THE ROLE OF PARENT STATE OF MIND AND PARENT BEHAVIOR ON

INFANT ATTACHMENT AND CHILD EXECUTIVE FUNCTIONING

by

Brynn Rosell

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Brynn Rosell

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

Approved: _____
Roger Kobak, Ph.D.
Committee member from the Department of Psychological and Brain Sciences

Approved: _____
Laura Eisenman, Ph. D.
Committee member from the Board of Senior Thesis Readers

Approved: _____
Michael Chajes, Ph.D.
Chair of the University Committee on Student and Faculty Honors

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ABSTRACT

Infant attachment quality reflects a child's expectations of parent availability, and has been shown to predict aspects of social functioning over development (Ainsworth, Blehar, Waters, & Wall, 1978). Previous studies have found that insecure attachment is associated with higher rates of depression and anxiety in adulthood than secure attachment (Widom, Czaja, Kozakowski, & Chauhan, 2017). Much of the literature has shown that the strongest predictor of attachment is parent state of mind, which refers to a parent's mental representation of his or her own attachment experiences (van IJzendoorn, 1995). The present study aims to examine the relationship between parent state of mind, parent behavior, attachment quality, and child executive functioning among adopted and foster infant-parent dyads. I hypothesized that autonomous state of mind would be associated with greater likelihood of secure child attachment, and higher child executive functioning relative to non-autonomous states of mind. I also hypothesized that parents with autonomous states of mind would exhibit higher sensitivity and lower intrusiveness than parents with non-autonomous states of mind. No significant associations were found between parent state of mind and infant attachment. Children of unresolved parents showed significantly higher EXF scores than children of parents who were not unresolved. Lastly, parents with autonomous states of mind were found to have significantly higher sensitivity and intrusiveness than non-autonomous parents.

Chapter 1

INTRODUCTION

Early adversity has been associated with detrimental effects on both child attachment quality and child executive functioning. These effects have the potential to negatively influence a child's developmental outcomes throughout the lifespan. For children who transition between multiple parents, such as children adopted internationally and foster children, attachment relationships can be challenged even further. The goal of the present study was to examine the relationships between parent state of mind, parent behavior, attachment quality, and child executive functioning among adopted and foster infant-parent dyads. Although several previous studies have investigated the effects of parenting on both infant attachment and executive functioning, this study is unique in that it expands the evaluation to both adoptive and foster children. I hypothesize that parents with autonomous states of mind will more often have infants with secure attachments, and their children will have stronger executive functioning, than parents with non-autonomous states of mind. Additionally, I hypothesize that parents with autonomous states of mind will exhibit higher sensitivity, and lower intrusiveness than parents with non-autonomous states of mind.

Attachment

Attachment is an evolutionarily based process. Infants are born fully dependent on their parents to provide protection, nurturance, and their basic needs (Bowlby, 1983). Attachment quality is affected by levels of parental responsivity and

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availability (Ainsworth, Blehar, Waters, & Wall, 1978). When parents are consistently responsive to their infant's distress and adequately meet his or her needs, the child is able to develop confident expectations of his or her parent. Children who have consistently available parents can expect that their parents will be responsive during times of need or distress. However, when parents are unpredictable and neglectful, the child will have lower expectations of parent availability (Ainsworth et al., 1978). Overall, infants' expectations of their parents are the basis of attachment quality.

Attachment is assessed via the Strange Situation, which is a laboratory procedure that subjects the child to a series of separations and reunions with his or her parent. The child's behavior is recorded and the infant can then be classified as secure, avoidant, resistant, or disorganized. Children who seek comfort from their parents when distressed, and who use their parent as a secure base in order to explore their environment are considered securely attached, while other insecurely attached children may behave by ignoring or resisting their parents (Ainsworth et al., 1978).

Securely attached children are more likely to have higher academic performance and social competence than insecurely attached children (Tai, 2016). In a study evaluating adult attachment and child maltreatment, it was shown that insecure attachments are positively correlated with both depression and anxiety in adulthood, and negatively associated with self-esteem (Widom, Czaja, Kozakowski & Chauhan, 2017). In addition, quality of attachment (secure versus insecure) is associated with behaviors exhibited in romantic relationships. Avoidant attachment is associated with fear of relational commitment, whereas resistant attachment is associated with a lack of trust and paranoia within the relationship (Widom et al., 2017).

Parent State of Mind and Behavior

Multiple studies have shown that the strongest predictors of infant attachment are parental state of mind and behavior (van IJzendoorn, 1995). Parent state of mind refers to a parent's mental representation of his or her early childhood experiences with regards to attachment. It is assessed through a semi-structured interview that asks parents to explain and elaborate on specific experiences with their own parents. Based on the parents' responses they are classified as autonomous, dismissing, preoccupied, or unresolved (George, Kaplan, & Main, 1996).

Parent state of mind is also associated with parent behaviors such as sensitivity and intrusiveness. Children of parents with different states of mind experience different behaviors exhibited by their parents, and the quality of the parent's behaviors will then shape the child's attachment quality. For example, autonomous parents tend to respond appropriately to their infant's signals and behave in sensitive ways, thus their infants have higher expectations of parental availability, and are more likely to develop secure attachments than other children (van IJzendoorn, 1995). Much of the literature has supported a direct link between parent state of mind and infant attachment. In one study, a 75% correspondence was shown between parent and infant attachment classifications (van IJzendoorn, 1995).

Executive Functioning

Executive functioning refers to higher cognitive functions such as attention, inhibitory control, self-regulation, and working memory (Zelazo, Carlson, & Kesek, 2008). Early development of executive functioning serves as a foundation for more advanced cognitions in the future, including academic performance and control of thought, behavior, and emotions. Studies have shown that the inhibitory control aspect

of executive functioning in preschoolers is positively associated with math and literacy abilities in kindergarten (Blair & Razza, 2007). In addition, executive functioning is associated with both theory of mind, which is the ability to understand another's perspective, and social competence (Devine, White, & Hughes, 2016). Childhood adversity can lead to detrimental effects on one's higher cognitions, and has been associated with certain mental disorders. Deficits in executive functioning during early development is associated with attention-deficit/hyperactivity disorder, which encompasses general issues with metacognition and behavioral regulation (Semrud-Clikeman, Walkowiak, Wilkinson, & Butcher, 2010).

The literature supports a relationship between attachment quality and child executive functioning. Securely attached children are more likely to have stronger executive functioning during school age than insecurely attached children (Bernier, Beauchamp, Carlson, & Lalonde, 2015). In addition, parental state of mind has also been shown to relate to child executive functioning. In a study evaluating the effects of maternal attachment on child cognitions, it was shown that maternal security (autonomous state of mind) was positively associated with child executive functioning (Von der Lippe, Eilersten, Hartmann, & Killen, 2010). The literature has also shown that sensitive caregiving is related to child executive functioning. In one study evaluating the relation between quality of parent-infant interactions and child executive functioning, parental dimensions such as sensitivity were correlated with child executive functioning as measured by memory and mental categorization tasks (Bernier, Carlson, & Whipple, 2010).

Present Study

The aim of the present study was to examine the relationships between parent state of mind and behavior, attachment quality, and child executive functioning among adopted and foster infant-parent dyads (Figure 1).
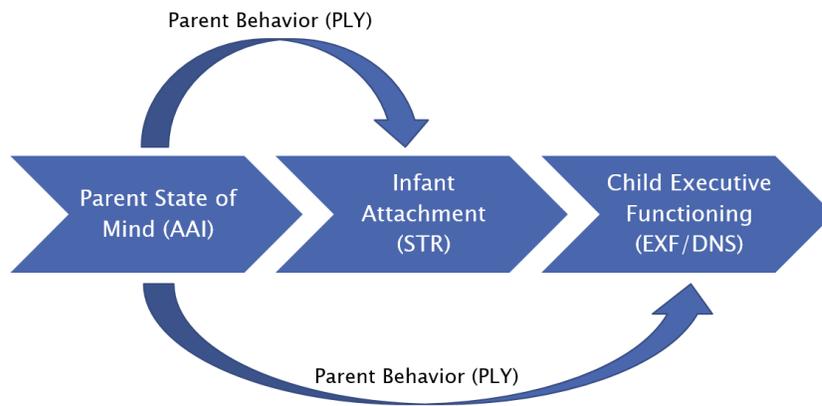

Figure 1. Graphic organizer of main analyses.

Figure 1   Graphic organizer of main analyses.

When children, such as with foster children and adopted children, are placed with multiple parents, further disruptions in attachment often occur. This study is unique in that it focuses on children who experienced attachment disruptions rather than children of biological parents. Much of the previous literature focuses on biological parent-child relationships, whereas studies on adopted and foster children and parental associations is lacking. These vulnerable populations exhibit an increased risk for cognitive deficits including increased externalizing problems (Lewis-Morrarty, Dozier, Bernard, Terracciano, & Moore, 2012) and poor academic performance (Allan, Hume, Allan, Farrington, & Lonigan, 2014).

Participants were taken from a larger longitudinal study assessing the effects of the Attachment Biobehavioral Catch-up (ABC) intervention. This intervention consists of 10 weekly sessions conducted in families' own homes. The focus of the intervention is to alter parenting behaviors by increasing parent sensitivity, while decreasing intrusiveness (Dozier & Bernard, 2017). I first examined if a relationship existed between parent state of mind and child attachment classifications. Second, I examined if attachment classifications were associated with child executive functioning. Third, I investigated the association between parent state of mind and child executive functioning. I hypothesized that more of the parents with autonomous states of mind would have infants with secure attachments, and their children would have stronger executive functioning, than parents with non-autonomous states of mind. Lastly, I tested the relationship between parent state of mind and parent behavior. I hypothesized that parents with autonomous states of mind would exhibit higher sensitivity, and lower intrusiveness than parents with non-autonomous states of mind.

Chapter 2

METHODS

Overview

A total of 128 parent-child dyads participated in this study. Of these, 69 of the dyads included internationally adopted children, 20 foster children, and 39 biological children. These participants were a part of larger randomized clinical trials studying the effects of the Attachment Biobehavioral Catchup (ABC) intervention. Parents were given the Adult Attachment interview (AAI) in their own homes. The Strange Situation was conducted in a laboratory setting when the child was an average age of 27.23 months (SD = 8.47). The Day-Night Stroop and Executive Functioning measures were completed either in the laboratory or within the home when the child was an average of 52.59 months (SD = 7.22).

Participants

Of the parents, 118 were mothers, while 8 of the primary parents were fathers. Approximately 55.5% of the children were female. The internationally adopted children were placed with their parents at an average age of 13.32 months, while the foster children's average age of placement was 13.20 months. There was no placement age for biological children. In regards to ethnicity, 75% of the parents were Caucasian, 14.1% African American, 3.1% Hispanic/Latino, 2.3% Asian, 0.8% biracial, and 4.7% did not report. Similarly, most (37.5%) of the children were Caucasian, 28.9% were Asian, 24.2% African American, 4.7% biracial, 2.4% Hispanic/Latino, 0.8% Native Hawaiian/Pacific Islander, and 1.6% were not reported. Nearly half (45.3%) of the dyads were interracial, meaning the parent's and child's ethnicity differed. In regards to family income, 39.8% of families had an income greater than $100,000, 35.2% had

an income between $60,000 and $99,999, 18% had an income less than $60,000, and 7% did not report. Most parents received at least a college degree at 70.5%, while 21.9% attainted at least a high school degree, 2.4% below a high school degree, and 5.5% did not report.

Measures

Adult Attachment Interview (AAI): The Adult Attachment Interview (George, Kaplan, & Main, 1996) is a semi-structured interview used to assess a parent's early childhood experiences and valuing of attachment. The interview can be conducted in both a laboratory setting or within an individual's home, by a trained professional. The interview consists of 20 questions with 21 supplemental questions, and from start to finish ranges between 45 to 90 minutes long. The interviewers ask the parents questions such as to describe their relationships with their parents, to think about effects their attachment relationships have had on their functioning, and to consider times when they felt upset or rejected as a child. The Adult Attachment Interview is coded based on Main and Goldwyn's coding scheme (Main, & Goldwyn, 1998). Codes are rated on a 9-point scale and are used to assess the parent's current state of mind with regards to attachment. Parent responses are assessed by their quality, quantity, relation, and manner.

Parents are categorized as autonomous (F), dismissing (D), preoccupied (E), or Unresolved (U). Autonomous parents tend to have a coherent and consistent discourse during the interview. They provide clear evidence supporting their descriptions of their parents, and show a valuing of attachment. Dismissing parents tend to idealize their experiences with their parents. They usually cannot provide detailed memories supporting their claims. They dismiss the importance of attachment, or may express

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cold anger towards the parent. Preoccupied parents tend to be caught up in their attachment experiences. They tend to exhibit a rambling discourse or to show involving anger toward parents. Unresolved parents are described as having dissociated lapses in memory for example, referring to the deceased as if they were alive. Their mental representations tend to be incoherent as a result of trauma or loss.

Interviews were audio-recorded and transcribed verbatim by trained professionals. These transcripts were then coded by a single coder who received reliability certification after attending a 2-week training course in Dr. Mary Main's laboratory. The coder was also blind to the population type, either adopted infant-parent dyad or foster infant-parent dyad. A random set of 88 interviews was double coded by a second certified coder. The codes were found to be in 88% agreement (Raby, et. al, 2017). Interviews were administered to parents as close to the child's placement date as possible. More details concerning descriptive information and reliability estimates are reported by Raby et. al (2017).

Strange Situation: The Strange Situation (Ainsworth et al., 1978) is a laboratory procedure which assesses an infant's attachment quality to their primary parent. The child is observed during 8 different episodes which consists of both separations and reunions with the parent. Each episode is about 3 minutes long. The infant is separated from his or her parents during two separate occasions, once with a stranger and once while completely alone. The procedure is designed to progressively become more distressing for the infant. The child's behavior upon reunion is coded and the infant is classified as secure (B), avoidant (A), resistant (C) or disorganized (D). Secure infants actively seek out their parents after reunion, and are easily soothed by their parents during times of distress. Avoidant infants ignore their parents and tend

to exhibit a minimal emotional response when parents depart or return. These infants also tend to turn away from their parents when distressed. Infants who are categorized as resistant may seek out their parents for comfort, but are not easily soothed and tend to push parents away or distance themselves from them. Disorganized infants display a breakdown in strategies. Their behaviors are contradictory and illogical such as, crying while playing with toys, throwing themselves onto the floor, or backing themselves into a corner.

All Strange Situation interactions were video-recorded behind a one-way mirror. The camera focused on the children and their movements in order to accurately record behavior. The room also contained the same layout for each interaction to ensure consistency. These interactions were then coded by certified coders, who attended training courses on organized (secure, avoidant, resistant) and disorganized attachment strategies. The coders received reliability certification after meeting 80% agreement with an expert coder. A random set of 88 interactions was double coded by a second certified coder and the codes were found to be in 100% agreement when the child was classified as either secure, avoidant, or resistant, and 82% agreement when the child was classified as disorganized.

The Day-Night Stroop (DNS): The Day-Night Stroop (Gerstadt, Hong, & Diamond, 1994) is a test which requires the use of higher cognitive functions such as inhibitory control and working memory. This test was modified from the Stroop color-word task developed by J. Ridley Stroop (Stroop, 2004). The Day-Night Stroop is presented as a "game" to the child. A deck contains two different cards a white card with a colored picture of a sun, and a black card with a crescent moon and stars is used in this task (See Appendix A). The child is asked to call the sun card "night" and the

moon card "day," which requires inhibitory control because the child must inhibit natural recognition tendencies to respond correctly. Two practice trials are given to the child to ensure that he or she understands the task before beginning the assessment. A total of 16 trials is shown to the child and the correct responses are recorded. Because this is a task of inhibitory control, a response is scored as incorrect even if the child self-corrects. The child is also given a working memory control condition. This task has the same procedure, but the child is shown two abstract cards: a red/blue squiggle card and told to say "white," and a red/blue checkerboard card and told to say "black."

Executive Functioning (EXF): The Executive Functioning Task (Carlson, 2005) is a test that requires cognitive flexibility and control. The EXF is an adaptation from a similar task developed by Zelazo called the Dimensional Change Card Sort Task (Zelazo, 2006). Just as in the Day-Night Stroop this task is presented as a set of "games" to the child. The EXF requires three separate decks of cards, each representing a different color-shape combination. The first deck contains two white cards with either an image of a large or small red cat. The second deck includes a blue card with an image of a black star, and a red card with an image of a black truck. The final deck contains two white cards, one with an image of a blue star and the other an image of a red truck (See Appendix B).

The executive functioning task consists of six distinct levels, each progressing in difficulty as the task advances. These levels are based on "cool" executive functioning measures, meaning they are emotionally neutral. They also utilize both conflict and delay domains of executive functioning (Beck, Schaefer, Pang & Carlson, 2011). During each level, two card boxes with slots are presented in front of the child. On the front of each box there is an attached target card, with these cards differing

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depending on the level of the task. Before beginning each level, the experimenter physically demonstrates the assigned rule, and gives the child a rule check to ensure he or she understands the task. The child must pass each preceding level before moving forward. If the child fails during any given level then the EXF is immediately concluded. The first level, categorization, requires the child to organize the first deck of cards by the size of the cat image. The experimenter asks the subject to place the "big kitty" card in the "big kitty box" and the "little kitty" card in the "little kitty box." Once all trials are completed the experimenter then begins the post-switch condition or reverse-categorization, and asks the child to place the "big kitty" card in the "little kitty box" and the "little kitty" card in the "big kitty box." The second level, separated, requires the child to organize the second deck of cards first by shape, either black star or black truck. The reverse-separated condition then asks the child to organize the cards by color. The third level, integrated, is similar to the second in that it asks the child to organize the cards by shape and color. However, during the integrated level there is more executive conflict, meaning the colors of the images are mis-matched during each trial. The fourth level, mixed, uses the same cards as in the integrated level, but rather than designate a single rule to the cards, both color and shape rules are combined. Depending on the experimenter's verbal cue the child must play either the "color game" or the "shape game." The fifth level, advanced, requires the child to independently assign rules to the "game" based on the presence or absence of a black border on the card. The experimenter instructs the child to play the color game when there is a black border, and to play the shape game when there is no border. The sixth level, reverse advanced, is almost identical to the advanced condition except the rule is switched, black border indicates shape game and no border indicates color game. Each

level is independently scored on the EXF scoring form. The form specifies if the child completed the rule check, and whether the child passed or failed each level. It also records the number of correct and incorrect responses with corresponding percentages.

Parental Sensitivity Assessment (Play): Play refers to the recorded interaction between a child and his or her primary parent. During this interaction the parent is instructed to play with his or her child as he or she normally would for about 10 minutes. Before directions are given, the child is given an array of toys to be played with. Depending on the age of the child the parent may first be instructed to engage in play by sitting 3 feet away from the child, and told not to touch the toys. Following the distance play, parents are permitted to sit closer to the child and touch the toys. Parent behaviors are coded using the NICHD system of assessing parental sensitivity (NICHD, 1996). The interactions are double coded by certified coders. The target behaviors that are focused on during this interaction are sensitivity, intrusiveness, and positive regard.

All three behaviors are coded on 5-point scales, ranging from 1 that is not at all characteristic of the parent and 5 as highly characteristic. A highly sensitive parent is exceptionally responsive to his or her child's needs and signals. The sensitive parent follows the child's lead, rather than directs the play interaction, and is at tuned to his or her child's moods and interests. A sensitive parent paces play activities based on his or her child's level of interest. An insensitive parent rarely responds appropriately to the child's cues, and does not show an awareness of the child's interests and feelings. The intrusive parent tends to impose his or her own agenda on the child, and may also demonstrate physical behaviors such as excessive tickling, taking away objects, poking or swatting, and putting toys in the child's face. A parent that displays

high positive regard consistently expresses affection towards the child through smiling, laughing, praise, and hugging (NICHD, 1996).

Chapter 3

RESULTS

All data analyses were completed using SPSS software. I first examined if a relationship existed between parent state of mind and child attachment classifications. Using a chi square I found that the relationships between autonomous and unresolved states of mind were not associated significantly with infant security (p values > .10).

I next examined whether attachment classifications were associated with executive functioning. In regards to the DNS, no significant association was found between attachment security or organization and the total corrected scored (p values > .10). Attachment security and attachment disorganization were not significantly associated with EXF scores (p values > .10).

When considering the relation between parent state of mind and child executive functioning, I found that children of unresolved parents had significantly higher EXF scores ($\bar{x}$ = 27.10) than resolved parents ($\bar{x}$ = 19.25) ; t(126) = 2.08, p = .039. (Figure 2).
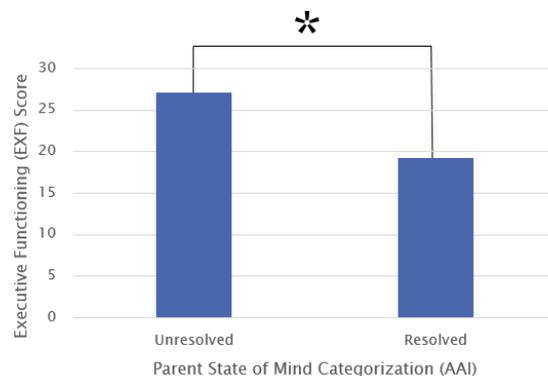

Figure 2   Relationship between parent state of mind and child EXF scores. $* = p < .05$

No significant association was found between autonomous state of mind and EXF scores ($p = .087$), although differences were in the predicted direction. There was no significant association found between autonomous or unresolved states of mind and DNS scores (p values $> .10$).

Using a one way ANOVA we evaluated the relation between parent state of mind and parent behavior in regards to sensitivity and intrusiveness, both before and after the intervention. Autonomous parents had significantly higher sensitivity ($\overline{x}=2.94$) than non-autonomous parents ($\overline{x}=2.513$) before the intervention ($F(1, 126) = 5.61$, $p = .019$). We also found that autonomous parents were significantly more intrusive ($\overline{x}=2.65$) than non-autonomous parents ($\overline{x}= 2.21$) preceding the intervention ($F(1, 126) = 4.52$, $p=.035$) (Figure 3).
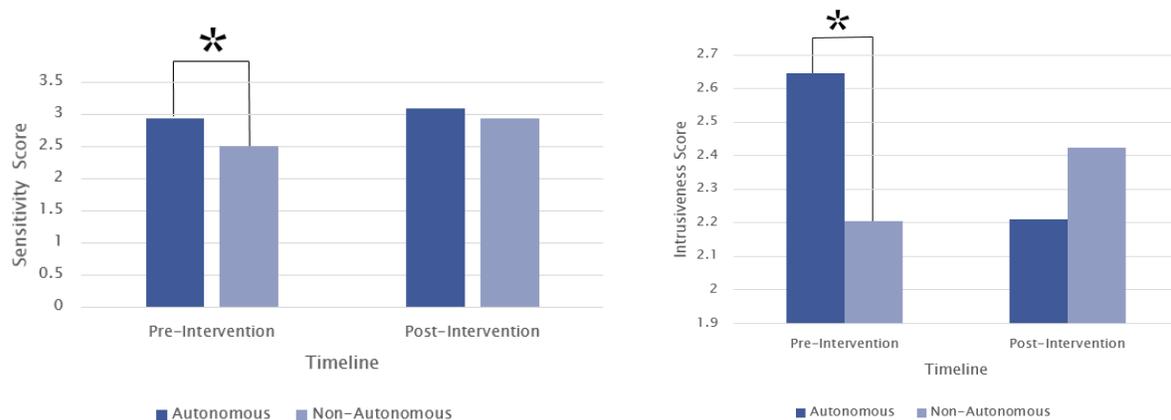

Figure 3   Relationship between parent state of mind and parent behavior. $* = p < .05$

There were no significant differences between autonomous and non-autonomous parents in sensitivity or intrusiveness (p values $> .10$) following the intervention. Parents who were not unresolved with regard to attachment were more sensitive ($\overline{x}= 2.92$) than unresolved parents ($\overline{x}= 2.25$) before the intervention ($p = .002$). After the intervention, directionality of the association remained consistent, but

differences were not significant ($p = .094$). Unresolved state of mind did not predict intrusiveness before ($p > .10$) or after ($p > .10$) the intervention.

Using a regression analysis I found no significant associations between sensitivity and EXF scores preceding the intervention or following the intervention (p values $> .10$). Similarly, intrusiveness before ($p > .10$) and after the intervention ($p > .10$) was not significantly related to EXF scores.

Chapter 4

DISCUSSION

The present study found that autonomous parents had significantly higher sensitivity and intrusiveness scores preceding the ABC intervention than non-autonomous parents. The relationship between autonomous parents and sensitivity is consistent with previous research. However, autonomous parents having higher intrusiveness scores was unexpected. Multiple studies have shown that caregivers with autonomous state of mind tend to display increased responsiveness and sensitivity towards their children, while displaying less intrusive behaviors relative to non-autonomous caregivers (Whipple, Bernier, & Mageau, 2011). Because sensitivity and intrusiveness tend to be inversely correlated, it was surprising to find that autonomous parents were relatively high in both behaviors. The uniqueness of my sample, containing as it did primarily adoptive parents may explain this finding. Adoptive parents may be prone to more intrusive behaviors due to the pressure to help their child "catch up" academically. Our results suggest the possibility that autonomous parents may be particularly susceptible to this effect, perhaps being more vigilant than other parents. Adoptive parents may behave by constantly quizzing their child, or controlling the focus of play interactions to be academic in nature.

Additionally, my results supported an unexpected finding that unresolved parents are associated with stronger child executive functioning. There is little to no evidence supporting this unexpected result, and much of the literature supports the opposite effect. In a study evaluating the effects of maternal attachment on child cognitions, maternal security (autonomous state of mind) was positively associated with child executive functioning (Von der Lippe, Eilersten, Hartmann, & Killen,

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2010). In addition, my results did not support a relationship between parent behavior and child executive functioning. This null result may be due to small sample size.

The present study's results did not support my hypothesis that parent state of mind predicts infant attachment quality. This is not in line with many previous studies. For example, van IJendoorn (1995) found a 75% correspondence between parent and infant attachment classifications (van IJzendoorn, 1995). The lack of association between parent state of mind and infant attachment may be explained by a small sample size. In addition, parents with preoccupied and dismissing states of mind were extremely underrepresented within my sample.

No associations emerged between infant attachment classifications and inhibitory control measures. These null findings are inconsistent with findings from a study evaluating the effects of attachment security on child developmental growth which used two distinct measures to assess executive functioning, the backward word/digit span and the Dimensional Change Card Sort Task.

Strengths and Limitations

A major strength of the present study is that a multi-modal assessment was used in order to evaluate child executive functioning by using both the DNS and EXF. Another strength of my study is the use of reliable and valid measures to assess infant and parent attachment classifications, and measures of inhibitory control. The Adult Attachment Interview, Strange Situation, Day-Night Stroop, and Executive Functioning Task are all found to be high in reliability and validity. A final strength was the uniqueness of my sample. My sample of adopted and foster parent-child dyads represents a population that is underrepresented in studies assessing the relations between parent state of mind, infant attachment, and child executive functioning.

A major limitation of this study is its small sample size. Having a small sample size may have limited my ability to detect smaller effects, and may have introduced random sample errors that skewed my results. Another limitation involves not controlling for other variables. For example, quality of a child's early environment, the quality of relationships with previous parents before adoption and foster care, and socioeconomic status have the potential to influence a child's attachment quality and executive functioning.

REFERENCES

Ainsworth, M.D.S., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment: A psychological study of the strange situation*. Hillsdale, NJ: Erlbaum.

Allan, N.P., Hume, L.E., Allan, D.M., Farrington, A.L, & Lonigan, C.J. (2014). Relations between inhibitory control and the development of academic skills in preschool and kindergarten: A meta-analysis. *Developmental Psychology, 50*(10), 2368-23679.

Beck, D.M., Schaefer, C., Pang, K., & Carlson, S.M. (2011). Executive function in preschool children:Test-Retest reliability. *Journal of Cognition and Development*, *12* (2), 169-193.

Bernier, A., Beauchamp, M.H., Carlson, S.M., & Lalonde, G. (2015). A secure base from which to regulate: Attachment security in toddlerhood as a predictor of executive functioning at school entry. *Developmental Psychology, 51*(9), 1177-1189.

Bernier, A., Carlson, S.M., & Whipple, N. (2010). From external regulation to self-regulation: Early parenting precursors of young children's executive functioning. *Child Development*, *81*, 326-339.

Blair, C., & Razza, R.P. (2007). Relating effortful control, executive function, and false belief understanding to emerging math and literacy ability in kindergarten. *Child Development*, *78*(2), 647-663.

Bowlby, J. (1983). Attachment and loss: Retrospect and prospect. *Annual Progress in Child Psychiatry and Child Development, 69*, 29-47.

Carlson. S.M. (2005). Developmentally sensitive measures of executive function in preschool children. *Developmental Neuropsychology, 28*(2), 595-616.

Devine, R.T., White, N., Ensor, R., & Hughes, C. (2016). Theory of mind in middle childhood: Longitudinal associations with executive function and social competence. *Developmental Psychology, 52*(5), 758-771.

Dozier, M., & Bernard, K. (2017). Attachment and Biobehavioral catch-up: Addressing the needs of infants and toddlers exposed to inadequate or problematic caregiving. *Current Opinion in Psychology*, *15*, 111-117.

George, C., Kaplan, N., & Main, M. (1996). *Adult Attachment Interview. Unpublished manuscript*. University of California, Berkeley.

Gerstadt, C.L., Hong, Y.J., & Diamond, A. (1994). The relationship between cognition and action performance of children 312-7 years old on a stroop-like day-night test. *Cognition*, *53* (2) 129-153.

Lewis-Morrarty, E., Dozier, M., Bernard, K., Terracciano, S.M., & Moore, S.V., (2012). Cognitive flexibility and theory of mind outcomes among foster children: Preschool follow-up results of a randomized clinical trial. *Journal of Adolescent Health*, *51*.

Main, M., & Goldwyn, R. (1998). *Adult attachment classification system*. London: University College.

Matte-Gagne, C., Bernier, A., Sirois, M., Lalonde, G., & Hertz, S. (2017). Attachment security and developmental patterns of growth in executive functioning during early elementary school. *Child Development*, *00*(0) 1-16

NICHD Early Child Care Research Network. (1996). Characteristics of infant child care: Factors contributing to positive caregiving. *Early Childhood Research Quarterly*, *11*, 269-306.

Raby, K.L., Yarger, H.A., Lind, T., Fraley, R.C., Leerkes, E., & Dozier, M. (2017). Attachment states of mind among internationally adoptive and foster parents. *Development and Psychopathology*, *29* 365-378.

Semrud-Clikeman, M., Walkowiak, J., Wilkinson, A., & Butcher, B. (2010). Executive functioning in children with Asperger syndrome, ADHD-combined type, ADHD-predominantly inattentive type, and controls. *Journal of Autism and Developmental Disorders, 40*(8), 1017-1027.

Stroop, J.R. (2004). Studies on interference in serial verbal reactions. *Cognitive Psychology: Key Readings*, 193-204.

Tai, H.L. (2016). *The role of attachment as a predictor of social and cognitive competence: Peer relations and academic achievement*. California School of Professional Psychology, Alliant International University.

Widom, C.S., Czaja, S.J., Kozakowski, S.S, & Chauhan, P. (2017). *Does adult attachment style mediate the relationship between childhood maltreatment and mental and physical health outcomes?* Psychology Department, The College of New Jersey.

Whipple, N., Bernier, A. & Mageau, G.A. (2011). A dimensional approach to maternal attachment state of mind: relations to maternal sensitivity and maternal autonomy support. *Developmental Psychology*, 47(2), 396-403.

van IJzendoorn, M.H. (1995). Adult attachment representations, parental responsiveness, and infant attachment: A meta-analysis on the predictive validity of the adult attachment interview. *Psychological Bulletin*, *117* (3), 387-403.

Von der Lippe, A., Eilersten, D.E., Hartmann, E., & Killen, K. (2010). The role of maternal attachment in children's attachment and cognitive executive functioning: A preliminary study. *Attachment & Human Development*, *12*(5), 429-444.

Zelazo, P.D. (2006). The Dimensional Change Card Sort (DCCS): A method of assessing executive function in children. *Nature Protocols*, *1*, 297-301.

Zelazo, P.D., Carlson, S.M., & Kesek, A. (2008). Development of executive function in childhood. In C. Nelson & M. Luciana (Eds.), *Handbook of Developmental Cognitive Neuroscience*, 553-574. Cambridge, MA: MIT Press.

Zelazo, P. D., Craik, F. I., & Booth, L. (2004). Executive function across the life span. *Acta Psychologica*, *115*, 167–183.

Appendix A

DAY NIGHT STROOP STIMULUS CARDS
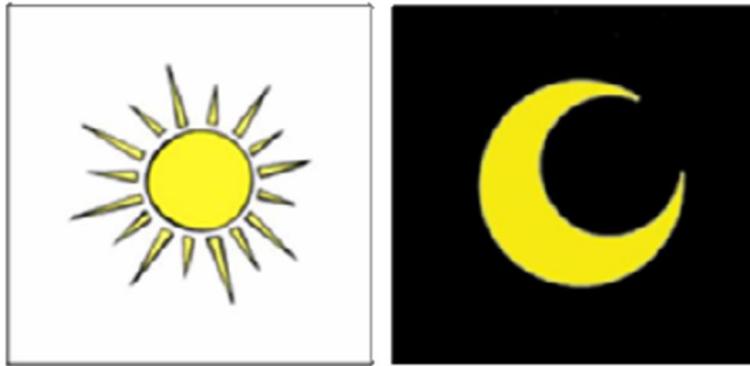
Appendix B

EXECUTIVE FUNCTIONING TASK STIMULUS CARDS