ATTACHMENT DISORGANIZATION IN INFANCY:

A DEVELOPMENTAL PRECURSOR TO MALADAPTIVE SOCIAL

INFORMATION PROCESSING AT AGE EIGHT

by

Lindsay Ann Zajac

A thesis submitted to the Faculty of the University of Delaware in partial fulfillment
of the requirements for the degree of Master of Arts in Psychology

Fall 2017

ATTACHMENT DISORGANIZATION IN INFANCY:

A DEVELOPMENTAL PRECURSOR TO MALADAPTIVE SOCIAL

INFORMATION PROCESSING AT AGE EIGHT

by

Lindsay Ann Zajac

Approved: _____
Mary Dozier, Ph.D.
Professor in charge of thesis on behalf of the Advisory Committee

Approved: _____
Robert F. Simons, Ph.D.
Chair of the Department of Psychological and Brain Sciences

Approved: _____
George H. Watson, Ph.D.
Dean of the College of Arts and Sciences

Approved: _____
Ann L. Ardis, Ph.D.
Senior Vice Provost for Graduate and Professional Education

ACKNOWLEDGMENTS

TABLE OF CONTENTS

Appendix

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

The goal of the current study was to examine relations between attachment security and organization in infancy and social information processing at age eight. The sample included 77 children at high risk for maltreatment. Attachment quality was assessed using the Strange Situation, when children were on average 19.4 months-old. Children's social information processing patterns were assessed using the Social Information Processing Application (SIP-AP), a video-based measure developed to assess distinct stages of social information processing, when children were approximately 8.4-years-old. Attachment organization in infancy predicted hostile attributional bias and aggressive goals in middle childhood. More specifically, children with disorganized attachments interpreted ambiguous provocations more negatively (as indicating more hostility, rejection, and disrespect and as resulting in more anger) and endorsed significantly more revenge and dominance goals than children with organized attachments. Attachment disorganization did not predict aggressive responses or aggressive response evaluation, and attachment insecurity did not predict any stages of social information processing. Results further our understanding of the problematic long-term outcomes associated with attachment disorganization in infancy, especially for children who have experienced early adversity, and suggest that these children are at risk for developing problematic peer relations in middle childhood. Findings are discussed in terms of strengths and limitations of the study and suggestions for future research.

Chapter 1

INTRODUCTION

When children experience early failures in caregiving, they are likely to develop insecure and disorganized attachments (Lyons-Ruth, Repacholi, McLeod, & Silva, 1991; van Ijzendoorn, Schuengel, & Bakermans-Kranenburg, 1999). When distressed, insecurely attached children use coherent and organized strategies, including avoidance or resistance, whereas children with disorganized attachments demonstrate a breakdown in strategy in the presence of their caregivers (Ainsworth, Blehar, Waters, & Wall, 1978; Main & Solomon, 1990). Insecure attachments are associated with less optimal outcomes than secure attachments, but disorganized attachments in particular are associated with adverse outcomes (e.g., Carlson, 1998; Fearon, Bakermans-Kranenburg, van IJzendoorn, Lapsley, & Roisman, 2010; Lyons-Ruth, Easterbrooks, & Cibelli, 1997). These adverse outcomes can be observed in middle childhood, when establishing peer relationships is one of the most important developmental tasks (Hartup, 1996). Social information processing (SIP) deficits have been proposed as a key mechanism explaining why children develop problematic peer relations (Crick & Dodge, 1994; Orobio de Castro, Veerman, Koops, Bosch, & Monshouwer, 2003). However, findings are mixed as to whether children with insecure attachments in infancy demonstrate more maladaptive social information processing patterns in middle childhood than children with secure attachments. Furthermore, to our knowledge, attachment disorganization in infancy has not been

linked to problematic social information processing patterns in middle childhood. To address these questions, this study examines attachment insecurity and disorganization in infancy as developmental precursors to social information processing deficits at age eight.

1.1 Peer Relations, Early Adversity, and Attachment

Healthy peer relationships buffer children from the stress associated with normative transitions in development (Hartup, 1983, 1996), and these relationships are particularly important for children from less optimal family environments (Bukowski, Motzoi, & Meyer, 2011). Children with positive peer relationships are more self-confident (Hartup, 1996), less lonely and depressed (Parker & Asher, 1987), more involved in school (Berndt, Hawkins, & Hoyle, 1986), and perform better academically (Berndt, Hawkins, & Hoyle, 1986) than children with few or problematic peer relationships. Furthermore, negative peer relationships predict current and later adjustment problems, such as criminal behavior, school drop-out, and psychopathology (Bierman, 2004; Cowen, Pederson, Babigian, Izzo, & Trost, 1973; Killen, Rutland, & Jampol, 2011; Parker & Asher, 1987; Rubin, Bowker, & Kennedy, 2011; Rubin, Bukowski, & Parker, 2006).

By middle childhood, children have the necessary cognitive and emotional skills to share their interests and beliefs and engage in meaningful interactions with peers (Bukowski, Motzoi, & Meyer, 2011). A number of skills have been identified as critical to the formation of positive peer relationships, including conflict resolution, positive affect sharing, reciprocity, cooperation, kindness, humor, and intimacy

(Aboud & Mendelson, 1996; Asher & McDonald, 2011; Berndt, Hawkins, & Hoyle, 1986; Bukowski, Motzoi, & Meyer, 2011; Bukowski, Pizzamiglio, Newcomb, & Hoza, 1996; Laursen & Pursell, 2011). Aggression, disruptive behavior, and social withdrawal interfere with the development of positive peer relationships (Asher & McDonald, 2011; Schneider, Atkinson, & Tardif, 2001).

Children who experience early adversity, such as maltreatment or neglect, are more likely to have problems establishing positive peer relationships than other children (Alessandri, 1991; Bolger & Patterson, 2001; Dodge, Bates, & Pettit, 1990; Erickson, Egeland, & Pianta, 1989; Haskett & Kistner, 1991; Howes & Espinosa, 1985; Parker & Herrera, 1996; Salzinger, Feldman, Hammer, & Rosario, 1993; Shields, Cicchetti, & Ryan, 1994; Weiss, Dodge, Bates, & Pettit, 1992). More specifically, children who have experienced adversity are less likely than other children to approach new peers (Alessandri, 1991; Howes & Espinosa, 1985), participate in group play and social conversation (Alessandri, 1991), and exhibit positive affect and intimacy (Parker & Herrera, 1996). In contrast, they are more likely to act aggressively (Alessandri, 1991; Dodge, Bates, & Pettit, 1990; Erickson, Egeland, & Pianta, 1989; Haskett & Kistner, 1991; Salzinger, Feldman, Hammer, & Rosario, 1993; Weiss, Dodge, Bates, & Pettit, 1992), withdraw socially (Dodge, Bates, & Pettit, 1990; Haskett & Kistner, 1991; Shields, Cicchetti, & Ryan, 1994), exhibit negative affect (Parker & Herrera, 1996), and ultimately, they are more likely to experience peer rejection than children who have not experienced adversity (Bolger & Patterson, 2001).

Given that children who experience early adversity are at risk for problematic peer relations and children who experience adversity are still able to develop secure and organized attachments, early attachment relationships could serve as a protective factor for establishing positive peer relations. Secure attachment in infancy may provide children with later confidence to explore the new environment of peer relationships (Kerns, 1996). In addition, early exchanges of positive affect, liking, reciprocity, and cooperativeness, which characterize secure attachment relationships, may generalize to peer relations (Russell, Pettit, & Mize, 1991; Schneider, Atkinson, & Tardif, 2001). Overall, secure attachment may enhance children's ability to establish and maintain friendships by fostering relationship skills that make securely attached children more attractive to peers (Sroufe et al., 2009). A meta-analysis by Schneider, Atkinson, and Tardif (2001) supported this prediction; children with secure attachments had higher quality friendships, were less socially withdrawn and aggressive, and showed higher leadership and sociability with peers in early and middle childhood than children with insecure attachments in infancy.

Whereas secure attachment could be viewed as a protective factor for peer relations, insecure attachment in infancy may serve as a risk factor for aggression toward peers and social withdrawal from peers in middle childhood (Cassidy, 1994; Rubin, Bukowski, & Parker, 2006; Sroufe, 2005; Troy & Sroufe, 1987; Yunger, Corby, & Perry, 2005). Children with insecure attachments may expect rejection, leading them to engage in pre-emptive displays of hostility (Cassidy, 1994; Sroufe, 2005; Troy & Sroufe, 1987; Yunger, Corby, & Perry, 2005) or passivity in peer

4

contexts (Rubin, Bukowski, & Parker, 2006). They may also exhibit manipulative behaviors, such as relational aggression, to elicit responses from peers, because they have learned to display negative emotions to elicit attention from their caregivers (Yunger, Corby, & Perry, 2005). Additionally, Cassidy (1994) suggests that children with insecure attachments might be less competent and self-confident in the peer context than children with secure attachments, due to the reduced exploration associated with attachment insecurity, placing them at heightened risk for peer victimization (Sroufe, 2005; Sroufe, Egeland, & Carlson, 1999).

Disorganized attachment may place children at even greater risk for negative peer relations than insecure attachment (Fearon, Bakermans-Kranenburg, van IJzendoorn, Lapsley, & Roisman, 2010; Groh et al., 2014; Granot & Mayseless, 2001; Jacobvitz & Hazen, 1999; Lyons-Ruth, Alpern, & Repacholi, 1993; Seibert & Kerns, 2015). Children with disorganized attachments do not exhibit coherent, organized strategies when distressed in the presence of caregivers (Main & Solomon, 1990), and this failure may translate to the peer context as children develop. In fact, children with disorganized attachments experience more challenges forming and maintaining peer relationships than children with insecure (but organized) attachments (Hartup, 1996; Jacobvitz & Hazen, 1999; Lyons-Ruth, Alpern, & Repacholi, 1993; Seibert & Kerns, 2015). During the preschool years, children with disorganized attachments tend to act out aggressively or withdraw from social situations (Jacobvitz & Hazen, 1999); Lyons-Ruth, Alpern, and Repacholli (1993) found that the strongest single predictor of hostile behavior among preschoolers was disorganized attachment. In a recent study,

Seibert and Kerns (2015) investigated the association between attachment at age three and peer relations in middle childhood. They found that attachment disorganization, and not attachment insecurity, predicted high levels of relational aggression and peer victimization and low levels of prosocial behavior. Thus, attachment disorganization may be a particularly important developmental precursor to poor peer relations.

1.2 Peer Relations and Social Information Processing

Children with insecure and disorganized attachments are at risk for processing social information differently than children with secure and organized attachments, and this distorted processing may explain why children with insecure and disorganized attachments experience problematic peer relations (DeOliveira, Bailey, Moran, & Pederson, 2005; Jacobvitz & Hazen, 1999; Lyons-Ruth & Jacobvitz, 2008; Moss, St. Laurent, DuBois-Comtois, & Cyr, 2005). Proposed by Dodge and colleagues (Crick & Dodge, 1994; Dodge, Petit, McClaskey, Brown, & Gottman, 1986), the SIP model provides a framework for the series of mental steps that children undergo when they encounter a social situation. The five cognitive steps include the encoding of internal and external cues, interpretation of these cues, selection of goals, construction of possible behavioral responses, and evaluation of those responses (Crick & Dodge, 1994; Fontaine & Dodge, 2006). Deficits in each step are associated with maladaptive social behavior, particularly aggression (Dodge et al., 1986), and these deficits are cumulative (Crick & Dodge, 1994). Below, I review existing literature linking attachment insecurity and disorganization to SIP.

1.2.1 Hostile Cue Interpretation

Hostile attributional bias, a social cognitive pattern in which children over-perceive hostility following ambiguous provocation, is a strong and consistent predictor of aggressive behavior toward peers and occurs when children interpret social cues (for a review, see Orobio de Castro, Veerman, Koops, Bosch, & Monshouwer, 2003). Prior research has drawn theoretically meaningful connections between attachment and hostile attributional bias (e.g., McElwain, Booth-LaForce, Lansford, Wu, & Dyer, 2008; Ziv, Oppenheim, & Sagi-Schwartz, 2004). In brief, early experiences with caregivers influence the extent to which children feel deserving of care and affection and view their caregiver as available, accepting, and responsive (Bowlby, 1969). These beliefs may develop into more generalized expectations about the warmth and responsiveness of others, including peers (Collins, 1996). Essentially, according to attachment theory, when children repeatedly receive rejection and hostility from an attachment figure, they begin to expect it from others, even those outside the caregiving relationship (McElwain, Booth-LaForce, Lansford, Wu, & Dyer, 2008; Ziv, Oppenheim, & Sagi-Schwartz, 2004).

Dodge (1993) hypothesized that children with insecure attachment relationships would display greater hostile attributional bias than other children. However, investigations of the association between attachment security in infancy and hostile attributional bias in childhood have yielded mixed findings. Two studies have supported Dodge's hypothesis, with five-year-old children being less likely to attribute positive intentions to peers in social conflict situations (Suess, Grossman, & Sroufe,

7

1992), and 7.5-year-old children being more likely to attribute peers' behaviors to negative motives in group entry situations (Ziv, Oppenheim, & Sagi-Schwartz, 2004) if they were classified as insecure versus secure as infants. However, two other studies did not find a significant association between infant attachment security and hostile attributional bias in the early school years (Cassidy et al., 1996; Raikes & Thompson, 2008).

In contrast to the literature on attachment security and hostile attributional bias, to our knowledge, the link between attachment disorganization in infancy and hostile attributional bias in middle childhood has never been investigated (Ziv, Oppenheim, & Sagi-Schwartz, 2004). However, one study did find that disorganized attachment in early childhood was concurrently associated with hostile attributional bias (Zaccagnino et al., 2013).

1.2.2 Aggressive Goals

After children interpret a social situation, they must then identify a goal or a desired outcome (Crick & Dodge, 1994). Aggressive goals might involve revenge, dominance, and self-interest (Erdley & Asher, 1996). To our knowledge, no longitudinal study has examined infant attachment as a predictor of aggressive goals in the peer context in the SIP model. However, in a study examining the concurrent relations between attachment representations assessed using an adaptation of the Attachment Doll Story Completion Task (Granot & Mayseless, 2001) and SIP goals in early adolescence, secure attachment representations were negatively associated with the endorsement of antisocial goals (e.g., the desire to retaliate using physical or

verbal aggression), and disorganized representations were positively associated with the endorsement of antisocial goals (Granot & Mayseless, 2010).

1.2.3 Aggressive Responses

With their goal in mind, children generate potential behavioral responses (Crick & Dodge, 1994). In the only longitudinal study assessing relations between mother-infant attachment and response generation of which we are aware, no support was found for a link between infant attachment and aggressive response generation in middle childhood (Ziv, Oppenheim, & Sagi-Schwartz, 2004). However, two concurrent studies from different developmental periods have suggested such associations. The first study found that disorganized and insecure-ambivalent attachment representations were concurrently associated with aggressive problem solving in early childhood (Zaccagnino et al., 2013). In the second study conducted with an early adolescent sample, disorganized representations were positively correlated with antisocial-aggressive responses, and secure attachment representations were negatively correlated with antisocial-aggressive responses (Granot & Mayseless, 2010).

1.2.4 Aggressive Response Evaluation

In the only study to investigate attachment and aggressive response evaluation of which we are aware, children with secure versus insecure attachment in infancy were compared on their evaluation of competent, inept, and aggressive responses in middle childhood. Children who were securely attached in infancy differentiated the responses, associating competent responses with positive interpersonal and

9

instrumental outcomes but inept or aggressive responses with negative social

outcomes. However, children who were insecurely attached in infancy did not make

such discriminations, instead associating all three responses with negative outcomes.

Furthermore, no associations emerged between attachment disorganization in infancy

and response evaluation (Ziv, Oppenheim, & Sagi-Schwartz, 2004).

1.3 The Current Study

In summary, although existing literature suggests links between attachment

and SIP, a number of questions remain. Findings are sometimes contradictory, with

some studies suggesting support for relations between attachment and SIP, but others

not. Studies differ depending on when SIP is assessed, and results differ depending on

whether attachment security or organization is assessed and whether the link between

attachment and SIP is concurrent or longitudinal. To address these gaps and

inconsistencies, the goal of the current study was to investigate relations between

attachment security and organization in infancy and SIP stages at age eight. We

hypothesized that children with insecure or disorganized attachments would interpret

ambiguous provocation more hostilely, set more aggressive goals, endorse more

aggressive responses, and evaluate those aggressive responses more positively, than

children with secure or organized attachments.

Chapter 2

METHOD

2.1 Participants

A total of 77 children participated in the current project. These children had been recruited as infants to participate in a randomized clinical trial testing the efficacy of an intervention for parents. Child welfare agencies referred parents with children at high risk for maltreatment, most often due to child neglect, domestic violence, homelessness, and parental substance abuse. Fifty-two percent ($n = 40$) of the children were male. Just over 83% of the children ($n = 64$) were African American or Biracial, and the remainder were White. Twenty-one percent ($n = 16$) were Hispanic or Latino, and 79% were non-Hispanic. When children's SIP patterns were assessed, parents ranged in age from 22.8 to 60.1 years ($M = 35.6$, $SD = 8.4$). All parents were female, with the exception of 2 males (3%). Just over 92% of the caregivers ($n = 71$) were African American or Biracial, and the remainder were White. Nineteen percent ($n = 15$) were Hispanic or Latino, and 81% were non-Hispanic. Thirty-nine parents (51%) reported having completed high school. The average household income was approximately $25,000, and 45 caregivers (58%) reported receiving Temporary Assistance for Needy Families or other welfare benefits.

2.2 Procedures

2.2.1 Data Collection

Data for this project were collected in the context of a longitudinal study assessing the efficacy of a parenting intervention for families involved in the Child

Welfare System. Attachment security and organization were assessed when children

were on average 19.4-months-old ($SD = 6.0$), and children's SIP was assessed when

children were approximately 8.4-years-old ($SD = 0.4$). Approval for the conduct of

this research was obtained from the University of Delaware Institutional Review

Board.

2.2.2 Measures

Attachment Quality. When children were infants, they completed the Strange

Situation with their parents. The Strange Situation is a laboratory procedure

developed to assess children's reliance on their parents when they are upset or

distressed (Ainsworth, Blehar, Waters, & Wall, 1978). It is approximately 24 minutes

long and consists of two separations from and subsequent reunions with the parent.

The Strange Situation begins with the parent and child alone in an experimental room

that contains several toys. For three minutes, the child is able to play freely on the

floor while the parent sits on a nearby chair. A stranger (i.e., a female research

assistant) then enters the room. The stranger and parent stay in the room with the

child for three minutes, and then the parent leaves the child alone in the room with the

stranger. After three minutes have passed, the parent returns to the room, and the

stranger leaves. Three minutes later, the parent again exits the room, leaving the child

alone for three minutes. The stranger then enters the room, and after three minutes,

the parent returns to the room. The parent and child are observed for the final three

minutes. Throughout the procedure, the stranger and parent can provide comfort to

the child as needed. Additionally, any separation from the caregiver is shortened if the child is very distressed.

Using criteria identified by Ainsworth, Blehar, Waters, and Wall (1978), attachment behaviors, such as proximity seeking, contact maintenance, avoidance, and resistance, were coded during reunion episodes. Children were classified as secure, avoidant, resistant, or disorganized. During the reunion, children who sought contact with and were soothed by their caregivers were classified as secure. Children who did not look to the caregiver for reassurance or turned away were classified as avoidant. Children who showed a mixture of proximity seeking and resistance, combined with an inability to be soothed, were classified as resistant. Finally, using guidelines specified by Main and Solomon (1990), children were classified as disorganized if they met the threshold for disorganized behaviors, such as displaying contradictory behaviors, freezing or stilling, approaching the stranger when upset, expressing fear when the parent returns, and disoriented wandering. Children who were classified as disorganized were given a secondary classification of secure, avoidant, or resistant. These classifications were then collapsed into two types of two-way classifications, and these two-way classifications were used in the current paper. In the first two-way classification, children were classified as secure or insecure (avoidant, resistant), with disorganized status not taken into account. In the second two-way classification, children were classified as organized (secure, avoidant, resistant) or disorganized (disorganized-secure, disorganized-avoidant, or disorganized-resistant).

Blind to other study information, two coders classified each participant's Strange Situation video. The primary coder, who had previously attended Strange Situation coding training at the University of Minnesota and passed the reliability test, coded all videos. The second coder, an expert coder of Strange Situations and co-leader of Strange Situation coder training, coded 34% of the videos. The two coders agreed on 85% of the classifications including both the original classification as secure, avoidant, resistant, or disorganized and the secondary classification of disorganized children as also secure, avoidant, or resistant ($k = .74$). In addition, the two coders agreed on 92% of two-way secure-insecure classifications ($k = .76$) and 87% of the two-way organized-disorganized classifications ($k = .76$). Any disagreements were resolved by conferencing. Alan Sroufe, another expert coder and leader of Strange Situation coder training, provided consultation for particularly challenging disagreements.

Social Information Processing (SIP). When children were eight years old, their SIP patterns were assessed using the Social Information Processing Application (SIP-AP), a Web-based, computerized, standardized measure developed to assess SIP cognitions. It consists of eight vignettes that portray everyday social situations with peers. The vignettes are filmed from the perspective of the protagonist. In each vignette, the outcome for the protagonist is negative, although the intentions of the perpetrator peer are ambiguous. The vignettes were developed by Dodge et al. (1986) and adapted for video presentation by Kupersmidt, Stelter, and Dodge (2011). Kupersmidt and colleagues developed video versions of these vignettes for use by and

depicting elementary-school-aged boys. For the purposes of this study, we collaborated with Janis Kupersmidt to create videos that were as similar as possible to the boy videos for use by and depicting elementary-school-aged girls. Child actors varied in race/ethnicity across the eight vignettes, and children of the same race/ethnicity were used in the boy and girl versions of each vignette.

The vignettes showed four different types of ambiguously aggressive behavior, with two vignettes depicting each type of aggression: a) physical aggression (e.g., protagonist trips over a peer's foot), b) relational aggression (e.g., protagonist approaches a group of peers whispering about a party to which he/she is not invited), c) covert aggression (e.g., protagonist loses a basketball game to a peer who may have cheated by crossing the free throw line), and d) property destruction (e.g., peer's ball knocks over a marble-run structure the protagonist built). Vignette order was counterbalanced across participants.

Children were instructed to imagine that the situation shown in each vignette was happening to them. After watching each vignette on a computer monitor, they answered 12 multiple-choice questions assessing various aspects of SIP. Each question and its corresponding possible answers were visually presented and read aloud by the computer program. Children selected their answer with a mouse click and received a warning from the program if they proceeded through the questions too quickly.

The first four questions assessed children's hostile cue interpretations in the ambiguous provocation depicted in the vignette. The first question asked about hostile

attributional biases as they have been traditionally assessed ("Do you think the boy/girl intended to be mean?"). The remaining three questions further assessed children's interpretations of the hostility of the ambiguous provocation by asking about how rejected, disrespected, or angry it would make them feel ("How disliked or rejected [disrespected, angry] would you feel if this happened to you?"). Scores ranged from 1 (no, definitely not mean; not at all disliked or rejected; not at all disrespected; not at all angry) to 5 (yes, definitely mean; very very disliked or rejected; very very disrespected; very very angry). Scores for variables termed Hostile Attributions, Rejection Attributions, Disrespect Attributions, and Anger were calculated by averaging scores for the relevant question across the eight vignettes.

Two questions assessed children's aggressive goals, including revenge goals ("Would you want to get back at the boy/girl or get the boy/girl in trouble if this happened to you?") and dominance goals ("Would you want to make sure that the boy/girl knows that you are the boss and he/she can't push you around?"). Scores ranged from 1 (no, definitely not) to 5 (yes, definitely). Scores for variables termed Revenge Goals and Dominance Goals were calculated by averaging scores for the relevant question across the eight vignettes.

Three questions assessed children's reported aggressive responses, specifically overt aggression ("Would you push, hit, call names, or insult the boy/girl or try to hurt him/her in some other way?"), dominance ("Would you threaten the boy/girl, order him/her around, or let him/her know you are the boss in some other way?"), and relational aggression ("Would you talk about the boy/girl behind his/her back or try to

get other kids to not play with him/her?"). Scores ranged from 1 (no, definitely not) to 5 (yes, definitely). Scores for variables termed Overt Aggressive Responses, Dominance Responses, and Relationally Aggressive Responses were calculated by averaging scores for the relevant question across the eight vignettes.

Three questions assessed children's aggressive response evaluations, including aggressive outcome expectancy ("If you get back at the boy/girl, would things turn out to be good or bad for you?"), self-efficacy ("How easy or hard would it be for you to get back at the boy/girl?"), and moral acceptability ("How right or wrong would it be to get back at the boy/girl?"). Scores ranged from 1 (very bad for me; very hard; definitely the wrong thing to do) to 5 (very good for me; very easy; definitely the right thing to do). Scores for variables termed Aggressive Outcome Expectancies, Self-Efficacy for Aggression, and Moral Acceptability of Aggression were calculated by averaging scores for the relevant questions across the eight vignettes.

Chapter 3

RESULTS

3.1 Data Analytic Approach

Preliminary analyses for the attachment classifications examined gender and intervention differences. Additional preliminary analyses for the SIP variables examined descriptive statistics, internal consistency, interscale correlations, and gender and intervention differences. Furthermore, a Confirmatory Factor Analysis (CFA) examined the number of factors that best represented the SIP variables.

Primary analyses addressed two questions. Structural Equation Modeling (SEM) was used to examine whether attachment security (secure versus insecure) and organization (organized versus disorganized) in infancy significantly predicted SIP at age eight.

Descriptive statistics, internal consistencies, and preliminary data analyses were conducted using SPSS version 23. Mplus version 7 (Muthén & Muthén, 1998 – 2015) was used for all tests of measurement model fit.

3.2 Preliminary Analyses for Attachment Variables

For the secure-insecure dichotomy, 40 children were classified as secure, and 37 children were classified as insecure. For the organized-disorganized dichotomy, 51 children were classified as organized, and 26 children were classified as disorganized.

Gender differences in the classifications were examined using chi-square tests. Children's gender was unrelated to the secure-insecure dichotomy, $\chi^2 (1, N = 77) =$

0.13, $p = 0.72$, and the organized-disorganized dichotomy, $\chi^2 (1, N = 77) = 0.06$, $p = 0.81$.

Chi-square tests also assessed whether there were intervention group differences (intervention versus control) in attachment classifications. In this sample, intervention group was unrelated to the secure-insecure dichotomy, $\chi^2 (1, N = 77) = 1.56$, $p = 0.21$, and the organized-disorganized dichotomy, $\chi^2 (1, N = 77) = 1.09$, $p = 0.30$. In the full sample of 120 children including 43 additional children for whom SIP data were not collected, intervention was related to the secure-insecure dichotomy, $\chi^2 (1, N = 120) = 4.13$, $p < .05$, and the organized-disorganized dichotomy, $\chi^2 (1, N = 120) = 7.60$, $p < .01$ (Bernard, Dozier, Bick, Lewis-Morrarty, Lindheim, & Carlson, 2012).

3.3 Preliminary Analyses for SIP Variables

Table 1 provides descriptive statistics (mean, standard deviation, skewness) and internal consistencies for the SIP variables. None of the variables were significantly skewed. The internal consistency for Hostile Attributions was unacceptably low ($\alpha = 0.59$), and additional analyses examined how to improve reliability. Removing the score for one of the eight vignettes (a physical aggression vignette) from the average for that item improved Cronbach's alpha to 0.62. Consequently, all analyses using the Hostile Attributions scale include only seven of the eight vignettes. Internal consistency was also lowest for the Hostile Attributions scale in Kupersmidt, Stelter, and Dodge (2011), likely because this variable is particularly influenced by slight differences in the ambiguity of the video vignettes,

which are challenging to standardize. Table 2 provides zero-order interscale correlations among the SIP variables.

Two MANOVAs were then conducted, one to test for gender differences in the 12 SIP variables and the other to test for intervention differences. No significant differences emerged for either MANOVA.

3.3.1 SIP-AP Factor Structure

Analyses began with the estimation of a hypothesized four-factor model identified in prior research (Kupersmidt, Stelter, & Dodge, 2011). The four hypothesized factors reflected underlying dimensions of the SIP framework: Hostile Cue Interpretations, Aggressive Goals, Aggressive Responses, and Aggressive Response Evaluations. Similar to Kupersmidt, Stelter, and Dodge (2011), the variables tested in this CFA were the 12 individual SIP scores, which as described previously, were calculated by averaging the scores of the individual items across vignettes. These item means were analyzed in a partial aggregation model (Bagozzi & Heatherton, 1994), which reduces the number of estimated parameters and is advantageous with smaller sample sizes.

The hypothesized four-factor model was specified as such: 1) the latent variable of Hostile Cue Interpretations was specified by loading Hostile Attributions, Rejection Attributions, Disrespect Attributions, and Anger; 2) the latent variable of Aggressive Goals was specified by loading Revenge Goals and Dominance Goals; 3) the latent variable of Aggressive Responses was specified by loading Overt Aggressive Responses, Dominance Responses, and Relationally Aggressive

Responses; 4) the latent variable of Aggressive Response Evaluations was specified by loading Aggressive Outcome Expectancies, Self-Efficacy for Aggression, and Moral Acceptability of Aggression.

The fit statistics for this hypothesized model were adequate [$\chi^2_{(48, n = 77)}$ = 67.78, p = .03, RMSEA = .07$_{(90\% \text{ CI} = .02-0.11)}$, CFI = .97, TLI = .96, SRMR = .08], as indicated by a variety of sources (Browne & Cudeck, 1992; Hu & Bentler, 1998, 1999; Kline, 2005). The chi-square test was significant, but the relative chi-square, or χ^2 divided by the degrees of freedom, was suggestive of adequate fit (e.g., Tabachnick & Fidell, 2007; Wheaton, Muthén, Alwin, & Summers, 1977). Modification indices were examined to assess ways in which model fit could be improved; results indicated that the uniqueness for Dominance Goals and Dominance Responses should be allowed to correlate. Given their theoretical and behavioral associations, this addition to the model was justifiable.

The fit statistics for the modified model were adequate [$\chi^2_{(47, n = 77)}$ = 48.33, p = .42, RMSEA = .02$_{(90\% \text{ CI} = .00-0.08)}$, CFI = 1.00, TLI = 1.00, SRMR = .05]. The fit of the modified model was significantly better than the original model, $\Delta\chi^2(1)$ = 19.45, $p <$ .001. Depicted in Table 3, the factor loadings for the model were all significant and high (Stevens, 2002). All of the SIP mechanisms were significantly correlated with one another in the expected directions, with correlations ranging from .30 to .78.

Internal consistencies of the four composite scales were calculated and indicated that the composites had adequate reliability. The Cronbach's coefficient α

was .90 for Hostile Cue Interpretations, .75 for Aggressive Goals, .94 for Aggressive Responses, and .79 for Aggressive Response Evaluations. Coefficient omega, which does not assume that all of the items load equally onto the latent variable (Dunn, Baguley, & Brunsden, 2014), also indicated that the items had adequate reliability. Coefficient omega was .90 for Hostile Cue Interpretations, .75 for Aggressive Goals, .95 for Aggressive Responses, and .83 for Aggressive Response Evaluations.

3.4 Attachment Classification Differences in SIP Constructs

Structural Equation Modeling (SEM) examined whether attachment security (i.e., secure versus insecure) and organization (i.e., organized versus disorganized) as assessed in infancy significantly predicted SIP constructs at age eight. SEM is advantageous because it allows the estimation of latent variable means, accounts for unreliability of measures, and can be more powerful than MANOVA (Thompson & Green, 2006).

To assess whether attachment security was a significant predictor of SIP constructs, the secure-insecure classification was included as a categorical predictor in the four-factor SIP model. Specifically, Hostile Cue Interpretations, Aggressive Goals, Aggressive Responses, and Aggressive Response Evaluations were regressed onto attachment security. The fit statistics for this hypothesized model were adequate $[\chi^2_{(55, n = 77)} = 54.25, p = .50$, RMSEA $= .00_{(90\% \text{ CI} = .00\text{-}0.07)}$, CFI $= 1.00$, TLI $= 1.00$, SRMR $= .05]$. However, as can be seen in Figure 1, attachment security in infancy did not significantly predict any of the SIP constructs at age eight. To increase the readability of the figure, Table 4 depicts factor interscale correlations.

To assess whether attachment organization was a significant predictor of SIP constructs, the organized-disorganized classification was included as a categorical predictor in the four-factor SIP model. Specifically, Hostile Cue Interpretations, Aggressive Goals, Aggressive Responses, and Aggressive Response Evaluations were regressed onto attachment organization. The fit statistics for this hypothesized model were adequate [$\chi^2_{(55, n = 77)} = 68.07$, $p = .11$, RMSEA = $.06_{(90\% \text{ CI} = .00\text{-}0.10)}$, CFI = .98, TLI = .97, SRMR = .05]. Table 4 depicts factor interscale correlations. As can be seen in Figure 2, attachment organization significantly predicted two SIP constructs: Hostile Cue Interpretations and Aggressive Goals. With respect to Hostile Cue Interpretations, children with disorganized attachments in infancy interpreted ambiguous provocations more negatively (as indicating more hostility, rejection, and disrespect and as resulting in more anger) at age eight than children with organized attachments. For Aggressive Goals, children with disorganized attachments endorsed significantly more revenge and dominance goals than children with organized attachments.

Table 1.1

Means, Standard Deviations, Skew, and Internal Consistency for Social Information Processing Variables

	α	M	SD	Skew
Hostile Attributions	0.62	3.53	0.90	-0.46
Rejection Attributions	0.77	3.58	0.95	-0.31
Disrespect Attributions	0.82	3.61	0.99	-0.25
Anger	0.83	3.73	0.96	-0.40
Revenge Goals	0.82	2.91	1.20	0.11
Dominance Goals	0.89	2.88	1.37	0.08
Overt Aggressive Responses	0.90	2.08	1.23	1.00
Dominance Responses	0.87	2.06	1.14	0.94
Relationally Aggressive Responses	0.92	2.25	1.32	0.71
Aggressive Outcome Expectancy	0.92	2.59	1.46	0.37
Self-Efficacy for Aggression	0.92	3.02	1.40	0.05
Moral Acceptability of Aggression	0.91	2.12	1.29	0.90

Table 2.1

Interscale Correlations for Social Information Processing Variables

	1	2	3	4	5	6	7	8	9	10	11	12
1. Hostile Attributions	-	.47**	.43**	.40**	.32**	.28*	.20	.19	.20	.14	.21	.11
2. Rejection Attributions		-	.91**	.80**	.58**	.37**	.31**	.29*	.31**	.26*	.28*	.22
3. Disrespect Attributions			-	.82**	.58**	.38**	.32**	.30**	.32**	.16	.28*	.16
4. Anger				-	.63**	.43**	.41**	.37**	.39**	.32**	.33**	.26*
5. Revenge Goals					-	.60**	.63**	.62**	.65**	.39**	.50**	.43**
6. Dominance Goals						-	.57**	.59**	.50**	.65**	.33**	.17**
7. Overt Aggressive Responses							-	-	.89**	.50**	.36**	.35**
8. Dominance Responses								-	.84**	.89**	.45**	.30**
9. Relationally Aggressive Responses									-	.84**	.40**	.37**
10. Aggressive Outcome Expectancies										-	.63**	.66**
11. Self-Efficacy for Aggression											-	.43**
12. Moral Acceptability of Aggression												-

Note. *p < .05, **p < .01.

25

Table 3.1

SIP-AP Model Factor Loadings

	Social Information Processing Construct			
SIP Variable	**Hostile Cue Interpretations**	**Aggressive Goals**	**Aggressive Responses**	**Aggressive Response Evaluations**
Hostile Attributions	0.47			
Rejection Attributions	0.95			
Disrespect Attributions	0.96			
Anger	0.85			
Revenge Goals		0.90		
Dominance Goals		0.66		
Overt Aggressive Responses			0.93	
Dominance Responses			0.88	
Relationally Aggressive Responses			0.96	
Aggressive Outcome Expectancies				0.89
Self-Efficacy for Aggression				0.70
Moral Acceptability of Aggression				0.72

Note. All scale loadings are significant at *p* <.001.

Table 4.1

Interscale Correlations between Social Information Processing Constructs

Factor	Hostile Cue Interpretations	Aggressive Goals	Aggressive Responses	Aggressive Response Evaluations
Hostile Cue Interpretations	-	.68**	.38**	.33**
Aggressive Goals	.67**	-	.79**	.59**
Aggressive Responses	.36**	.80**	-	.53**
Aggressive Response Evaluations	.33**	.60**	.53**	-

Note. **$p < .01$. Correlations for model with attachment insecurity as a predictor depicted above the diagonal, and correlations for model with attachment disorganization as a predictor below the diagonal.

Figure 1.1

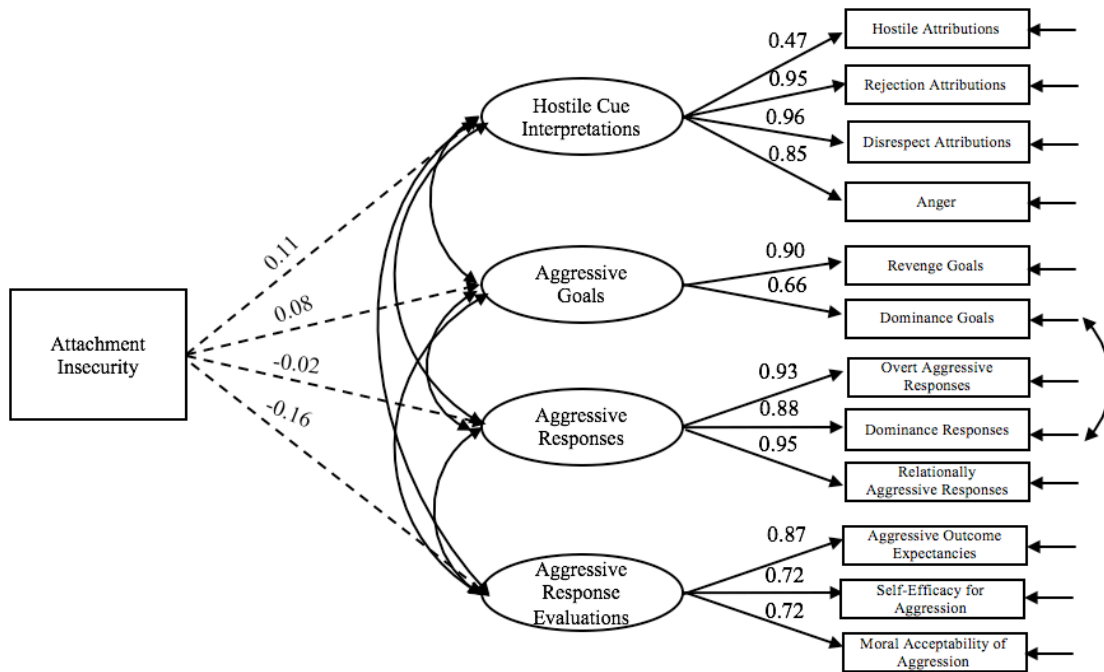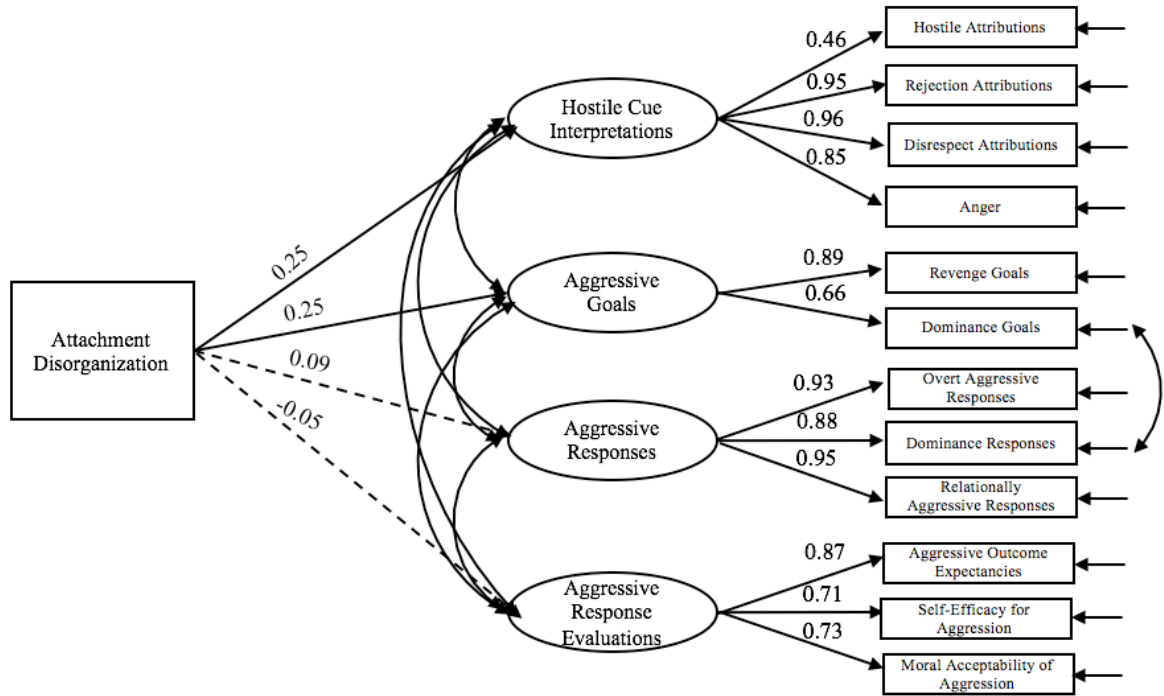*Structural Equation Model of Attachment Insecurity as a Predictor of SIP Constructs*

Figure 2.1

Structural Equation Model of Attachment Disorganization as a Predictor of SIP Constructs

Chapter 4

DISCUSSION

The current study was designed to enhance our understanding of the relations between attachment security and organization in infancy and SIP patterns in middle childhood. We hypothesized that children with insecure or disorganized attachments would interpret ambiguous provocation more hostilely, set more aggressive goals, endorse more aggressive responses, and evaluate those aggressive responses more positively than children with secure or organized attachments.

Results provided support for our hypothesis about attachment disorganization and two steps of the SIP model. Specifically, children with disorganized attachments in infancy displayed more hostile attributional bias and endorsed more aggressive goals in middle childhood than children with organized attachments. Although theorists have speculated on links between attachment disorganization and maladaptive SIP (e.g., Jacobvitz & Hazen, 1999; Ziv, Oppenheim, & Sagi-Schwartz, 2004), to our knowledge, this is the first study of any kind to link attachment disorganization to hostile attributional bias, as well as the first longitudinal study to link attachment disorganization in infancy to aggressive goals. Considering that smaller effect sizes are typically observed when studies assess SIP using multiple-choice questions or video stimuli (Orobio de Castro, Veerman, Koops, Bosch, & Monshouwer, 2003), these significant associations are particularly notable.

The links between attachment disorganization and both hostile attributional bias and aggressive goals are theoretically supported and have important implications for children's peer relations. Children with disorganized attachments are likely to experience harsh and frightening caregiving (Main & Hesse, 1990), and these early experiences with caregivers may foster expectations that peers will also behave with hostility. If this expectation of hostility does indeed transfer from the caregiving context to the peer context, it may impact children's peer relations broadly, particularly with respect to peer rejection. Previous studies have documented a perpetuating cycle between hostile attributional bias and peer rejection; children who overattribute hostility toward peers are more likely to behave aggressively, and this aggression leads to increased peer rejection (for a review, see Orobio de Castro, Veerman, Koops, Bosch, & Monshouwer, 2003). Rejecting interactions with peers only further children's conviction that peers are hostile (Crick & Dodge, 1994).

Early caregiving experiences might also explain why attachment disorganization in infancy leads to aggressive goals in middle childhood. When caregivers act in frightening and harsh ways, this might lead children to believe that they should behave in hostile ways with peers. Additionally, children with disorganized attachments are often placed in an "unsolvable dilemma" in that they fear but also must rely on their caregivers (Main & Hesse, 1990). As a result, they might endorse more revenge and dominance goals with their peers to establish control and stability that they lack in the home environment. An orientation toward aggressive goals is consistent with the finding that attachment disorganization is predictive of

later externalizing symptomatology (Fearon et al., 2010). Aggressive goals are problematic because they suggest that children might use maladaptive strategies to solve social problems (Crick & Dodge, 1994). It is challenging for children to hold different social goals in their head at once (Erdley & Asher, 1996). If children with disorganized attachments have aggressive goals, they are less likely to hold prosocial goals that would encourage conflict resolution, cooperation, and kindness. This might reduce their ability to engage in behaviors that promote positive peer relations and further increase their risk of peer rejection.

In contrast, disorganized attachment in infancy did not predict aggressive responses or the evaluation of aggressive responses in middle childhood, a finding that is consistent with a previous study (Ziv, Oppenheim, & Sagi-Schwartz, 2004). The "breakdown in strategy" that distressed infants with disorganized attachments demonstrate in the presence of their caregivers may translate to the later peer context and render these children unable to respond consistently or systematically with aggressive behavior, even when their SIP tendencies at earlier stages of the model would suggest that aggressive responses would follow. The SIP-AP also did not inquire about other negative responses, such as withdrawal, that might be more typical of children with disorganized attachments in infancy. Additionally, even though children with disorganized attachments did not report engaging in more aggressive behaviors, the current findings rely on self-report based on hypothetical vignettes. When children with disorganized attachments enter real social situations with peers,

they still might actually engage in more aggressive behavior even if they are not able to report doing so. With regard to aggressive response evaluations, children with disorganized attachments exhibit conflicting behaviors when they are in distress and have caregivers who respond inconsistently; both of these experiences potentially reduce children's ability to evaluate the efficacy of behaviors, and this inability may translate to the peer context.

Hypotheses were not supported for associations between attachment security in infancy and any step of the SIP model in middle childhood. This null result may be due to low power resulting from a small sample size and the small effect sizes that result when SIP is assessed using multiple-choice questions and video stimuli (Orobio de Castro, Veerman, Koops, Bosch, & Monshouwer, 2003). However, the finding is consistent with two prior studies that also did not find an association between attachment security and children's tendency to view ambiguous provocations as hostile (Cassidy, Kirsh, Scolton, & Parke, 1996; Raikes & Thompson, 2008). Of note, both of these studies, as well as the current study, assessed hostile attributional bias using peers' ambiguous provocations as stimuli. In contrast, two previous studies (Suess, Grossmann, & Sroufe, 1992; Ziv, Oppenheim, & Sagi-Schwartz, 2004) which did find an association between attachment security and hostile attributional bias used children's interpretation of social conflict scenarios or more clearly hostile or benign behavior to index hostile attributional bias. Thus, when hostile attributional bias is strictly assessed using ambiguous provocations, previous literature and the current

33

study consistently fail to find an association between the construct and attachment security.

With regard to the null findings for the remaining SIP constructs and attachment security, previous studies have found concurrent links between attachment insecurity and aggressive goals or responses in early childhood and early adolescence (Granot & Mayseless, 2010; Zaccagnino et al., 2013) but have failed to find longitudinal links from infancy to middle childhood (Ziv, Oppenheim, & Sagi-Schwartz, 2004). The studies finding concurrent links between attachment insecurity and aggressive goals or responses assessed both attachment representations and SIP using interviews with children. The shared method variance and temporal proximity characteristic of these studies might result in increased power to detect a relationship. The null finding for attachment security and aggressive response evaluation is in contrast to a previous study finding a longitudinal link between attachment insecurity in infancy and response evaluation in middle childhood (Ziv, Oppenheim, & Sagi-Schwartz, 2004). However, that study assessed aggressive response evaluation using clearly hostile and benign behaviors as stimuli rather than ambiguously provocative behaviors, which hold particular significance for understanding children's peer relations (Dodge, McClaskey, & Feldman, 1985).

Interestingly, in the current study, attachment disorganization, and not attachment insecurity, in infancy predicted hostile attributional bias and aggressive goals in middle childhood. This result maps nicely onto previous work suggesting that disorganized attachment may place children at even higher risk for negative peer

34

relations than insecure attachment (Fearon, Bakermans-Kranenburg, van IJzendoorn, Lapsley, & Roisman, 2010; Groh et al., 2014; Granot & Mayseless, 2001; Jacobvitz & Hazen, 1999; Lyons-Ruth, Alpern, & Repacholi, 1993; Seibert & Kerns, 2015). Furthermore, attachment disorganization rather than insecurity has been associated with problematic outcomes beyond SIP that may also manifest in the peer context, including physiological dysregulation (Bernard, Dozier, Bick, & Gordon, in press; Oosterman, De Schipper, Fisher, Dozier, & Schuengel, 2010), externalizing symptoms at age seven (Lyons-Ruth, Easterbrooks, & Cibelli, 1997), reduced syllogistic reasoning at age nine (Jacobsen, Edelstein, & Hofmann, 1994), and dissociative symptoms in middle school, high school, and early adulthood (Carlson, 1998). In this respect, the present study advances our understanding of outcomes associated specifically with attachment disorganization and provides empirical evidence to further support intervening early to promote attachment organization.

4.1 Strengths and Limitations

This study is marked by several strengths, with the first being the methodologies used to assess attachment quality and SIP. Given its strong psychometric properties and observational nature, the Strange Situation procedure has been perceived as the "gold standard" for examining children's attachment quality. Similarly, the Social Information Processing Application (SIP-AP) provided a comprehensive and psychometrically strong evaluation of the multiple steps of children's SIP (Kupersmidt, Stelter, & Dodge, 2011). Using video vignettes that were filmed from the first-person perspective, the SIP-AP assessed four distinct steps of SIP

35

with multiple questions to assess each step. To our knowledge, this is the first study to use both of these measures to assess relations between children's attachment quality in infancy and multiple steps of SIP in middle childhood.

Another strength of this study can be found in its sample and design. In the peer relations literature, many studies examine SIP in clinical samples, focusing on children who present with antisocial and aggressive behaviors (for a review, see Orobio de Castro, Merk, Koops, Veerman, & Bosch, 2005). The present study examined SIP in children at high risk for maltreatment in infancy. Furthermore, this sample of children was followed longitudinally, permitting prediction from attachment quality in infancy to SIP deficits in middle childhood.

This study is also characterized by several limitations. First, the small sample size may have resulted in inadequate power to detect some effects, and it did not permit comparisons between subtypes of insecure attachment classifications (i.e., avoidant and resistant). Second, the SIP-AP did not include items assessing children's encoding abilities. Finally, although SIP is an important aspect of children's peer relations, we did not measure children's actual behavior with peers.

4.2 Future Directions

The study also suggests a number of exciting directions for future research. First, the use of a larger sample size would allow comparison across infant insecure attachment classifications of hostile attributional bias and aggressive goals in middle childhood. Second, examining potential mediators of the relation between attachment quality in infancy and SIP in middle childhood would further enhance our

36

understanding of these associations; possibilities include parenting in early childhood or middle childhood, negative life events, and children's emotion regulation. Third, a number of atypical maternal behaviors, such as withdrawal and role-confusion, are associated with attachment disorganization in infancy (Lyons-Ruth, Bronfman, & Parsons, 1999) and might predict the severity of children's SIP deficits in middle childhood. Finally, future research should examine whether deficits in SIP, specifically hostile attributional bias and aggressive goals, are predictive of children's problematic peer relations in terms of constructs such as peer rejection or actual aggressive behavior toward peers.

4.3 Conclusion

Results from this longitudinal study indicate that attachment disorganization in infancy places children at risk for greater hostile attributional bias and more aggressive goals in middle childhood. As the first study to provide empirical evidence that attachment disorganization in infancy predicts maladaptive SIP in middle childhood, the study advances our understanding of problematic long-term outcomes associated with attachment disorganization.

REFERENCES

Aboud, F. E., & Mendelson, M. J. (1996). Determinants of friendship selection and quality: Developmental perspectives. In A F. Newcomb & W. W. Hartup (Eds.), *The company they keep: Friendship in childhood and adolescence* (pp. 87 - 112). New York, NY: Cambridge University Press.

Ainsworth, M. D. S., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment: A psychological study of the Strange Situation.* Hillsdale, N.J: Erlbaum.

Alessandri, S. M. (1991). Play and social behaviors in maltreated preschoolers. *Development and Psychopathology, 3*(2), 191 - 206.

Asher, S. R., & McDonald, K. L. (2011). The behavioral basis of acceptance, rejection, and perceived popularity. In K. H. Rubin, W. M. Bukowski, & B. Laursen (Eds.), *Handbook of peer interactions, relationships, and groups* (pp. 232 – 248). New York: The Guilford Press.

Bagozzi, R., & Heatherton, T. (1994). A general approach to representing multifaceted personality constructs: Application to state self-esteem. *Structural Equation Modeling*, *1*, 35–67.

Bernard, K., Dozier, M., Bick, J., Lewis-Morrarty, E., Lindheim, O., & Carlson, E. (2012). Enhancing attachment organization among maltreated children: Results of a randomized clinical trial. *Child Development, 83*(12), 623 - 636.

Bernard, K., Dozier, M., Bick, J., & Gordon, M. K. (in press). Intervening to enhance cortisol regulation among children at risk for neglect: Results of a randomized clinical trial. *Development and Psychopathology*.

Berndt, T. J., Hawkins, J. A., & Hoyle, S. G. (1986). Changes in friendship during a school year: Effects on children's and adolescents' impressions of friendships and sharing with friends. *Child Development*, *57,* 1284 - 1297.

Bierman, K. L. (2004). *Peer rejection: Developmental processes and intervention strategies.* New York: Guilford Press.

Bolger, K. E., & Patterson, C. J. (2001). Developmental pathways from child maltreatment to peer rejection. *Child Development*, *72*(2), 549 - 568.

Browne, M., & Cudeck, R. (1992). Alternative ways of assessing model fit. *Sociological Methods and Research*, *21*, 230 – 258.

Bukowski, W. M., Motzoi, C., & Meyer, F. (2011). Friendship as process, function, and outcome. In K. H. Rubin, W. M. Bukowski, & B. Laursen (Eds.), *Handbook of peer interactions, relationships, and groups* (pp. 217 – 231). New York: The Guilford Press.

Bukowski, W. M., Pizzamiglio, M. T., Newcomb, A. F., & Hoza, B. (1996). Popularity as an affordance for friendship: The link between group and dyadic experience. *Social Development*, *5*(2), 189 - 202.

Carlson, E. A. (1998). A prospective longitudinal study of attachment disorganization/disorientation. *Child Development*, *69*(4), 1107-1128.

Cassidy, J. (1994). Emotion regulation: Influences of attachment relationships. *Monographs of the Society for Research in Child Development*, *59*(2-3), 228 - 249.

Cassidy, J., Kirsh, S. J., Scolton, K. L., & Parke, R. D. (1996). Attachment and representations of peer relationships. *Developmental Psychology*, *32*(5), 892 - 904.

Crick, N. R., & Dodge, K. A. (1994). A review and reformulation of social information-processing mechanisms in children's social adjustment. *Psychological Bulletin*, *115*(1), 74 - 101.

Cowen, E. L., Pederson, A., Babigian, H., Isso, L. D., & Trost, M. A. (1973). Long-term follow-up of early detected vulnerable children. *Journal of Consulting and Clinical Psychology*, *41*(3), 438 - 446.

DeOliveira, C. A., Moran, G., & Pederson, D. R. (2005). Understanding the link between maternal adult attachment classifications and thoughts and feelings about emotions. *Attachment & Human Development*, *7*(2), 153 - 170.

Dodge, K. A. (1993). Social-cognitive mechanisms in the development of conduct disorder and depression. *Annual Review of Psychology*, *44*(1), 559 - 584.

Dodge, K. A., Bates, J. E., & Pettit, G. S. (1990). Mechanisms in the cycle of violence. *Science*, *250*(4988), 1678 - 1683.

Dodge, K. A., McClaskey, C. L., & Feldman, E. (1985). Situational approach to the assessment of social competence in children. *Journal of Consulting and Clinical Psychology*, *53*, 344 – 353.

Dodge, K. A., Pettit, G. S., Bates, J. E., & Valente, E. (1995). Social information-processing patterns partially mediate the effect of early physical abuse on later conduct problems. *Journal of Abnormal Psychology*, *104*(4), 632 - 643.

Dodge, K. A., Pettit, G. S., McClaskey, C. L., Brown, M. M., & Gottman, J. M. (1986). Social competence in children. *Monographs of the Society for Research in Child Development*, i - 85.

Dunn, T. J., Baguley, T., & Brunsden, V. (2014). From alpha to omega: A practical solution to the pervasive problem of internal consistency estimation. *British Journal of Psychology*, *105*(3), 399 – 412.

Erdley, C. A., & Asher, S. R. (1996). Children's social goals and self-efficacy perceptions as influences on their responses to ambiguous provocation. *Child Development*, *67*(4), 1329 - 1344.

Erickson, M. F., Egeland, B., & Pianta, R. (1989). The effects of maltreatment on the development of young children. R. D. Cicchetti & V. Carlson (Eds.), *Child maltreatment: Theory and research on the causes and consequences of child abuse and neglect* (pp. 647 - 684). New York, NY: Cambridge University Press.

Fearon, R. P., Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., Lapsley, A. M., & Roisman, G. I. (2010). The significance of insecure attachment and disorganization in the development of children's externalizing behavior: A meta-analytic study. *Child Development*, *81*(2), 435 - 456.

Fontaine, R., & Dodge, K. A. (2006). Real-time decision making and aggressive behavior in youth: A heuristic model of response evaluation and decision (RED). *Aggressive Behavior*, *32*, 604 – 624.

Granot, D., & Mayseless, O. (2001). Attachment security and adjustment to school in middle childhood. *International Journal of Behavioral Development*, *25*(6), 530 - 541.

Granot, D., & Mayseless, O. (2012). Representations of mother-child attachment relationships and social-information processing of peer relationships in early adolescence. *The Journal of Early Adolescence*, *32*(4), 537 - 564.

Groh, A. M., Fearon, R. P., Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., Steele, R. D., & Roisman, G. I. (2014). The significance of attachment security for children's social competence with peers: A meta-analytic study. *Attachment and Human Development*, *16*(2), 103 - 136.

Hartup, W. W (1983). The peer system. In P. H. Mussen (Ed.), *Handbook of child psychology* (pp. 103-196). Hoboken, NJ: John Wiley & Sons, Inc.

Hartup, W. W. (1996). The company they keep: Friendships and their developmental significance. *Child Development, 67*, 1 – 13.

Haskett, M. E., & Kistner, J. A. (1991). Social interactions and peer perceptions of young physically abused children. *Child Development*, *62*(5), 979 - 990.

Howes, C., & Espinosa, M. P. (1985). The consequences of child abuse for the formation of relationships with peers. *Child Abuse & Neglect*, *9*(3), 397 - 404.

Hu, L., & Bentler, P. M. (1998). Fit indices in covariance structure modeling: Sensitivity to underparameterized model misspecification. *Psychological Methods*, *3*, 424 – 453.

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, *6,* 1 – 55.

Jacobsen, T., Edelstein, W., & Hofmann, V. (1994). A longitudinal study of the relation between the representations of attachment in childhood and cognitive functioning in childhood and adolescence. *Developmental Psychology*, *30*, 112 – 124.

Jacobvitz, D., & Hazen, N. (1999). Developmental pathways from infant disorganization to childhood peer relationships. In J. Solomon & C. George (Eds.), *Attachment disorganization* (pp. 127-159). New York, NY: Guilford Press.

Kerns, K. A. (1996). Individual differences in friendship quality: Links to child-mother attachment. In W. M. Bukowski, A. F. Newcomb & W. W. Hartup (Eds.), *The company they keep: Friendship in childhood and adolescence* (pp. 137–157). New York, NY: Cambridge University Press.

Killen, M., Rutland, A., & Jampol, N. S. (2011). Social exclusion in childhood and adolescence. In K. H. Rubin, W. M. Bukowski, & B. Laursen (Eds.), *Handbook of peer interactions, relationships, and groups* (pp. 249 – 266). New York: The Guilford Press.

Kline, R. (2005). *Principles and practice of structural equation modeling, 2nd edition*. New York, NY: The Guilford Press.

Kupersmidt, J. B., Stelter, R., & Dodge, K. A. (2011). Development and validation of the social information processing application: A Web-based measure of social information processing patterns in elementary school-age boys. *Psychological Assessment*, *23*(4), 834 - 847.

Laursen, B., & Pursell, G. (2011). Conflict in peer relationships. In K. H. Rubin, W. M. Bukowski, & B. Laursen (Eds.), *Handbook of peer interactions, relationships, and groups* (pp. 267 – 286). New York: The Guilford Press.

Lyons-Ruth, K., Connell, D. B., Grunebaum, H., & Botein, S. (1990). Infants at social risk: Maternal depression and family support services as mediators of infant development and security of attachment. *Child Development, 61*, 85 - 98.

Lyons-Ruth, K., Easterbrooks, M., & Cibelli, C. D. (1997). Infant attachment strategies, infant mental lag, and maternal depressive symptoms: predictors of internalizing and externalizing problems at age 7. *Developmental Psychology*, *33*(4), 681 - 692.

Lyons-Ruth, K., & Jacobvitz, D. (2008). Attachment disorganization: Genetic factors, parenting contexts, and developmental transformation from infancy to adulthood. In J. Cassidy, & P. R. Shaver (Eds.)., *Handbook of attachment: Theory, research, and clinical applications, 2nd edition* (pp. 666 – 697). New York, NY: The Guilford Press.

Lyons-Ruth, K., Repacholi, B., McLeod, S., & Silva, E. (1991). Disorganized attachment behavior in infancy: Short-term stability, maternal and infant correlates and risk-related subtypes. *Development and Psychopathology*, 3, 377 - 396.

Main, M., & Hesse, E. (1990). Parents' unresolved traumatic experiences are related to infant disorganized attachment status: Is frightened and/or frightening parental behavior the linking mechanism? In M. T. Greenburg, D. Cicchetti, & E. Cummings (Eds.), Attachment in the preschool years: Theory, research, and intervention (pp. 161 – 182). Chicago, IL: University of Chicago Press.

Main, M., & Solomon, J. (1990). Discovery of an insecure-disorganized/disoriented attachment pattern. In T. B. Brazelton & M. W. Yogman (Eds.), *Affective development in infancy* (pp. 95 – 124). Westport, CT: Ablex Publishing.

McElwain, N. L., Booth-LaForce, C., Lansford, J. E., Wu, X., & Justin Dyer, W. (2008). A process model of attachment–friend linkages: Hostile attribution biases, language ability, and mother–child affective mutuality as intervening

mechanisms. *Child Development*, *79*(6), 1891 - 1906.

Moss, E., St. Laurent, D., Dubois-Comtois, K., & Cyr, C. (2005). Quality of
attachment at school age. In K. A. Kerns and R. A. Richardson (Eds.),
Attachment in middle childhood (pp. 189 - 211). New York, NY: The Guilford
Press.

Muthén, L.K. and Muthén, B.O. (1997-2015). Mplus User's Guide. Seventh Edition.
Los Angeles, CA: Muthén & Muthén.

Oosterman, M., De Schipper, J. C., Fisher, P., Dozier, M., & Schuengel, C. (2010).
Autonomic reactivity in relation to attachment and early adversity among
foster children. *Development and Psychopathology*, *22*, 109 - 118.

Orobio de Castro, B., Merk, W., Koops, W., Veerman, J. W., & Bosch, J. D. (2005).
Emotions in social information processing and their relations with reactive and
proactive aggression in referred aggressive boys. *Journal of Clinical Child and
Adolescent Psychology*, *34*(1), 105 - 116.

Parker, J. G., & Asher, S. R. (1987). Peer relations and later personal adjustment: Are
low-accepted children at risk?. *Psychological Bulletin*, *102*(3), 357 - 389.

Parker, J. G., & Herrera, C. (1996). Interpersonal processes in friendship: A
comparison of abused and nonabused children's experiences. *Developmental
Psychology*, *32*(6), 1025 – 1038.

Raikes, H. A., & Thompson, R. A. (2008). Attachment security and parenting quality
predict children's problem-solving, attributions, and loneliness with
peers. *Attachment & Human Development*, *10*(3), 319 - 344.

Rubin, K. H., Bowker, J. C., & Kennedy, A. E. (2011). Avoiding and withdrawing
from the peer group. In K. H. Rubin, W. M. Bukowski, & B. Laursen (Eds.),
Handbook of peer interactions, relationships, and groups (pp. 303 – 321).
New York: The Guilford Press.

Rubin, K. H., Bukowski, W., & Parker, J. G. (2006). Peer interactions, relationships,
and groups. In W. Damon, R. M. Lerner, & N. Eisenberg (Eds.), *Handbook of
child psychology: Vol. 3. Social, emotional, and personality development* (6th
ed., pp. 571 - 645). New York: Wiley.

Russell, A., Pettit, G. S., & Mize, J. (1998). Horizontal qualities in parent–child
relationships: Parallels with and possible consequences for children's peer
relationships. *Developmental Review*, *18*(3), 313 - 352.

Salzinger, S., Feldman, R. S., Hammer, M., & Rosario, M. (1993). The effects of physical abuse on children's social relationships. *Child Development*, *64,* 169 – 187.

Schneider, B. H., Atkinson, L., & Tardif, C. (2001). Child–parent attachment and children's peer relations: A quantitative review. *Developmental Psychology*, *37*(1), 86 - 100.

Seibert, A., & Kerns, K. (2015). Early mother–child attachment: Longitudinal prediction to the quality of peer relationships in middle childhood. *International Journal of Behavioral Development*, *39*(2), 1 - 9.

Shields, A. M., Cicchetti, D., & Ryan, R. M. (1994). The development of emotional and behavioral self-regulation and social competence among maltreated school-age children. *Development and Psychopathology*, *6*, 57 - 75.

Sroufe, L. A. (2005). Attachment and development: A prospective, longitudinal study from birth to adulthood. *Attachment & Human Development*, *7*(4), 349 - 367.

Sroufe, L. A., Egeland, B., & Carlson, E. A. (1999). One social world: The integrated development of parent-child and peer relationships. In W. A. Collins & B. Laursen (Eds.), *Minnesota Symposia on Child Psychology: Vol. 30. Relationships as developmental contexts: Festschrift in honor of Willard W. Hartup* (pp. 241 – 261). Mahwah, NJ: Erlbaum.

Sroufe, L. A., Egeland, B., Carlson, E. A., & Collins, W. A. (2009). *The development of the person: The Minnesota study of risk and adaptation from birth to adulthood*. New York, NY: Guilford Press.

Stevens, J. (2002). *Applied multivariate statistics for the social sciences, 4th edition*. New York, NY: Taylor & Francis Group.

Suess, G. J., Grossmann, K. E., & Sroufe, L. A. (1992). Effects of infant attachment to mother and father on quality of adaptation in preschool: From dyadic to individual organization of self. *International Journal of Behavioral Development*, *15*(1), 43 - 65.

Tabachnick, B. G., & Fidell, L. S. (2007), *Using multivariate statistics, 5th edition*. New York: Allyn and Bacon.

Thompson, M. S., & Green, S. B. (2006). Evaluating between-group differences in latent variable means. In G. R. Hancock & R. O. Mueller (Eds.), *Structural*

equation modeling: A second course, (pp. 119-169). Charlotte, NC: Information Age Publishing, Inc.

Troy, M., & Sroufe, L. A. (1987). Victimization of preschoolers: Role of attachment relationship history. *Journal of the American Academy of Child and Adolescent Psychiatry, 26,* 166 – 172.

Van Ijzendoorn, M. H., Schuengel, C., & Bakermans–Kranenburg, M. J. (1999). Disorganized attachment in early childhood: Meta-analysis of precursors, concomitants, and sequelae. *Development and Psychopathology*, *11*(2), 225 – 250.

Weiss, B., Dodge, K. A., Bates, J. E., & Pettit, G. S. (1992). Some consequences of early harsh discipline: Child aggression and a maladaptive social information processing style. *Child Development*, *63*(6), 1321 - 1335.

Wheaton, B., Muthén, B., Alwin, D. F., & Summers, G. F. (1977). Assessing reliability and stability in panel models. In D. R. Heise (Ed.), *Sociological methodology* (pp. 84–136). San Francisco: Jossey-Bass.

Yunger, J. L., Corby, B. C., & Perry, D. G. (2005). Dimensions of attachment in middle childhood. In K. A. Kerns & R. A. Richardson (Eds.), *Attachment in middle childhood* (pp. 89 – 114). New York, NY: Guilford Press.

Zaccagnino, M., Cussino, M., Callerame, C., Actis Perinetti, B., Veglia, F., & Green, J. (2013). Attachment and social understanding in young school-age children: An investigation using the Manchester Child Attachment Story Task. *Minerva Psichiatrica*, *54*, 59 – 69.

Ziv, Y., Oppenheim, D., & Sagi-Schwartz, A. (2004). Social information processing in middle childhood: Relations to infant-mother attachment. *Attachment & Human Development*, *6*(3), 327 - 348.

Appendix

IRB APPROVAL LETTER

DATE: February 20, 2017

TO: Mary Dozier, PhD
FROM: University of Delaware IRB (HUMANS)

STUDY TITLE: [547621-10] Intervening Early with Neglected Children: Key Middle Childhood
                    Outcomes

SUBMISSION TYPE: Continuing Review/Progress Report

ACTION: APPROVED
APPROVAL DATE: February 20, 2017
EXPIRATION DATE: February 14, 2018
REVIEW TYPE: Full Committee Review

Thank you for your submission of Continuing Review/Progress Report materials for this research study. The University of Delaware IRB has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a study design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

This submission has received Full Committee Review based on the applicable federal regulation.

Please remember that informed consent is a process beginning with a description of the study and insurance of participant understanding followed by a signed consent form. Informed consent must continue throughout the study via a dialogue between the researcher and research participant. Federal regulations require each participant receive a copy of the signed consent document.

Please note that any revision to previously approved materials must be approved by this office prior to initiation. Please use the appropriate revision forms for this procedure.

All SERIOUS and UNEXPECTED adverse events must be reported to this office. Please use the appropriate adverse event forms for this procedure. All sponsor reporting requirements should also be followed.

Please report all NON-COMPLIANCE issues or COMPLAINTS regarding this study to this office.

Please note that all research records must be retained for a minimum of three years.

Based on the risks, this project requires Continuing Review by this office on an annual basis. Please use the appropriate renewal forms for this procedure.

If you have any questions, please contact Maria Palazuelos at (302) 831-8619 or mariapj@udel.edu.
Please include your study title and reference number in all correspondence with this office.