathy/help, and teasing/taunting content themes. While the refuse empathy/help content theme was positively associated with the teasing/taunting theme, no other associations were obtained among these three measures and a reliable scale was unable to be obtained. One possibility is that the MacArthur Story Stem Narrative Coding System (Robinson et al., 1992; 2004) used in this study was designed to measure themes of overt aggression and conflict, rather than themes of covert aggression. Relatively few content themes reflected components of relational aggression and perhaps a different coding scheme would have been better able to capture hypothesized components of relational aggression. Future researchers may want to include a coding scheme that encompasses items pertaining specifically to relational aggression. However, individual items pertaining to representations of relational aggression were related to constructs of interest, as described below.

Consistent with previous research (Oppenheim, Nir, et al., 1997; von Klitzing et al., 2000; Woolgar et al., 2001; Zahn-Waxler et al., 2008), gender differences in the physical aggression and empathic/prosocial themes emerged. Narratives told by boys included more themes of physical aggression than those told by girls, while narratives told by girls included more empathic/prosocial themes than those told by boys. Von Klitzing and colleagues (2000) have suggested that this difference is reflective of gender differences seen in displays of overt aggression, which lends support to the argument that the MSSB is indexing social-cognitive schemata contributing to these displays. In

addition, girls' narratives included more teasing/taunting content themes than those of

boys. While no studies to date have investigated gender differences in this particular

content theme, this finding is interesting given that the teasing/taunting theme was

hypothesized to reflect a component of relational aggression. If the teasing/taunting

theme indexes a component of a relationally aggressive knowledge structure, this

coincides with literature that has indicated that girls display relational aggression more

often than boys (Crick & Grotpeter, 1995; Crick, Ostrov, Burr, et al., 2006; Ostrov &

Keating, 2004; Ostrov, Woods, et al., 2004). In addition, this finding provides

preliminary evidence for this difference appearing early on in social-cognitive knowledge

structures, and provides support for the assertion that the MSSB can be used to measure

relationally aggressive schemata in young children.

Associations within the MSSB

Among measures within the MSSB, themes of physical aggression were

negatively associated with narrative coherence, whereas themes of empathy/prosocial

relations were positively associated with narrative coherence. These findings are

consistent with previous research (Oppenheim, Emde, & Warren, 1997; Oppenheim, Nir,

et al., 1997; von Klitzing et al., 2000) and suggest that children's ability to cogently

organize responses to interpersonal conflicts is related to social knowledge in

interpersonal situations. In fact, some researchers have suggested that children with

behavior problems not only include aggressive themes in their narratives, but are unable

to coherently resolve themes due to these children's real-life difficulties in regulating

their own emotions (von Klitzing et al., 2000; Warren, 2003). This is in line with

previous research that has found a negative relationship between children's skills in

emotion regulation and the display of aggression (Campbell, Shaw, & Gilliom, 2000; Eisenberg et al., 1996; Eisenberg, et al., 1997; Fabes et al., 1999; Keenan, 2000) and lends further credence to previous studies linking children's narrative representations with actual experience (Murray et al., 1999; Warren, 2003).

Themes of physical aggression were also positively associated with themes of teasing/taunting. Given that prior research has not investigated links between these two themes, no definitive conclusions can be drawn about this particular relationship. However, such a connection is interesting because the teasing/taunting theme was hypothesized to index a relationally aggressive component of knowledge structures, whereas the physical aggression theme was hypothesized to index a physically aggressive component of knowledge structures. It appears that when children include themes of physical aggression in their narratives, they also include aspects of relational aggression. This finding coincides with recent research that found that acts of physical and relational aggression co-occur during the preschool and elementary school periods (Crain, Finch, & Foster, 2005; Juliano, Werner, & Cassidy, 2006) and provides additional preliminary evidence that the MSSB is a useful tool in assessing children's representations of interpersonal experiences.

Finally, the theme of refuse empathy/help was negatively associated with narrative coherence. While there is no specific research that addresses this association, it is consistent with research that has found an inverse relationship between themes of physical aggression and coherence in children's narratives (Oppenheim, Emde, & Warren, 1997; Oppenheim, Nir, et al., 1997; von Klitzing et al., 2000). Since the refuse empathy/help theme was hypothesized to reflect a component of relational aggression,

perhaps children who include relationally aggressive themes in narratives also have difficulty regulating their emotions in response to real-life conflict and therefore provide more incoherent narratives (von Klitzing et al., 2000; Warren, 2003). In addition, this suggests that each type of aggression interacts with skills in emotion regulation to influence the display of aggressive behaviors and highlights the need for further research to clarify these associations.

Associations with Child IQ and TOM

As expected, children's intelligence score was related to children's emotion understanding, the exclusion of other narrative theme, and hostile attribution bias. Specifically, higher intelligence scores were associated with higher levels of emotion understanding, but lower rates of the exclusion of other narrative theme and hostile attribution bias. The association between children's intelligence score and emotion understanding is consistent with existing literature (Ensor & Hughes, 2005; Hughes, Dunn, & White, 1998; Izard et al., 2008) and underscores the importance of including measures of intelligence in investigations of children's social information and emotion processing. As Ensor and Hughes (2005) noted, greater skills in cognitive measures such as verbal ability likely facilitate the development of emotion understanding by increasing opportunities for children to discuss mental states with others. In addition, the inverse association between children's intelligence score and social information processing measures coincides with prior research (e.g., Crick & Dodge, 1994; Dodge & Pettit, 2003). Children with higher intelligence scores likely have the resources to accurately assess ambiguous social situations, which in turn may lead to a decrease in intent attribution errors and the display of aggression. Children's intelligence score was also

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associated with the coherence of children's stories. This supports previous research (Fiorentino & Howe, 2004; Oppenheim, Emde, & Warren, 1996) and highlights the important connection between children's general cognitive ability and language competence. As one would expect, children with higher intellectual skills are able to tell more organized and cohesive stories.

Similarly, children's theory of mind skills were related in expected directions to their level of emotion understanding, as well as themes of empathic/prosocial relations. Prior research has found a positive association between emotion understanding and theory of mind (e.g., Hughes & Dunn, 1998; Hughes, Dunn, & White, 1998) as well as between theory of mind and prosocial behavior (e.g., Cassidy, Werner, Rourke, & Zubernis, 2003; Walker, 2005). Not surprisingly, children with greater meta-cognitive understanding tend to have greater emotion understanding and higher rates of empathic/prosocial relations in narratives.

Associations among Social Information and Emotion Processing

Overall, the data revealed a mixed picture when associations between social information and emotion processing measures were examined. As hypothesized, the physical aggression narrative theme was associated with emotion understanding, but the direction of the relationship was contrary to what was expected. Specifically, children who generated more physically aggressive narrative themes also tended to manifest higher levels of emotion understanding. Also contrary to expectation, children's emotion understanding was not related to items of relational aggression, themes of empathic/prosocial relations, or hostile attribution bias. These findings contrast with previous research, which has found links between deficits in emotion understanding and

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the display of aggressive behavior (Arsenio, Cooperman, & Lover, 2000; Denham et al., 2002; Hughes & Dunn, 1998; Hughes, Dunn, & White, 1998), between deficits in emotion understanding and a hostile attribution bias (Lemerise, Gregory, & Fredstrom, 2004), as well as positive associations between emotion understanding and the display of social competence (Cassidy et al., 2003; Denham, 1998; Saarni, 1999). However, the current study departed from previous studies by controlling for individual differences in intelligence and theory of mind skills. Perhaps removing the effects of these variables changed the direction of the association between these measures. In support of this, zero-order correlations (e.g., without controlling for child IQ and theory of mind skills) conducted among variables did not reveal a significant relationship between themes of physical aggression and emotion understanding, and revealed a marginally significant negative relationship between emotion understanding and hostile attribution bias. When partial correlations controlling for child IQ and theory of mind skills were conducted, results revealed a positive relationship between themes of physical aggression and emotion understanding, but no significant relationship between emotion understanding and hostile attribution bias. Taken together, these findings suggest that once the influence of children's intelligence score and theory of mind skills are removed, children with more physically aggressive schemata do not necessarily have deficits in emotion understanding. In addition, emotion understanding appears to be unrelated to mental representations of relational aggression and prosocial behavior, as well as biases in intent attributions. A recent study conducted by Cassidy and colleagues (2003) also found that relationships between emotion understanding and social behavior in young children disappeared when language ability, a component of cognitive maturity, was partialled out

of these relationships. Thus, the inclusion of an intelligence score in the predictive model likely changed the pattern of effects.

However, more physically aggressive and exclusionary narrative themes were associated in expected directions with hostile attribution biases. This coincides with literature that has linked more hostile, aggressive knowledge structures with a hostile attribution bias (Burks et al., 1999; Crick & Dodge, 1994; Dodge, 2006; Dodge et al., 2002), as well as literature that has linked relational aggression with a hostile attribution bias (Crick, 1995; Crick, Grotpeter, & Bigbee, 2002; Delveaux & Daniels, 2000). The relationships among these measures are discussed in more detail below, but findings suggest that themes from the MSSB are indexing facets of children's social-cognitive knowledge structures and provide continued support for using the MSSB in investigations of young children's social information processing.

Social Information Processing: Predictors

Overall, findings revealed unique and interactive contributions of child gender, level of emotion understanding, and components of affective social-cognitive knowledge structures to the display of a hostile attribution bias. The predictive model containing children's intelligence score, gender, emotion understanding, and physically and relationally aggressive narrative themes significantly predicted the display of a hostile attribution bias. In particular, more narrative themes of excluding others predicted a hostile attribution bias, while higher levels of emotion understanding predicted a decrease in the likelihood that girls, but not boys, would display a hostile attribution bias. In addition, there was a trend for more physically aggressive narrative themes to predict hostile attribution biases, as well as for the interaction of emotion understanding skills

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and the teasing/taunting theme to predict a hostile attribution bias. Each finding will be discussed below.

The significant positive association between narrative themes of excluding others and the display of a hostile attribution bias is interesting for several reasons. First, this is consistent with prior studies showing positive associations between children's hostile, aggressive knowledge structures and hostile attribution biases (Burks et al., 1999; Crick & Dodge, 1994; Dodge, 2006; Dodge et al., 2002). Second, this finding suggests that schemas of relational aggression are present in kindergartners and are likely related to hostile attribution biases. This extends the aforementioned literature to children just beginning school and supports arguments that relationally aggressive schemata are linked to hostile attribution biases (Crick, 1995; Crick, Grotpeter, & Bigbee, 2002; Delveaux & Daniels, 2000). Finally, this finding suggests that the MSSB can be used to index relationally aggressive components of children's knowledge structures and provides preliminary support for the hypothesis that the exclusion of other theme is representative of a relationally aggressive knowledge structure.

The significant inverse association between levels of emotion understanding and the display of a hostile attribution bias is consistent with existing literature (Lemerise, Gregory, & Fredstrom, 2004), as well as research that has found similar relationships between emotion understanding and the display of aggression (Arsenio, Cooperman, & Lover, 2000; Denham et al., 2002; Hughes & Dunn, 1998; Hughes, Dunn, & White, 1998). As researchers have noted (Denham, 1998; Saarni, 1999), the ability to understand other's emotions is a key component in accurately perceiving and responding competently in interpersonal contexts. Thus, the current finding supports this assertion by

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showing that high levels of emotion understanding predicted low attributions of hostile

intent in interpersonal contexts. Interestingly, this finding was obtained only for girls; this

suggests that different patterns between emotion and social information processing exist

for boys and girls. In support of this, Denham and colleagues (2002) found that deficits in

early emotion knowledge were linked with aggression in preschool-aged girls, but

deficits in understanding basic and mixed emotions and display rules were linked with

aggression in preschool-aged boys. Taken together, it appears that early deficits in

emotion understanding are risk factors for hostile information processing in young girls,

but are not risk factors for young boys.

Finally, the marginally significant positive association between physically

aggressive narrative themes and the display of a hostile attribution bias is consistent with

a large body of research that has found positive associations between hostile, aggressive

knowledge structures and a hostile attribution bias (e.g., Burks et al., 1999; Crick &

Dodge, 1994; Dodge, 2006; Dodge et al., 2002). Further, this finding provides additional

support to the assertion that hostile, physically aggressive schemas are present in early

childhood and can be assessed through the MSSB. Likewise, the trend for the interaction

of skills in emotion understanding and teasing/taunting narrative themes suggest a link

among emotion and social information processes. Given that the teasing/taunting

narrative theme was hypothesized to be an indicator of a relationally aggressive

knowledge structure, it appears that early emotion and social information processes

interact to predict subsequent social information processing. This coincides with

researchers' arguments that emotion and cognition are linked early in development

(Izard, 1977; 2001; Izard et al., 2002; Lemerise, Gregory, & Fredstrom, 2004) and

supports the inclusion of emotion processes in examinations of social information processes.

Limitations

There were some limitations to the generalizability of these findings. First, the majority of children in this sample came from intact, middle class, two-parent households. This limits generalizability to children in different economic and family circumstances such as low-income households or single-parent households. Second, children in this sample represented an at-risk population, which limits generalizability to children diagnosed with a clinical disorder. Finally, measures in this study were taken at the same time point, so explicit statements about causality and direction of effects cannot be made.

Conclusion

The current study adds to and extends the current literature in several important ways. First, significant associations between measures of emotion understanding and children's social-cognitive knowledge structures support researchers' arguments for the inclusion of emotion processes in the investigation of children's social information processing (Denham et al., 2002; Izard, 2001; Izard et al., 2002; Lemerise & Arsenio, 2000). It appears that children's emotion understanding is associated with social information processing mechanisms, but further research is needed to clarify these relationships. In addition, emotion understanding represents a small component of emotion processes that children engage in when processing an ambiguous social situation. As Lemerise and Arsenio (2000) have noted, other emotion mechanisms such as emotion regulation, temperament, or display rules should also be investigated. Second,

the current study adds to the social information and emotion processing literature by extending associations between children's social-cognitive schemata and intent attributions developmentally downward to the kindergarten period. Findings suggest that children as young as age 5 have developed affective social-cognitive schemas of interpersonal relationships, which may directly impact how they perceive their peers' behaviors in social situations. Findings also provide further support for the use and validity of the MacArthur Story Stem Narrative Coding System (Robinson et al., 1992; 2004) in investigating distinct themes and gender differences within children's narratives. The current study supports previous literature that has found distinct themes within children's narratives as well as gender differences among these themes (Oppenheim, Emde, & Warren, 1996; Oppenheim, Nir, et al., 1997; von Klitzing et al., 2000; Zahn-Waxler et al., 2008). Moreover, the current study provides preliminary support for using the MSSB to index children's early social-cognitive schemata. To the author's knowledge, no other studies have used the MSSB to examine children's early social information processing mechanisms. The significant associations obtained between measures on the MSSB and other measures of children's social cognition, emotion understanding, and intellectual functioning suggest that the MSSB is a promising tool for tapping young children's representations of physical and relational aggression.

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Table 2.1 Means, Standard Deviations, and Results of MANOVA (controlling for Child IQ and Theory of Mind) of Study Variables, Presented Separately by Child Gender

Variables	Boys		Girls		Difference
	M	*SD*	*M*	*SD*	
IQ score	24.69	4.35	24.81	4.20	n.s.
Theory of Mind score	4.07	1.76	4.24	1.75	n.s.
Emotion Understanding score	11.43	4.33	12.28	4.66	n.s.
MSSB tasks					
Physical Aggression Scale	3.71	4.24	1.93	2.64	*p*<.01
Empathic/Prosocial Scale	2.26	1.54	3.34	2.34	*p*<.01
Relational Aggression Items					
Exclusion of Other	.89	1.00	.92	.93	n.s.
Refuse Empathy/Help	.05	.22	.10	.34	n.s.
Teasing/Taunting	.14	.45	.26	.50	*p*<.05
Narrative Coherence	1.99	.60	2.18	.62	n.s.
Hostile Attribution Bias	1.42	1.36	1.13	1.35	n.s.

Note: MSSB = MacArthur Story Stem Battery.

Table 2.2 Reliability of MSSB Scales

Scale	Cronbach's α	N	Number of Items
Physical Aggression	.84	173	4
Relational Aggression	.34	173	3
Empathic/Prosocial	.60	172	3

Table 2.3 Correlations between Child IQ, Theory of Mind, and Study Variables

	IQ	Theory of Mind
1. Emotion Understanding	.39***	.15*
2. Physical Aggression Scale	-.05	-.08
3. Empathic/Prosocial Scale	.12	.19*
4. Exclusion of Other Theme	-.17*	-.05
5. Refuse Empathy/Help Theme	.12	.13[+]
6. Teasing/Taunting Theme	-.05	.05
7. Narrative Coherence	.20*	.10
8. Hostile Attribution Bias	-.18*	-.08

Note: [+]$p<.10$. *$p<.05$. **$p<.01$. ***$p<.001$.

Table 2.4 Intercorrelations of Study Variables (With Child IQ and Theory of Mind Controlled)

	1	2	3	4	5	6	7	8
1. Emotion Understanding	——	.20*	-.15[+]	.10	.05	.14[+]	-.06	.01
2. Physical Aggression Scale		——	-.07	.14	.14[+]	.30***	-.17*	.16*
3. Empathic/Prosocial Scale			——	.13	.01	-.01	.43***	.05
4. Exclusion of Other Theme				——	.10	.11	.14[+]	.21*
5. Refuse Empathy/Help Theme					——	.37***	-.17*	-.03
6. Teasing/Taunting Theme						——	.05	-.06
7. Narrative Coherence							——	.01
8. Hostile Attribution Bias								——

Note: [+]*p*<.10. **p*<.05. ***p*<.01. ****p*<.001.

Table 2.5 Summary of Negative Binomial Regression Predicting Hostile Attribution Bias

Variable	B	SE B	Wald χ^2
1. Child IQ	-.05	.03	2.45
2. Child Gender	.15	.26	.34
3. Emotion Understanding	-.10	.05	4.31*
4. Physical Aggression	.10	.07	2.16+
5. Exclusion of Other	.24	.12	3.91*
6. Teasing/Taunting	-.47	.42	1.24
7. Gender x Emotion Understanding	.12	.06	4.33*
8. Gender x Physical Aggression	-.07	.08	.82
9. Gender x Teasing/Taunting	.13	.65	.04
10. Emotion Understanding x Teasing/Taunting	-.21	.11	3.72+
11. Exclusion of Other x Teasing/Taunting	.50	.34	2.16

Note: +p=.10. *p<.05.

Figure 2.1 Relationship Examined between Children's Affective Social-Cognitive
Schemata and the Presence of a Hostile Attribution Bias (adapted from Dodge, 2006)
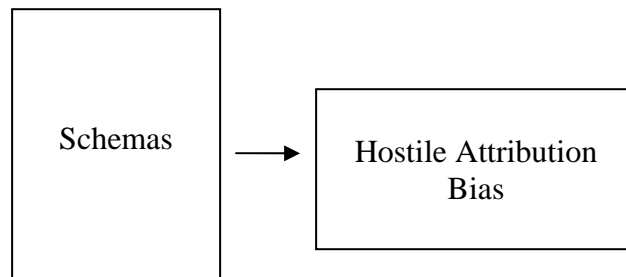
Figure 2.2 Interaction of Child Gender and Emotion Understanding Predicting Hostile
Attribution Bias
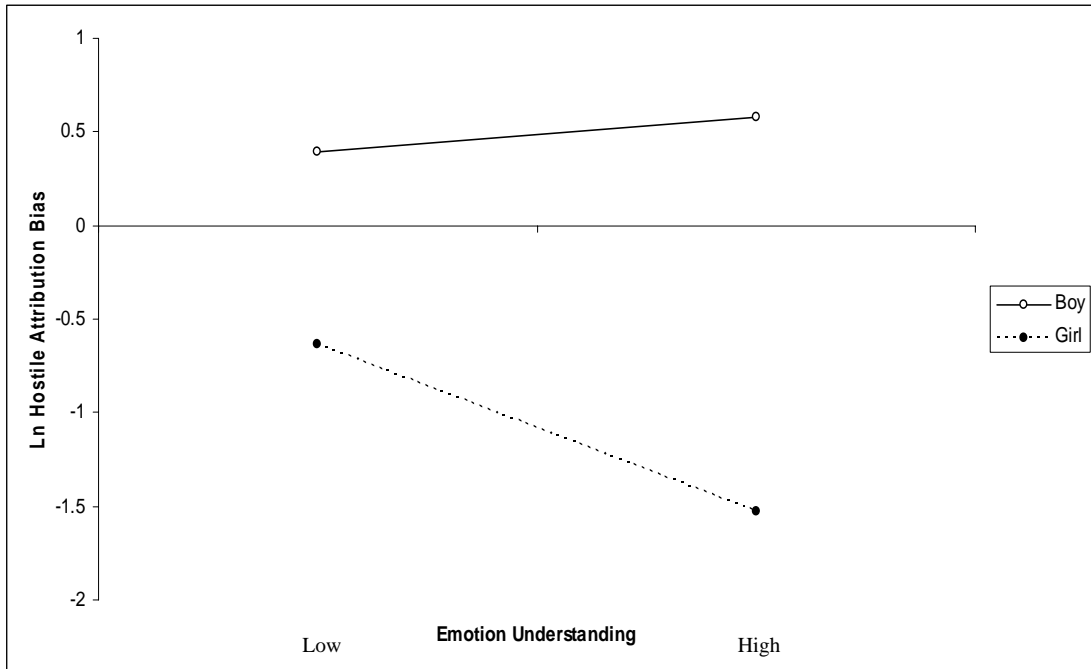
Note: For ease of interpretation, the natural log of hostile attribution bias is plotted so that the linear
effect of the interaction between child gender and emotion understanding can be shown.

Chapter III

Patterns of Social-Cognitive and Emotion Processing in Aggression:
Effects of Child Gender and Form of Aggression

As reviewed in Chapter II, deficits in social cognition are linked with

maladjustment in interpersonal contexts as well as the development of psychopathology.

A large literature has linked children's aggressive behavior with each step of Crick and

Dodge's (1994) social information processing model, with many studies finding a link

between the presence of a hostile attribution bias and the display of aggressive behavior

(Crick & Dodge, 1994; Orobio de Castro, Veerman, Koops, Bosch, & Monshouwer,

2002; Dodge, 2006; Dodge & Pettit, 2003; Dodge, 1980; Feldman & Dodge, 1987;

MacBrayer, Milich, & Hundley, 2003; Steinberg & Dodge, 1983; Yoon, Hughes, Gaur,

& Thompson, 1999). However, as Dodge (2006) recently postulated, there is evidence

that children's maladaptive knowledge structures directly influence the tendency to

attribute benign versus hostile intent in ambiguous situations (e.g., Burks, Laird, Dodge,

Pettit, & Bates, 1999; Crick, 1995; Dodge, 2006; Dodge & Pettit, 2003; Zelli, Dodge,

Lochman, Laird, & Conduct Problems Prevention Research Group [CPPRG], 1999). In

addition, deficits in children's emotion understanding have been found to contribute to

biases in interpretation and behavioral enactment (Lemerise, Gregory, & Fredstrom,

2004; Schultz, Izard, & Bear, 2004) as well as to the display of aggressive behavior

(Arsenio, Cooperman, & Lover, 2000; Denham, Caverly, et al., 2002; Hughes, Dunn, &

White, 1998). This is in line with arguments that both social-cognitive and emotion

processes need to be considered when examining social information processing

mechanisms in the development of aggression in children (e.g., Izard, 2001; Izard, Fine,

Mostow, Trentacosta, & Campbell, 2002; Lemerise & Arsenio, 2000). Likewise, findings

from Chapter II provide additional evidence for associations among early social-cognitive

and emotion processes. In particular, deficits in young children's level of emotion

understanding and social-cognitive schemata were associated with the presence of a

hostile attribution bias. Taken together, these findings suggest that deviance and/or

deficiencies in affective social-cognitive knowledge structures are present in the

kindergarten years and contribute to individual differences in the presence of a hostile

attribution bias. However, it is also important to consider children's ability to regulate

their own emotions when examining the development of persistent aggression.

Emotion Regulation and Social Information Processing

Emotion regulation has been defined as the dynamic interaction between

behavioral, psychophysiological, attentional, and affective systems that allow young

children to participate successfully in their social world and manage interpersonal

situations (Cole, Martin, & Dennis, 2004; Denham, Blair, Schmidt & DeMulder, 2002;

Denham et al., 2003; Parker & Gottman, 1989). Given that emotion regulation is a broad

construct that encompasses affective, cognitive, and behavioral processes (Blair,

Denham, Kochanoff, & Whipple, 2004), many researchers have noted the importance of

examining children's emotion regulation in relation to social information processing

mechanisms (Denham, Caverly, et al., 2002; Izard, 2001; Lemerise & Arsenio, 2000).

Researchers have argued that children's own emotional arousal can affect what is

encoded in a social situation and increase the likelihood of accessing mood congruent

information or knowledge structures, thus influencing the interpretation of social cues (e.g., Izard, 2001; Lemerise & Arsenio, 2000). This inability to assess the situation from different cognitive and affective perspectives also prevents the child from processing all contextual factors, which decreases children's flexibility in choosing an appropriate response (Saarni, 1999). Instead, poor regulatory abilities increase the probability that children will engage in preemptive processing, in which the child responds "automatically" with predetermined and inaccurate attributions and behaviors (Costanzo & Dix, 1983; Crick & Dodge, 1994; Dodge, 2006). Research investigating reactive aggression in children supports this idea by showing that children who engage in reactive aggression have difficulty controlling negative emotions such as anger and are more likely to attribute hostile intent in ambiguous situations (Dodge, 2006; Dodge & Pettit, 2003). Therefore, a child that has the ability to regulate and cope with negative emotions that they experience will be more likely to have the social-cognitive resources to attend to relevant cues and process situations more accurately. However, the combination of poor regulatory abilities and deficient or maladaptive skills in emotion understanding would make the display of aggression more likely due to preemptive processing and the recall of deviant emotion-congruent knowledge structures.

To date, relatively few studies have examined children's emotion regulation in conjunction with social information processing variables. Available studies revealed a mixed picture. While at least one study indicates that emotion regulation directly influences social information processing variables (Musher-Eizenman et al., 2004), other research suggests that emotion regulation has effects independent of social information processing in the development of aggression (Orobio de Castro, Merk, Koops, Veerman,

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& Bosch, 2005; Schultz, Izard & Bear, 2004; Schwartz & Proctor, 2000). For instance, Orobio de Castro and colleagues (2005) examined the influence of emotion attribution and regulation, as well as hostile attribution bias, response generation, approval of response, and behavioral enactment on the development of aggression in 7-13 year old reactively and proactively aggressive children. They found that children's hostile attribution bias was the only social information processing variable that significantly predicted teacher ratings of reactive and proactive aggression. Children's emotion regulatory abilities, on the other hand, significantly and uniquely predicted variance in both reactive and proactive aggression above and beyond hostile attribution bias. This finding suggests that emotion regulatory abilities do not influence social information processing per se, but have direct effects on the development of aggression. This supports a large body of research that indicates that children's inability to regulate their own emotions, especially in combination with intense negative emotional displays, is linked with less competence with peers, as well as higher levels of anger expressions, externalizing behavior, and aggression (Campbell, Shaw, & Gilliom, 2000; Eisenberg et al., 1996; Eisenberg et al., 1997; Fabes et al., 1999; Keenan, 2000). Further, this suggests that the combination of deficits in social information processing and emotion regulation would lead to the display of aggressive behaviors.

However, gender also needs to be taken into account in the examination of emotion regulation and the development of aggression. Recent research on early emotion regulatory abilities, attentional skills, and the development of aggression across the preschool period suggests that emotion dysregulation is more of a risk factor for the development of stable patterns of aggression in girls rather than boys (Hill, Degnan,

Calkins, & Keane, 2006). Specifically, Hill and colleagues (2006) found that for girls, emotion dysregulation at age 2 robustly and uniquely predicted membership in a chronic-clinical profile of externalizing behavior, whereas emotion dysregulation was not predictive for boys. Thus, understanding how early social information processing variables, emotion regulatory skills, and gender influence these processes may help to illuminate specific pathways in the development of aggression over time.

Physical vs. Relational Aggression

Yet, aggression is a heterogeneous construct. For example, research has demonstrated the presence of two conceptually distinct forms of aggression: physical and relational (Crick & Grotpeter, 1995; Crick, Ostrov, Burr, et al., 2006; Ostrov & Keating, 2004). Physical aggression is defined by proactive or reactive overt behaviors such as hitting, kicking, and biting, whereas relational aggression is characterized by more subtle behaviors such as excluding individuals from activities, ignoring them, or whispering about them (Crick & Grotpeter, 1995; Ostrov & Keating, 2004).Traditionally, researchers have focused on the presence of physical aggression when examining early peer relationships, which consequently led to an underestimation of aggression displayed by girls (Crick, Ostrov, & Werner, 2006; Crick et al., 1999). In fact, a growing body of research has shown that girls typically utilize relational aggression more often than boys (Crick & Grotpeter, 1995; Crick, Ostrov, Burr, et al., 2006; Ostrov & Keating, 2004; Ostrov, Woods, Jansen, Casas, & Crick, 2004) and the inclusion of relational aggression in studies significantly increases the proportion of females that can be identified as highly aggressive (Bonica, Yershova, Arnold, Fisher, & Zeljo, 2003; Crick, Ostrov, Burr, et al.,

2006). Therefore, it is important to include measures of physical and relational aggression when examining the development and maintenance of aggression in young children.

As reviewed in Chapter II, the majority of studies investigating the role of social information processing in the development of aggression have focused predominantly on overt forms of aggression (Crick, Ostrov, & Werner, 2006; Yoon et al., 1999, for a review), which has likely obscured gender differences in social information and emotion processing related to the display of aggression (Crick & Grotpeter, 1995; Crick, Ostrov, Burr, et al., 2006; Ostrov & Keating, 2004; Ostrov et al., 2004). In fact, recent research suggests that particular interpersonal contexts pull for particular interpersonal goals (Crick, 1995; Crick & Werner, 1998). For example, Crick and Werner (1998) found that children evaluate instrumental goals more positively in instrumental situations and relational goals more positively in relational contexts. However, research is mixed regarding the relationship between a hostile attribution bias and the display of relational aggression. While some research indicates that relationally aggressive school-age boys and girls exhibit a hostile attribution bias in relationally interpersonal situations (Crick, 1995; Crick, Grotpeter, & Bigbee, 2002), other research indicates that there is not a connection (Crain, Finch, & Foster, 2005). Examining social information processing and emotion variables in relation to each form of aggression, then, may reveal specific deviations or deficits in social information processing mechanisms that increase the likelihood that particular forms of aggression will be displayed.

Methodological Issues

To review, researchers have used children's verbal responses based on hypothetical vignettes to index social information processing mechanisms in the

development of children's aggression (e.g., Burks et al., 1999; Crain, Finch, & Foster, 2005; Crick & Dodge, 1996; Dodge, Laird, Lochman, Zelli, & CPPRG, 2002). While methodological issues regarding the assessment of social information processing mechanisms in young children were reviewed in Chapter II, it is important to highlight one particular limitation here. Children may be less emotionally invested in the vignettes because they are delivered in an interview format and do not require more active participation. In turn, this may allow children more time to process the vignettes and provide more socially adaptive answers because they are not required to regulate their emotions at the same time that they are processing social information. Thus, the use of a more interactive, hands-on approach such as the MacArthur Story Stem Battery (MSSB) creates a situation where children must effectively regulate their own emotions as they actively cope with the challenges of each story in their effort to address and resolve the conflict (Emde, 2003; Oppenheim, Nir, Warren, & Emde, 1997). Given that emotion regulation has been theorized to impact social information processing mechanisms (Denham, Caverly, et al., 2002; Izard, 2001; Lemerise & Arsenio, 2000), the use of the MSSB should provide valuable information about affective social-cognitive knowledge structures in the context of children's emotion regulatory abilities.

Current Study

In sum, there is a paucity of research examining how early social-cognitive and emotion processes relate to the development of overt and relational aggression. The majority of studies has focused on older school-age children and adolescents, and has focused almost exclusively on boys. In addition, most studies have neglected to include emotion understanding and regulation in investigations of social information processing

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mechanisms in the development of aggression. As a result, the current study examined qualitative differences in children's affective social-cognitive schemata and skills in emotion regulation during the kindergarten period and investigated how differences relate to the display of overt and relational forms of aggression.

The current study expanded upon findings from Chapter II and sought to develop a predictive model of social-cognitive and emotion processing in the development of overt and relational forms of aggression. Thus, the research questions and hypotheses focused on three main issues. First, relationships among social-cognitive and affective components of kindergartener's knowledge structures and emotion regulatory abilities were examined in relation to overt and relational forms of aggression. Specifically, individual differences in narrative themes of physical aggression, relational aggression, and empathic/prosocial relations, narrative coherence, emotion understanding, and emotion regulation were examined in relation to teacher reports of overt and relational forms of aggression. Based on previous research, I hypothesized that a) themes of physical aggression would be related to teacher reports of overt aggression, whereas themes of relational aggression would be related to teacher reports of relational aggression, b) the empathic/prosocial relations theme, narrative coherence, and emotion understanding would be negatively related to teacher reports of overt and relational aggression, and c) that poor emotion regulation skills would be associated with teacher reports of overt and relational aggression. I did not make any explicit hypotheses regarding interactions among emotion regulation, narrative themes and coherence, and emotion understanding given that the research is mixed. Second, I explored how children's ability to regulate their own emotions impacted relationships among the social

and emotional components of children's knowledge structures and aggression once the presence of a hostile attribution bias was included. I hypothesized that a hostile attribution bias would be associated with teacher reports of both overt and relational aggression, but did not make explicit hypotheses regarding interactions among emotion regulation, narrative themes and coherence, emotion understanding, and a hostile attribution bias given that findings are mixed. Finally, gender differences in these relationships were explored to illuminate potential differences in the contribution of social-cognitive and emotion processes to the development of overt and relational forms of aggression.

Method

Participants

Participants were 173 children (73 girls) who were recruited to be part of an ongoing longitudinal study investigating the correlates and antecedents of externalizing behavior problems (Olson, Sameroff, Kerr, Lopez, & Wellman, 2005). For a full description of the participant sample, see Chapter II. Data from the second time point of the study were used in the present study.

Procedures

School assessment. Kindergarten teachers were asked to contribute ratings of children's behavioral adjustment. Those who agreed were mailed a packet of questionnaires, and asked to return them by mail or by experimenter pick-up when completed. They were given gift certificates for their participation.

Laboratory Assessment. Children participated in a 4-hour laboratory assessment held at a local preschool on a Saturday morning ($N= 228$ at time 1; $N= 199$ at time 2).

Some children did not complete this assessment because of scheduling conflicts or pronounced difficulty with parental separation. After building rapport with the children, graduate student examiners administered a battery of social, cognitive, and emotion tests. A more detailed description of the laboratory assessments used in this study will be described below. Children provided assent and received small gifts for their participation.

Measures

Social information processing: Affective social-cognitive knowledge structures. Children's affective social-cognitive knowledge structures were assessed during time 2 using the MacArthur Story Stem Battery (MSSB; Bretherton, Oppenheim, Buchsbaum, Emde, & the MacArthur Narrative Group, 1990). See Chapter II for a full description of this task. The following eight story stems were used, presented in random order to each child (see Appendix A for full descriptions of each story stem): The Lost Keys, Bedtime, New Bike, Cookie Dilemma, Departure from Parents, Reunion, Friends Fighting, and Mom's Hurt Knee. The child was given unlimited time to complete this task and all story stem presentations were videotaped.

As described in Chapter II, undergraduate research assistants were trained to code the MSSB using The MacArthur Story Stem Narrative Coding System (Robinson, Mantz-Simmons, MacFie, Kelsay, Holmberg, & the MacArthur Narrative Group, 1992; 2004; see Appendix B). Aggregate scores for each content theme measure were created by summing scores across all eight story stems and an overall narrative coherence measure was created by averaging the coherence scores across stories. Scales for physical aggression and empathic/prosocial relations were created and used in analyses, while

individual items for relational aggression were used in analyses (see Chapter II for a full description).

Social information processing: Hostile attribution bias. Children's intent attributions were measured using Webster-Stratton and Lindsay's (1999) hostile attribution bias interview (see Chapter II for a detailed description). A total aggressive attribution score was created by summing across the four scenarios and used in the current study.

Emotion understanding. Children's emotion understanding at time 2 was assessed using an appearance-reality emotion understanding task developed by Harris, Donnelly, Guz, and Pitt-Watson (1986). For a detailed description of this task, see Chapter II. A composite emotion understanding score was calculated for the appearance-reality emotion tasks by summing the children's correct responses on the emotion labeling portion of the task with their correct judgments of the protagonists' real and apparent emotion. This score was then divided by a total possible score of 18.

Emotion regulation. Children's emotion regulation with peers at time 2 was measured with the Emotion Regulation Checklist (ERC; Shields & Cicchetti, 1997). The checklist contains 24 positively and negatively weighted items that measure emotion regulation processes such as affective lability, intensity, valence, flexibility, and situational appropriateness. Kindergarten teachers were asked to provide ratings on each item using a 4-point Likert-type scale ranging from 1= *Rarely/never* to 4= *Almost always* and two subscales were derived to index emotion regulation. The Lability/Negativity subscale includes items representing the lack of flexibility, mood lability, and dysregulated negative affect (e.g., "Is prone to angry outbursts"), whereas the Emotion

Regulation subscale describes appropriate affective displays, empathy, and emotional self-awareness (e.g., "Can say what s/he is feeling sad, angry or mad, fearful, or afraid"). Research has demonstrated high internal consistency for each subscale and moderate construct validity (Shields & Cicchetti, 1997). The Emotion Regulation subscale was used to provide a measure of children's ability to regulate their emotions with peers.

Aggression. Kindergarten teachers completed a questionnaire that combined items from the Inventory of Peer Relations (Dodge & Coie, 1987) and the Children's Social Behavior Scale-Teacher Form (CSBS-TF; Crick, 1996). The Inventory of Peer Relations includes 20 items that provides measures of reactive (e.g., "When this child has been teased or threatened he or she gets angry easily and strikes back") and proactive (e.g., "This child threatens or bullies others in order to get his or her own way") peer aggression. Teachers respond to each item using a Likert-type scale ranging from 1 = *Never true* to 5 = *Always true* and a composite score is created for each scale by summing across relevant items. The scale has been found to have high internal consistency and moderate construct validity (Dodge and Coie, 1987). The CSBS-TF consists of 15 items, seven of which provide a measure of relational aggression (e.g., "This child spreads rumors or gossips about some peers"). Teachers use the same Likert-type scale to rate each item and a composite score is created by summing across the relevant items. The scale has also been found to have high internal consistency and moderate construct validity (Crick, 1996). The measure of relational aggression from the CSBS-TF was combined with the measures of reactive and proactive aggression from the Inventory of Peer Relations for this study. In addition, the reactive and proactive subscales were

combined to index the presence of overt aggression and the relational aggression subscale was used to index relational aggression.

Control variable: Child IQ. An index of children's intelligence was used as a control variable in all analyses. Children's intelligence was assessed using the Vocabulary and Block design subtests of the Wechsler Intelligence Scale for Children-3rd Edition-Revised (WISC-III-R; Wechsler, 1992) during time 2. Children's intelligence scores were created from the summed scores of the Vocabulary and Block design subtests.

Control variable: Theory of mind. Children's theory of mind at time 2 was assessed by the Bartsch and Wellman (1989) Belief-Desire reasoning tasks (for a full description, see Chapter II). Scores were summed across the prediction and explanatory belief-desire tasks and then divided by the total possible score of 12 in order to obtain an overall theory of mind score.

<div align="center">Results</div>

Preliminary Analyses

Table 3.1 provides the means and standard deviations of teacher reports of emotion regulation, overt aggression, and relational aggression, presented separately by child gender. The means and standard deviations for narrative themes, narrative coherence, emotion understanding, and hostile attribution bias can be found in Table 2.1. Table 3.1 also includes results of a multivariate analysis of variance (MANOVA) examining gender differences in teacher reports of emotion regulation, overt aggression, and relational aggression. Child gender was entered as the between subjects factor, while child IQ, theory of mind skills, and teacher reports of emotion regulation, overt

aggression, and relational aggression were dependent variables. Results revealed

significant main effects for teacher reports of emotion regulation and overt aggression

($F(3, 185)=5.96$, $p<.01$). Univariate tests indicated that teachers rated girls higher on

emotion regulation than boys ($F(1, 187)=4.43$, $p<.05$), but lower than boys on measures

of overt aggression ($F(1, 187)=4.79$, $p<.05$). No significant gender differences were

found for teacher reports of relational aggression.

Correlations among Study Variables.

First, zero-order correlations were conducted among all variables of interest.

Results revealed that IQ was not correlated with teacher reports of emotion regulation

($r(170) = -.08$, p=n.s.), overt aggression ($r(169) = .00$, p=n.s), or relational aggression

($r(168) = -.01$, p=n.s.). Likewise, theory of mind skills were not correlated with teacher

reports of either overt or relational aggression ($r(163) = -.11$, p=n.s., for overt; $r(162) = -$

.08, p=n.s., for relational). However, the positive correlation between theory of mind

skills and teacher report of emotion regulation approached significance ($r(164) = .14$,

$p<.10$). There was also a strong positive correlation between teacher reports of overt and

relational aggression ($r(189) = .71$, $p<.001$). As a result, overt aggression was used as a

control variable in analyses examining relational aggression and vice versa.

Table 3.2 presents the results of partial correlations among the social-cognitive,

emotion understanding, and aggression measures, presented separately by child gender

and controlling for child IQ and theory of mind skills. Child IQ and theory of mind skills

were used as control variables in order to examine the unique variance associated with

the social-cognitive, emotion understanding, and aggression measures. Results revealed

significant associations with teacher reports of aggression for boys, but no significant

associations with teacher reports of aggression for girls. Specifically, the physical aggression narrative scale was positively correlated with teacher reports of relational aggression. Also, the refuse empathy/help narrative theme was marginally positively correlated with teacher reports of relational aggression and the display of a hostile attribution bias was marginally positively correlated with teacher reports of overt aggression. No other significant associations were obtained.

Partial correlations among the social-cognitive, emotion understanding, emotion regulation, and aggression measures, presented separately by child gender and controlling for child IQ and theory of mind skills, are shown in Table 3.3. Again, child IQ and theory of mind skills were used as control variables in order to examine the unique variance associated with the social-cognitive, emotion understanding, emotion regulation, and aggression measures. Results indicated a significant negative correlation between the exclusion of other narrative theme and teacher reports of emotion regulation for boys, as well as between teacher reports of overt aggression and emotion regulation for girls. Two other associations also approached significance. In particular, there was a marginally positive association between hostile attribution biases and teacher reports of emotion regulation for boys and a marginally negative association between the physical aggression narrative scale and teacher reports of emotion regulation for girls. No other significant correlations were found.

Schemata and Emotion Regulation as Predictors of Aggression

Figure 3.1 depicts a diagram of the direct and indirect relationships among children's affective social-cognitive schemata, emotion regulatory skills, and aggressive behavior that were examined in the first set of analyses. In order to examine direct and

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indirect effects of these relationships, four separate linear regressions were conducted. OLS regressions, rather than negative binomial regressions, were used in the current study because the measures for the dependent variable, aggression, reflected data with a normal distribution and greater range of scores. Overt and relational aggression were examined separately so that specific patterns of relationships could be uncovered. In addition, the linear regressions were conducted separately by child gender to illuminate different patterns of effect given that significant interactions with gender were obtained in analyses from Chapter II and different patterns of effect were obtained from partial correlations discussed above. For each regression, one form of aggression (e.g., overt or relational) was entered as the dependent variable; child IQ, theory of mind skills, and the other form of aggression (e.g., overt or relational) were entered as control variables; and level of emotion understanding, physical aggression narrative scale, exclusion of other narrative themes, and emotion regulation were entered as independent variables. Child IQ, theory of mind skills, and aggression were entered as control variables so that the unique relationships among emotion understanding, narrative themes, emotion regulation, and aggression could be examined. In addition, findings from Chapter II indicated that the physical aggression narrative scale was positively correlated with children's level of emotion understanding. As a result, children's level of emotion understanding was included as an independent variable despite non-significant correlations with each measure of aggression to determine if interactive relationships containing emotion understanding impacted the display of aggression.

The predictive models for each form of aggression were constructed in several steps. First, all the aforementioned variables and interaction terms were entered as

predictor variables. Second, all predictor variables with *p*-values greater than .30 were excluded from the model and the linear regression analysis was re-run using the remaining predictor variables. This process was repeated until all the predictor variables in the model achieved a *p*-value of .30 or less. Thus, the final linear regression model reflected the predictor variables that best explained the variance in each form of aggression. Analyses and results for the predictive models of aggression will be described and reported for boys and girls separately.

Teacher Reports of Boys' Aggression

Two linear regressions were performed separately by aggression to illuminate the unique and interactive contributions of affective social-cognitive schemata and emotion regulation on teacher reports of overt and relational aggression. In the first linear regression, teacher reports of overt aggression were used as the dependent variable and control and predictive variables were as follows: child IQ, theory of mind skills, teacher reports of relational aggression, level of emotion understanding, physical aggression narrative scale, exclusion of other narrative theme, and teacher reports of emotion regulation. In the second linear regression, teacher reports of relational aggression were used as the dependent variable and control and predictive variables were as follows: child IQ, theory of mind skills, teacher reports of overt aggression, level of emotion understanding, physical aggression narrative scale, exclusion of other narrative theme, and teacher reports of emotion regulation. Interactive terms among the predictive variables also were examined in all analyses.

Results of the final model predicting teacher reports of boys' overt aggression are shown in Table 3.4. The overall predictive model achieved significance ($F(6, 74)=18.65$,

$p<.001$), with $R^2 = .60$. Results revealed significant main effects for teacher reports of relational aggression, level of emotion understanding, and teacher reports of emotion regulation. The significant positive beta for relational aggression indicated that higher rates of teacher reported relational aggression were associated with higher rates of teacher reported overt aggression. Also, teacher reports of relational aggression accounted for 50% of the variance in overt aggression. The significant negative betas for emotion understanding and emotion regulation indicated that higher levels of emotion understanding and regulation uniquely predicted decreases in overt aggression. Level of emotion understanding and teacher reports of emotion regulation accounted for 5% and 12% of the variance in teacher reports of overt aggression, respectively. In addition, results revealed a significant interaction between level of emotion understanding and teacher reports of emotion regulation.

Given that the significant interaction between level of emotion understanding and teacher reports of emotion regulation contained an interaction between two continuous variables, the main effects of the interaction are not directly interpretable. As a result, post-hoc analyses were conducted according to Jaccard and Turrisi's (2003) guidelines for examining interactions among continuous variables. For example, the emotion understanding and emotion regulation variables were centered using low and high values. Low values corresponded to 1 standard deviation below the mean and high values corresponded to 1 standard deviation above the mean. The low- and high-centered variables were then entered into the original model and the resulting beta values for emotion understanding and emotion regulation represented slopes of the main effects when each variable was low and high.

Results revealed a significant difference in overt aggression between low and high levels of emotion regulation when emotion understanding was low ($F(1, 74)=12.67$, $p<.01$). As shown in Figure 3.2, lower levels of emotion understanding predicted higher rates of overt aggression when emotion regulation was low (B= -.43, $p<.01$), but not when emotion regulation was high (B=-.06, p=n.s.). In addition, this interaction accounted for 6% of the variance in teacher reports of overt aggression.

Table 3.5 presents the results of the final model predicting teacher reports of boys' relational aggression. The overall predictive model achieved significance ($F(8, 63)=16.71$, $p<.001$), with $R^2 = .68$. Results revealed significant main effects for teacher reports of overt aggression and the physical aggression narrative scale, as well as a significant interaction between the physical aggression narrative scale and teacher reports of emotion regulation. The significant positive beta for teacher reports of overt aggression indicated that higher rates of teacher reported overt aggression were associated with higher rates of teacher reported relational aggression. Also, teacher reports of overt aggression accounted for 43% of the variance in teacher reports of relational aggression. The significant positive beta for the physical aggression narrative scale indicated that more narrative themes of physical aggression were related to higher rates of teacher reported relational aggression. This association accounted for 12% of the variance in teacher reports of relational aggression.

Post-hoc analyses to examine the direction of main effects for the significant interaction between the physical aggression narrative scale and teacher reports of emotion regulation were conducted using the Jaccard and Turrisi (2003) guidelines as described above. Results revealed a marginally significant difference in relational aggression

between low and high emotion regulation when rates of physically aggressive narrative themes were high ($F(1, 63)=3.05$, $p<.10$). Thus, there was a trend for higher rates of physically aggressive narrative themes to predict higher rates of teacher reports of relational aggression when boys' emotion regulatory abilities were low (B=-.49, $p<.10$), but not when emotion regulatory abilities were high (B=-.16, p=n.s.). This interaction accounted for 10% of the variance in teacher reports of relational aggression.

Teacher Reports of Girls' Aggression

Similar to the analyses with boys, two linear regressions were performed separately by aggression to illuminate the unique and interactive contributions of affective social-cognitive schemata and emotion regulation on teacher reports of overt and relational aggression. In the first linear regression, teacher reports of overt aggression were used as the dependent variable and control and predictive variables were as follows: child IQ, theory of mind skills, teacher reports of relational aggression, level of emotion understanding, physical aggression narrative scale, exclusion of other narrative theme, and teacher reports of emotion regulation. In the second linear regression, teacher reports of relational aggression were used as the dependent variable and control and predictive variables were as follows: child IQ, theory of mind skills, teacher reports of overt aggression, level of emotion understanding, physical aggression narrative scale, exclusion of other narrative theme, and teacher reports of emotion regulation. Interactive terms among the predictive variables also were examined in all analyses.

Results of the final model predicting teacher reports of girls' overt aggression are shown in Table 3.6. The overall predictive model achieved significance ($F(8, 46)=14.94$, $p<.001$), with $R^2 = .72$. Results revealed significant main effects for teacher reports of

relational aggression, theory of mind skills, level of emotion understanding, and the physical aggression narrative scale. The significant positive betas for relational aggression and emotion understanding indicated that higher rates of teacher reported relational aggression, as well as higher levels of emotion understanding, were associated with higher rates of teacher reported overt aggression. These associations accounted for 64% and 19% of the variance in relational aggression, respectively. However, the significant negative betas for theory of mind skills and the physical aggression narrative scale indicated that higher levels of theory of mind and more physically aggressive narrative themes were associated with lower rates of teacher reported overt aggression. These relationships accounted for 8% and 9% of the variance in teacher reports of relational aggression, respectively.

Following Jaccard and Turrisi (2003), post-hoc analyses were conducted to examine the direction of main effects for the significant interaction between the physical aggression narrative scale and teacher reports of emotion regulation. Results revealed that there was not a significant difference in overt aggression between low and high levels of emotion regulation ($F(1, 46)=1.84$, p=n.s.). Thus, higher rates of physical aggression in girls' narratives predicted lower rates of teacher reports of overt aggression independent of girls' emotion regulatory skills.

Likewise, post-hoc analyses following Jaccard and Turrisi's (2003) guidelines were performed to examine the direction of main effects in the significant interaction between level of emotion understanding and teachers report of emotion regulation. Results revealed a significant difference in overt aggression between low and high levels of emotion regulation when level of emotion understanding was high ($F(1, 46)=16.97$,

p<.001). As presented in Figure 3.3, higher levels of emotion understanding predicted higher rates of teacher reported overt aggression when girls' emotion regulatory abilities were low (B=-.87, *p*<.001), but not when emotion regulatory abilities were high (B=-.15, *p*=n.s.). This interaction accounted for 17% of the variance in teacher reports of relational aggression.

Table 3.7 presents the results of the final model predicting teacher reports of girls' relational aggression. The overall predictive model achieved significance ($F(8, 46)=14.33$, *p*<.001), with $R^2 = .72$. Results revealed significant main effects for teacher reports of overt aggression, level of emotion understanding, and teacher reports of emotion regulation, as well as a significant interaction between level of emotion understanding and teacher reports of emotion regulation. The significant positive beta for teacher reports of overt aggression indicated that higher rates of overt aggression were associated with higher rates of teacher reports of relational aggression. Also, teacher reports of overt aggression accounted for 64% of the variance in teacher reports of relational aggression. On the other hand, the significant negative betas for emotion understanding and emotion regulation indicated that higher levels of each predicted lower rates of teacher reported relational aggression. These associations accounted for 28% and 19% of the variance in teacher reports of relational aggression, respectively.

Post-hoc analyses, conducted according to Jaccard and Turrisi's (2003) guidelines, were used to examine the direction of effects in the significant interaction between level of emotion understanding and teacher reports of emotion regulation. Results revealed a significant difference in relational aggression between low and high levels of emotion regulation when level of emotion understanding was high ($F(1,$

46)=12.92, $p<.01$). As shown in Figure 3.4, higher levels of emotion understanding predicted lower rates of teacher reported relational aggression when girls' emotion regulatory abilities were low (B=.88, $p<.01$), but not but not when emotion regulatory abilities were high (B=-.15, p=n.s.). This interaction accounted for 28% of the variance in teacher reports of relational aggression.

Schemata, Intent Attribution, and Emotion Regulation as Predictors of Aggression

The aforementioned models were expanded to include the intent attribution step of Crick and Dodge's (1994) social information processing model to explore how the combination of affective social-cognitive knowledge structures, intent attribution, and emotion regulatory skills would influence the display of aggression. Figure 3.5 depicts a diagram of the direct and indirect relationships among children's affective social-cognitive schemata, emotion regulatory skills, hostile attribution biases, and aggressive behavior that were examined in the second set of analyses. Four separate linear regressions were conducted and overt and relational aggression were again examined separately so that specific patterns of relationships could be uncovered. As noted previously, OLS regressions were because the measures for the dependent variable, aggression, reflected data with a normal distribution and greater range of scores. Analyses were also conducted separately by child gender to illuminate different patterns of effect. For each linear regression, one form of aggression (e.g., overt or relational) was entered as the dependent variable; child IQ, theory of mind skills, and the other form of aggression (e.g., overt or relational) were entered as control variables; and level of emotion understanding, physical aggression narrative scale, exclusion of other narrative themes, hostile attribution bias, and teacher reports of emotion regulation were entered as

independent variables. Child IQ, theory of mind skills, and other form of aggression were entered as control variables so that the unique relationships among emotion understanding, narrative themes, hostile attribution bias, emotion regulation, and aggression could be examined. In addition, findings from Chapter II indicated that the physical aggression narrative scale was positively correlated with children's level of emotion understanding and that children's level of emotion understanding was associated with the display of a hostile attribution bias. As a result, children's level of emotion understanding was included as an independent variable despite non-significant correlations with each measure of aggression to determine if interactive relationships containing emotion understanding impacted the display of aggression.

As described previously, the predictive models for each form of aggression were constructed in several steps. First, all the aforementioned variables and interaction terms were entered as predictor variables. Second, all predictor variables with *p*-values greater than .30 were excluded from the model and the linear regression analysis was re-run using the remaining predictor variables. This process was repeated until all the predictor variables in the model achieved a *p*-value of .30 or less. Thus, the final linear regression model reflected the predictor variables that best explained the variance in each form of aggression. Analyses and results for the predictive models of aggression will be described and reported for boys and girls separately.

Teacher Reports of Boys' Aggression

Two linear regressions were performed separately by aggression to illuminate the unique and interactive contributions of affective social-cognitive schemata, intent attribution, and emotion regulation on teacher reports of overt and relational aggression.

In the first linear regression, teacher reports of overt aggression were used as the dependent variable and control and predictive variables were as follows: child IQ, theory of mind skills, teacher reports of relational aggression, level of emotion understanding, physical aggression narrative scale, exclusion of other narrative theme, hostile attribution bias, and teacher reports of emotion regulation. In the second linear regression, teacher reports of relational aggression were used as the dependent variable and control and predictive variables were as follows: child IQ, theory of mind skills, teacher reports of overt aggression, level of emotion understanding, physical aggression narrative scale, exclusion of other narrative theme, hostile attribution bias, and teacher reports of emotion regulation. Interactive terms among the predictive variables also were examined in all analyses.

Results of the final model predicting teacher reports of boys' overt aggression are shown in Table 3.8. The overall predictive model achieved significance ($F(8, 71)=15.52$, $p<.001$), with $R^2 = .64$. Results revealed that the addition of hostile attribution bias as a predictor variable did not alter previous effects. Specifically, significant main effects for teacher reports of relational aggression, level of emotion understanding, and teacher reports of emotion regulation were still obtained, as was the significant interaction between level of emotion understanding and teacher reports of emotion regulation. The positive beta for hostile attribution bias predicting teacher report of overt aggression approached significance. No other significant results were obtained.

Table 3.9 presents the results of the final model predicting teacher reports of boys' relational aggression. The overall predictive model achieved significance ($F(10, 60)=13.83$, $p<.001$), with $R^2 = .70$. Results revealed that the addition of a hostile

attribution bias as a predictor did not alter previously obtained effects. Significant main effects for teacher reports of overt aggression and the physical aggression narrative scale, as well as a significant interaction between the physical aggression narrative scale and teacher reports of emotion regulation remained. In addition, there was a significant main effect for hostile attribution bias and a significant interaction between hostile attribution bias and teacher reports of emotion regulation. The significant negative beta for hostile attribution bias indicated that higher levels of a hostile attribution bias were associated with lower rates of teacher reported relational aggression. This association accounted for 7% of the variance in teacher reports of relational aggression.

Post-hoc analyses were conducted according to Jaccard and Turrisi's (2003) guidelines to examine the direction of effects for the significant interaction between hostile attribution bias and teacher reports of emotion regulation. Results revealed that there was not a significant difference in relational aggression between low and high levels of emotion regulation ($F(1, 60)=1.02$, p=n.s.). Therefore, boys' hostile attribution biases predicted lower rates of relational aggression independently of boys' emotion regulatory skills.

Teacher Reports of Girls' Aggression

Similar to analyses conducted with boys, two linear regressions were performed separately by aggression to illuminate the unique and interactive contributions of affective social-cognitive schemata, intent attribution, and emotion regulation on teacher reports of overt and relational aggression. In the first linear regression, teacher reports of overt aggression were used as the dependent variable and control and predictive variables were as follows: child IQ, theory of mind skills, teacher reports of relational aggression,

level of emotion understanding, physical aggression narrative scale, exclusion of other narrative theme, hostile attribution bias, and teacher reports of emotion regulation. In the second linear regression, teacher reports of relational aggression were used as the dependent variable and control and predictive variables were as follows: child IQ, theory of mind skills, teacher reports of overt aggression, level of emotion understanding, physical aggression narrative scale, exclusion of other narrative theme, hostile attribution bias, and teacher reports of emotion regulation. Interactive terms among the predictive variables also were examined in all analyses.

Results of the final model predicting teacher reports of girls' overt aggression are shown in Table 3.10. The overall predictive model achieved significance ($F(10, 44)=13.02$, $p<.001$), with $R^2 = .75$. Results revealed that the addition of hostile attribution bias as a predictor variable altered some of the previous findings. Specifically, significant main effects for teacher reports of relational aggression, level of emotion understanding, and the significant interaction between level of emotion understanding and teacher reports of emotion regulation remained. However, the significant main effects for theory of mind skills, the physical aggression narrative scale, and the interaction between the physical aggression narrative scale and teacher reports of emotion regulation disappeared with the addition of hostile attribution bias as a predictor. In addition, a significant main effect was obtained for hostile attribution bias, as was a significant interaction between hostile attribution bias and teacher reports of emotion regulation. The significant negative beta for hostile attribution bias indicates that higher levels of a hostile attribution bias predicted a decrease in teacher reports of overt aggression. In addition, this association accounted for 9% of the variance in teacher report of overt aggression.

Following Jaccard and Turrisi (2003), post-hoc analyses were conducted to examine the direction of main effects in the significant interaction between hostile attribution bias and teacher reports of emotion regulation. Results revealed that there was not a significant difference in overt aggression between low and high levels of emotion regulation ($F(1, 44)=.11$, p=n.s.). Thus, girls' hostile attribution biases predicted lower rates of teacher reports of overt aggression independently of their emotion regulatory skills.

Table 3.11 presents the results of the final model predicting teacher report of girls' relational aggression. The overall predictive model achieved significance ($F(10, 44)=11.55$, $p<.001$), with $R^2 = .72$. Results revealed that the addition of hostile attribution bias as a predictor did not alter previously obtained effects. Significant main effects for teacher reports of overt aggression, level of emotion understanding, and teacher reports of emotion regulation remained, as did the significant interaction between level of emotion understanding and teacher reports of emotion regulation. No other significant results were obtained.

Discussion

Research has linked children's overt and relational aggression with deficits and biases in social information processing mechanisms (e.g., Burks et al., 1999; Crain, Finch, & Foster, 2005; Crick & Dodge, 1994; Crick, Grotpeter, & Bigbee, 2002; Dodge & Pettit, 2003; Yoon et al., 1999). Specifically, hostile social-cognitive knowledge structures have been linked with a hostile attribution bias, which in turn has been linked with the display of aggressive behavior (e.g., Crick & Dodge, 1994; Dodge, 2006; Dodge & Pettit, 2003; Orobio de Castro et al., 2002). However, a number of researchers have

noted that emotion processes, such as emotion understanding and regulation, need to be included in examinations of social information processing in children (Denham, Caverly, et al., 2002; Izard, 2001; Izard et al., 2002; Lemerise & Arsenio, 2000). As Lemerise and Arsenio (2000) noted, separate literatures have linked deficits in emotion understanding with the development of aggression (Arsenio, Cooperman, & Lover, 2000; Denham, Caverly, et al., 2002; Hughes, Dunn, & White, 1998; Keenan, 2000) and poor emotion regulatory abilities with the display of aggression (Campbell, Shaw, & Gilliom, 2000; Eisenberg et al., 1996; Eisenberg et al., 1997; Fabes et al., 1999; Keenan, 2000). While few studies have investigated both social information and emotion processes in children's aggression, research suggests that deficits in emotion understanding contribute to the display of aggression through cognitive-affective links within children's knowledge structures (Izard, 1977; 2001; Izard et al., 2002; Lemerise, Gregory, & Fredstrom, 2004). However, research is mixed regarding the role of emotion regulation in social information processing mechanisms (e.g., Musher-Eizenman et al., 2004; Orobio de Castro et al., 2005; Schultz, Izard & Bear, 2004; Schwartz & Proctor, 2000). Limitations in the research, such as the focus on school age children, overt aggression, and boys, make it difficult to generalize findings to younger children, relational aggression, and girls. In addition, all of the studies conducted have relied on children's verbal responses to hypothetical vignettes to index social information processing mechanisms. As a result, the current study used the MSSB to assess the presence of early social-cognitive components of children's schemata and included measures of children's intent attributions, emotion understanding, and emotion regulation in order to examine unique

and interactive contributions of social information and emotion processing on boys' and girls' aggressive behaviors.

Descriptive Analyses

Not surprisingly, teachers rated boys higher on measures of overt aggression than they did girls. This finding is consistent with a large body of research that has found that gender differences in the display of overt aggression emerge beginning around the age of 4 and continue into the school-age years (Keenan & Shaw, 1997; 2003; Smith, Calkins, Keane, Anastopolous, & Shelton, 2004). On the other hand, teacher reports of relational aggression did not differ between boys and girls. This is somewhat surprising given that researchers have found evidence for higher rates of relational aggression in girls beginning in the preschool period (Crick & Grotpeter, 1995; Crick, Ostrov, Burr, et al., 2006; Ostrov & Keating, 2004; Ostrov et al., 2004). It is unclear why this discrepancy occurred; however, one possibility may be that teachers in this study were equally sensitive to relationally aggressive displays among boys and girls. Results also revealed a strong positive correlation between teacher reports of overt and relational aggression. Although one explanation for this finding is that the same informant was used to assess both types of aggression, this finding coincides with recent research that has found that acts of physical and relational aggression co-occur during the preschool and elementary school periods (Crain, Finch, & Foster, 2005; Juliano, Werner, & Cassidy, 2006). Thus, teachers in this study also appeared to be witnessing co-occurrences of overt and relational aggression.

On the other hand, teachers rated girls as having higher emotion regulatory abilities than boys. This coincides with literature that has found faster rates of

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development for girls in biological, cognitive, and socio-emotional skills (see Keenan &

Shaw, 1997, for a review) and suggests that skills in emotion regulation may follow a

similar developmental pattern.

Associations with Teacher Reports of Aggression

Some of the hypothesized relationships were obtained among the social-cognitive,

emotion, and aggression measures, and were patterned differently for boys and girls. As

hypothesized, narrative themes of physical aggression and teacher reports of relational

aggression were positively related for boys, while teacher reports of emotion regulation

and overt aggression were negatively related for girls. These findings support separate

literatures that have found links between physically aggressive narrative themes and the

display of overt aggression (Oppenheim, Emde, & Warren, 1997; Oppenheim, Nir,

Warren, & Emde, 1997; von Klitzing, Kelsay, Emde, Robinson, & Schmitz, 2000;

Warren, 2003; Warren, Oppenheim, & Emde, 1996; Zahn-Waxler et al., 2008) and

between poor emotion regulatory skills and the display of aggression (Campbell, Shaw,

& Gilliom, 2000; Eisenberg et al., 1996; Eisenberg et al., 1997; Fabes et al., 1999;

Keenan, 2000). Moreover, the link between narrative themes of physical aggression and

teacher reports of relational aggression provides continued support for the assertion that

the MSSB is useful in indexing aggressive schemata of kindergarteners. Similarly, hostile

attribution biases were marginally positively correlated with teacher reports of overt

aggression for boys. This finding is consistent with prior studies that have found that

hostile attribution biases predict the display of overt aggression (Crick & Dodge, 1994;

Dodge, 2006; Dodge & Pettit, 2003; Orobio de Castro et al., 2002) and provides support

for this association appearing early in childhood. In addition, there was a trend for

narrative themes of refusing empathy/help to be positively correlated with teacher reports of relational aggression. While this finding did not achieve significance, it is interesting because it suggests that schemas of relational aggression are present in kindergartners and are likely related to the display of relationally aggressive behavior.

Contrary to expectation, children's level of emotion understanding was not associated with teacher reports of either form of aggression. This finding contrasts with prior studies that have found links between deficits in emotion understanding and the display of aggressive behavior (Arsenio, Cooperman, & Lover, 2000; Denham, Caverly, et al., 2002; Hughes & Dunn, 1998; Hughes, Dunn, & White, 1998), as well as positive associations between emotion understanding and the display of social competence (Cassidy, Werner, Rourke, Zubernis, & Balaraman, 2003; Denham, 1998; Saarni, 1999). However, as noted in Chapter II, the current study departed from previous studies by controlling for individual differences in intelligence and theory of mind skills. Similar to the pattern of results obtained in Chapter II, the inclusion of an intelligence score and theory of mind as control variables likely altered the pattern of effects. Indeed, Cassidy and colleagues (2003) found that relationships between emotion understanding and social behavior in young children disappeared when language ability, a component of cognitive maturity, was partialled out of these relationships. Thus, children who display overt or relational aggression may not necessarily have deficits in emotion understanding once the influence of intelligence and theory of mind skills are removed.

Also contrary to expectation, neither narrative themes of empathy/prosocial relations nor narrative coherence were related to teacher reports of aggressive behavior. This finding is somewhat surprising given that prior research supports inverse

associations (Oppenheim, Emde, & Warren, 1997; Oppenheim, Nir, et al., 1997; von Klitzing et al., 2000). Perhaps other indicators from the MSSB, such as themes of physical aggression or excluding others, are more powerful predictors of children's aggressive behaviors. In addition, no significant associations were obtained for teacher reports of relational aggression. It is unclear why this occurred given that prior studies have found links between social information processing and the display of relational aggression (Crick, 1995; Crick, Grotpeter, & Bigbee, 2002; Delveaux & Daniels, 2000). One possibility is that a combination of variables, rather than one single variable, is related to the display of aggression. In support of this, subsequent analyses examining unique and interactive contributions of social-cognitive and affective measures obtained significant findings. While these findings are discussed in more detail below, this supports arguments that social information and emotion processing variables interact to predict aggression (Denham, Caverly, et al., 2002; Izard, 2001; Lemerise & Arsenio, 2000) and should be included in investigations of children's aggression.

Associations with Emotion Regulation

No specific hypotheses were made about relationships among measures of social information processing and emotion regulation due to the presence of mixed findings in the literature (e.g., Musher-Eizenman et al., 2004; Orobio de Castro et al., 2005; Schultz, Izard & Bear, 2004; Schwartz & Proctor, 2000). However, results of the current study revealed that, for boys, poor emotion regulatory skills were associated with higher rates of excluding others in narratives. This finding is interesting for a number of reasons. First, it provides evidence for the connection between children's social-cognitive schemata and emotion regulation. Second, this finding suggests that relationally

aggressive knowledge structures may also be related to poor emotion regulation. While no literature has specifically addressed this relationship, it coincides with studies that have found links between physical aggression and emotion dysregulation (Campbell, Shaw, & Gilliom, 2000; Eisenberg et al., 1996; Eisenberg et al., 1997; Fabes et al., 1999; Keenan, 2000) and suggests that there are distinct pathways between emotion regulation and the types of aggression children display. Finally, this finding is consistent with research that has found an inverse relationship between themes of physical aggression and coherence in children's narratives (Oppenheim, Emde, & Warren, 1997; Oppenheim, Nir, et al., 1997; von Klitzing et al., 2000) and suggests that boys who include relationally aggressive themes in narratives also have difficulty regulating their emotions in response to real-life conflict (von Klitzing et al., 2000; Warren, 2003). Thus, it appears that the MSSB may be sensitive not only to early social-cognitive schemata, but emotion regulatory skills as well.

Two other associations approached significance. Specifically, there was a trend for poor emotion regulatory abilities to be associated with hostile attribution biases for boys and for poor emotion regulatory abilities to be associated with more narrative themes of physical aggression for girls. These findings support researchers who have argued that there is a connection between social information and emotion processes (Denham, Caverly, et al., 2002; Izard, 2001; Lemerise & Arsenio, 2000) and suggest that there may be specific connections between social-cognitive processes and poor emotion regulation for boys and girls.

Social-Cognitive and Emotion Predictors of Aggression

In order to examine direct and indirect effects of social information and emotion processes on the development of aggression, separate models were developed for overt and relational aggression in boys and girls. First, predictive models including measures of children's intelligence, theory of mind skills, affective social-cognitive schemata and teacher reports of emotion regulation were examined to illuminate unique and interactive contributions on the display of aggression. Second, the models were expanded to include the intent attribution step of Crick and Dodge's (1994) model to explore how the combination of affective social-cognitive knowledge structures, biases in intent attribution, and emotion regulatory skills influence the display of aggression. As a result, findings will be discussed in the following order: models of overt aggression for boys and girls; models of relational aggression for boys and girls; and general conclusions on pathways to aggression.

Boys' Overt Aggression

A somewhat surprising picture emerged when the unique and interactive contributions of boys' affective social-cognitive schemata, intent attributions, and emotion regulation to teacher reports of overt aggression were examined. As expected, teacher reports of relational aggression were positively associated with teacher reports of overt aggression. However, only the emotion processes emerged as significant contributors to teacher reports of boys' overt aggression once relational aggression, intelligence score, and theory of mind skills were controlled. In particular, emotion understanding and emotion regulation emerged as unique and interactive predictors of teacher reports of boys' overt aggression. These findings support previous studies that have found associations between deficits in emotion understanding and the display of

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aggression (Arsenio, Cooperman, & Lover, 2000; Denham, Caverly, et al., 2002; Hughes & Dunn, 1998; Hughes, Dunn, & White, 1998), as well as poor emotion regulation skills and the display of aggression (Campbell, Shaw, & Gilliom, 2000; Eisenberg et al., 1996; Eisenberg et al., 1997; Fabes et al., 1999; Keenan, 2000). Further, findings suggest that it is the combination of deficits in emotion understanding and regulation that is particularly important in predicting boys' overt aggression. In the current study, boys who experienced concurrent deficits in emotion understanding and emotion regulation were rated as more overtly aggressive by teachers. This finding coincides with research investigating reactive aggression in children (Dodge, 2006; Pettit & Dodge, 2003) and suggests that boys who lack the ability to regulate and cope with negative emotions that they experience will be less likely to have the cognitive resources to attend to relevant emotion cues and process situations accurately. In fact, researchers have argued that it is children's inability to control their own emotional arousal that decreases cognitive flexibility in choosing an appropriate interpersonal response (Saarni, 1999) and increases the likelihood of referencing maladaptive knowledge structures for cues on how to respond (e.g., Izard, 2001; Lemerise & Arsenio, 2000). This, in turn, leads children to respond "automatically" with predetermined and inaccurate attributions and behaviors due to preemptive processing (Costanzo & Dix, 1983; Crick & Dodge, 1994; Dodge, 2006). Although the relationship between hostile attribution biases and teacher reports of overt aggression was only marginally significant, the direction of effect is consistent with previous research (Orobio de Castro et al., 2005; Schultz, Izard & Bear, 2004; Schwartz & Proctor, 2000) and provides evidence that boys rated as overtly aggressive were engaging in preemptive processing. Thus, the combination of poor regulatory abilities

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and deficient or maladaptive skills in emotion understanding appear to make boys'
display of overt aggression more likely due to the recall of maladaptive emotion-
congruent knowledge structures and inaccurate intent attributions.

Girls' Overt Aggression

When examining direct and indirect effects of girls' affective social-cognitive
schemata, intent attribution, and emotion regulation on teacher reports of overt
aggression, a complex yet intriguing picture emerged. Similar to the model for boys,
teacher reports of girls' relational aggression were positively associated with teacher
reports of girls' overt aggression. In addition, girls' skills in theory of mind and more
narrative themes of physical aggression uniquely predicted lower rates of teacher reports
of overt aggression, while higher levels of girls' emotion understanding were associated
with increased rates of overt aggression. Results also revealed that higher levels of girls'
emotion understanding predicted teacher reports of overt aggression only when girls'
emotion regulatory skills were poor. Interestingly, the inclusion of a hostile attribution
bias as a predictor made many of the previously significant associations disappear. In
particular, the significant findings for theory of mind skills and physically aggressive
narrative themes no longer remained. However, a significant positive association between
hostile attribution biases and teacher rates of overt aggression was obtained. Taken
together, these findings indicate more indirect effects of social information processing on
the display of overt aggression in girls, but direct effects of emotion processes on the
display of girls' overt aggression.

Consistent with the literature, girls' hostile attribution biases uniquely predicted
teacher reports of overt aggression (Orobio de Castro et al., 2005; Schultz, Izard & Bear,

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2004; Schwartz & Proctor, 2000). Contrary to expectation, girls' hostile attribution biases were associated with lower rates of teacher reports of overt aggression. It is unclear why this inverse association occurred given that the aforementioned studies have found positive associations between hostile attribution biases and the display of overt aggression. One possible explanation for this counterintuitive finding is that the majority of research has focused on the relationship between boys' hostile attribution biases and overt aggression, rather than on girls. Perhaps girls do not exhibit this direct, positive association because they are socialized to inhibit the display of overt aggression. For example, research suggests that parents make more of an effort to socialize girls to be nonaggressive than they do boys (Keenan & Shaw, 1997; Kerig, Cowan, & Cowan, 1993; Zhou et al., 2002). Thus, it may be the case that young girls choose a behavioral response other than overt aggression when confronted with hostile interpretations given this socialization. In support of this, prior studies have found that girls display overt aggression less often than boys and tend to engage in other maladaptive behaviors, such as relational aggression, more often than boys (Crick & Grotpeter, 1995; Crick, Ostrov, Burr, et al., 2006; Ostrov & Keating, 2004; Ostrov et al., 2004). In fact, teachers in this study rated boys as displaying higher rates of overt aggression than girls. Taken together, this implies more of an indirect effect of social information processing in the display of girls' overt aggression.

However, findings from the current study suggested that girls' emotion processes directly affected teacher reports of overt aggression. For example, girls' with higher levels of emotion understanding were rated as higher on overt aggression, particularly when they exhibited poor emotion regulation. In other words, it appeared that girls'

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inability to regulate emotions was a particular risk factor for displaying overt aggression. This supports a large body of research that indicates that children's inability to regulate their own emotions is linked with less competence with peers, as well as higher levels of overt aggression (Campbell, Shaw, & Gilliom, 2000; Eisenberg et al., 1996; Eisenberg et al., 1997; Fabes et al., 1999; Keenan, 2000). Moreover, this finding is in line with a recent study conducted by Hill and colleagues (2006) that found evidence for emotion dysregulation being a particular risk factor for the display of chronic aggression in girls. Thus, emotion regulation in particular appears to be a significant contributor to the display of girls' overt aggression.

Boys' Relational Aggression

An interesting picture emerged when the direct and indirect effects of boys' affective social-cognitive schemata, intent attribution, and emotion regulation on teacher reports of relational aggression were examined. Not surprisingly, teacher reports of boys' overt aggression were positively associated with teacher reports of boys' relational aggression. Interestingly, findings revealed that boys who generated more physically aggressive narrative themes were rated as more relationally aggressive by their teachers, with a trend for boys rated as having poorer skills in emotion regulation to be particularly rated higher on relational aggression. In addition, a significant inverse association between hostile attribution bias and teacher report of boys' relational aggression was obtained. Therefore, findings suggest direct and interactive contributions of social-cognitive and emotion processes on the display of relational aggression in boys.

For boys, it appeared that the inability to appropriately regulate emotions may serve as a risk factor for the display of relational aggression. For instance, the

combination of aggressive, hostile schemata and poor emotion regulation emerged as a marginally significant predictor of teacher reports of relational aggression. This finding is interesting for a number of reasons. First, it suggests that hostile social-cognitive schemata interact with emotion processes to predict the display of boys' relational aggression. This is in line with researchers' arguments that poor regulatory abilities increase the probability that children will be unable to assess the situation from different cognitive and affective perspectives (Izard, 2001; Lemerise & Arsenio, 2000; Saarni, 1999) and thus engage in preemptive processing (Costanzo & Dix, 1983; Crick & Dodge, 1994; Dodge, 2006). Also, this finding is consistent with prior studies that have found a positive association between emotion dysregulation and the display of aggressive behavior (Campbell, Shaw, & Gilliom, 2000; Eisenberg et al., 1996; Eisenberg et al., 1997; Fabes et al., 1999; Keenan, 2000) and extends this literature to include social information processing mechanisms. Second, this finding supports previous research that has found links between hostile, aggressive schemata and the display of overt aggression in boys (e.g., Burks et al., 1999; Crick, 1995; Dodge, 2006; Dodge & Pettit, 2003; Zelli et al., 1999) and suggests that a similar mechanism exists for the display of relational aggression. Finally, this finding coincides with prior studies that have found associations between children's physically aggressive narratives and the display of aggression (Oppenheim, Emde, & Warren, 1997; Oppenheim, Nir, et al., 1997; von Klitzing et al., 2000; Warren, 2003; Warren, Oppenheim, & Emde, 1996; Zahn-Waxler et al., 2008) and provides additional support for using the MSSB in assessments of children's social-cognitive and emotion processes.

The significant inverse association between hostile attribution biases and teacher reports of relational aggression is somewhat surprising given that the literature has found positive associations between hostile attribution biases and relational aggression (Crick, 1995; Crick, Grotpeter, & Bigbee, 2002; Delveaux & Daniels, 2000). However, this finding coincides with a recent study conducted by Crain, Finch, and Foster (2005) that found no connection between the presence of a hostile attribution bias and the display of relational aggression. Crain and colleagues suggested that other social-cognitive factors, such as the evaluation of relationally aggressive goals, may have more primacy in predicting relationally aggressive displays. Although the study conducted by Crain and colleagues focused on school-age girls, it suggests that similar social-cognitive factors may also influence the display of relational aggression in boys.

Girls' Relational Aggression

For girls, a somewhat surprising picture emerged when the unique and interactive contributions of affective social-cognitive schemata, intent attribution, and emotion regulation on teacher reports of relational aggression were examined. Similar to the model for boys, teacher reports of girls' overt aggression were positively related to teacher reports of girls' relational aggression. However, only emotion measures emerged as significant contributors to teacher reports of relational aggression, even when hostile attribution bias was included in the predictive model. Findings revealed that girls' level of emotion understanding and emotion regulatory abilities were inversely associated with teacher reports of relational aggression, but that higher levels of emotion understanding were associated with lower rates of relational aggression particularly when girls' emotion regulatory abilities were low. Taken together, these findings suggest that affective

components of information processing play a more primary role in the display of kindergarten girls' relational aggression and that emotion understanding in particular serves as a protective factor against displays of relational aggression.

While it is surprising that social information processing was not linked with the display of girls' relational aggression, it is consistent with Crain, Finch, and Foster's (2005) findings that there was not a relationship between biases in intent attribution and relational aggression in school-aged girls. Instead, findings from the current study suggested that higher levels of emotion understanding provided an ameliorative effect on the relationship between girls' poor emotion regulatory skills and teacher reports of relational aggression. This is consistent with prior studies that have obtained positive links between emotion understanding and the display of social competence (Cassidy et al., 2003; Denham, 1998; Saarni, 1999), as well as inverse associations between emotion understanding and the display of overt aggression (Arsenio, Cooperman, & Lover, 2000; Denham, Caverly, et al., 2002; Hughes & Dunn, 1998; Hughes, Dunn, & White, 1998). In fact, Denham and colleagues (2002) found that skills in emotion understanding were particularly salient in predicting preschool girls' overtly aggressive displays. Similarly, appropriate skills in emotion understanding appear to have important effects on the display of relational aggression in girls.

Overall Patterns of Overt and Relational Aggression

Findings revealed distinct patterns in the development of overt and relational aggression during the kindergarten period. For boys, it appeared that deficits and biases in social information and emotion processing contributed to the display of overt aggression uniquely, whereas deficits and biases in social information and emotion

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processing interacted to contribute to the display of relational aggression. For girls, it appeared that deficits in emotion processing primarily contributed to the display of both overt and relational aggression, although social information processing seemed to have an indirect effect on the display of overt aggression. Findings from the current study also highlighted the important role of poor emotion regulation skills in teacher reports of aggression for both boys and girls. Taken together, these findings underscore the importance of including measures of both social-cognitive and emotion processes in investigations of kindergartener's aggression and suggest that the inclusion of emotion regulation skills in particular may help to illuminate social-cognitive and affective pathways to aggression. In addition, it appears that gender-congruent displays of aggression during this period (e.g., boys displaying overt aggression, girls displaying relational aggression) rely more on automatic, affective processes and do not require as many levels of processing, whereas gender-incongruent displays of aggression during this period (e.g., boys displaying relational aggression, girls displaying overt aggression) are more complex and require multiple levels of processing. Perhaps as children grow older and have more interpersonal experiences, they begin to incorporate social-cognitive processes into gender-congruent displays of aggression, which in turn may influence children's sophistication in how or when to use a particular form of aggression. Future research would benefit from examining these relationships over multiple time points of development in order to elucidate how social information and emotion processes change over time.

Limitations

There were some limitations to the generalizability of these findings. First, the majority of children in this sample came from intact, middle class, two-parent households. This limits generalizability to children in different economic and family circumstances such as low-income households or single-parent households. Second, children in this sample represented an at-risk population, which limits generalizability to children diagnosed with a clinical disorder. In addition, measures in this study were taken at the same time point, so explicit statements about causality and direction of effects cannot be made. Finally, subsamples of boys and girls were used in examinations of overt and relational aggression, which decreased the sample size and power for each analysis. Future studies would benefit from the inclusion of more boys and girls in each subgroup in an effort to replicate and extend current findings.

Conclusion

The current study adds to and extends the current literature in several important ways. First, significant associations between measures of children's affective social-cognitive schemata, intent attributions, and skills in emotion regulation provide additional support for researchers' arguments for the inclusion of emotion processes in the investigation of children's social information processing (Denham, Caverly, et al., 2002; Izard, 2001; Izard et al., 2002; Lemerise & Arsenio, 2000). In addition, the current study found evidence for children's emotion regulatory abilities affecting the display of children's aggression through both direct and indirect means. For example, the combination of deficits in emotion regulation and understanding, as well as the combination of deficits in emotion regulation and maladaptive social-cognitive schemata, predicted boys' displays of overt and relational aggression. These findings support a

recent study conducted by Musher-Eizenman and colleagues (2004) that found evidence

for emotion regulation directly influencing social information processing variables and

extend the findings developmentally downward to the kindergarten period. However,

findings from the current study suggested that affective components of information

processing affect the display of kindergarten girls' aggression directly, whereas social-

cognitive components do so indirectly. This supports prior studies that have found direct

effects of emotion processes on the display of aggression when both social information

and emotion processes were examined (Orobio de Castro et al., 2005; Schultz, Izard &

Bear, 2004; Schwartz & Proctor, 2000). Further, this suggests that the mixed findings in

the literature may be attributable to individual studies' focus on boys and overt forms of

aggression and highlight the importance of examining overt and relational forms of

aggression separately for boys and girls. Future studies would benefit from examining

exactly how emotion regulation interacts with other affective and social-cognitive

measures to predict aggressive displays in young boys and girls. Finally, findings from

the current study provide continued support for using the MSSB to index children's early

social-cognitive schemata. To the author's knowledge, no other studies have used the

MSSB in conjunction with measures of emotion understanding and regulation to examine

the display of overt and relational aggression. The significant associations obtained

between measures on the MSSB and measures of children's emotion regulation abilities

and aggression suggest that the MSSB is a promising tool for tapping young children's

representations of physical and relational aggression.

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Table 3.1 Means, Standard Deviations, and Results of MANOVA (controlling for IQ and Theory of Mind) of Study Variables, Presented Separately by Child Gender

Variables	Boys		Girls		Difference
	M	*SD*	*M*	*SD*	
Emotion Regulation	26.95	3.82	28.13	3.81	$p<.05$
Overt Aggression	10.17	5.53	8.69	4.18	$p<.05$
Relational Aggression	8.46	3.98	9.00	4.82	n.s.

Table 3.2 Partial correlations between Chapter II Variables and Overt and Relational Aggression (With Child IQ, Theory of Mind, and Relevant Aggression controlled), Presented Separately by Child Gender

	Overt Aggression		Relational Aggression	
Variables	Boys	Girls	Boys	Girls
Emotion Understanding	.17	.20	-.10	-.12
Physical Aggression Scale	.06	.11	.25*	-.07
Empathic/Prosocial Scale	-.03	.10	-.00	-.13
Exclusion of Other	-.00	.00	.12	-.12
Refuse Empathy/Help	-.10	-.06	.20+	.05
Teasing/Taunting	-.14	.03	.06	-.03
Narrative Coherence	-.04	.16	-.14	-.08
Hostile Attribution Bias	.23+	-.07	-.08	-.00

Note: +$p<.10$. *$p<.05$.

Table 3.3 Partial correlations between Study Variables and Emotion Regulation (With Child IQ, Theory of Mind, and Relevant Aggression controlled), Presented Separately by Child Gender

	Emotion Regulation	
Variables	Boys	Girls
Emotion Understanding	-.10	-.04
Physical Aggression Scale	-.07	-.26[+]
Empathic/Prosocial Scale	.02	-.02
Exclusion of Other	-.27*	.00
Refuse Empathy/Help	.08	.08
Teasing/Taunting	.04	.06
Narrative Coherence	.01	-.02
Hostile Attribution Bias	.23[+]	.05
Overt Aggression	-.10	-.34*
Relational Aggression	-.18	.11

Note: $^+p<.10.$ $^*p<.05.$

Table 3.4 Summary of Regression Predicting Teacher Reports of Boys' Overt Aggression

Variable	B	SE B	β	t	Partial η^2
1. Child IQ	-.05	.10	-.04	-.48	.00
2. Theory of Mind	.21	.24	.07	.89	.01
3. Relational Aggression	1.00	.12	.71	8.52***	.50
4. Emotion Understanding	-1.10	.55	-.93	-2.01*	.05
5. Emotion Regulation	-.73	.23	-.55	-3.20**	.12
6. Emotion Understanding x Emotion Regulation	.04	.02	1.03	2.10*	.06

Note: $^+p<.10$. $*p<.05$. $**p<.01$. $***p<.001$.

Table 3.5 Summary of Regression Predicting Teacher Reports of Boys' Relational Aggression

Variable	B	SE B	β	t	Partial η^2
1. Child IQ	.09	.07	.11	1.37	.03
2. Theory of Mind	-.22	.18	-.10	-1.21	.02
3. Overt Aggression	.43	.06	.58	6.91***	.43
4. Emotion Understanding	-.69	.59	-.79	-1.17	.02
5. Physical Aggression Scale	1.19	.40	1.41	2.97**	.12
6. Emotion Regulation	-.18	.24	-.17	-.74	.01
7. Physical Aggression x Emotion Regulation	-.04	.02	-1.21	-2.65*	.10
8. Emotion Understanding x Emotion Regulation	.02	.02	.70	1.01	.02

Note: $^+p<.10$. $*p<.05$. $**p<.01$. $***p<.001$.

Table 3.6 Summary of Regression Predicting Teacher Reports of Girls' Overt Aggression

Variable	B	SE B	β	t	Partial η^2
1. Child IQ	.09	.10	.08	.94	.02
2. Theory of Mind	-.46	.23	-.17	-2.02*	.08
3. Relational Aggression	.71	.08	.79	8.95***	.64
4. Emotion Understanding	2.42	.75	2.39	3.23**	.19
5. Physical Aggression Scale	-2.23	1.03	-1.20	-2.16*	.09
6. Emotion Regulation	.46	.30	.34	1.54	.05
7. Physical Aggression x Emotion Regulation	.08	.04	1.11	2.08*	.09
8. Emotion Understanding x Emotion Regulation	-.08	.03	-2.33	-3.08**	.17

Note: $^+p<.10$. $*p<.05$. $**p<.01$. $***p<.001$.

Table 3.7 Summary of Regression Predicting Teacher Reports of Girls' Relational Aggression

Variable	B	SE B	β	t	Partial η^2
1. Child IQ	-.16	.11	-.13	-1.41	.04
2. Theory of Mind	.35	.26	.12	1.35	.04
3. Overt Aggression	.90	.10	.81	8.95***	.64
4. Emotion Understanding	-3.38	.79	-3.01	-4.28***	.28
5. Physical Aggression Scale	2.01	1.18	.97	1.70[+]	.06
6. Emotion Regulation	-1.03	.31	-.69	-3.28**	.19
7. Physical Aggression x Emotion Regulation	-.07	.05	-.89	-1.62	.05
8. Emotion Understanding x Emotion Regulation	.12	.03	3.01	4.19***	.28

Note: [+]*p*<.10. **p*<.05. ***p*<.01. ****p*<.001.

Table 3.8 Summary of Regression (Including Hostile Attribution Bias) Predicting Teacher Reports of Boys' Overt Aggression

Variable	B	SE B	β	t	Partial η^2
1. Child IQ	-.00	.10	-.00	-.04	.00
2. Theory of Mind	.15	.23	.05	.65	.01
3. Relational Aggression	.98	.12	.69	8.13***	.48
4. Emotion Understanding	-1.22	.55	-1.02	-2.21*	.06
5. Emotion Regulation	-.67	.23	-.51	-2.84**	.10
6. Hostile Attribution Bias	4.10	2.37	1.10	1.72+	.04
7. Emotion Understanding x Emotion Regulation	.05	.02	1.09	2.25*	.07
8. Hostile Attribution Bias x Emotion Regulation	-.13	.09	-.96	-1.46	.03

Note: $^+p<.10$. $*p<.05$. $**p<.01$. $***p<.001$.

Table 3.9 Summary of Regression (Including Hostile Attribution Bias) Predicting Teacher Reports of Boys' Relational Aggression

Variable	B	SE B	β	t	Partial η^2
1. Child IQ	.12	.07	.14	1.62	.04
2. Theory of Mind	-.22	.18	-.10	-1.26	.03
3. Overt Aggression	.43	.07	.58	6.58***	.42
4. Emotion Understanding	-.57	.68	-.64	-.84	.01
5. Physical Aggression Scale	1.12	.41	1.35	2.76**	.11
6. Emotion Regulation	-.29	.28	-.28	-1.04	.02
7. Hostile Attribution Bias	-3.54	1.62	-1.34	-2.18*	.07
8. Physical Aggression x Emotion Regulation	-.04	.02	-1.16	-2.49*	.09
8. Emotion Understanding x Emotion Regulation	.02	.02	.53	.68	.01
9. Hostile Attribution Bias x Emotion Regulation	.13	.06	1.40	2.22*	.08

Note: $^+p<.10$. $*p<.05$. $**p<.01$. $***p<.001$.

Table 3.10 Summary of Regression (Including Hostile Attribution Bias) Predicting Teacher Reports of Girls' Overt Aggression

Variable	B	SE B	β	t	Partial η^2
1. Child IQ	.12	.10	.11	1.21	.03
2. Theory of Mind	-.40	.22	-.15	-1.80+	.07
3. Relational Aggression	.66	.08	.73	8.23***	.61
4. Emotion Understanding	2.04	.76	2.02	2.70**	.14
5. Physical Aggression Scale	-1.78	1.05	-.96	-1.69+	.06
6. Emotion Regulation	.15	.33	.11	.46	.01
7. Hostile Attribution Bias	-5.14	2.53	-1.62	-2.03*	.09
8. Physical Aggression x Emotion Regulation	.07	.04	.96	1.78+	.07
8. Emotion Understanding x Emotion Regulation	-.07	.03	1.95	-2.56*	.13
9. Hostile Attribution Bias x Emotion Regulation	.18	.09	1.66	2.08*	.09

Note: +*p*<.10. **p*<.05. ***p*<.01. ****p*<.001.

Table 3.11 Summary of Regression (Including Hostile Attribution Bias) Predicting Teacher Reports of Girls' Relational Aggression

Variable	B	SE B	β	t	Partial η²
1. Child IQ	-.15	.11	-.12	1.37	.04
2. Theory of Mind	.34	.26	.11	1.29	.04
3. Overt Aggression	.86	.10	.78	8.47***	.50
4. Emotion Understanding	-2.86	.73	-2.54	-3.90***	.26
5. Physical Aggression Scale	-.20	.29	-.10	-.69	.01
6. Emotion Regulation	-.90	.32	-.60	-2.79**	.15
7. Hostile Attribution Bias	-1.36	.91	-.39	-1.49	.05
8. Physical Aggression x Hostile Attribution Bias	.16	.12	.22	1.36	.04
8. Emotion Understanding x Emotion Regulation	.09	.03	2.45	3.60**	.23
9. Emotion Understanding x Hostile Attribution Bias	.09	.08	.30	1.17	.03

Note: $^+p<.10$. $*p<.05$. $**p<.01$. $***p<.001$.

Figure 3.1 Relationship Examined among Children's Affective Social-Cognitive
Schemata, Emotion Regulation, and Aggressive Behavior (adapted from Dodge, 2006)

Schemas

+

Emotion Regulation

Aggressive
Behavior
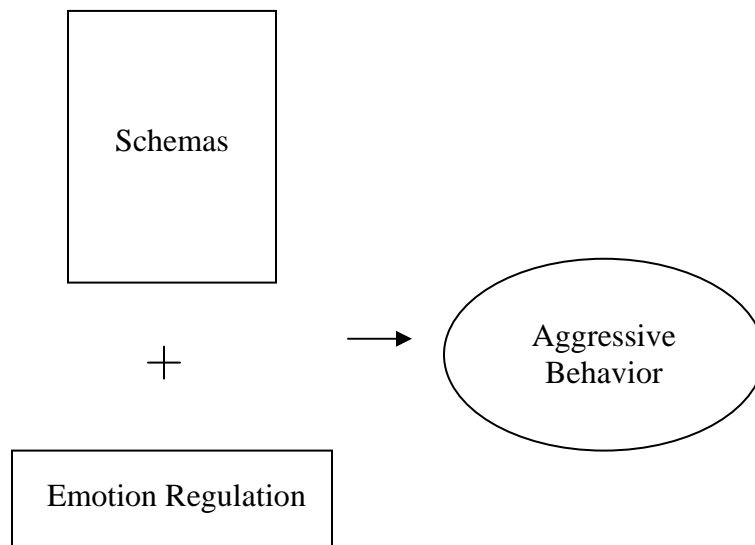
Figure 3.2 Interaction of Emotion Understanding and Emotion Regulation Predicting
Teacher Reports of Boys' Overt Aggression
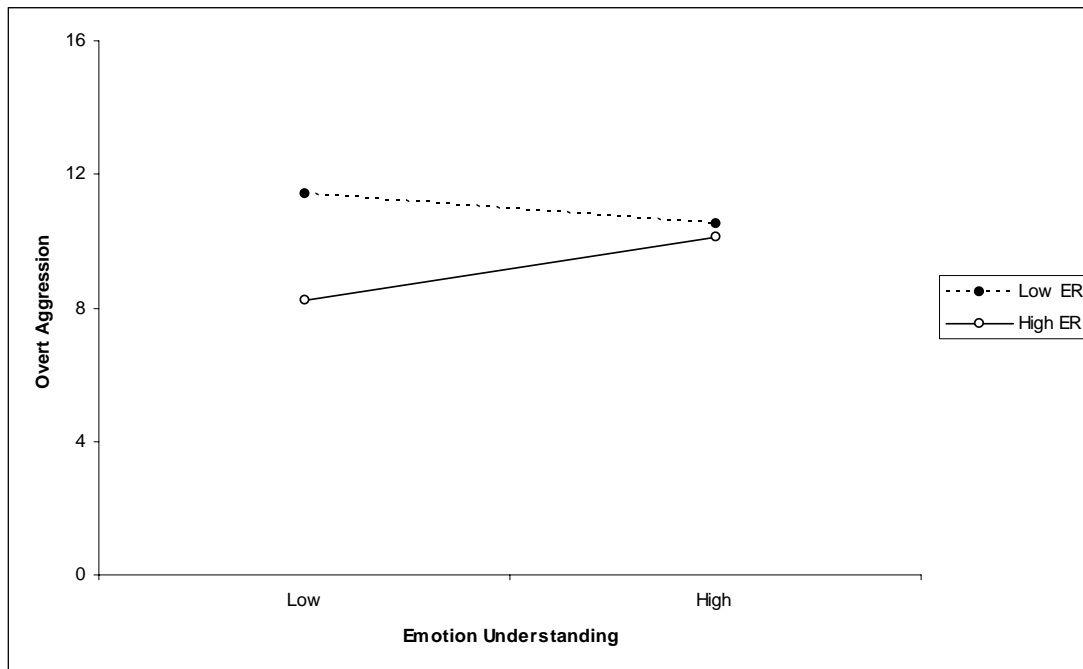
Figure 3.3 Interaction of Emotion Understanding and Emotion Regulation Predicting
Teacher Reports of Girls' Overt Aggression
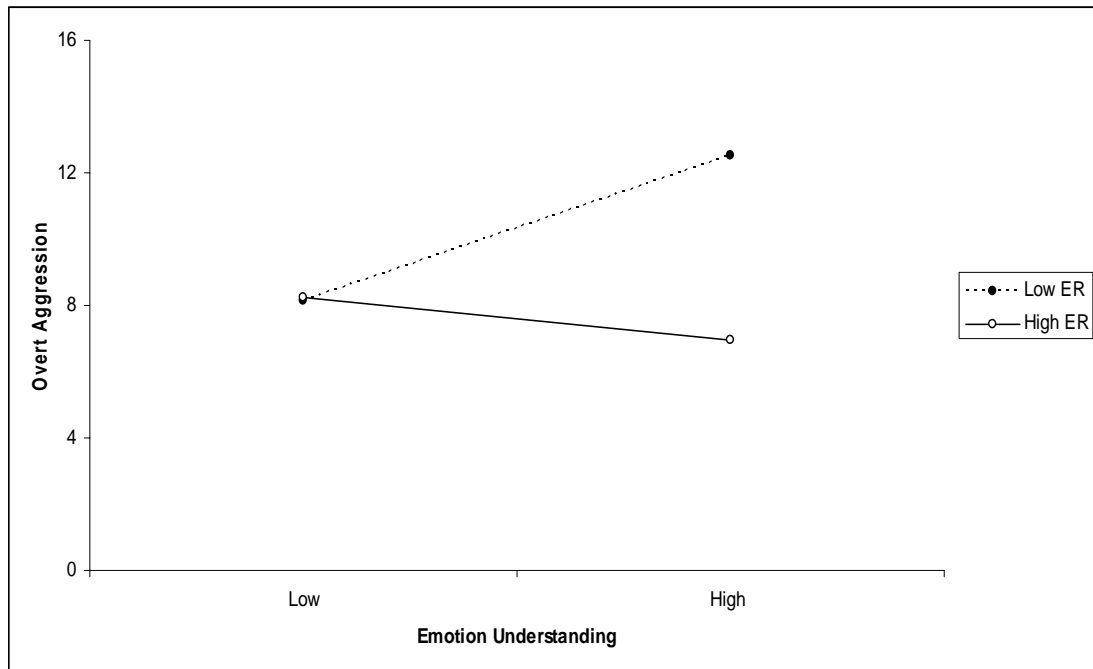
Figure 3.4 Interaction of Emotion Understanding and Emotion Regulation Predicting Teacher Reports of Girls' Relational Aggression
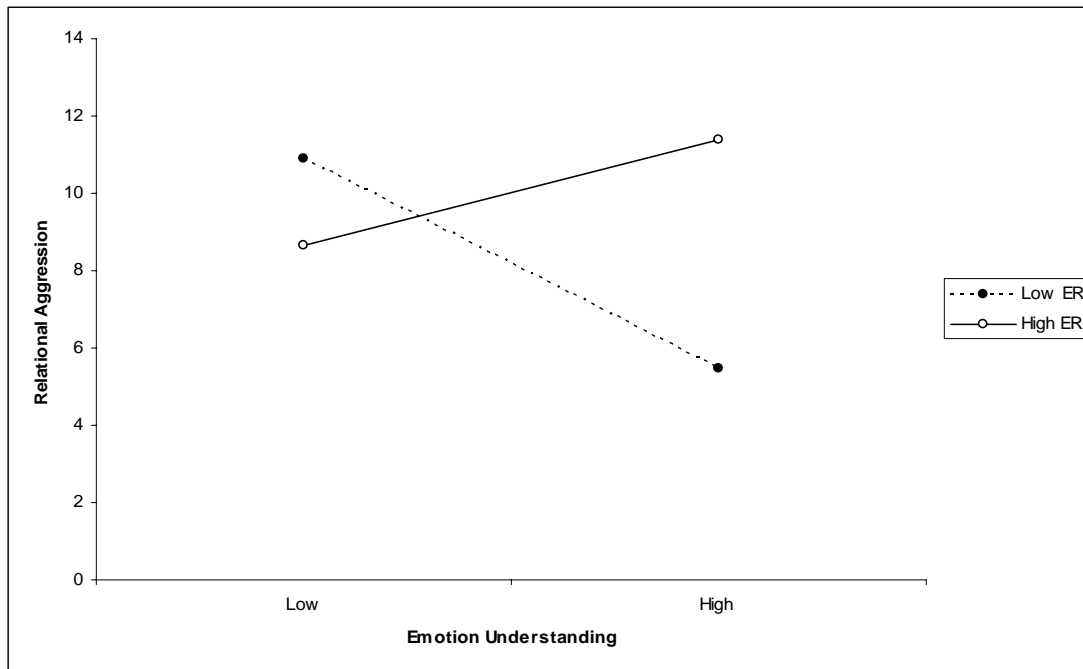
Figure 3.5 Relationship Examined among Children's Affective Social-Cognitive Schemata, Emotion Regulation, Hostile Attribution Bias, and Aggressive Behavior (adapted from Dodge, 2006)
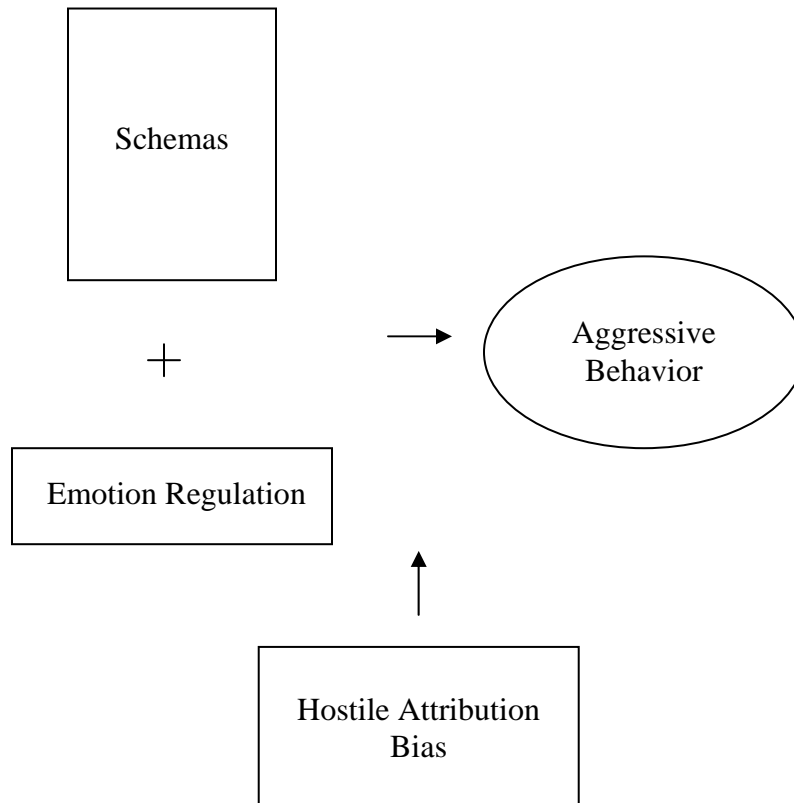
Chapter IV

**Parent and Child Characteristics during the Preschool Period:
Relationships with Aggressive Schemata in Kindergarten**

Findings from the preceding studies bolster evidence that deviance and/or

deficiencies in affective social-cognitive knowledge structures are present in the

kindergarten years and contribute to individual differences in the presence of a hostile

attribution bias and to the display of aggressive behavior. In particular, deficits in young

children's level of emotion understanding and social-cognitive schemata were associated

with the presence of a hostile attribution bias, while deficits in emotion regulatory

abilities interacted with maladaptive affective social-cognitive schemata to predict the

display of physical and relational aggression. Therefore, it is important to understand how

children's maladaptive knowledge structures develop given that they are theorized to

influence each step of Crick and Dodge's (1994) social information processing model. As

a result, the current study departed from the preceding studies by examining early

antecedents of kindergartener's social information and emotion processing mechanisms.

As reviewed previously, children's aggressive behaviors have been linked with a

broad range of deficits and biases in the mechanism of social information processing

(Burks, Laird, Dodge, Pettit, & Bates, 1999; Crain, Finch, & Foster, 2005; Crick &

Dodge, 1994; Dodge & Pettit, 2003; Yoon, Hughes, Gaur, & Thompson, 1999). In

particular, many studies have linked the display of aggressive behavior with the presence

of a hostile attribution bias (e.g., Crick & Dodge, 1994; Orobio de Castro, Veerman,

Koops, Bosch, & Monshouwer, 2002; Dodge, 2006; Dodge & Pettit, 2003; Dodge, 1980; MacBrayer, Milich, & Hundley, 2003; Yoon et al., 1999). However, Dodge (2006) recently argued that it is children's maladaptive knowledge structures that directly influence the tendency to attribute benign versus hostile intent in ambiguous situations, which subsequent studies have supported (e.g., Burks et al., 1999; Crick, 1995; Dodge, 2006; Dodge & Pettit, 2003; Zelli, Dodge, Lochman, Laird, & Conduct Problems Prevention Research Group [CPPRG], 1999). Likewise, deficits in children's emotion understanding have been found to contribute to biases in interpretation and behavioral enactment (Lemerise, Gregory, & Fredstrom, 2004; Schultz, Izard, & Bear, 2004) as well as to the display of aggressive behavior (Arsenio, Cooperman, & Lover, 2000; Denham et al., 2002; Hughes, Dunn, & White, 1998). Taken together, these findings indicate that deficits and biases in affective social-cognitive knowledge structures place children at risk for developing biases in intent attribution, which further places children at risk for the display of aggressive behavior. Examining antecedents to young children's affective social-cognitive knowledge structures, then, is an important avenue of investigation.

Parenting, Social Information, and Emotion Processing

Few studies have examined early antecedents of children's social information processing despite evidence that deficits in these mechanisms are found as early as the kindergarten years (Burks et al., 1999; Dodge, 2006). One promising avenue of research involves the influence of parenting practices on children's social information processing mechanisms. A budding literature has found links among parenting practices and social information processing (Criss, Shaw, & Insgoldby, 2003; Gomez, Gomez, DeMello, & Tallent, 2001; Haskett & Willoughby, 2007; Heidgerken, Hughes, Cavell, & Willson,

2004; Runions & Keating, 2007; Scaramella & Leve, 2004), as well as among parenting

practices, children's temperament, and social information processing (Criss, Pettit, Bates,

Dodge, & Lapp, 2002). For example, Heidgerken and colleagues (2004) examined a dual

mediation model on the relationship among harsh parenting, social information

processing, and child aggression in second through fourth graders. They found that harsh

parenting, characterized by inconsistent and harsh discipline, increased the likelihood that

children would endorse more hostile goals, which in turn increased children's tendency to

attribute hostile intent in ambiguous social situations and choose more aggressive

responses. This finding was subsequently supported by Haskett and Willoughby (2007)

who found that harsh parenting, characterized by intrusiveness, negative regard, and

harsh physical discipline, was associated with more maladaptive social information

processing in children. On the other hand, they found that nurturing parenting,

characterized by responsiveness, sensitivity, and positive regard, was positively

associated with more adaptive social information processing in children. These findings

support a robust literature linking harsh parenting practices with the display of aggression

(Bates, Pettit, Dodge, & Ridge, 1998; Dodge, Pettit, & Bates, 1994; Gershoff, 2002;

NICHD Early Child Care Research Network [ECCRN], 2004; O'Leary, Slep, & Reid,

1999; Patterson, 2002; Rubin, Burgess, Dwyer, & Hastings, 2003; Smith, Calkins, Keane,

Anastopoulos, & Shelton, 2004) and suggest that parenting practices may influence the

development of aggression through social information processing mechanisms.

Likewise, a separate literature has linked parenting practices with children's skills

in emotion processing (see Thompson & Meyer, 2007, for a review). For example,

Gilliom, Shaw, Beck, Schonberg, and Lukon (2002) found that mothers who exhibited

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more warmth and approval with their infant sons had toddlers who managed their negative emotions more effectively, while Fabes, Leonard, Kupanoff, and Martin (2001) found that mothers who responded harshly and punitively to their preschoolers' negative emotions had children who expressed more intense negative emotions with peers and lacked skills in social competence. Thus, it appears that the quality of parenting also influences children's skills in emotion processing. Given that studies have found evidence for children's skills in emotion processing to influence the display of aggressive behavior (Arsenio, Cooperman, & Lover, 2000; Denham et al., 2002; Hughes, Dunn, & White, 1998), these findings suggest that parenting practices may also influence the development of aggression through emotion processing mechanisms.

While the literature pertaining to the relationship between parenting practices and emotion processing has focused on the early years of development, the literature pertaining to the relationship between parenting practices and social information processing has been limited by its focus on elementary school-aged children. Given that there is evidence that maladaptive affective social-cognitive knowledge structures are present during the kindergarten period, it is important to examine how parenting practices during the preschool period influence young children's social information and emotion processing. In their review of the attachment and social interaction theories of child aggression, Scaramella and Leve (2004) concluded that harsh parenting practices interact with child characteristics very early in life to influence later aggressive behaviors. As Scaramella and Leve (2004) noted, the quality of parent-child relationships during early childhood is particularly important because children learn strategies for interacting with others here that they apply to future behavior and relationships. While few studies have

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examined the links between early parenting practices and children's social information processing, one recent study conducted by Runions and Keating (2007) found evidence for the relationship between preschool parenting practices and children's social information processing in elementary school. In this study, the authors examined the influence of socioeconomic status, mothers' harsh parenting practices, and mothers' depressive symptoms on children's intent attributions and aggressive responses. They found that mother's authoritarian attitudes during preschool, reflected by beliefs that children should be trained to be obedient, predicted hostile attribution biases in the first grade above and beyond hostile attribution biases in preschool. Although the authors did not focus on children's maladaptive knowledge structures per se, this finding suggests that harsh parenting may predict more hostile knowledge structures since research has shown that hostile attribution biases are associated with more hostile knowledge structures (Burks et al., 1999; Crick, 1995; Dodge, 2006; Dodge & Pettit, 2003; Zelli et al., 1999). Thus, a longitudinal examination of the relationship between early parenting practices and children's social information and emotion processing would help to elucidate one avenue through which aggression may develop.

Child Antecedents of Social Information Processing

An additional limitation of the aforementioned studies is that early characteristics of children were not included in the examination of parenting practices and social information processing. Although parents act as the primary socializing agents of their children, parents themselves are influenced by and respond to children's behavior. For example, the early childhood coercion model (ECCM) posits that transactional processes between behavior and affect displayed by parents and children increase the likelihood of

children's chronic externalizing problems (Scaramella & Leve, 2004). In particular, Scaramella and Leve (2004) argued that temperament traits, such as children's emotional arousal or ability to regulate emotional arousal, are important to consider when examining interactions between parenting and children's behavior. Similarly, as reviewed in Chapters II and III, emotion processes are theorized to play an integral role in social information processing (e.g., Lemerise & Arsenio, 2000) and therefore should be included in investigations of parenting and social information processing mechanisms.

One recent study conducted by Criss and colleagues (2002) included measures of children's temperament in an investigation of the relationships between parenting practices and children's social information processing. Specifically, these researchers examined risk and resilience in relationships among ecological disadvantage, violent marital conflict, harsh discipline, peer friendships, child temperament, social information processing, and aggression from kindergarten through second grade. They found that harsh discipline was positively associated with children's resistant temperament and further, both harsh discipline and resistant temperament were negatively associated with children's encoding skill. Thus, children's social information processing was found to be associated with both parenting practices and emotion processes. This finding highlights the importance of including emotion processes when examining the relationship between parenting practices and social information processing. In addition, this finding supports separate literatures that have linked specific parenting practices with individual differences in emotion understanding (e.g., Hughes, Deater-Deckard, & Cutting, 1999; Pears & Moses, 2003), as well as in emotion regulation (e.g., Eisenberg et al., 2001; Chang, Schwartz, Dodge, & McBride-Chang, 2003; Scaramella & Leve, 2004). Taken

together, findings suggest that understanding how early parenting practices interact with children's emotion understanding and temperament traits to predict the development of maladaptive affective social-cognitive knowledge structures would help to elucidate specific risks.

Gender Differences

However, a substantial body of research has demonstrated that parents' discipline techniques differ between boys and girls (e.g., Casas et al., 2006; Chang et al., 2003; Keenan & Shaw, 1997, for a review; Zhou et al., 2002). While studies on parental influences of social information processing have not focused on gender differences, studies from the aggression literature suggest that mothers may be more controlling and harsh with boys than with girls (Miller, Cowan, Cowan, Hetherington, & Clingempeel, 1993; Webster-Stratton, 1996) and parents of school-age girls are warmer in their interactions than parents of school-age boys (Zhou et al., 2002). Given this, it appears that parents may differentially socialize sons and daughters in ways that affect the display of disruptive behaviors. On the other hand, boys and girls also may respond differentially to their parents' behaviors. For example, a recent study conducted by Casas and colleagues (2006) found that mothers' and fathers' authoritarian and permissive parenting styles were differentially associated with preschool boys' and girls' physical and relational aggression. Thus, it is important to examine the effects of parenting separately for boys and girls in order to examine different patterns among social information and emotion processing.

Current Study

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To summarize, few studies have investigated early antecedents of children's social information and emotion processing mechanisms. Available research suggests that harsh parenting practices are associated with maladaptive social information and emotion processing, whereas nurturing parenting practices are associated with more adaptive social information and emotion processing. Likewise, there is evidence that parenting practices interact with early temperament traits and skills in emotion understanding to predict subsequent social information processing, but further research is needed to replicate these findings. Moreover, available research is limited by its focus on elementary school-aged children and boys. As a result, the current study examined how mothers' use of harsh and non-harsh discipline techniques, children's emotion understanding, and children's susceptibility to anger during the preschool period interacted to predict boys' and girls' affective social-cognitive knowledge structures during kindergarten.

The current study expanded upon findings from Chapters II and III, which used the MacArthur Story Stem Battery (MSSB) to index kindergartner's social-cognitive knowledge structures. Consequently, the research questions and hypotheses focused on four main issues. First, individual differences in preschooler's emotion understanding and anger susceptibility were examined in relation to kindergartener's affective social-cognitive schemata. In particular, individual differences in children's early level of emotion understanding and anger susceptibility were examined in relation to children's subsequent emotion understanding and narrative themes of physical aggression, relational aggression, and empathic/prosocial relations during kindergarten. I hypothesized that children's early emotion understanding would be positively associated with subsequent

emotion understanding and narrative themes of empathy/prosocial relations, whereas children's early susceptibility to anger would be positively associated with narrative themes of physical and relational aggression. Second, individual differences in mothers' discipline techniques during the preschool period were examined in relation to children's affective social-cognitive schemata during kindergarten. Specifically, individual differences in mothers' early use of warm, responsive parenting, inductive discipline, and harsh physical discipline were examined in relation to children's emotion understanding and narrative themes of physical aggression, relational aggression, and empathic/prosocial relations during kindergarten. Based on previous research, I hypothesized that a) mothers' use of warm, responsive parenting and an inductive discipline style during preschool would be negatively associated with narrative themes of physical and relational aggression during kindergarten, but positively associated with emotion understanding and narrative themes of empathy/prosocial relations during kindergarten, and b) mothers' use of harsh physical discipline during preschool would be positively associated with narrative themes of physical and relational aggression during kindergarten, but negatively associated with emotion understanding and narrative themes of empathy/prosocial relations during kindergarten. Third, the interactions among early maternal parenting and children's emotion processing were examined in relation to the development of affective social-cognitive schemata. Specifically, the interactions among mothers' use of harsh and non-harsh discipline techniques and children's emotion understanding and susceptibility to anger during the preschool period were examined in relation to children's emotion understanding and narrative themes of physical aggression, relational aggression, and empathic/prosocial relations during kindergarten. Based on

previous research, I hypothesized that a) the combination of mothers' use of harsh physical discipline, low levels of children's emotion understanding, and higher susceptibility to anger during preschool would predict more narrative themes of physical and relational aggression during kindergarten, but lower levels of emotion understanding and fewer narrative themes of empathy/prosocial relations during kindergarten, and b) the combination of mothers' use of warm, responsive parenting, inductive discipline, and higher levels of children's emotion understanding and lower susceptibility to anger during preschool would predict higher levels of emotion understanding and more narrative themes of empathy/prosocial relations during kindergarten, but fewer narrative themes of physical and relational aggression during kindergarten. Finally, gender differences in each of these relationships were explored to illuminate potential differences in the contribution of early maternal parenting practices and child characteristics on the development of affective social-cognitive schemata.

<center>Method</center>

Participants

Participants were 132 children (55 girls) and their mothers who were recruited to be part of an ongoing longitudinal study investigating the correlates and antecedents of externalizing behavior problems (Olson, Sameroff, Kerr, Lopez, & Wellman, 2005). For a full description of the participant sample, see Chapter II. Data from both time points were used in the present study.

Procedures

Home assessment. Mothers and children were administered questionnaires and assessments in their homes by a female social worker. The home assessment began with a

parent interview that took approximately two hours. Following the home assessment,

parents were provided a packet of questionnaires which they were allowed to fill out on

their own time and return by mail or experimenter pick-up. Families were given $100 for

each wave in which they participated.

   Laboratory Assessment. Children participated in a 4-hour laboratory assessment

held at a local preschool on a Saturday morning (*N*= 228 at time 1; *N*= 199 at time 2).

Some children did not complete this assessment because of scheduling conflicts or

pronounced difficulty with parental separation. After building rapport with the children,

graduate student examiners administered a battery of social, cognitive, and emotion tests.

A more detailed description of the laboratory assessments used in this study will be

described below. Children provided assent and received small gifts for their participation.

Measures

   Social information processing: Affective social-cognitive knowledge structures.

Children's affective social-cognitive knowledge structures were assessed during time 2

using the MacArthur Story Stem Battery (MSSB; Bretherton, Oppenheim, Buchsbaum,

Emde, & the MacArthur Narrative Group, 1990). See Chapter II for a full description of

this task. The following eight story stems were used, presented in random order to each

child (see Appendix A for full descriptions of each story stem): The Lost Keys, Bedtime,

New Bike, Cookie Dilemma, Departure from Parents, Reunion, Friends Fighting, and

Mom's Hurt Knee. The child was given unlimited time to complete this task and all story

stem presentations were videotaped.

   As described in Chapter II, undergraduate research assistants were trained to code

the MSSB using The MacArthur Story Stem Narrative Coding System (Robinson, Mantz-

Simmons, MacFie, Kelsay, Holmberg, & the MacArthur Narrative Group, 1992; 2004; see Appendix B). Aggregate scores for each content theme measure were created by summing scores across all eight story stems. Scales for physical aggression and empathic/prosocial relations were created and used in analyses; however, individual items for relational aggression were used in analyses (see Chapter II for a full description).

Emotion understanding. Children's emotion understanding at time 1 was assessed with the Denham (1986) emotion understanding task. This puppet-based task is a widely used assessment that has been found to consistently and reliably measure young children's understanding of emotion and emotion causation (e.g., Dunn, Brown, Slomkowski, Tesla, & Youngblade, 1991). The task has three parts: an emotion labeling component, a stereotypical (matching) affective perspective-taking component, and a non-stereotypical (nonmatching) affective perspective-taking component. The emotion labeling component requires the child to identify and label line drawings of facial expressions depicting the emotions of happy, sad, mad (angry), and scared, each of which is displayed on the puppet by a Velcro-detachable face. In the two affective perspective-taking components of the task, the experimenter acts out a story with a puppet gender-matched to the child that includes an emotion eliciting situation. After the experimenter acts out the story, the experimenter asks, "How does the puppet feel?" to asses the child's ability to identify the emotion being felt by the puppet. The child can either respond verbally or by placing an emotion-matched Velcro-detachable face on the puppet. The stereotypical (matching) half of the affective perspective-taking measure involves the experimenter acting out a situation where the puppet's emotional response to the situation

is congruent with that of a typical child. For example, one vignette has the puppet dreaming about a tiger chasing him/her, after which the puppet acts frightened. The nonstereotypical (nonmatching) half of the task involves the experimenter acting out a situation where the puppet's emotional response to the story is opposite to what the child's response would typically be (as reported by each child's parent). For instance, a story about going to the pool to swim is acted out by the experimenter as either frightening (e.g., the puppet is worried they will get water on their face) or joyfully exciting (e.g., the puppet is happy to swim in the cool water). A composite emotion understanding score was calculated for each child by summing total scores across all three items on the Denham emotion understanding task and dividing this score by 36, which was the total score possible.

Children's emotion understanding at time 2 was assessed using an appearance-reality emotion understanding task developed by Harris, Donnelly, Guz, and Pitt-Watson (1986). For a detailed description of this task, see Chapter II. A composite emotion understanding score was calculated for the appearance-reality emotion tasks by summing the children's correct responses on the emotion labeling portion of the task with their correct judgments of the protagonists' real and apparent emotion. This score was then divided by a total possible score of 18.

Anger susceptibility. At time 1, children's dispositional susceptibility to anger was assessed by the Child Behavior Questionnaire (CBQ), a caregiver-report measure designed to assess 15 primary temperament characteristics in children ages 3-7 (Rothbart, Ahadi, Hershey, & Fisher, 2001). Parents respond to each item using a 7-point Likert-type scale ranging from 1 = *extremely untrue of your child* to 7 = *extremely true of your*

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child. The scores were averaged across the items for each subscale to obtain an overall

measure for each temperament characteristic. This test has been found to have high

internal consistency and construct validity (Ahadi, Rothbart, & Ye, 1993). Mothers'

reports of their child's susceptibility to anger were indexed using the anger regulation

subscale of the CBQ.

      Discipline techniques. Mothers completed the Parenting Dimensions Inventory

(PDI; Power, Kobayashi-Winata, & Kelley, 1992), a self-report questionnaire designed to

measure parenting styles and discipline practices. The Reasoning and Reminding

subscales were theorized to reflect an inductive parenting style and were positively

correlated for mothers (r (232) = .67, *p*<.001). Thus, *z*-scores of the Reasoning and

Reminding subscales were averaged together to create a composite score for an inductive

parenting style (α=.75). Likewise, the Nurturance and Responsiveness subscales were

theorized to reflect the dimension of parental warm responsiveness and were positively

correlated for mothers (r (232) = .47, *p*<.001). As a result, the Nurturance and

Responsiveness subscales were converted into *z*-scores and averaged to create a

composite score for the dimension of parental warm responsiveness (α=.73).

      Mothers were also asked to complete the Harshness of Discipline Scale (Dodge,

Petit, & Bates, 1994) during individual interviews. This scale assessed the frequency with

which each parent had physically disciplined their child (e.g. spank, shake, grab) within

the past 3 months. Parents could choose *never* (value = 0), *once/month* (1), *once/week* (2),

daily (3), or *several times daily* (4); when mothers circled two adjacent responses, the

value was averaged (e.g., 1.5 = between *once/month* and *once/week*). Because mothers'

reports of their own use of physical discipline were relatively low in frequency (Kerr,

Lopez, Olson, & Sameroff, 2004) and research suggests that the amount of physical punishment a child receives from both parents is considerably greater than from either parent alone (Nobes & Smith, 1997), the current measure was adapted to a rank order scale to measure the frequency with which each parent reported that their child received physical punishment from either parent (Kerr et al., 2004). For example, the lowest rank (rank = 0) was assigned to children who received no physical punishment from either parent (scores = 0 and 0). According to mothers, 23% of the sample was in this group. The next lowest rank (rank = 1) was assigned to children who had received physical punishment from one parent between "once per month" and "never," but none of this type of punishment from the other parent (scores = 0.5 and 0). Children were assigned a rank of 2 if they received scores of 0.5 and 0.5. Thirty-six rankings were made on the basis of responses in this sample. Children who reportedly experienced physical punishment from both parents several times daily received the highest rank.

Control variable: Child IQ. Children's intelligence was assessed using the Vocabulary and Block design subtests of the Wechsler Preschool and Primary Intelligence Scale- Revised (WPPSI-R; Wechsler, l989) during time 1. An intelligence score for children was created from the summed scores of the Vocabulary and Block design subtests.

Control variable: Theory of mind. Children's theory of mind was assessed at time 1 by the Bartsch and Wellman (1989) Belief-Desire reasoning tasks (for a full description, see Chapter II). Scores were summed across the prediction and explanatory belief-desire tasks and then divided by the total possible score of 12 in order to obtain an overall theory of mind score.

Results

Preliminary Analyses

Table 4.1 provides the means and standard deviations for the child and parenting

measures, presented separately by child gender. The means and standard deviations for

narrative themes and emotion understanding at time 2 can be found in Table 2.1. Table

4.1 also includes results of a multivariate analysis of variance (MANOVA) examining

gender differences in child and parenting measures. Child gender was entered as the

between subjects factor, while child IQ, theory of mind skills, early child measures, and

early parenting measures were dependent variables. Results revealed that there were no

significant differences among the variables (F(7, 201)=1.48, p=n.s.); thus, boys and girls

scored comparably on laboratory and maternal report measures.

Correlations among Study Variables

The results of zero-order correlations conducted among all variables of interest

are shown in Table 4.2. Results revealed that early child IQ was strongly positively

correlated with children's emotion understanding at both time points and modestly

positively correlated with mothers' reports of warm responsiveness and an inductive

discipline style. In addition, there was a modest negative association between early child

IQ and the physical aggression narrative scale and narrative themes of exclusion of other.

Similarly, children's early skills in theory of mind were moderately positively associated

with children's emotion understanding at both time points and modestly positively

correlated with mothers' reports of an inductive discipline style. Results also revealed a

negative association between children's early skills in theory of mind and mothers'

reported use of harsh physical discipline. In addition, there was a trend for children's

early skills in theory of mind to be negatively associated with children's early susceptibility to anger. Consequently, children's intelligence score and theory of mind skills during the preschool period were used as control variables in all analyses.

Table 4.3 presents the results of partial correlations conducted among measures of children's early emotion skills, mothers' reports of early parenting behaviors, and children's affective social-cognitive knowledge structures, presented separately by child gender. As noted, children's preschool IQ and theory of mind skills were used as control variables. Results revealed significant associations between measures concurrently and across time. Given that the concurrent associations between measures of children's affective social-cognitive knowledge structures were discussed in Chapter II, only the concurrent associations between children's early emotion skills and mothers' reports of early parenting behaviors will be reported here.

During the preschool period, boys' susceptibility to anger was negatively associated with mothers' reports of inductive discipline and a warm, responsive parenting style, but positively associated with mothers' reports of harsh physical discipline. For girls, early susceptibility to anger was negatively associated with level of emotion understanding and tended to be positively associated with mothers' reports of harsh physical discipline. In addition, mothers' reports of an inductive discipline style were positively associated with reports of warm, responsive parenting and negatively associated with reports of harsh physical discipline for both boys and girls. Likewise, mothers' reports of warm, responsive parenting were negatively associated with reports of harsh physical discipline for girls and tended to be associated for boys.

Results revealed only one significant association between measures across time. In particular, girls' early level of emotion understanding was positively associated with subsequent level of emotion understanding. While there was a trend for mothers' reported use of warm, responsive parenting during preschool to be associated with girls' narrative themes of excluding others in kindergarten, no other significant associations were obtained between measures across time.

Early Child and Maternal Predictors of Children's Schemata

Figure 4.1 depicts a diagram of the direct and indirect relationships examined among early parenting practices, early child characteristics, and children's subsequent affective social-cognitive schemata. In order to examine direct and indirect effects of these relationships, four separate hierarchical linear regressions were conducted. Components of children's affective social-cognitive knowledge structures during kindergarten were examined separately so that specific patterns of relationships could be uncovered. In addition, the hierarchical linear regressions were conducted separately by child gender to illuminate different patterns of effect. For each regression analysis, one component of children's affective social-cognitive knowledge structures was entered as the dependent variable (e.g., emotion understanding, empathic/prosocial narrative scale, physical aggression narrative scale, or exclusion of other narrative theme); child IQ and theory of mind skills during preschool were entered as a block on step 1; children's emotion understanding and anger susceptibility during preschool were entered as a block on step 2; mothers' reports of warm, responsive parenting, an inductive discipline style, and use of harsh physical punishment during preschool were entered as a block on step 3; and interactions between early child and maternal measures were entered as a block on

the final step. Preschool IQ and theory of mind skills were entered as control variables so that the unique relationships among early parenting practices, child antecedents, and affective social-cognitive schemata could be examined. Prior to analyses, multicollinearity statistics were performed on the predictor variables to determine if the variables required centering. Results revealed no multicollinearity between predictor variables (tolerance >.1; VIF<4); thus, analyses were conducted on the original variables.

The predictive models for children's affective social-cognitive schemata were constructed in several steps. First, all main effects and interaction terms were entered as described above. Second, all interaction terms with *p*-values greater than .30 were excluded from the model and the regression analysis was re-run using the main effects and remaining interaction terms. This process was repeated until all the interaction terms in the model achieved a *p*-value of .30 or less. Thus, the final hierarchical linear regression model reflected the predictor variables that best explained the variance in each knowledge structure. Analyses and results for the predictive models of affective social-cognitive schemata will be described and reported for boys and girls separately.

Predictors of Boys' Affective Social-Cognitive Schemata

Results of the final model predicting boys' emotion understanding during kindergarten are shown in Table 4.4. The overall predictive model approached significance ($R^2 = .16$) and several variables added significantly to the model. Results revealed that preschool IQ and theory of mind accounted for a significant proportion of the variance in emotion understanding during kindergarten. The significant positive beta for theory of mind indicated that more skills in theory of mind during preschool were associated with higher levels of emotion understanding during kindergarten. In addition,

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there was a trend for boys' early intelligence score to be associated with higher levels of emotion understanding during kindergarten. On the other hand, neither boys' early emotion skills nor mothers' reports of parenting and discipline styles added significantly to the model. However, there was a trend for the interaction between boys' early level of emotion understanding and anger susceptibility to add significantly to the model.

Table 4.5 presents the results of the final model predicting the empathic/prosocial narrative scale for boys during kindergarten. The overall predictive model achieved significance ($R^2 = .24$). Results revealed that boys' preschool IQ and theory of mind did not add significantly to the model. However, there was a trend for boys' abilities in early emotion processing to significantly contribute to the model and each measure was significantly associated with the empathic/prosocial narrative scale. Specifically, results revealed that boys' early level of emotion understanding, as well as early susceptibility to anger, was inversely associated with narrative themes of empathy/prosocial relations. Mothers' reports of parenting and discipline did not add significantly to the model. On the other hand, the interactions between early child and maternal measures added significantly to the model. In particular, the interaction between boys' early level of emotion understanding and anger susceptibility significantly predicted narrative themes of empathy/prosocial relations.

Given that the significant interaction between level of emotion understanding and susceptibility to anger contained an interaction between two continuous variables, the main effects of the interaction are not directly interpretable. Thus, post-hoc analyses to examine the direction of main effects were conducted according to the Jaccard and Turrisi (2003) guidelines as described in Chapter III. Results revealed a significant

difference in empathic/prosocial narrative themes between low and high levels of anger susceptibility when emotion understanding was low ($F(1, 79)=17.67$, $p<.01$). As shown in Figure 4.2, lower levels of emotion understanding predicted more themes of empathy/prosocial relations when anger susceptibility was low (B= -1.61, $p<.001$), but not when anger susceptibility was high (B=.44, p=n.s.).

Results of the final model predicting the physical aggression narrative scale for boys during kindergarten are shown in Table 4.6. The overall predictive model did not achieve significance (R^2=.09) and neither early emotion processes nor mothers' reports of parenting and discipline style contributed significantly to the model. Likewise, the interaction between early child and maternal variables did not add significantly to the model.

Table 4.7 presents the results of the final model predicting boys' exclusion of other narrative themes during kindergarten. The overall predictive model did not achieve significance (R^2=.12) and neither early emotion processes nor mothers' reports of parenting and discipline style contributed significantly to the model. Similarly, the interaction between early child and maternal variables did not add significantly to the model.

Predictors of Girls' Affective Social-Cognitive Schemata

Results of the final model predicting girls' emotion understanding during kindergarten are shown in Table 4.8. The overall predictive model achieved significance (R^2=.36) and several variables added significantly to the model. Results revealed that girls' preschool IQ and skills in theory of mind accounted for a significant proportion of the variance in levels of emotion understanding during kindergarten, but neither had

significant unique contributions. Girls' early emotion processes also added significantly to the model. The significant positive beta for girls' early level of emotion understanding indicated that higher levels of emotion understanding in preschool predicted higher levels of emotion understanding in kindergarten. Likewise, there was a trend for girls' early susceptibility to anger to positively predict subsequent emotion understanding. While early reports of mothers' parenting behaviors did not contribute significantly to the model, interactions between girls' and mothers' behaviors during the preschool period did contribute significantly. Results revealed that the interactions between girls' level of anger susceptibility and mothers' reports of an inductive discipline style, as well as between girls' level of anger susceptibility and mothers' reported use of harsh physical discipline, were significantly associated with girls' level of emotion understanding in kindergarten. Also, there was a trend for the interaction of girls' early level of emotion understanding and mothers' reports of an inductive discipline style to predict subsequent levels of girls' emotion understanding.

Following Jaccard and Turrisi (2003), post-hoc analyses were conducted to examine the direction of main effects for the significant interaction between girls' level of anger susceptibility and mothers' reports of an inductive discipline style. Results revealed a significant difference in kindergarten girls' level of emotion understanding between low and high levels of anger susceptibility when maternal induction in preschool was low ($F(1, 60)=7.75, p<.01$). As presented in Figure 4.3, lower levels of reported maternal induction during preschool predicted higher levels of emotion understanding during kindergarten when girls' early susceptibility to anger was high (B=4.59, $p<.01$), but not when girls' early susceptibility to anger were low (B=-.88, p=n.s.).

Likewise, post-hoc analyses following Jaccard and Turrisi's (2003) guidelines were performed to examine the direction of main effects in the significant interaction between girls' level of anger susceptibility and mothers' reported use of harsh physical discipline. Results revealed there was not a significant difference in girls' level of emotion understanding during kindergarten between low and high levels of anger susceptibility ($F(1, 71)=3.13$, p=n.s). Thus, girls' early susceptibility to anger tended to predict higher levels of subsequent emotion understanding independent of mothers' reported use of harsh physical discipline.

Table 4.9 presents the results of the final model predicting the empathic/prosocial narrative scale for girls during kindergarten. The overall predictive model did not achieve significance ($R^2 = .18$). While there was a trend for the interactions between measures of girls' and mothers' early behaviors to predict subsequent rates of empathic/prosocial narrative themes, neither early emotion processes nor mothers' reports of parenting and discipline styles contributed significantly to the model.

Results of the final model predicting the physical aggression narrative scale for girls during kindergarten are shown in Table 4.10. The overall predictive model did not achieve significance (R^2=.23) and neither girls' early emotion processes nor mothers' early reports of parenting added significantly to the model. However, results revealed the interactions between measures of girls' and mothers' early behaviors contributed significantly to the model. Specifically, the interaction between girls' early level of emotion understanding and mothers' early reports of warm, responsive parenting, as well as the interaction between girls' early level of anger susceptibility and mothers' early reported use of harsh physical discipline, were significantly associated with girls'

physically aggressive narrative themes during kindergarten. In addition, there was a trend for girls' early susceptibility to anger to interact with mothers' early reports of inductive discipline to predict narrative themes of physical aggression.

Following Jaccard and Turrisi (2003), post-hoc analyses were conducted to examine the direction of main effects for the significant interaction between girls' early level of emotion understanding and mothers' early reports of warm, responsive parenting. Results revealed there was not a significant difference in rates of girls' physically aggressive narrative themes between low and high levels of early emotion understanding ($F(1, 65)=2.33$, p=n.s.). Thus, early levels of girls' emotion understanding and mothers' reports of a warm, responsive parenting style did not appear to be related to girls' narrative themes of physical aggression in kindergarten.

Likewise, post-hoc analyses following Jaccard and Turrisi's (2003) guidelines were performed to examine the direction of main effects in the significant interaction between girls' early level of anger susceptibility and mothers' reported use of harsh physical discipline. Results revealed a significant difference in rates of girls' physically aggressive narrative themes between low and high levels of early anger susceptibility when mothers' use of harsh physical discipline was high ($F(1, 65)=4.46$, $p<.05$). As shown in Figure 4.4, higher rates of harsh physical discipline predicted more narrative themes of physical aggression when girls' early susceptibility to anger was low (B=-1.48, $p<.05$), but not when girls' early susceptibility to anger was high (B=.64, p=n.s.).

Table 4.11 presents the results of the final model predicting girls' exclusion of other narrative themes during kindergarten. The overall predictive model approached significance (R^2=.27). Results revealed that only the interactions between girls' early

emotion processes and mothers' early reports of parenting contributed significantly to the model. Specifically, the interaction between girls' early level of emotion understanding and early level of anger susceptibility predicted narrative themes of excluding others in kindergarten. In addition, there were trends for girls' early level of emotion understanding to negatively predict exclusion of other narrative themes in kindergarten and for the interaction of girls' early level of anger susceptibility and mothers' early reports of warm, responsive parenting to predict girls' exclusion of other narrative themes in kindergarten.

Post-hoc analyses, conducted according to Jaccard and Turrisi's (2003) guidelines, were used to examine the direction of effects in the significant interaction between girls' early level of emotion understanding and susceptibility to anger. Results revealed a significant difference in exclusion of other narrative themes between low and high levels of early anger susceptibility when girls early level of emotion understanding was high ($F(1, 65)=5.73$, $p<.05$). As shown in Figure 4.5, higher levels of emotion understanding during preschool predicted more narrative themes of excluding others during kindergarten when girls' level of susceptibility to anger was high (B=.71, $p<.05$), but not when girls' level of susceptibility to anger was low (B=.02, p=n.s.).

Discussion

Few studies have investigated early antecedents of children's social information and emotion processing mechanisms despite evidence that deficits in these mechanisms are found as early as the kindergarten years (Arsenio, Cooperman, & Lover, 2000; Burks et al., 1999; Denham et al., 2002; Dodge, 2006; Hughes, Dunn, & White, 1998). While available research suggests that parenting practices are associated with qualitative

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differences in children's social information and emotion processing (Criss et al., 2002; Criss, Shaw, & Insgoldby, 2003; Gomez et al., 2001; Haskett & Willoughby, 2007; Heidgerken et al., 2004; Runions & Keating, 2007; Scaramella & Leve, 2004), additional research is needed to replicate these findings. Limitations in the research, such as the focus on school-aged children, overt aggression, and boys, also make it difficult to generalize findings to younger children, relational aggression, and girls. In addition, all of the studies conducted have relied on children's verbal responses to hypothetical vignettes to index social information processing mechanisms. As a result, the current study used the MSSB to index kindergartner's social-cognitive knowledge structures and examined how mothers' use of harsh and non-harsh discipline techniques, children's emotion understanding, and children's susceptibility to anger during the preschool period interacted to predict individual differences in boys' and girls' affective social-cognitive knowledge structures during kindergarten.

Descriptive Analyses

For a full discussion of the descriptive analyses for the narrative and emotion understanding measures obtained in kindergarten, please see Chapter II. In the current study, results revealed no gender differences among the preschool measures. Thus, it appeared that boys and girls scored comparably on laboratory measures and that mothers in the current study used similar parenting practices with boys and girls during the preschool period.

Associations with Preschool IQ and Theory of Mind

Preliminary analyses revealed that children's intelligence score and skills in theory of mind during preschool were associated with measures both concurrently and

across time. Specifically, children's intelligence score during preschool was positively associated with children's emotion understanding at both time points, but negatively associated with narrative themes of physical aggression and excluding others during kindergarten. The association between children's intelligence score and emotion understanding during preschool is consistent with the positive association obtained between kindergarten children's intelligence score and emotion understanding in Chapter II as well as existing literature (Ensor & Hughes, 2005; Hughes, Dunn, & White, 1998; Izard et al., 2008). Moreover, the positive association between preschoolers' intelligence score and emotion understanding during kindergarten underscores the importance of including measures of intellectual functioning in investigations of children's emotion processing. In addition, this finding provides support for the argument that higher levels of intelligence facilitate the development of emotion understanding (Ensor & Hughes, 2005). Likewise, the inverse association between children's intelligence score and social information processing measures is consistent with the findings from Chapter II as well as prior research (e.g., Crick & Dodge, 1994; Dodge & Pettit, 2003). Children with higher levels of intelligence early in life are likely to have higher levels later in life, which may increase children's cognitive resources to accurately assess ambiguous social situations and respond appropriately.

Interestingly, preschoolers' intelligence score was positively associated with mothers' reports of warm, responsive parenting and an inductive discipline style. One explanation for this finding is that preschoolers who have higher levels of intelligence are easier to parent; thus, they elicit more warmth, responsiveness, and induction from their mothers. On the other hand, it is also possible that mothers who exhibit a parenting style

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characterized by warmth, responsiveness, and induction help to facilitate their children's intelligence. In fact, a recent study examining the effects of a parenting skills intervention found that mothers who learned to be more sensitive and responsive to their infants had infants who developed greater language skills (Landry, Smith, & Swank, 2006). It appears that mothers' parenting behaviors play an important role in the development of children's competence and suggests that intelligence or cognitive maturity may also be a pathway through which parents influence children's social information and emotion processing.

Preliminary results also revealed that children's early skills in theory of mind were associated in expected directions with children's emotion understanding at both time points. The association between children's skills in theory of mind and level of emotion understanding during preschool is consistent with the positive association obtained between kindergarten children's skills in theory of mind and level of emotion understanding in Chapter II as well as existing literature (e.g., Hughes & Dunn, 1998; Hughes, Dunn, & White, 1998). In addition, the positive association between preschoolers' theory of mind skills and level of emotion understanding in kindergarten suggests that such skills are relatively stable and that children with greater meta-cognitive understanding tend to have greater emotion understanding across development.

Not surprisingly, children's early skills in theory of mind were positively associated with mothers' reports of an inductive discipline style and negatively associated with mothers' reports of harsh physical discipline. These findings are consistent with prior studies that have examined parents' use of power assertive techniques and preschoolers' skills in theory of mind (Hughes, Deater-Deckard, & Cutting, 1999; Pears

& Moses, 2003; Ruffman, Perner, & Parker, 1999). Although causality cannot be determined, it is likely that preschoolers who experience harsh physical discipline have deficits in their general meta-cognitive understanding due to the disorganizing effects of such discipline. For instance, researchers have argued that discipline characterized by strong negative affect and coercive behavior likely influences children's skills in theory of mind, rather than vice versa, because the relationship exists even when age, level of intellectual functioning, and other variables are controlled (Pears & Moses, 2003). Likewise, preschoolers who experience more gentle discipline characterized by reasoning and reminding of rules likely have greater skills in meta-cognitive understanding due to a more supportive atmosphere.

Associations among Preschool and Kindergarten Measures

Given that the associations among the kindergarten measures were examined and discussed in Chapter II, only the associations including preschool measures will be discussed here. As expected, boys' susceptibility to anger was negatively associated with mothers' reports of warm, responsive parenting and an inductive discipline style, and positively associated with mothers' reports of harsh physical discipline. In addition, there was a trend for girls' susceptibility to anger to be positively associated with mothers' reports of harsh physical discipline. These findings are consistent with studies that have found inverse relationships between aspects of difficult temperament in early childhood and supportive parenting (NICHD ECCRN, 2004; Stright, Gallagher, & Kelley, 2008) as well as positive associations between aspects of young children's difficult temperament and parents' use of harsh discipline (Criss et al., 2002). Given that characteristics of children's temperament have been shown to influence maternal parenting (Rothbart &

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Bates, 1998; Rubin et al., 2003), these findings suggest that preschool boys who are more prone to anger may elicit more punitive discipline and less warm, responsive parenting from their mothers.

While girls' susceptibility to anger was not significantly associated with mothers' reports of parenting or discipline styles, it was negatively associated with girls' level of emotion understanding. In other words, girls who were more prone to anger during the preschool period also appeared to have deficits in understanding emotions. Although aggression was not directly examined in this study, this finding supports prior studies that have found links among deficits in emotion understanding, poor emotion regulatory skills, and the display of reactive aggression in children (Dodge, 2006; Pettit & Dodge, 2003). Thus, it appears that early precursors to aggression are present as early as the preschool period and may begin to develop as a result of early transactions between children's dispositional styles and affective processing.

Several associations among mothers' reports of parenting and discipline styles were also found. For both boys and girls, mothers' reports of a warm, responsive parenting style were positively associated with reports of an inductive discipline style, whereas an inductive discipline style was negatively associated with mothers' reported use of harsh physical discipline. Also, a negative relationship between mothers' reports of a warm, responsive parenting style and reported use of harsh physical discipline was significant for girls and approached significance for boys. Not surprisingly, it appears that mothers who endorse more sensitive and responsive parenting behaviors do not engage in punitive parenting practices and vice versa.

While there was a trend for mothers' warm, responsive parenting style to be inversely related to kindergarten girls' narrative themes of excluding others, only one significant association was obtained between measures across time. Specifically, girls' early level of emotion understanding was positively associated with their subsequent level of emotion understanding. This finding provides validity for the combined use of Denham's (1998) and Harris, Donnelly, Guz, and Pitt-Watson's (1986) emotion understanding tasks, and suggests that girls' skills in emotion understanding are stable across time.

Early Antecedents of Children's Affective Social-Cognitive Schemata

In order to examine the direct and indirect effects of early child and parenting characteristics on the development of children's affective social-cognitive schemata, separate models were developed for boys' and girls' affective social-cognitive knowledge structures. In particular, predictive models including preschool measures of children's intellectual functioning, theory of mind skills, aspects of emotion processing, and mothers' parenting and discipline styles were examined to illuminate unique and interactive contributions on the affective and social-cognitive components of boys' and girls' knowledge structures in kindergarten. Measures of children's emotion understanding and narrative themes from the MSSB were used to index components of children's affective social-cognitive knowledge structures and each were examined separately so that specific patterns could be revealed. Findings are discussed separately for boys and girls in detail below.

Antecedents of Boys' Affective and Social-Cognitive Schemata

Consistent with hypotheses, early skills in emotion processing predicted subsequent skills in social information processing. In particular, results revealed that boys who had lower levels of emotion understanding, but were less prone to anger during the preschool period told narratives with more themes of empathy/prosocial relations during the kindergarten period. This finding suggests that preschoolers may be able to compensate for deficits in emotion understanding through their ability to regulate anger. While prior studies have not specifically studied this relationship, this finding is in line with a recent study conducted by Criss and colleagues (2002) that found an inverse relationship between children's resistant temperament and encoding skill. In addition, this is consistent with a similar finding in Chapter III where boys who experienced concurrent deficits in emotion understanding and emotion regulation during kindergarten were rated as more overtly aggressive by teachers. Taken together, it appears that strengths in aspects of emotion regulation may help to counteract early deficits in emotion understanding, whereas the combination of early deficits in emotion processing may make it difficult for boys to cultivate socially competent skills. These findings coincide with research investigating reactive aggression in children (Dodge, 2006; Pettit & Dodge, 2003) and suggest that boys who lack skills in understanding emotions and are unable to regulate negative emotions will be less likely to process situations accurately and display socially competent skills. On the other hand, boys who lack skills in understanding emotions, but are able to regulate negative emotions, may be able to accurately process social situations and thus respond accordingly.

Contrary to hypotheses, mothers' reports of parenting and discipline styles did not predict boys' schemata of physical or relational aggression, empathy/prosocial relations,

or emotion understanding. Similarly, boys' early emotion processes did not predict schemata of physical or relational aggression or emotion understanding, either uniquely or in combination with mothers' reports of parenting and discipline styles. These findings are somewhat surprising given that prior studies have found evidence for the link between parenting practices and social information processing (Criss, Shaw, & Insgoldby, 2003; Gomez et al., 2001; Haskett & Willoughby, 2007; Hiedgerken et al., 2004; Runions & Keating, 2007) as well as evidence for the interactive contribution of parenting and child temperament to predict social information processing (Criss et al., 2002). One possible explanation for the lack of findings is that the current study departed from prior studies by examining the relationship between parenting practices and children's social information processing over the preschool to school transition. Perhaps the relationship between parenting practices and children's social information processing does not solidify until the elementary school years. In addition, the current study differed from prior studies by focusing on a subsample of parenting and child factors hypothesized to be related to social information processing. For example, the current study relied on mothers' reports of how often children were harshly disciplined by both parents in the home to index harsh physical discipline, whereas other studies included multiple measures (e.g., Haskett & Willoughby, 2007; Heidgerken et al., 2004). It is likely that the combination of parenting practices, rather then one singular component, contributes to the development of children's social information processing. In fact, the aforementioned studies that found links between parenting practices and children's social information processing included measures that tapped parents' beliefs about their children. For instance, Runions and Keating (2007) found that mothers' authoritarian

beliefs, rather than their use of negative control, predicted kindergartener's hostile

attribution biases. Perhaps it is the cognitive aspects of parenting, rather than physical or

emotional aspects, that influence children's social-cognitive schemata. Future

investigations would benefit from including measures of mothers' cognitions about

parenting and their children.

Antecedents of Girls' Affective and Social-Cognitive Schemata

As expected, early child and parenting characteristics contributed uniquely and in

combination to components of girls' affective schemata during the kindergarten period.

In particular, higher levels of girls' emotion understanding during the preschool period

predicted higher levels of emotion understanding during the kindergarten period above

and beyond girls' early level of intellectual functioning and theory of mind skills. This

finding supports previous research that indicates that the ability to understand emotions is

distinct from general intellect and meta-cognitive understanding (e.g., Cassidy, Werner,

Rourke, Zubernis, & Balaraman, 2003; Hughes, Dunn, & White 1998; Pears & Moses,

2003) and suggests that skills in emotion understanding are relatively stable. Although

mothers' reports of parenting and discipline styles during the preschool period did not

uniquely predict girls' level of emotion understanding during the kindergarten period, the

combination of mothers' parenting styles and girls' early emotion processing predicted

subsequent levels of emotion understanding. Specifically, girls who were more prone to

anger and received lower levels of maternal induction during the preschool period were

more likely to display higher skills in emotion understanding during the kindergarten

period. While this finding appears counterintuitive, this is consistent with Pears and

Moses' (2003) finding that parents' use of consequences was negatively associated with

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preschoolers' emotion understanding. As these authors suggested, the use of logical explanations in discipline likely does not impact the development of emotion understanding because explanations of affects are not involved. Similarly, girls' early experiences with anger and negative emotions likely strengthen their knowledge of emotions by providing them with more direct affective experiences. In fact, there was a trend for girls' early susceptibility to anger to predict increases in emotion understanding, which suggests that girls' early affective experiences do influence subsequent emotion understanding. Taken together, these findings indicate that early emotion processes have a more prominent role than parenting practices in the development of girls' emotion understanding.

Findings revealed a mixed picture for components of girls' social-cognitive schemata. Contrary to hypotheses, models including girls' early emotion processes and mothers' reports of parenting and discipline styles during preschool did not significantly predict girls' schemata of physical or relational aggression or empathic/prosocial relations during kindergarten. However, despite insignificant models, interactions among girls' early emotion processing skills and between mothers' reports of harsh physical discipline and girls' early emotion processing skills emerged as potential predictors of girls' aggressive schemata. In particular, preschool girls who were less prone to anger and received more harsh physical discipline appeared to tell more physically aggressive narratives in kindergarten. On the other hand, preschool girls who were more prone to anger and had higher levels of emotion understanding tended to tell narratives with more themes of excluding others in kindergarten. Although these findings are preliminary, this

suggests that there are distinct risk factors in the development of girls' physically and relationally aggressive schemata.

The significant relationship between maternal parenting practices and girls' early skills in emotion processing predicting narrative themes of physical aggression supports prior research that has found links between harsh parenting practices and maladaptive social information processing (Criss et al., 2002; Gomez et al., 2001; Haskett & Willoughby, 2007; Hiedgerken et al., 2004; Runions & Keating, 2007) as well as literature that has found links between harsh parenting practices and the development of aggression (Bates et al., 1998; Gershoff, 2002; NICHD ECCRN, 2004; Patterson, 2002; Rubin et al., 2003; Smith et al., 2004). Given that the experience of harsh physical discipline predicted more narrative themes of physical aggression only for girls who were less prone to anger, it appears that harsh physical discipline, rather than early susceptibility to anger, is a particular risk factor for girls developing physically aggressive schemata. However, girls' early affective characteristics, rather than parenting practices, appear to be more important in predicting the formation of relationally aggressive schemata. What is particularly interesting is that the combination of *high* levels of emotion understanding and susceptibility to anger predicted more narrative themes of excluding others. This implies that a certain degree of affective sophistication is needed to develop social-cognitive schemata of relational aggression and further, girls who are more susceptible to anger may have motivation to use that knowledge to aggress relationally. Even more intriguing, this relationship appears to begin emerging during the preschool period. This coincides with recent research that has found evidence for relational aggression appearing as early as age 3 (Bonica, Yershova, Arnold, Fisher, &

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Zeljo, 2003; Crick et al., 2006; Ostrov & Keating, 2004; Ostrov, Woods, Jansen, Casas, & Crick, 2004) and suggests that relationally aggressive schemata have already begun to emerge and contribute to relational aggression prior to school entry. Taken together, these findings suggest that maladaptive social information processing mechanisms begin as early as the preschool period and underscore the importance of examining antecedents of these mechanisms very early in children's lives.

Limitations

There were some limitations to the generalizability of these findings. First, the majority of children in this sample came from intact, middle class, two-parent households. This limits generalizability to children in different economic and family circumstances such as low-income households or single-parent households. Second, children in this sample represented an at-risk population, which limits generalizability to children diagnosed with a clinical disorder. Third, measures of mothers' parenting and discipline styles were based on maternal self-report; future studies should include observational measures of parenting in addition to self-reports to provide a more nuanced picture of parenting as well as to decrease the likelihood of reporter bias. Finally, subsamples of boys and girls were used in the examinations of affective social-cognitive schemata over time, which decreased the sample size and power for each analysis. Future studies would benefit from the inclusion of more boys and girls in each subgroup in an effort to replicate and extend current findings.

Conclusion

The current study adds to and extends the literature in several important ways. First, relatively few studies have examined the relationship between parenting practices

and social information processing across time and even fewer have focused on the preschool to school transition. Further, few studies have included measures of both parenting and child characteristics in investigations of children's social information processing despite recent arguments that transactional processes between behavior and affect displayed by parents and children influence children's subsequent behavior (Scaramella & Leve, 2004). Findings from the current study revealed that unique and interactive associations among mothers' parenting practices and children's skills in emotion processing during preschool predicted social information and emotion processing in kindergarten. These findings support separate studies that have found links among parenting practices, early child characteristics, and children's social information processing (Criss et al., 2002; Gomez et al., 2001; Haskett & Willoughby, 2007; Hiedgerken et al., 2004; Runions & Keating, 2007) and extend these findings developmentally downward to the preschool and kindergarten periods. In addition, the significant associations between measures of children's affective social-cognitive schemata in kindergarten and emotion processing in preschool provide additional support for researchers' arguments that emotion processes should be included in investigations of children's social information processing (Denham et al., 2002; Izard, 2001; Izard, Fine, Mostow, Trentacosta, & Campbell, 2002; Lemerise & Arsenio, 2000). Second, the current study extended the literature on early antecedents of children's social information processing by including measures associated with relational aggression. To the author's knowledge, no studies to date have included measures of social information processing related to relational aggression. The significant association between girls' early emotion processing and subsequent schema related to relational aggression supports prior research

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that has found evidence for relational aggression appearing as early as age 3 (Bonica et al., 2003; Crick et al., 2006; Ostrov & Keating, 2004; Ostrov et al., 2004) and highlights the importance of including social information processing measures related to relational aggression in examinations of early antecedents of social information processing. Similarly, prior studies examining early antecedents of children's social information processing have neglected to include investigations of gender differences in these relationships. Given that the current study found evidence for distinct pathways in the development of boys' and girls' affective social-cognitive schemata, future studies would benefit from the inclusion of analyses examining gender-differentiated pathways in the development of children's social information and emotion processing. Finally, findings from the current study provide continued support for using the MSSB to index children's early social-cognitive schemata. To the author's knowledge, no other studies have used the MSSB in conjunction with measures of early child and parenting characteristics to examine the development of maladaptive affective social-cognitive schemata. The significant associations obtained between measures on the MSSB and measures of early child and parenting characteristics suggest that the MSSB is a promising tool for tapping young children's representations of prosocial relations, physical aggression, and relational aggression.

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Table 4.1 Means, Standard Deviations, and Results of MANOVA (controlling for Child IQ and Theory of Mind) of Study Variables, Presented Separately by Child Gender

Variables	Boys		Girls		Difference
	M	*SD*	*M*	*SD*	
IQ score (T1)	21.72	5.45	22.34	5.44	n.s.
Theory of Mind score (T1)	1.24	1.75	2.00	2.31	n.s.
Child Measures (T1)					
Emotion Understanding	27.03	5.95	27.40	6.85	n.s.
Anger Susceptibility	4.58	.76	4.56	.73	n.s.
Parenting Measures (T1)					
Induction	.06	1.88	-.05	1.77	n.s.
Warm Responsiveness	-.11	1.80	.15	1.59	n.s.
Harsh Discipline	7.30	7.58	5.23	5.82	n.s.

Table 4.2 Correlations between Child IQ, Theory of Mind, and Study Variables

	IQ (T1)	Theory of Mind (T1)
1. Emotion Understanding (T1)	.44***	.30***
2. Anger Susceptibility (T1)	-.08	-.12+
3. Maternal Induction (T1)	.17*	.16*
4. Maternal Warm Responsiveness (T1)	.19**	.08
5. Maternal Harsh Discipline (T1)	-.08	-.21**
6. Emotion Understanding (T2)	.30***	.26***
7. Empathy/Prosocial Scale (T2)	.00	.06
8. Physical Aggression Scale (T2)	-.16*	-.12
9. Exclusion of Other Theme (T2)	-.19*	-.12

Note: $^+p<.10$. $^*p<.05$. $^{**}p<.01$. $^{***}p<.001$.

Table 4.3 Intercorrelations of Study Variables (With T1 Child IQ and Theory of Mind Controlled), Presented Separately by Child Gender

	1	2	3	4	5	6	7	8	9
1. Emotion Understanding (T1)	——	-.30*	.10	-.04	-.05	.32*	-.04	-.08	.11
2. Anger Susceptibility (T1)	-.04	——	-.10	-.19	.22[+]	-.05	-.01	-.11	.02
3. Maternal Induction (T1)	-.00	-.49***	——	.36**	-.29*	-.11	.01	.16	.06
4. Maternal Warm Responsiveness (T1)	-.07	-.14	.39**	——	-.33*	-.18	-.20	.05	-.25[+]
5. Maternal Harsh Discipline (T1)	-.12	.28*	-.34**	-.20[+]	——	-.01	-.06	.10	.06
6. Emotion Understanding (T2)	-.10	-.15	.07	.04	-.03	——	-.15	.28*	.26[+]
7. Empathy/Prosocial Scale (T2)	-.16	-.25*	.07	-.08	-.07	.04	——	.11	.12
8. Physical Aggression Scale (T2)	.00	-.09	.07	.06	.16	.21[+]	-.08	——	.10
9. Exclusion of Other Theme (T2)	-.09	.01	.05	-.03	-.06	.02	.27*	.14	——

Note: $^+p<.10$. $^*p<.05$. $^{**}p<.01$. $^{***}p<.001$. Correlations for girls are above the diagonal, whereas correlations for boys are below the diagonal.

Table 4.4 Summary of Hierarchical Regression for Early Child and Maternal Factors Predicting Kindergarten Boys' Emotion Understanding

Variables	B	SE B	R^2	ΔR^2	ΔF	F
1. Child IQ (T1)	.17[+]	.10	.09	.09*	4.46	
Theory of Mind (T1)	.61*	.25				
2. Emotion Understanding (T1)	-1.01*	.52	.12	.03	1.55	
Anger Susceptibility (T1)	-6.54*	3.03				
3. Maternal Induction (T1)	-.05	.28	.13	.00	.12	
Maternal Warm Responsiveness (T1)	.05	.28				
Maternal Harsh Discipline (T1)	.03	.06				
4. Emotion Understanding x Anger Susceptibility (T1)	.21[+]	.11	.16	.04[+]	3.43	
Model						1.99[+]

Note: [+]$p<.10$. *$p<.05$.

Table 4.5 Summary of Hierarchical Regression for Early Child and Maternal Factors
Predicting Kindergarten Boys' Empathic/Prosocial Narrative Scale

Variables	B	SE B	R^2	ΔR^2	ΔF	F
1. Child IQ (T1)	.03	.03	.03	.03	1.17	
Theory of Mind (T1)	-.18+	.10				
2. Emotion Understanding (T1)	-.81***	.22	.09	.06[+]	2.88	
Anger Susceptibility (T1)	-5.25***	1.34				
3. Maternal Induction (T1)	-1.65*	.68	.09	.01	.24	
Maternal Warm Responsiveness (T1)	.53	.54				
Maternal Harsh Discipline (T1)	-.00	.02				
4. Emotion Understanding x Anger Susceptibility (T1)	.17**	.05	.24	.14**	3.66	
Emotion Understanding x Maternal Induction (T1)	.04+	.02				
Emotion Understanding x Maternal Warm Responsiveness (T1)	-.02	.02				
Anger Susceptibility x Maternal Induction (T1)	.13	.09				
Model						2.22*

Note: [+]$p<.10$. *$p<.05$. **$p<.01$. ***$p<.001$.

Table 4.6 Summary of Hierarchical Regression for Early Child and Maternal Factors Predicting Kindergarten Boys' Physical Aggression Narrative Scale

Variables	B	SE B	R^2	ΔR^2	ΔF	F
1. Child IQ (T1)	-.19*	.10	.03	.03	1.30	
Theory of Mind (T1)	.01	.27				
2. Emotion Understanding (T1)	1.01[+]	.55	.03	.00	.20	
Anger Susceptibility (T1)	6.09[+]	3.50				
3. Maternal Induction (T1)	.14	.30	.06	.03	.88	
Maternal Warm Responsiveness (T1)	.03	.28				
Maternal Harsh Discipline (T1)	-.41	.37				
4. Emotion Understanding x Anger Susceptibility (T1)	-.25[+]	.13	.09	.03	1.13	
Anger Susceptibility x Maternal Harsh Discipline (T1)	.02	.01				
Model						.87

Note: [+]$p<.10$. *$p<.05$.

Table 4.7 Summary of Hierarchical Regression for Early Child and Maternal Factors Predicting Kindergarten Boys' Exclusion of Other Narrative Theme

Variables	B	SE B	R^2	ΔR^2	ΔF	F
1. Child IQ (T1)	-.04[+]	.02	.05	.05	2.28	
Theory of Mind (T1)	-.00	.07				
2. Emotion Understanding (T1)	-.02	.02	.06	.01	.56	
Anger Susceptibility (T1)	.13	.17				
3. Maternal Induction (T1)	.01	.42	.07	.01	.35	
Maternal Warm Responsiveness (T1)	.09	.57				
Maternal Harsh Discipline (T1)	-.00	.02				
4. Emotion Understanding x Maternal Induction (T1)	-.01	.06	.12	.05	1.07	
Emotion Understanding x Maternal Warm Responsiveness (T1)	.02	.10				
Anger Susceptibility x Maternal Induction (T1)	.08	.01				
Anger Susceptibility x Maternal Warm Responsiveness (T1)	-.12	.01				
Model						.99

Note: [+]$p<.10$.

Table 4.8 Summary of Hierarchical Regression for Early Child and Maternal Factors
Predicting Kindergarten Girls' Emotion Understanding

Variables	B	SE B	R^2	ΔR^2	ΔF	F
1. Child IQ (T1)	.12	.12	.14	.14**	5.63	
Theory of Mind (T1)	.32	.26				
2. Emotion Understanding (T1)	.23*	.10	.22	.07*	3.11	
Anger Susceptibility (T1)	1.77+	1.06				
3. Maternal Induction (T1)	9.33**	3.22	.24	.02	.63	
Maternal Warm Responsiveness (T1)	-.07*	.37				
Maternal Harsh Discipline (T1)	1.71	.65				
4. Emotion Understanding x Maternal Induction (T1)	-.09+	.05	.36	.12**	3.61	
Anger Susceptibility x Maternal Induction (T1)	-1.55**	.53				
Anger Susceptibility x Maternal Harsh Discipline (T1)	-.34*	.13				
Model						3.30**

Note: $^+p<.10.$ $*p<.05.$ $**p<.01.$

Table 4.9 Summary of Hierarchical Regression for Early Child and Maternal Factors Predicting Kindergarten Girls' Empathic/Prosocial Narrative Scale

Variables	B	SE B	R^2	ΔR^2	ΔF	F
1. Child IQ (T1)	-.05	.07	.03	.03	1.07	
Theory of Mind (T1)	.17	.17				
2. Emotion Understanding (T1)	-.02	.06	.03	.00	.01	
Anger Susceptibility (T1)	-.34	.61				
3. Maternal Induction (T1)	-2.55[+]	1.42	.07	.04	.77	
Maternal Warm Responsiveness (T1)	-2.54*	1.08				
Maternal Harsh Discipline (T1)	-.56	.38				
4. Emotion Understanding x Maternal Warm Responsiveness (T1)	.08*	.04	.18	.11[+]	2.32	
Anger Susceptibility x Maternal Induction (T1)	.60[+]	.32				
Anger Susceptibility x Maternal Harsh Discipline (T1)	.10	.07				
Model						1.17

Note: $^+p<.10$. $^*p<.05$.

Table 4.10 Summary of Hierarchical Regression for Early Child and Maternal Factors
Predicting Kindergarten Girls' Physical Aggression Narrative Scale

Variables	B	SE B	R^2	ΔR^2	ΔF	F
1. Child IQ (T1)	-.02	.08	.04	.04	1.18	
Theory of Mind (T1)	-.07	.19				
2. Emotion Understanding (T1)	-.03	.07	.05	.01	.48	
Anger Susceptibility (T1)	.53	.69				
3. Maternal Induction (T1)	4.59[+]	2.58	.08	.03	.65	
Maternal Warm Responsiveness (T1)	-2.29[+]	1.32				
Maternal Harsh Discipline (T1)	1.03*	.45				
4. Emotion Understanding x Maternal Induction (T1)	-.04	.04	.23	.15*	2.51	
Emotion Understanding x Maternal Warm Responsiveness (T1)	.09*	.05				
Anger Susceptibility x Maternal Induction (T1)	-.75[+]	.40				
Anger Susceptibility x Maternal Harsh Discipline (T1)	-.18*	.08				
Model						1.43

Note: $^+p<.10$. $^*p<.05$.

Table 4.11 Summary of Hierarchical Regression for Early Child and Maternal Factors Predicting Kindergarten Girls' Exclusion of Other Narrative Theme

Variables	B	SE B	R^2	ΔR^2	ΔF	F
1. Child IQ (T1)	-.05*	.03	.06	.06	2.09	
Theory of Mind (T1)	-.04	.06				
2. Emotion Understanding (T1)	-.20[+]	.12	.06	.00	.01	
Anger Susceptibility (T1)	-1.02	.72				
3. Maternal Induction (T1)	.11	.08	.12	.05	1.17	
Maternal Warm Responsiveness (T1)	.83	.57				
Maternal Harsh Discipline (T1)	.18	.16				
4. Emotion Understanding x Anger Susceptibility (T1)	.05*	.02	.27	.15*	2.75	
Emotion Understanding x Maternal Harsh Discipline (T1)	-.00	.00				
Anger Susceptibility x Maternal Warm Responsiveness (T1)	-.20[+]	.12				
Anger Susceptibility x Maternal Harsh Discipline (T1)	-.02	.03				
Model						1.78[+]

Note: [+]$p<.10$. *$p<.05$.

Figure 4.1 Relationships Examined among Parenting, Child Antecedents, and Children's Affective Social-Cognitive Schemata (adapted from Dodge, 2006)

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┌──────────────────┐
│                  │
│  Neural/Biological │ ──────────╲
│   Dispositions   │             ╲      ┌──────────────┐
│                  │              ╲     │              │
└──────────────────┘               ╲   │              │
                                        │   Schemas    │
            +                           │              │
                                    ╱   │              │
┌──────────────────┐               ╱    └──────────────┘
│ Socialization by: │              ╱
│ • Attachment     │ ────────────╱
│ • Physical Abuse │
│ • Modeling       │
│ • Success/Failure │
│ • Culture        │
└──────────────────┘
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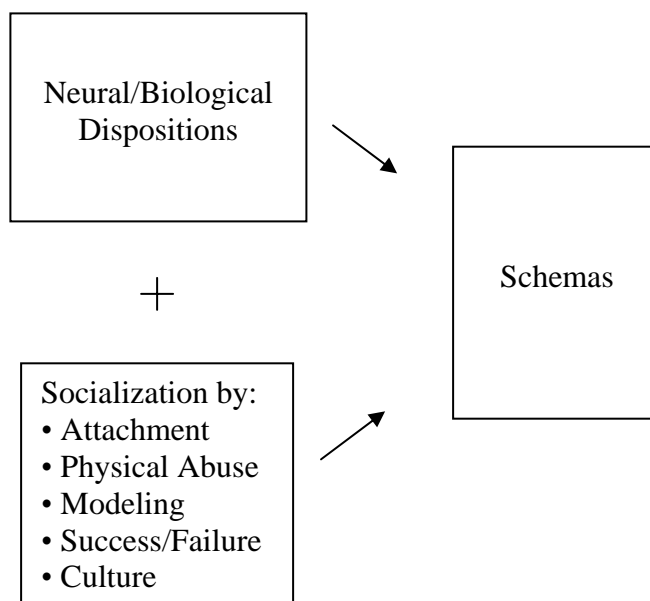
Figure 4.2 Interaction of Boys' Preschool Emotion Understanding and Anger Susceptibility Predicting Narrative Themes of Empathy/Prosocial Relations in Kindergarten
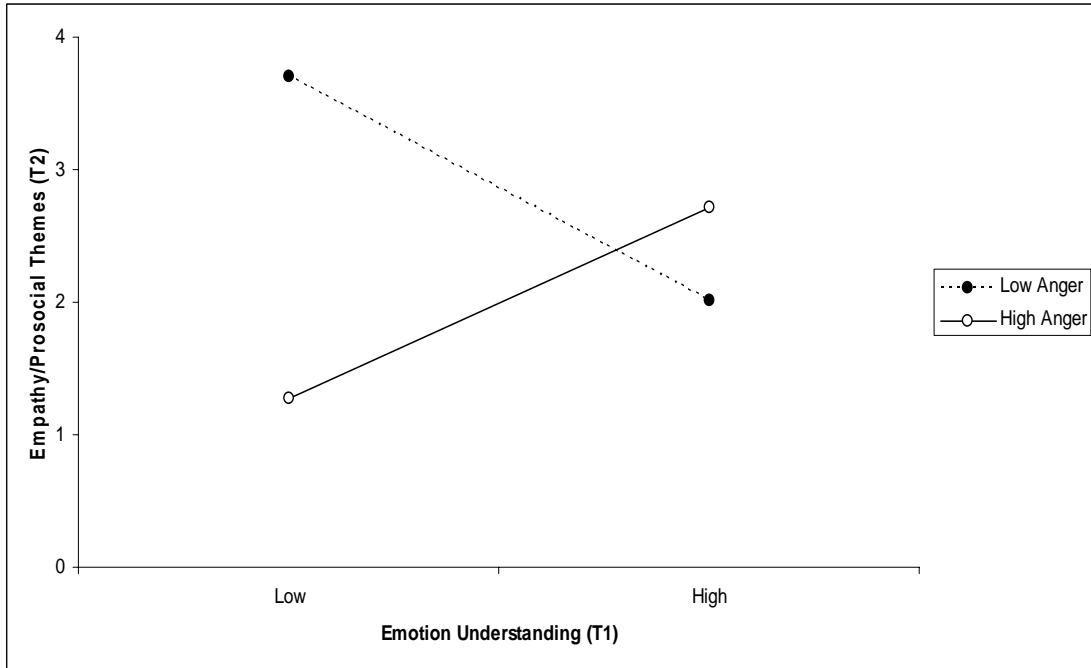
Figure 4.3 Interaction of Mothers' Induction and Girls' Anger Susceptibility during Preschool Predicting Emotion Understanding in Kindergarten

Figure 4.4 Interaction of Mothers' Harsh Discipline and Girls' Anger Susceptibility during Preschool Predicting Narrative Themes of Physical Aggression in Kindergarten

Figure 4.5 Interaction of Preschool Girls' Emotion Understanding and Anger Susceptibility Predicting Exclusion of Other Narrative Themes in Kindergarten
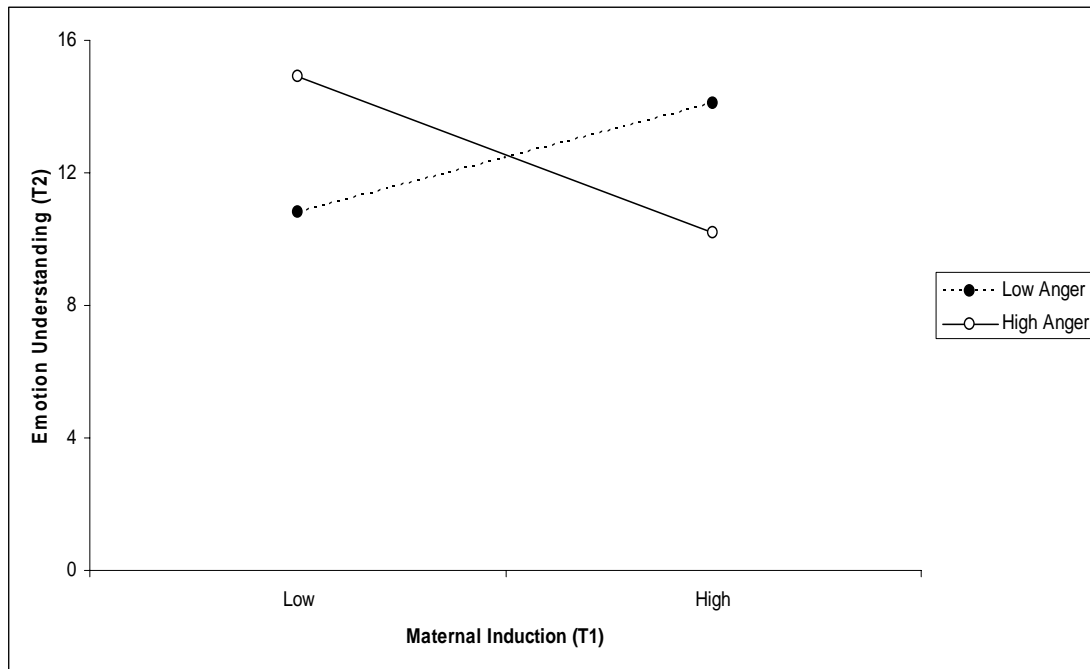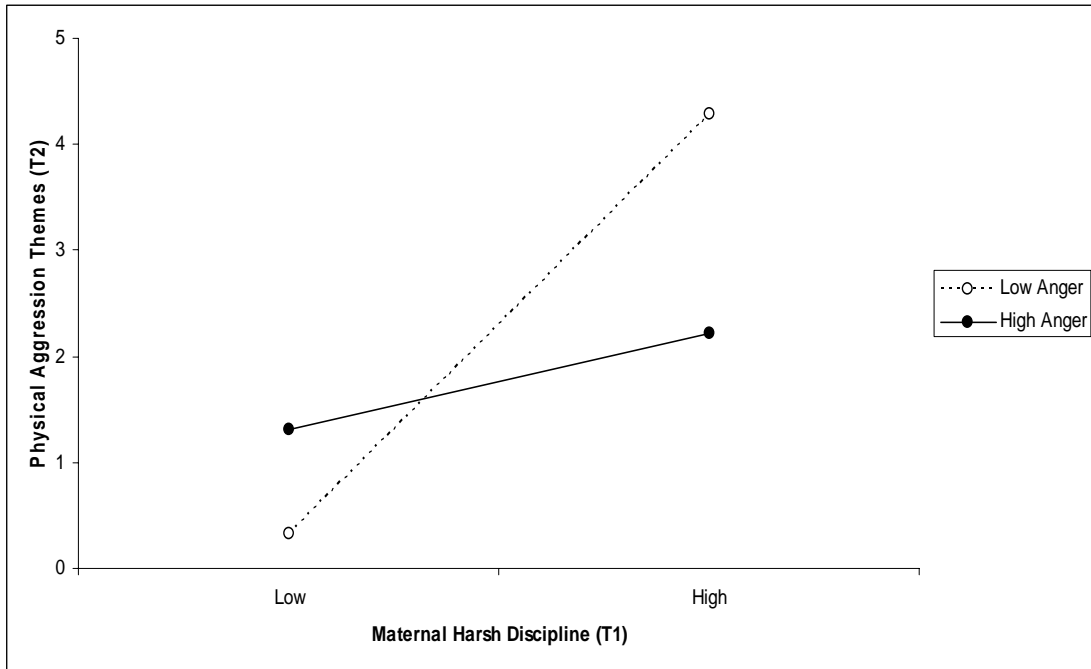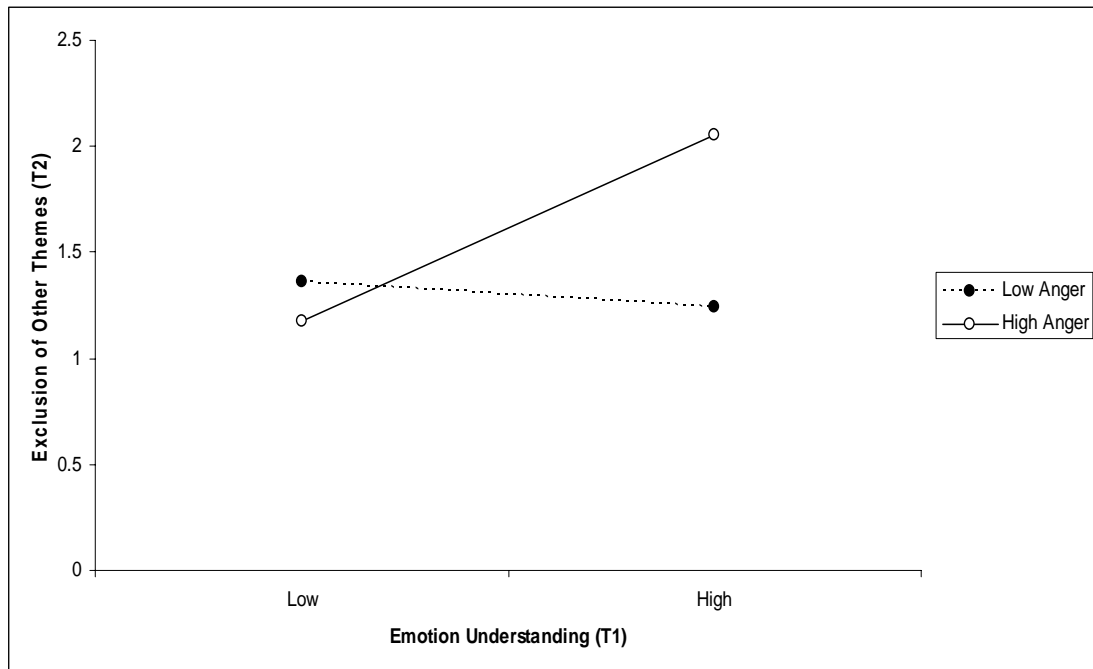
Chapter V

Conclusion

The current dissertation used a multi-manuscript format to examine how social-cognitive and emotion processing relate to the display of aggression during the preschool to school transition. As shown in Figure 5.1, the current studies were designed to address pathways from children's affective social-cognitive schemata, skills in emotion regulation, and biases in intent attributions to the display of aggressive behavior, as well as potential antecedents to these relationships. Given that the current studies were the first to utilize the MacArthur Story Stem Battery (MSSB; Bretherton, Oppenheim, Buchsbaum, Emde, & the MacArthur Narrative Group, 1990) to index children's affective social cognitive schemata, the studies were separated and conducted to 1) determine if a measure of children's affective social-cognitive schemata could be obtained and how that measure related to the display of a hostile attribution bias; 2) investigate if and how qualitative differences in children's affective social-cognitive schemata, emotion regulatory skills, and hostile attribution biases relate to the display of overt and relational aggression; and 3) explore early environmental and child antecedents to these relationships. As a result, the studies in each chapter reflected this division and sequence of investigation.

Many limitations within the social information processing literature were addressed by the current dissertation. Overall, findings extended the literature by

examining individual differences in boys' and girls' social information and emotion

processing during the preschool to school transition and how such differences relate to

the display of overt and relational aggression. First, findings highlighted the importance

of including emotion processes in examinations of children's social information

processing. Consistent with current arguments (e.g., Izard, 2001; Lemerise & Arsenio,

2000), deficits in children's emotion understanding and poor emotion regulatory abilities

were associated with maladaptive social information processing as well as the display of

aggressive behavior. For instance, findings from Chapter II showed that deficits in girls'

emotion understanding were associated with hostile attribution biases, whereas findings

from Chapter III revealed that deficits in both boys' and girls' emotion understanding and

regulation contributed uniquely, as well as in interaction with social information

processing measures, to the display of overt and relational aggression. Likewise, findings

from Chapter IV provided preliminary evidence for preschoolers' early emotion

processing skills to predict social information processing in kindergarten. Taken together,

these findings underscore the importance of including affective measures in

investigations of social information processing and suggest that emotional components of

children's social information processing should also be targeted in therapeutic efforts

aimed at changing children's maladaptive social-cognitive schemata. In fact, there is

evidence that interventions that focus on increasing emotion knowledge and regulation

during the preschool to school transition decrease the display of overt aggression (Izard et

al., 2008) and disruptive behavior (Eyberg, Nelson, & Boggs, 2008, for a review). Thus,

the inclusion of emotion processes is beneficial not only in understanding developmental

pathways to aggression but also in prevention and intervention efforts.

Second, findings highlighted the importance of examining gender- and aggression-differentiated pathways in investigations of children's social information and emotion processing. Specifically, findings indicated different patterns of effect in boys' and girls' social information and emotion processing, as well as in how these mechanisms related to the display of overt and relational aggression. For example, findings from Chapter II showed that distinct schemata related to physical and relational aggression were uniquely associated with hostile intent attributions and that deficits in emotion understanding were associated with hostile intent attributions for girls, but not for boys. Similarly, findings from Chapter III indicated that for boys, deficits and biases in social information and emotion processing contributed to the display of overt aggression directly but interacted to contribute to the display of relational aggression, whereas for girls, deficits in emotion processing primarily contributed to the display of both overt and relational aggression. Findings from Chapter IV provided further support for different patterns of effect by showing that early deficits and biases in emotion processing predicted less socially adaptive schemata for kindergarten boys, but that early deficits and biases in emotion processing interacted with mothers' parenting to predict more skills in emotion processing for kindergarten girls. Overall, these findings support prior literature examining social information processing in girls (e.g., Crick & Doge, 1994; Crick, Grotpeter, & Bigbee, 2002) and in the display of relational aggression (e.g., Crick, Grotpeter, & Bigbee, 2002; Delveaux & Daniels, 2000). Moreover, findings suggest that future investigations should continue to examine gender and aggression differences in social information and emotion processing in order to elucidate particular risk and protective factors in the development of aggression.

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Third, findings provided evidence for the utility of the MSSB in assessing children's early social-cognitive schemata. To the author's knowledge, no studies to date have used the MSSB in examinations of social information processing. While findings from Chapters II, III, and IV all revealed significant associations with components of children's social-cognitive schemata, findings from Chapters II and III provided the most direct evidence for the utility of the MSSB. Consistent with previous research (e.g., Oppenheim, Emde, & Warren, 1996; von Klitzing, Kelsay, Emde, Robinson, & Schmitz, 2000), distinct themes of empathy/prosocial relations, and physical and relational aggression within boys' and girls' narratives were obtained in Chapter II. Moreover, distinct components of children's early hostile social-cognitive schemata were associated with hostile intent attributions in Chapter II. Likewise, findings from Chapter III indicated that distinct components of children's early hostile social-cognitive schemata were associated with displays of overt and relational aggression. Taken together, these findings support prior studies that have linked hostile social-cognitive schemata with hostile attribution biases using different methodologies (e.g., Burks, Laird, Dodge, Pettit, & Bates, 1999; Crick, Grotpeter, & Bigbee, 2002; Dodge, 2006) as well as studies that have linked hostile social-cognitive schemata with the display of overt and relational aggression (e.g., Crick, Grotpeter, & Bigbee, 2002; Delveaux & Daniels, 2000; Orobio de Castro, Veerman, Koops, Bosch, & Monshouwer, 2002; Schultz, Izard & Bear, 2004). Further, these findings suggest that the MSSB is a promising tool for tapping young children's representations of physical and relational aggression. Thus, children's narratives themselves could be a point of intervention for maladaptive social information processing. In fact, research involving children's experiences of trauma has shown that

narrative qualities moderate the impact of trauma on behavior such that children who successfully modify their narratives around a trauma also modify their behavior (Oppenheim, 2006). Perhaps children who tell highly physically or relationally aggressive narratives could be taught how to tell more socially adaptive narratives and reinforced for coming up with alternative narratives with fewer physical or relational aggression themes. This ability to modify narratives may, in turn, decrease children's aggressive displays. On the other hand, narratives from the MSSB could also be used to index changes in children's social-cognitive schemata. For example, the assessment of children's narratives could be included in pre- and post-test measures in interventions to determine if changes in social-cognitive schemata occurred. Either way, findings indicate that the MSSB is useful in assessing children's representations of physical and relational aggression and future research should address how and whether changes in maladaptive social-cognitive schemata relate to changes in children's maladaptive behavior.

Fourth, findings provided preliminary support for early parenting and child characteristics interacting to predict subsequent social information and emotion processing. Although few significant associations emerged, findings from Chapter IV suggested that skills in emotion processing and mothers' parenting practices during preschool work uniquely and together to predict affective social-cognitive schemata in kindergarten. These findings support previous research (e.g. Criss, Pettit, Bates, Dodge, & Lapp, 2002; Runions & Keating, 2007) and suggest that longitudinal examinations of the relationship between early parenting practices and children's social information and emotion processing would help to elucidate one potential avenue through which aggression may develop. Moreover, findings highlighted the importance of examining

this relationship early in development given that significant associations appear to be present as early as the preschool years. Given this, parenting practices would also serve as a beneficial point of intervention for children's maladaptive social information processing. Interventions such as the Incredible Years Parent Training (Webster-Stratton & Reid, 2003) or Parent Management Training Oregon Model (Patterson, Reid, Jones, & Conger, 1975) would likely be successful due to its focus on teaching parents effective discipline techniques and emphasis on teaching appropriate problem-solving skills to children. In this way, both parents and children would learn more adaptive social information and emotion processing skills and parents in particular would be better equipped to cope with and address deficits and/or biases in children's social information and emotion processing.

Finally, findings indicated that deficits and biases in social information and emotion processing are evident as early as the kindergarten period and contribute to overtly and relationally aggressive behavior in the classroom. These findings coincide with prior research (e.g., Burks et al., 1999; Arsenio, Cooperman, & Lover, 2000; Denham et al., 2002) and emphasize the importance of early prevention and intervention efforts. As researchers have noted, intervention efforts are more likely to be successful if implemented earlier in development because social-cognitive representations are still malleable and children do not have to suppress maladaptive responses (Dodge, 2006; Dodge & Pettit, 2003). Consequently, intervention efforts aimed at changing children's maladaptive affective and social-cognitive schemata should be initiated as early as kindergarten in order to achieve optimal success and decrease the display of aggressive behavior.

Overall, findings addressed many limitations within the social information processing literature and revealed opportunities for successful prevention and intervention efforts. However, several relationships hypothesized to exist either were not present or were present in unexpected directions. For example, an overall measure for a relationally aggressive knowledge structure was unable to be obtained in Chapter II and consequently, robust findings related to the display of relational aggression were not found in Chapter III. This relative lack of findings was likely due to the narrative coding system used in the current studies, which was designed to measure overt, physical forms of aggression and did not include many items pertaining to relational aggression. Likewise, most of the relationships between preschool parenting, child antecedents, and children's affective social-cognitive schemata in Chapter IV were not significant. While it is possible that the inclusion of additional parenting and child measures could strengthen the findings, it is also possible that relationships between parenting, child characteristics, and social information and emotion processing are not stable until the elementary school years. As noted, most of the social information processing literature has focused on older children and it may be the case that such relationships are not formed until later in life. Finally, findings from Chapter III indicated an inverse relationship between hostile attribution biases and the display of aggressive behavior. While this finding is inconsistent with prior studies (Crick & Dodge, 1994; Dodge, 2006; Dodge & Pettit, 2003), this may result from the young age of the current sample. Again, perhaps relationships among affective social-cognitive information processing and the display of aggression are not stable until the elementary school years. Additional

investigations that focus on the preschool to school transition and beyond are needed to fully elucidate these relationships.

In sum, findings from the current dissertation provide avenues for future research. For example, the majority of findings from the current studies were obtained from cross-sectional data, which precludes statements about causality. Future research would benefit from longitudinal examinations that include measures from three or more time points so that developmental pathways in these mechanisms could be revealed. In particular, path analytic analyses that incorporate early antecedents, children's social information and emotion processes, and aggressive behavior would aid in identifying specific trajectories in the display of aggressive behavior. In fact, findings from Chapter II and III indicated that the presence of a hostile attribution bias may mediate the relationship between children's affective social-cognitive schemata and the display of aggression. As presented in Figure 5.1, future research with this sample will use mediation and/or path analytic techniques to address specifically how children's social information and emotion processing impact the display of aggressive behavior. Similarly, future studies with this sample will include additional social information and emotion processing measures, such as children's evaluations of social responses or skills in effortful control, as well as additional parenting measures, such as parent's attributions of their child's behavior. This inclusion of additional measures will provide a more nuanced picture of children's social information and emotion processing and help to further elucidate developmental pathways in the display of aggressive behavior. Finally, additional research on the utility of the MSSB in assessing children's social information processing is needed to replicate the current findings. Given that no other studies have used the MSSB in investigations of

social information processing, more research is needed to determine if the MSSB is a valid instrument to use, as well as with what ages and for which populations. This would provide an additional method to index children's early social information processing mechanisms and help to further illuminate pathways to aggression.

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Figure 5.1 Potential Model of the Relationships among Early Environmental Precursors, Children's Social Information and Emotion Processing, and Aggressive Behavior (adapted from Dodge, 2006)
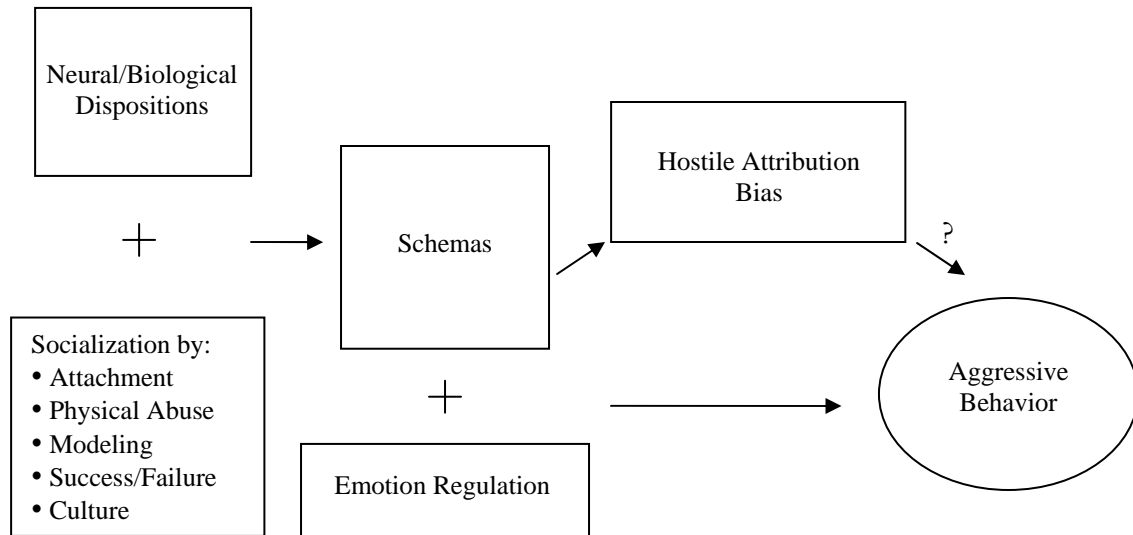
Appendix A

Description of MacArthur Story Stem Prompts

Note: In all story stems that focus on one child doll, the child doll is gender-matched to the child. Also, in all stories that include the child doll's friend, that friend is gender-matched to the child.

Introduction of figures

Examiner: Look what we have here (*brings out family of dolls*). Here's our family. Look. This is the grandma, this is the daddy, this is the mommy, and here's their little boy, Mark, and their little girl, Christy. (*Examiner shows them to the child as they are named*).

E: So who do we have here? Let's run through their names again. (*Examiner points to the figures and asks the child to tell him/her who is who in the family*). You know what? I've got an idea. Let's make up some stories about them. Tell you what, how about if I start a story about our family and you finish it?

Warm-Up Story: Birthday Party

Props: Cake, table, china cabinet

Characters: All dolls (Grandma, Mom, Dad, Mark, and Christy)

Examiner: Here's their table and what's this? (*Examiner shows cake to child and waits for the child to name the cake*)… What kind of cake? It's a birthday cake. You listen carefully to the story. The mommy has baked this beautiful cake and she calls out:

Mom: Come on Grandma, come on Dad, come on Mark and Christy, let's have a birthday party!!

E: Show me what happens now (*Examiner hands dolls to the child*)

Story 1: The Lost Keys (Overt Parental Conflict Story)

Props: Couch, table, chairs

Characters: Mom, Dad, Mark

Examiner: Mark comes into the room. Mother and father are looking at each other like this. (*Examiner has child look at his/her facial expression to convey anger. Mother and father are facing each other in glare positions*).

Mom (*accusatory/angry, stamps feet*): You lost my car keys!! Again!!

Dad (*Angrily*): I did not!!

Mom: You did too! Why don't you ever put anything back where you found it?

E: Show me what happens now.

Prompt: If no acknowledgement of fight, say "What's going to happen about Mom and Dad's fight?"

Story 2: Bedtime

Props: Bed, toy box (open with two toys in it – a doll and a truck)

Characters: Mother and Mark

Examiner: (*lays out toys in front of Mark*) Mark is playing in his room and Mom comes in.

Mom (*mildly insistent voice*): Mark, no more toys. Lay down and take your nap like I told you to.

Mark (*whiny/irritable*): I don't want to take a nap.

Mom (*annoyed/firmly*): I want you to do what I tell you. Take your nap now. (*Mother puts toys away and leaves*)

E: Mom leaves the room. (*Examiner puts mother to the side, but on table. Mark is left sitting between the bed and the toy box*). Show me what happens now.

Prompts: If goes to bed, ask "What happens about the toys?"; If goes to toys, ask "What happens about the nap?"

Story 3: New Bike (Physical Aggression Story)

Props: Bike, lawn

Characters: Two little boys (*Examiner clarifies who is Mark and who is his friend, Scott*)

Mark: Look at my brand new bike. I'm gonna ride it all around the yard. Watch me!

(*Mark rides bike around yard*)

Scott (*demanding/assertive*): I want a turn! Let me ride!

Examiner: Scott pushes Mark off the bike and takes it.

Mark (*gets up; mad*): Ow! You hurt me! Gimme my bike back!

E: Show me what happens now.

Prompt: If no acknowledgement about the bike, ask "And what happens about the bike?"

Story 4: Cookie Dilemma

Props: Cookie jar, china cabinet, table, toys

Characters: Mother, Mark, Scott (*Examiner clarifies who is Mark and who is his friend, Scott*)

Examiner: Mark and Scott are playing.

Scott (*enthusiastically*): I'm hungry. Let's get a cookie.

Mark (*warily*): I'm not allowed to get cookies until after supper.

Scott (*impatiently and with a tempting glee*): Oh c'mon. Let's just get one cookie. Your mom will never know if you don't tell her. I'm gonna take one (*Scott reaches in, gets one, then makes crunching sounds as he eats it*)

E: Mark starts to reach for a cookie, but then hears Mom coming and stops. Mother walks in and looks.

Mom (*mildly surprised*): Did someone eat a cookie? (*annoyed*) There's not as many cookies here – who took a cookie from the cookie jar?

E: Show me what happens now.

Prompt: If no reference to Mark's thoughts or behavior, ask "What about Mark – what could he do or say?"

Stories 5 & 6: Departure from Parents/Reunion

Story 5: Separation

Props: Car, green felt for lawn

Characters: Mother, father, grandmother, Mark and Christy

(*Grandma and children stand apart on the lawn while Mom and Dad stand near the car*)

Examiner: Here is the family – Mom, Dad, Grandma, Mark and Christy. Here's their car. Here's their front lawn. Mom and Dad are going away for an overnight trip.

Mom and Dad: Good-bye! We're leaving. See you tomorrow morning. Listen to Grandma, she's gonna take care of you tonight.

E: Show me what happens next.

Prompts: If parents go, ask "And what do Mark and Christy do after Mom and Dad go away?"; If parents don't go, ask "And what happens about Mom and Dad's trip overnight?"

Story 6: Reunion (*In the event that child says parents did not leave on their trip,

continue with reunion saying: "Let's pretend their parents did go away after all and are

coming back now.")

<u>Props:</u> Same as prior

<u>Characters:</u> Same as prior

(*Parents are in car at far end of table facing lawn. Grandma and kids are together on*

lawn).

E: It is the next day…

Grandma (*excitement/pleasure*): Look, Mark and Christy, here come Mommy and

Daddy! (*parents drive up*) They're coming back from their overnight trip.

E: Show me what happens now.

Prompt: If no recognition of the reunion, say "What about Mommy and Daddy coming

home?"

Story 7: Friends Fighting (Verbal Aggression Story)

<u>Props:</u> Toys

<u>Characters:</u> Mark and Scott (*Examiner clarifies who is Mark and who is Scott*)

Examiner: Mark and Scott are yelling at each other (*Angry tone throughout*)

Mark: You're a big ugly dumb-dumb!

Scott: Nuh uh!

Mark: Uh, huh, dumb-dumb!

Scott: Nuh uh!

Mark: Uh huh!

Scott: Oh, shut up!

E: Show me what happens now.

Prompt: If no acknowledgement of conflict, ask "What happens about the fight?"

Story 8: Mom's Hurt Knee (Empathy for Mother)

Props: Couch, table, toys

Characters: Mother and Mark

Examiner: Mark is playing with his toys on the living room floor. Here comes Mom.

Mark: Hi, Mom.

Mom: Hi, Mark.

E: Mom walks over to the couch and hits her knee on the table and falls on the couch.

Mom (*loudly*): Ow! Ow! I hit my knee on the table!! Ow! Ow! It really hurts!!

E: Show me what happens now.

Prompt: If no acknowledgement of knee, ask "What happens about Mom's hurt knee?"

Appendix B

Excerpt from The MacArthur Story Stem Narrative Coding System

INTRODUCTION

The narrative story stem battery was designed for use with children from 3-7 years of age. Coding does not differ, except in the applicability of the Narrative Coherence scale, which is most applicable for children 4-7 years. Included in this manual are two additional, independent scoring systems: Parental Representations and a subset of the Narrative Emotion Codes. A few points about how examiner errors may compromise scoring are made here. Further information about this scoring system can be obtained from the first authors.

A few remarks about how examiner errors affect narrative scoring follow. Examiner errors may occur in several ways that will effect how the narrative is to be scored.

    1) During the presentation phase a key point in the story may be deleted (i.e. in the exclusion story the parents don't kiss). If this occurs, do not code the narrative and write a note under comments as to why the narrative was not coded.

    2) During the narrative development phase, the examiner may incorrectly deliver a prompt or a prompt may be added that changes the story line. If the child has had time to develop a portion of the narrative, code everything up to the point at which the examiner inadvertently changes the story. Note this in the comment section. If this occurs before the child has had time to begin much of their narrative do not code it and note this in the comment section.

    3) In some situations the examiner may wait too long after the child has completed their story to end the narrative phase and this may cause the child to try and fill in that time with disorganized or incoherent statements. If this occurs, code only the coherent portion of the child's story, and note this in the comment section.

I. CONTENT THEMES - coding will be based on the presence or absence of the following themes throughout the narrative development phase of each story. Mark one box on the score sheet corresponding to each theme, indicating their presence or absence with a (/) in the appropriate box (0 or 1). Circles indicate multiple responses can be endorsed and marks should be made for all levels present or absent by marking the 0 circle. **Performance should still be coded when no themes are present.**

A. NO THEMES - there is no evidence of any of the themes identified under content codes. Atypical responses may be coded along with this 'no themes' code as long as the atypical response does not include the content codes listed. Responses such as "I don't know" fit this category however, there may still be a coherent story if the child only utilized themes that are not listed in this scoring system. In any case, performance codes should be scored.

B. INTERPERSONAL CONFLICT THEMES

IC01) COMPETITION (CM)
A dyadic relationship between children or adults striving for the same object or activity. Competitive comments include: competitive comments, complaints about turns or fairness, or negative comparisons of other to self. Competition occurs over some*thing*, not some*one*.
Ex: - "No, I got it first**",**
    - "It's my turn!"
    - "I can ride better than you"
    - child states "They all tried to get the ball."

IC02) RIVALRY/JEALOUSY (R/J)
A triadic relationship between children over adult attention, between adults, or between children. This might be considered social competition about another. Rivalry/jealousy occurs over some*one*, not some*thing*.

Ex: - child goes over to father who is holding brother and asks to
      be picked up while exclaiming "He's my dad too"

IC03) EXCLUSION OF OTHERS (EX-O)
One character prevents another from joining in an activity or a character is sent away. One child tells another they can't join, even if that is not enacted. Going to jail is exclusion and would be listed under the comment section.
Ex: - parent sending a child to their room (may be combined with P/D 1 if
          appropriate)
    - any doll stating that they feel lonely, left out, or alone

IC04) ACTIVE REFUSAL OF EMPATHY/HELPING (REH-A)- one character approaches another for empathy/help and it is actively denied**.**
Ex: - child asks mom to help find Barney and mom says "No"

- little sister asks to play and big sister says "No" without any explanation or offer of resolution in "three's a crowd" or the little brother pleads, "I'm your little brother" and the response is "so what?" or "who cares?"

IC05) VERBAL CONFLICT (VC) - includes verbal argumentative remarks such as name calling or yelling between children and/or the adult characters. Two or more verbal exchanges must occur to score this. It must be an interchange--one remark elicits a retort from a second character. (A single instance of name calling is coded as Verbal Aggression).

Ex: - child says "I'm not giving it to you" in response to another child angrily stating they want the ball back.

IC06) CONFLICT RESOLUTION (CR) - refers to various means of conflict resolution between children**,** between parents**,** or between parents and children. If more than one form of conflict resolution occurs within a single narrative code both strategies.

1 = Going to an Adult for Help – this includes any time a child asks an adult for help, anyone calling 911,or anyone calling the police. Also included in this category are instances of tattling, a child threatening to tattle to an adult, and/or bribes. This is not just seeking reassurance but rather actual help.

Ex: - child goes to mom or dad when scary dog growls at them
      - mom or dad calls police in 'Lost Keys' story
      - child tells parent that the older sibling won't let them play ball in "Three's a Crowd" story in a way that indicates they wanted the parent to intervene on their behalf so that they would be included.

 2 = "Adult" Like Strategy – child uses an 'adult like' like strategy to   resolve conflict.
 Ex: - Crowd story - children negotiate a time limit between each other so
        that everyone gets a turn.

IC07) COMPLIANCE (CP) - refers to situations in which a character yields to the rules or requests of an adult and does what is asked. Child must have demonstrated some understanding of the stem to make compliance meaningful. Children can also demonstrate compliance with each other.
Ex: - child wipes up juice upon request from parent but must say child is wiping it
    - child cleans up room upon request
    - child goes to room upon request but must say child is going to room now
     - friend says little sister can play after big sister asks her if she can

IC08) NON-COMPLIANCE (NC) - refers to situations in which the character ignores the rule or request and/or does something in opposition to it. The character may also acknowledge and justify breaking a rule before or while they are breaking

it. Child must have demonstrated an understanding of the story stem to make non-compliance meaningful

Ex: - child gets a band-aid from bathroom shelf while saying "I know we're not supposed to but Johnny's hurt"

  - child plays with the special present before cleaning their room when they were instructed not to

  - child goes to their room following parent demand but child then sneaks out

IC09) SHAME (SM)- character exhibits signs of embarrassment or may make self-reproaching types of statements, or when one character shames another. This usually involves angry vocalizations.

1. Shame self - child makes self-deprecating statements.

  Ex: - child says "I'm so stupid, I can't do anything right" after being scolded for spilling juice

   - child doll hides when he knows Mom is going to catch him playing with toys instead of taking a nap

    - child laughs when they see parents kiss (embarrassment)

    - "he didn't mean to make a spill!"

2. Shame other - one character shaming another.

  Ex: - "Shame on you, you are bad" or "You are a naughty girl"

   - slap on the face

IC10) BLAME (BLM)– Statements about responsibility, especially for mishaps or misdeeds. Code unspecified scolding, getting yelled at as Blame Other.

1. Blame self - a character blames self for act committed by others, may be viewed as an effort towards conflict reduction

Ex: - Keys - child character says, "I lost the keys"

2. Blame other - one character blames another for an act that they may or may not have committed. (Caution - not same as tattling). This includes accusatory comments

Ex: - "What did <u>you</u> do with those keys?" (In a harsh voice)

IC11) TEASING/TAUNTING (T/T) - one character teasing another with an object that they desire. The voice can also carry an expression of teasing and taunting that may not show verbal content. Taunting often is in the form of a defensive comment. Include also verbal provocation such as using threats to attempt conflict resolution is coding here.

Ex: - one child says to another "Mom gave me a cookie and you didn't get one"

  - "I don't care if I can't have it, I didn't want it anyway"

  - "Now it's mine!"

  -"I won't be your friend if you won't let him play"

  - (**not** "You're a lousy friend!"; code this under verbal aggression)

-"if you let him play I'll give you some candy"

C. EMPATHIC RELATIONS THEMES

ER01) SHARING (SH) - this denotes a positive relationship between children and/or adults. These interactions include the sharing of an object or animal. There must be some level of a character giving something up. Affiliation may also be coded if the children dolls share a ball and they all play together.
Ex: - child offers the ball to their sibling to play
   - "you can have it too"
   - child states "They can share it"
1. **Code level one when the response is appropriate and modulated.**
2. **Code level two where the response is overboard and histrionic.**

ER02) EMPATHY/HELPING/REASSURANCE (E/H) - a character identifies with or demonstrates an understanding of the thoughts or feelings of another through action. This may be demonstrated by a worried or concerned facial expression or tone of voice, a movement or gesture toward "someone" in distress or needing help. Also include instances of a character seeking reassurance from the victim, attempts to divert the victim's attention as a way of comforting, sharing something with the victim, or helping the victim by performing an act to relieve distress.

Helping behavior includes instances of one character helping another to perform a task or providing assistance so that a job gets done correctly or more quickly. This does not include one doll doing an act independently for another such as Mom cleaning up the juice, unless mom says "I'll do it for you."
Ex: - one doll offers a toy to the injured party
   - child tells the examiner "I cut my finger once, too" in response to a character in the story cutting their finger
   - mom doll assisting child doll in wiping up the juice
   - one child sticking up for a sibling of friend
   - mom or dad telling the child they may come along on the trip in response to the child's distress over being left behind
   - dad or mom makes dog go away in "Scary Dog"

  Empathic Reassurance includes instances of adult giving reassurance to a child:
   "It's okay." or "Everything will be all right." It also includes instances of a child character seeking reassurance from an adult character: "Dad, I'm worried about my brother."

1. **Code level one when the response is appropriate and modulated.**
2. **Code level two where the response is overboard and histrionic.**

ER03) AFFILIATION (AFL) - refers to situations in which 2 or more of the characters are participating in an activity together. There must be a clear sense of inclusion or belonging. This can be demonstrated through turn taking when the

participants are in agreement. Affiliation can also be suggested nonverbally if there is a sense they are in an activity together. Do not code if they all go to bed or drink juice.

Ex: -"Everyone gets a turn on the bike"
    -"Everyone goes to the park"
     -"They both go home"
     - They go outside to play"
    -"They go on a trip" when there is a clear sense that they are all doing it together

1. **Code level one when the response is appropriate and modulated.**
2. **Code level two where the response is overboard and histrionic.**

ER04) AFFECTION (AFF) - any display of hugs, kisses, compliments, warm or caring touch, or praise. Pay attention to the affect expressed in the voice: a parent's gentle and soothing voice is an expression of affection. Do not include touch that is a normal part of a game such as everyone holding hand in 'Ring Around the Rosy'. "Thank you" is coded under the politeness category.

 Ex: - Mom telling child they did a good job
    - Affection to an animal and vice-versa such as a dog   kissing a person
    - Holding hands

1. **Code level one when the response is appropriate and modulated.**
2. **Code level two where the response is overboard and histrionic.**

ER05) REPARATION/GUILT (RG) - the act or process of a character making amends or apologizing following some disharmony between the child and/or adult characters. This may be verbal or non-verbal. Also include in this category instances of making things right again by repairing the main conflict presented in the story stem. Reparation and guilt is suggested by anyone repairing or righting a wrong.

 Ex:- fixing or righting the wrong
    - any doll puts candy back
    - "I'm Sorry"
    - parents apologize in the "Key" story

1. **Code level one when the response is appropriate and modulated.**
2. **Code level two where the response is overboard and histrionic.**
    Ex. – Apologizing over and over
    -   Making amends in a manner that is very much out of proportion to the disharmony, e.g., buying an expensive gift to say "Sorry."

D. DYSREGULATED AGGRESSIVE THEMES

DA01) AGGRESSION (AGG) - Interpersonal acts of aggression. (Pay attention to facial expressions and vocalizations that may or may not co-occur with physical or verbal aggression). Aggression against the scarey dog is NOT coded. Also, the scarey dog being aggressive to people is NOT coded under aggression.

1 = Verbal Aggression – This includes name calling, shaming comments, threats, and personal insults that are well-regulated vs. dysregulated. A single utterance without exchange of words is coded here. Multiple aggressive verbal exchanges is scored as Verbal Conflict (VC).

2 .= Physical Aggression – contact between children and adults, between children or between adults that is intended to hurt and/or cause harm. **Only code aggression that is provoked and regulated under this code.**
Ex: - Parents hit each other
      - Stabbing or shooting someone
      - Children knocking each other over to cause pain or hurt.

3 = Unprovoked Dysregulated Aggression - Use this code when there is no apparent reason for the aggression. also include incidences of aggression that is dysregulated which often appears random and chaotic.
Ex: - everyone gets knocked down at the end of story.

4 = Child verbally or physically assaults an adult - This   should also be coded under Atypical Responses 2 (AR2).

5 = Killing or being killed by someone (but not dying).

DA02) ESCALATION OF INTERPERSONAL CONFLICT (ESC) - indicates incidences of a character escalating the level of aggression beyond that evident in either character's first expression of aggression. Conflict escalates beyond the level initially introduced by the child, not the stem. Also include acts of retaliation that may reflect the same level of aggression or anger that was initially directed towards them. These may also be coded under the aggression category. Do not include in this category situations that involve discipline or punishment in which Mom may go from talking sternly to spanking. Also do not code any acts of retaliation that the dog may have against the characters or the characters have against the dog. These should be put in the danger code or under AR2.
Ex: - Mom yells at child, child hits mom.
      - child that gets knocked off horse hits the aggressor back
      - in "Three's A Crowd" story child says "you should let him play because he's my brother" and when that doesn't work the older brother says "I will not give your ball back if he can't play".

DA03) PERSONAL INJURY (PI) - pertains to an instance of a character being **clearly** physically hurt or injured in which the physical pain may or may not be acknowledged. This may be self- inflicted injury, the result of an accident that was caused by another character, or a prop. Do not include instances such as one doll jumping on the stomach of another doll unless the victim indicates pain. (Do not assume pain). Do note code PI when the dog is hurt.

  Ex: - child screams when falling off the rock
     - child describes the injury
      - child exclaiming "Ouch" when they touch the stove
      - someone goes to the hospital

DA04) ATYPICAL RESPONSES (AR) - Mark the appropriate box when either Neutral/Positive or Negative Atypical Responses occur. Record the child's words verbatim. This code refers to any response that is uncommon for a particular group of children.

1 = Neutral or Positive - atypical responses that are not concerning or alarming.
    Ex: - dad puts his head in his cup. Also note use of distinctive television themes here.

2 = Negative - any atypical, disorganized, and disturbing response that leaves   the coder with a sense of concern and that has a negative tone to it. When the term 'whoopings' is used to mean spankings, do not include it here, code it as punishment/discipline only.
      Ex: - "the house catches on fire and everyone dies"
              - a child assaults an adult (also coded as Aggression 4)
              - stabbing or shooting
              - Grandmother saying "I'm gonna kill the both of you"
              - getting hit with a belt or electrical cord
              - character running away from home
               - dad killing dog with a gun or a knife in 'Scary Dog' story

DA05) SEXUALIZED ACTIVITY (SEX) - Describes activity or words from the child that have sexual quality. For example the child may make a sexual statement, such as "they are making babies". The sexualized activity may occur shortly following affection but has more aggressive tone than affection. For example characters may kiss, and shortly after are banging into each other, or jumping on top of each other. Characters may start out lying on top of each other, and end up jumping up and down on each other. Affection can be coded if this is seen first.

E. MORAL THEMES

MT01) DISHONESTY (DSH) - a character in the story lies, steals, cheats, tricks, or sneaks as part of the narrative. Code if the child indicates that an outsider has stolen the dog. Also code for hiding in order to trick someone.

Ex: - doll hides cookie behind back and tells mom "I don't have anything"
    - tiptoes to get Band-Aid off the bathroom shelf
    - child steals ball away in "Three's a Crowd"

MT02) PUNISHMENT/DISCIPLINE/ MATURITY DEMANDS (PD) - vocalizations don't have to be harsh. Include threats of P/D for instances in which one child tells another that they are going to tell a parent so that the parent will discipline them. The TYPES of discipline/ punishment LISTED may be stated or enacted. Don't include P/D to the dog by anyone**.** Requests to come in and eat (e.g., Spilled Juice or Departure stories) are not included in this category.

1 = Verbal - punishment or discipline (or threat of) with no physical element.
 These include time out, scolding, exclusion, deprivation, increased demands, rules or policies, and the socialization of politeness (i.e. parental expression of appropriate child behaviors and politeness rule).
Ex: -child runs to parent to tattle and the parent says: "I am talking right now."
    -Grandma says to the children who are fighting "Apologize to each other"

ALSO code in this category unspecified acts of punishment where child indicates that P/D takes place but they don't indicate the form it takes.
 Ex: - "He gets in trouble"
       - "Mom puts him in his room" (no vocalizations)
   - "Mom takes him home" (e.g., in Candy Store) along with some indication that he's in trouble.

2 = Physical - punishment or discipline (or threat of) with a physical element. The subject or character inflicts pain or discomfort on another character, which may take the form of spanking. This may be used for parents disciplining children, parents disciplining parents, children disciplining each other or the parents.

3 = Excessive – code in this category when punishments are excessively long and complex in their requirements.
Ex: -"He has to stay in his room, and not play with friends after school, and not eat dinner every night…for 6 months"

MT03) POLITENESS (POL) - Verbal expressions of politeness. The tone of voice used may also be an indicator of politeness.
Ex: - the use of "Sir", "Ma'am", or "please"
   -    a characters request to ask for something such as "Can I ask you a question?" or "Can I talk to you in private?".

F. NARRATIVE EMOTION CODES (Susan Warren, Linda Mantz-Simmons, & Robert Emde)

NE01) DANGER THEME (DAN) - This theme refers to the presence of a theme which involves danger in the narrative. The danger theme may represent the continuation of a danger theme which was already presented or a clear worsening of the danger. Code the highest number present. Do not code threats, just code dangers which are present in the story. Usual aggression (characters hitting each other or fighting) and dying (without an explanation of what caused the death), are not considered dangers. If a character dies as a result of a particular danger (e.g., eaten by a bear), code this. Overwhelming engulfment by others (monster, animal, or other character), i.e., being eatern, is a danger. Unusual or severe aggression (such as a character's getting a hammer to hit the other character; characters dropping off a cliff; or furniture or objects attacking people) are considered dangers. Danger means there is fear for the character.

0 = No Danger theme present

1 = Continuation of Danger Theme - This code is to be used when the child keeps the danger theme, which was presented in the story stem, going or simply repeats it once.
Examples:
Scary dog - growling of the dog or another character shows fear
Hot Soup - one other character may burn their hand
Band-Aid - one other character may cut themselves or the younger sibling may cut themselves again

2 = New Danger or Clear Worsening of Danger - This code is to be used if a new danger is created (which was not present in the story stem) or if there is a clear worsening of the danger. Clear worsening can also occur if help is unobtainable and the child is bothered by this. GETTING LOST IS A DANGER. Ending up in a dangerous situation should be coded level 2.

Examples:
Scary dog - the dog becomes a monster; or a new scary dog is introduced
Any story - the child's ball goes into the street or into the water and the child has to go get it; or, the ball goes into the yard of a neighbor with a dangerous dog; ball accidentally knocks them all into the river
Hot Soup- more than one other character may burn their hand or a character may burn their head or Mom has to get a second, bigger bandage because it is a "really big hurt"
Band-Aid - child cuts themselves more than one more time or dies from the bleeding of the cut; or there is tons of blood all over the place

3 = Trapped in a Dangerous Situation – Unable to get out; not being found

NE02) SAFETY (SAF) – Code Safety if a child hides to be safe, also include going someplace to be safe, and running away to be safe Ex. - child hears a loud noise and hides in the closet Use of locks to protect. Do not confuse with being sneaky or dishonest.

NE03) DESTRUCTION OF OBJECTS (DES) -
   1 = This theme should be coded when objects are destroyed. (Example: The dog eats the ball). Destruction of the dog is not destruction of an object but of a person. Knocking the toys over or off the table does not count unless the child says that something was destroyed or broken.
      Ex: - pitcher breaks
        - scary dog eats the ball

  2 = Making a mess; messing things up

NE04) CHILD POWER (POW) -

0 = No Inappropriate Child Power

1 = Inappropriate Parental Role Child Power. This refers to when the child tries to resolve situations in a way which seems to portray them as a parent or little adult. These actions are usually appropriate for a parent to do but not a child. The child in the story may tell the parents what to do as if the parents were the children. This may also represent a pseudo-mature position. (The child may be trying to take care of the parents.)
Examples:
Keys - the child separates the parents or scolds the father and punishes him or says to the parents "You stop that!" or "Don't fight!"; if the child takes the blame even though he/she did not take the keys, use this code.
Departure - the children drive the car
Candy Store - child buys the candy if the child is age 6 or under
Hot Soup - child moves the table or the stove; NOT child gets a bandaid

2 = Inappropriate Grandiose Child Power. This refers to when the child demonstrates superhuman power. Examples include the child beating up and killing the monster, triumphing over their friend (in a big way, not just getting the ball but displaying great powers such as fancy karate moves), the child being able to fly or swim under the ocean, or the child scaring the monster away or the children using Grandma as a soccer ball (demonstrating great power over people). Don't code simple fighting with adults, parents or the dog; more clear power needs to be shown such as triumphing over the dog in a big way or kicking the dog around as a soccer ball. Do not code turning the TV upside down or using the TV as a soccer ball (which is power over objects, not power over people).

NE05) HOPEFULNESS – Child expresses that things will be better soon.

NE06) REACTION TO SEPARATION (SEP)
This scale is meant to capture the child's response when they are faced with a situation in which they are faced with a separation from parent(s). This scale is specifically going to be used for the Departure story, but can be applied to other stories where the child introduces a desire to not separate from parents. The desires which are coded are basic desires (wanting to go on a trip with the parents) and the desires are usually blocked by the parents. Give the highest code which applies. Two main elements are needed: (1) Child wants to stay with their parents (2) The desire is prohibited by a parent, older sibling or fate

0 = No response to limitation
Example: - children just go off and play when Mom and Dad leave

OR Child accepts the limitation on their being able to satisfy their desires. In order to use this code, it must be clear that they have noticed the limitation
Example: - child cries or is sad after their parents leave on the trip but doesn't argue or try to go. Child may also express concern that the parents aren't coming back or that they don't love him.

1 = Child tries to overcome the limitation by arguing or trying to get attention but does not actually get their desire
Example: - gets in the car with the parents or argues or cries in front of them but doesn't go on the trip ultimately

OR Child overcomes the limitation and gets their desire.
Example: - child gets to go with parents on the trip

2 = Child continues to express distress and desire to leave with parents after the examiner delivers the prompt and the parents drive off.

NE07) EMOTIONAL INCOHERENCE (TO POSITIVE) - (INCPO)
This scale refers to incoherence which occurs in terms of the emotional themes in the story. For example, if, in scary dog, the child runs away from the dog and then becomes friend with the dog, this would be called emotional incoherence because it would be unclear how the fearful responses changed into a happy, friendly relationship. Similarly, if the child hides from the monster or is afraid of the monster and then is happy without a clear explanation, this also is emotional incoherence because is again unclear how the child went from a fearful to a happy state. If the child is fighting with the friend and then they become friends (without an explanation as to why), this would represent a shift from an angry state to a happy state. If the emotional shift in the story does not make sense, use this code. If there is more than one example in the story, pick the clearest or predominant shift. In addition, this code can be used if the child shifts from a theme presented in the story

stem (not just from a theme that they presented themselves). To summarize, two elements are needed:
- (a) A sudden shift in emotions
- (b) No clear explanation

Emotional incoherence which involves transformation of a specific **negative** (sad, hurt, distress, fearful, or angry or aggressive) theme or non-specific negative to a positive theme

If a dog (or another animal) dies and comes back alive, do NOT code that as Incoherent. But if parents or children die and come to back to life, then code as INCPOS

NE08) EMOTIONAL INCOHERENCE TO NEGATIVE- (**INCNEG**)
This scale refers to incoherence which occurs in terms of the emotional themes in the story. It differs from EMOTIONAL INCOHERENCE TO POSITIVE in that instead of the themes shifting away from a negative theme to a neutral or positive theme, they shift from a positive theme to a negative theme. For example, the family is happy and kissing each other and then begins physically fighting suddenly without explanation. (This would be a shift to aggression.) Another example is if the children are playing and suddenly a monster appears and they are afraid. (This would be a shift to fear.) If the emotional shift in the story does not make sense, use this code. If there is more than one shift, pick the clearest or predominant shift. If the initial theme is not clearly positive, do not code the shift.

NE09) FIRST REACTION – (FIR) Record the FIRST narrative response, either Content or Performance code with priority given to content over Performance. Record the appropriate code into the 4 spaces provided.

NE10) FINAL CONTENT - **(FIN)** This scale is meant to describe the LAST narrative response, particularly pertaining to the child/protagonist. This scale is coded at the END of the narrative phase or just before a new story is begun (whichever comes first). If, at the end of the story, the examiner is simply clarifying the story, the child's responses can be coded. If the child does not generate stories in response to the prompts, code the final story they generate before the prompts as the final content. This scale differs from the other scales in that it describes a particular time during the narratives.

0 = Neutral content - This code is to be used when the final response appears to not fit any of the other categories or appears to have neutral content. Examples include the child going to bed, and the family having dinner. This code can also be used when there appears to be both a slight negative and slight positive end so that they seem to balance each other out.
Band-Aid - Child's fingers are in the snow for a long time and Mom helps the child heal
Any story except Headache - watching TV

<u>Any story</u> - character apologizes but does not fix a negative situation; character cleans up a spill

1 = Positive content - This code is often used when a major problem or negative situation in the story is resolved at the end, thus providing a sense of relief. Alternatively, the child may end the story with a clear positive ending.
Examples:
<u>Scary dog</u> - the child and dog become friends
<u>Any story</u> - a threatening character dies at the end, thus leaving the children safe; character apologizes and fixes a negative situation
<u>Barney</u> - the child indicates that Barney is going to be found at the end of the story (child can have Barney reappear or can have the examiner bring him back)
<u>Canceled visit</u> - the child is happy after visiting the friend or the child is happy despite not visiting the friend
<u>Monster</u> - the child and monster become friends or the monster is killed at the end, thus saving the family
<u>Fight with friend</u> - the child becomes friends with the peer again after the fight or plays with their ball at the end (with no obvious horrible problems)
<u>Keys</u> - "The parents got the keys before they hurt each other" (thus, at the last minute, the family is saved)
<u>Band-Aid</u> - child (or any character) gets a Band-Aid
<u>Departure</u> - children are singing while waiting for their parents to return
<u>Headache</u> - Watching TV at the end is positive (since this was a possible deprivation for the child at the beginning)
<u>Three's a crowd</u> - The children play with the ball at the end (with no obvious horrible problems)
<u>Spilled juice</u> - if the child comes out of their room (after time-out) and then immediately has dinner, use this code. (Because the punishment has been lifted). If there is a longer discussion about the dinner at the end (thus focusing not on the lifting of punishment but rather on the dinner itself), use code 2.

2 = Negative content (includes anger and fear or one cannot distinguish between the negative affects) - For this code, the final response involves negative and can include mild frustration or punishment. Forbidding-tone punishment-type questions (such as "Did you spill that?") are coded here. To summarize, this code is to be used when there is:

A. **The following emotions**:
* a mixture of negative emotions
* very mild negative emotions (such as mild frustration or a mild forbidding-tone punishment-type question)
* sadness/loss
* negative themes which involve manipulation, defiance (without fighting), dishonesty, non-severe punishment, being a tattletale or sneaking, jail
Examples:

<u>Fight with friend</u> - the child may say to the friend "It's my ball, my ball, I only rented it to you. Bye, bye"; or, the child says at the end "Dad didn't want the ball but took it anyway."

<u>Scary dog</u> - the dog runs off with the ball

<u>Canceled visit</u> - the child is upset after visiting their friend or not visiting their friend; or, the child runs away from home and lives with their friend forever; or, the child goes to visit their friend but their friend says they cannot play together; child has to stay with Dad (and there is no show of happiness about this)

<u>Barney</u> - Barney dies

<u>Spilled gravy</u> - mom says with frustration that she has to start cooking again

<u>Three's a crowd</u> - child is upset at the end because they cannot play with the ball

<u>Cookie</u> - Character complies with what they're told to do after doing something wrong "Mom picks up a cookie and Dad say put it back"

<u>Three's a crowd</u> - child is upset at the end because they cannot play with the ball

B. **Fear content** - The final response involves the mention of fear or a fearful situation. (Example: They tell ghost stories.)

   <u>Scary dog</u> - dog growls

C. **Angry content** - The final response involves someone being angry, such as the parents being mad at the child or the child making an angry statement or verbal fighting or defending oneself verbally (when a character is defending themselves verbally, they may sound distressed). Critical remarks and reprimands are also coded here such as "Oh, daddy, why did you do that!" or "Next time, do as I say!")

D. Destruction/injury - The final response involves destruction or injury of characters or property or fighting. If the child makes the doll's head spin at the end, use this code. Severe or extreme punishment is coded here. Death or destruction of objects (turning the TV upside-down) is coded here.

CODING OF PARENTAL REPRESENTATIONS IN NARRATIVES (David Oppenheim, Sun Park, JoAnn Robinson, Linda Mantz-Simmons, Jenny MacFie)

These are parent to child only, not parent to parent. When coding parental representations look for moments in which parent is described as doing or saying something in the past, present or future. Also, notice when subject talks about the parents even if their actions are not described, or when the subject describes the child-protagonist's expectations of the parent. Do not code references of the child to his or her actual parents. Several codes can be given for each narrative. However, even if the same code repeats itself it is given only once. This strategy avoids getting into problems related to deciding on the boundaries of themes. Code presence for mother, father, and grandmother.

PR1) POSITIVE (POS): Pay attention to the tone of voice, A gentle, soothing parental tone of voice will be coded as a positive parental representation.

> **A) Protective:** Parent is described as protecting the child from possible or actual harm.
>   Ex: - "Be careful with the scissors"
> **B) Caretaking:** Parent is described as engaging in caretaking actions, involving feeding or taking care of child's hurt.
>   Ex: - parents put Band-Aid on finger, parent feeds the family, parent carries child to bed
> **C) Affectionate, warm, caring**, supportive and affirming: a broad category for a range of positive descriptions: Hugging, kissing, complementing child.
>   Ex: - "She likes to be with her Mom and Dad"
>   - "Give Mom and Dad a kiss"
> **D) Helpful**: Parent gives child concrete help or child seeks help from the parent and assisted by parent.
>   Ex: - parent helps child find lost dog

PR2) NEGATIVE (NEG): A cold and hostile tone of voice is coded as negative parental representation.

> **A) Harsh, punitive** - typically involves aggression or exaggerations of discipline to include killing or severe beatings that have a random (and out of control) quality.
>   Ex: - "I'm going to kick you"
>   - Mother throws a pot at the child
>   - blaming
>   - sexualized affection
> **B) Rejecting** - parent pushes child away.
>   Ex: - "That's an ugly picture"
> **C) Ineffectual** - parent is unable or unwilling to help or assist the child when the child ask a question or ask for help.

PR 3) DISCIPLINE/CONTROL (D/C):

  A) Discipline - involves a description of the parent as an authority figure who disciplines and controls the child. May involve physical punishment as long as it is well regulated and limited such as:

     - a whooping or a single slap to the face
     - butt beating with or without object
     - use of 'the look' as a threat, also include verbal threats

  The disciplining action is done quickly and stops; there are no random acts and if there is yelling there is no screaming.

   Ex: - "I told you NO!", "Don't do that."

PR04) TRIANGULATION/TRIADIC RELATIONSHIP (TTR) – would most often refer to the relationship between the child and his parents, but can also be between child and siblings or peers. Consider coding this whenever there are threesomes or triads represented.

1. Code level one for adaptive responding to both parents with positive feelings about their unified influence on the child. These include positive disciplining representations. When child is not clearly positive about parent attributes or does not bring in two 'others', code 0.

2. Code level two for maladaptive responding, where there is splitting. Child manipulates one parent against the other; one 'other' is attributed with positive and the other negative qualities. Not just ignoring one member of the triad. **Child has a strong alliance with one side of the triangle. Child often comes into an argument and sides with "good" parent.**

III. PERFORMANCE CODES

PC11) NARRATIVE COHERENCE - addresses the degree to which the child responds to the story stem with a logical sequence of events as well as the degree of elaboration which is brought to the response. Stories with emotional shifts that are incoherent (INCPOS or INCNEG) must be coded with narrative incoherence as well.

Conflict Not Handled

(0) = No response or "I don't know what happens". Child may repeat a portion or all of the story stem without any additions.

(1) = Not coherent: fragmented shifts in story line. Child does not return to original story stem.

(2) = Child stays within story line but does not address the conflict or story. A portion of the story may be incoherent.

(3) = Child exhibits an understanding of the conflict but does not offer any resolution when a resolution is expected or does not offer an ending to the story. A portion of the narrative may be incoherent.

Conflict Handled by Changing Constraints

(4) = Child handles the conflict by changing the constraints presented in the original stem or prompt; this may allow child to avoid dealing with the conflict. Narrative may include incoherent shifts. Ex: "Mom says it's OK to have cookies" or "There is no fight."

(5) = Child demonstrates an understanding of the conflict or story and handles it indirectly by offering an easier solution. Ex: in Keys child says "The fight between the parents stops."   In Crowd, the friend just walks away without his/her ball

Embellished Incoherent

(6) = Child demonstrates an understanding of the conflict or story and/or offers a resolution without any story embellishment. Typically these stories are very short. Child offers the minimal amount necessary to tell the story. A segment of the story is incoherent.

(8) = Child demonstrates an understanding of the conflict or story and offers a resolution with some story embellishment. A segment of the story is incoherent.

Embellished Coherent

(7) = The same as 6 with NO incoherence. Often emotionally constricted. If the child extends his/her narrative by repeating a simple, scripted story, code here.

(9) = The same as 8 with NO incoherence. Often emotionally rich.

(10) = A very coherent, logical, sequential series of events that are related to the story stem. Child may add to the story but does not change the original stem. An understanding of the conflict and a resolution to the conflict are presented, or an understanding of the story and an ending to the story are provided when there is no conflict. There are no incoherent shifts in the story and there is a lot of embellishment and a positive ending.