

1-1-2012

A study of the effect of maternal depressive symptoms on the mother-infant relationship and protective effect of maternal reflective functioning

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**A STUDY OF THE EFFECT OF MATERNAL DEPRESSIVE SYMPTOMS ON THE
MOTHER-INFANT RELATIONSHIP AND PROTECTIVE EFFECT OF MATERNAL
REFLECTIVE FUNCTIONING**

by

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THESIS

Submitted to the Graduate School

of Wayne State University,

Detroit, Michigan

in partial fulfillment of the requirements

for the degree of

MASTER OF ARTS

2012

MAJOR: PSYCHOLOGY (Cognitive,
Developmental, Social)

Approved By:

Advisor

Date

DEDICATION

This work is dedicated to infants and families everywhere, may the future be filled with opportunity to better the lives of many generations to come. I would also like to dedicate this work to my family and to Jack, without you I would not be where I am today. To my committee, who have guided me and shown me the importance of our work. Finally, I would like to dedicate this work to Dr. Ann Stacks. Thank you for mentoring me, teaching me, and showing me how to bring our research to life.

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CHAPTER 1

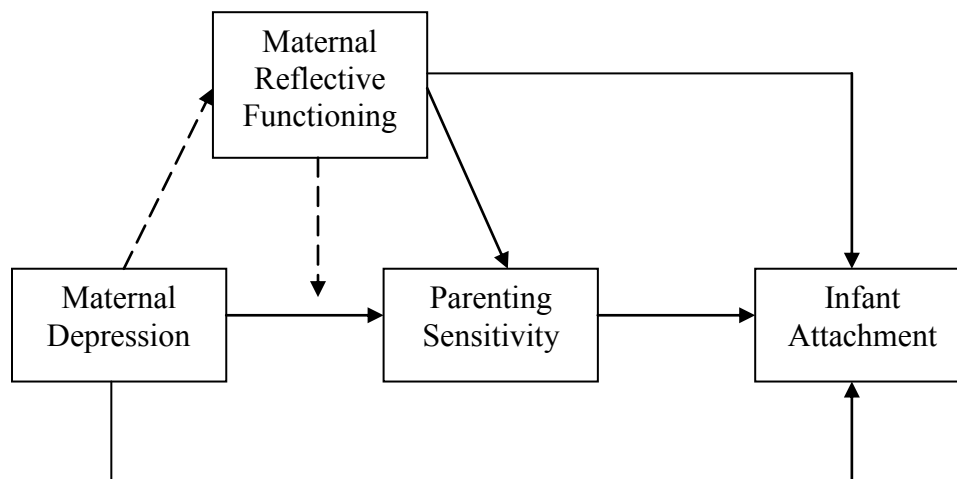
Introduction

The relationship between mother and child has been shown to be an extremely important foundation for optimal child development (Bowlby, 1969; Main, 1996; Ainsworth, 1978; Cassidy, 2008). Caregivers provide a wide array of resources to help their immature infants learn about the world around them. Not only do caregivers provide for physical and environmental needs, they also provide for their infant's social emotional needs by being sensitive and responsive to their cues. These early interactions are related to the development of an attachment relationship that is associated with later social emotional skills and long term mental health (Ainsworth, 1979; Bowlby, 1969; van IJzendoorn, 1995). Several risk factors are associated with the development of insensitive or frightening parenting that may result in insecure or disorganized infant attachment, as well as socio-emotional difficulties that may be precursors to later psychopathology (Deklyen & Greenberg, 2008 for review). Maternal psychopathology is one specific risk factor that has been found to be associated with insensitive parenting, the development of an insecure or disorganized attachment, and poor infant social-emotional outcomes (Schecter et al. 2008; Goodman, Rouse, Connell, Broth, Hall, & Heyward, 2011). Much research has been done on the effect of maternal depression on parenting, infant attachment and infant outcomes. This research suggests that depression is a risk factor for less positive parenting and insecure attachment, however not all depressed women demonstrate insensitive parenting and not all infants of depressed mothers develop an insecure attachment or social emotional problems. It is important to ask, among depressed women, what factors support sensitive parenting and infant attachment security? An emerging field of research suggests that a parent's ability to understand and acknowledge their infant's physical and emotional needs is a

precursor to sensitive parenting and secure infant attachment. This ability, also known as reflective functioning, may be hindered or diminished as a result of maternal psychopathology. Despite the important clinical implications of this relationship, to date only one study has assessed the relationship between depression and reflective functioning (Vrieze, 2011).

This thesis examines the literature on maternal depressive symptoms and the impact that they have on parenting and infant attachment classification; it seeks to further extend the knowledge on the concept of reflective functioning and the possibility of its role as a protective factor in healthy infant socio-emotional outcomes. In the remaining sections attachment theory will be reviewed and explored as a developmental outcome that is influenced by maternal depression. Parental reflective functioning is proposed as the protective factor that can support positive parenting, even in the face of depressive symptomatology. Figure 1 is a conceptual model of this study. Solid lines represent relationships that are known to exist within the literature and dashed lines represent unknown relationships that this study seeks to uncover.

Figure 1. Conceptual Model of Maternal Depression, Reflective Functioning, Parenting and Child Attachment



Attachment Theory

Attachment theory was introduced by John Bowlby (1969) and the theory emphasized that infants seek protection from a primary caregiver in times of distress. Attachment is rooted in evolutionary and psychoanalytic psychology and according to theory, an infant relies on his/her primary caregiver for protection, love, and nurturance. Bowlby (1969) believed that the mechanism by which this attachment was formed was via the relationship shared between caregiver and child. All children were said to form attachments if they had a primary caregiver, regardless if their needs were met or not.

The quality of infant attachment is related to parental responsiveness when an infant's attachment system is activated; Mary Ainsworth (1978) described three major attachment classifications tied to parental responsiveness. Ainsworth coded children as either secure, insecure-avoidant or insecure-ambivalent based on behaviors displayed in a laboratory procedure called the Strange Situation Paradigm (Ainsworth, 1978). This measure is widely used in the assessment of infant attachment (van IJzendoorn, 1995; Waters, Merrick, Treboux, Crowell, & Albersheim, 2000) and slowly activates the infant's attachment system with the introduction of a stranger and a series of separations and reunions. In this procedure, infants classified as secure demonstrate the ability to explore their environment, using their caregiver as a secure base during times of safety as well as seeking comfort from their caregiver during times of distress. Research suggests that infants classified as secure have parents who consistently respond to their needs in a sensitive and timely manner (Ainsworth, 1978; van IJzendoorn, 1995; Nevlar & Becker, 2008).

Ainsworth (1978) described two types of insecure attachments; insecure avoidant and insecure ambivalent. Infants with avoidant attachment actively avoid and sometimes resist their

primary caregiver when their attachment system is activated. Parents of these infants do not respond to their infant's cues sensitively, instead they display behaviors that are overly intrusive and over-stimulating. As a result, these behaviors interfere with the infant's desire and ability to seek the caregiver in times of need. Infants with insecure-ambivalent attachment approach their parents for comfort when their attachment system is activated, but are difficult to console (Belsky & Fearon, 2002). Parents of these infants respond to their needs inconsistently therefore leaving them to interpret and anticipate their parent's availability but not ever truly forming a mental representation of how to have their needs met.

A fourth classification, disorganized attachment was identified by Main and Solomon (1986). The disorganized classification is denoted by infants who upon reunion with the caregiver display contradictory behavior when their attachment system is activated. For example they may freeze when they approach the parent or reach their arms to be lifted while turning away. This classification is said to be a result of the infant's fear of not being able to predict how their parents will react to their needs. Parents of disorganized infants are said to have their own unresolved histories that impact their ability to consciously be aware of their infant's needs (Lyons-Ruth & Jacobvitz, 2008).

Intergenerational Transmission of Attachment

Attachment remains important throughout the lifespan. As a result of interactions with attachment figures in childhood, internal working models of relationships are established and carried forward into adulthood. Studies suggest that attachment from infancy to adulthood remains stable (Thompson, Lamb, & Estes, 1982; Waters, Hamilton, & Weinfield, 2000) and is associated with attachment that is passed down from one generation to the next. This passing down is referred to in the literature as the Intergenerational Transmission of Attachment. Van

IJzendoorn (1995) conducted a meta-analysis examining the concordance between maternal and infant attachment classifications. Results suggest that 75% of infant attachment classifications could be accounted for by the mother's attachment classification. The author proposed the parents own internal working model of relationships influenced their ability to be responsive to their infants' attachment needs. Intergenerational transmission of attachment has become a very crucial topic in attempting to understand how and why these influences are carried forward to future generations. Many have examined the reasons for the transmission of attachment, and have found that parenting behaviors promote the transmission from generation to generation. More specifically, parents who respond sensitively to their child's needs are able to promote secure attachments that allow their child to gain a secure understanding of relationships, therefore promoting the same behaviors when parenting their own children. Contradictory to this, parents that respond insensitively therefore promote the same insensitive behaviors in their children. Children of insensitive parents go on to engage in these behaviors limiting their own child's opportunity to develop a secure attachment style.

Adult Attachment and Parenting

Several studies have examined the link between adult attachment representations and parenting sensitivity. In a small sample of 60, Pederson, Gleason, Moran, & Bento (1998) found that parental sensitivity mediated the relationship between mothers' attachment classifications and their infant's attachment security. Others have also found Adult Attachment Interviews (AAI) to be associated with parent's emotional availability (Biringen, Brown, Donaldson, Green, Krcmarik, & Lovas, 2000). Parent's own attachment style impacts their ability to support their child by fostering attachment styles similar to their own. However, as stated previously the concordance between parent and infant attachment is not perfect. Adam et al. (2004) examined

adult attachment classifications and their relation to maternal behavior and infant well-being. Adults with preoccupied attachment displayed higher instances of intrusiveness during interactions with toddlers supporting the idea that parents who have unresolved issues from their own past can impact their infant's attachment negatively. Parents with a traumatic history may develop defensive strategies to cope with their feelings; these strategies may include displaying frightening caregiving behaviors. For over a decade, Erik Hesse and Mary Main (2006), have hypothesized and examined the relationship between parental unresolved attachments, parent frightening behaviors, and disorganized infant attachment. The relationship between these variables has been identified as impacting the parent's ability to provide a positive context for development. Examples of frightening behaviors are freezing during interaction, threatening or frightening facial expressions, and sudden frightened movements that distance them from the infant. These behaviors are said to be differentiated from non-disorganizing freezing, threatening, and frightened behaviors in that they are rooted in the internal parental experience. It is important to recognize that while there is a high level of concordance between a mother's attachment representations and her child's pattern of attachment, there are instances where a lack of concordance exists. In fact, about 25% of the time mothers and their infants do not have the same attachment classification, this is known as the transmission gap of attachment. Researchers are currently attempting to identify why this gap exists and how parents are able to promote different attachment styles than those of their own.

Parenting and Attachment

Parenting sensitivity has been studied widely among attachment and child development researchers. It has been suggested that parent sensitivity mediates the relationship between mother and infant attachment (Pederson, Gleason, Moran, & Bento, 1998). Mary Ainsworth was

the first to show that sensitive parenting provided the context for the development of a secure attachment. Since that time, a large body of research has attempted to replicate this finding, but has yielded mixed results. Some studies find large and significant associations between sensitivity and attachment (Ainsworth, Blehar, Waters, & Wall, 1978; Belsky, Rovine, & Taylor, 1984; Isabella, 1993; McElwain & Booth La-Force, 2006), while others find a small (Goldsmith & Alansky, 1987) or no association between sensitivity and attachment (Ward & Carlson, 1995). A meta-analysis of 66 studies found that maternal sensitivity was moderately associated with infant attachment security (de Wolff & van IJzendoorn, 1997). The authors concluded that although sensitivity was associated with attachment security, it was not the only maternal behavior that associated with attachment.

While the meta-analytic finding is most robust, there is still a question about discrepant findings across studies. Perhaps these differences are the result of the ways in which researchers are operationalizing and measuring sensitivity. Evidence from a meta-analytic study suggests that measurement and timing of sensitivity and attachment measures negatively impact the effect size of maternal sensitivity and attachment (Atkinson et al., 2000). That is, as the time between assessments increases, the relation between maternal sensitivity and attachment decreases. This evidence has important implications for assessments of maternal sensitivity and infant attachment and also suggests that parental sensitivity changes over time. Using de Wolff & van IJzendoorn's (1997) data, Nievar & Becker (2008) attempted to address the issue of the way in which sensitivity is operationalized. These researchers regrouped multiple maternal behaviors into what they considered maternal sensitivity. Instead of using a strict definition of sensitivity, they included three maternal behaviors: synchrony, mutuality, and sensitivity. Their findings indicate that this broader definition of maternal sensitivity was a stronger predictor of infant

attachment security. Although the relationship between parental sensitivity and child behavior has been established there is still much research that is needed in order to further understand how parent attachment and parenting behaviors directly impact infant behavior and development.

Infant Attachment, Child Behavior, and Development

A large amount of cross sectional and longitudinal studies demonstrate that infant attachment is associated with a variety of developmental outcomes that have long term consequences for brain development, emotion regulation and behavior, later psychological adjustment and representations of relationships (Thompson, 2008). Findings from the Minnesota Study of Risk and Adaptation from Birth to Adulthood (Sroufe, Egeland, Carlson, & Collins, 2005) suggest that that being exposed to sensitive parenting behaviors promotes secure infant attachment and that lack of sensitive caregiving behaviors can lead to development of insecure infant attachment. Disorganized attachment was also examined and it was found that parent intrusiveness, maltreatment, and unavailability were found to be predictive of infant disorganization (Sroufe, 2005). These results are similar to those found in the National Institute of Child Health and Human Development (NICHD) Study of Early Child Care. In this study, researchers sought to find out if attachment classifications using the Strange Situation were still applicable to infants who were in early child care compared to those who were not. This study included 1,153 dyads, it examined the duration, quality, and effects of extensive periods in early child care. Infant attachment was compared to relevant variables such as psychopathology and sensitivity. These variables were assessed at one, six, and fifteen months of age. It was found that infants in prolonged periods of early child care did not show lower amounts of distress compared to their counterparts; showing evidence that the Strange Situation can be used as a valid measurement of attachment for those who attend early child care. The results also found that

mothers who had higher levels of sensitivity, responsive behaviors, and better maternal mental health were more likely to have securely attached infants. No significant relationship between attachment security was found for child gender, maternal sensitivity in play, and child temperament characteristics.

Belsky (2002) examined the predictive power of attachment and the possibility of attachment status acting as either a protective or risk factor; results indicated that the predictive power of attachment varied as function of the level of social contextual risk. This finding has many implications to understanding the development of infants; it is not only the attachment insecurity that acts as the hindrance to optimal development, but the combination of attachment and contextual factors that interact to yield either a positive or negative outcome.

Cicchetti, Rogosch, & Toth (1998) investigated how maternal depression and contextual risk factors impacted the development of problem behaviors and attachment insecurity in toddlers. It was hypothesized that children of depressed mothers would have higher levels of insecure attachment, and would be in families with higher levels of contextual risk. The authors also examined the concordance between child behavioral issues and maternal depression. Participants were part of a longitudinal study interested in the effects of maternal depression on infant and child development. The authors found that contextual risk significantly impacted the development of behavior problems above and beyond maternal depression.

Past research studies on parental behaviors have been prevalent in the literature because caregivers have been noted to provide strong influences on infant development. Young infants are completely reliant on their primary caregivers and without the proper support their development is at risk. Maternal mental health has been shown to have a great impact on infant development (NICHD-ECCRN, 1997; Goodman & Tully, 2006; Spieker & Booth, 1988; Slade,

Cohen, Sadler, & Miller, 2008) and one of the most prevalent disorders that impacts women and mothers is depression (Bennett, Einarson, Taddio, Koren, & Einarson, 2004). Understanding all aspects of how and why depression impacts this relationship is crucial in identifying ways to aid in supporting infants and mothers.

Maternal Depression

Diagnostic Criteria

Depression as defined by the *Diagnostic and Statistical Manual of Psychological Disorders, 4th edition, Text Revision*, is an episode that lasts at least two weeks, where an individual experiences a loss of interest or pleasure or a depressed mood not accounted for by a medical condition, delusions or hallucinations. In addition, individuals may experience sleep problems, lack of energy, feelings of worthlessness, diminished ability to concentrate, weight changes, and suicidal thoughts which effect daily psychological functioning (American Psychiatric Association [DSM-IV-TR], 2000). A significant amount of literature exists documenting the prevalence of depression in women. It has been found that depression in women is twice as prevalent as depression in men (as referenced in Keyes & Goodman, 2006). Women of childbearing age have been identified as having the highest rates of depression; across studies documented rates from have ranged 8-51% during pregnancy (Bennett, Einarson, Taddio, Koren, & Einarson, 2004).

The onset of depression within four weeks after the birth of an infant is known as post partum depression (PPD). PPD has been acknowledged as a documented risk factor for negative parenting outcomes (Boyd & Worley, 2007; Chicchetti & Toth, 1998 ;Downey & Coyne, 1990; Nylen et al., 2006;). Although the DSM-IV TR defines PPD as, a depressive episode that appears four weeks after delivery, there have been many researchers that have documented the effects of

PPD in mothers up to one year after birth (Gavin, Gaynes, Lohr, Meltzer-Brody, Gartlehner, & Swinson, 2005). Documented rates of PPD have ranged from 5-15% of women (Goodman & Tully, 2006) with rates being higher for women with financial adversity (Segre, O'Hara, Arndt, & Stuart, 2007).

Maternal Depression, Parenting, and Attachment

Research suggests that maternal depression is both directly and indirectly associated with infant attachment. Precursors to these developmental issues can be seen in interactions between mothers and their infants. Studies also have found evidence that children of depressed mothers are at greater risk for behavioral problems, emotion regulation problems, and cognitive difficulties (Cicchetti, Rogosch, & Toth, 1998; Field, 1995).

Cohn et al. (1990) found that in three short minutes of interactions with their two month old infants, depressed mothers showed more instances of negative affect than mothers who were not depressed. Furthermore, toddlers of depressed mothers were found to be more likely to have insecure attachments than those of their peers (Cicchetti & Toth, 1999). Mothers with higher levels of depressive symptoms were found to be less attuned, engaged, and emotionally aware of the impact their emotions had on their toddlers (Coyne et al, 2007). The ability to be available and properly attuned to a child may be hindered by the effects of stressful life situations and experiences (Field, 1995; Grieg, 2001). Interactions that parents have with their children can either promote secure or insecure attachment styles. Many studies have evidence that suggests depression is associated with insecure attachment (Cicchetti & Toth, 1998; Downey & Coyne, 1990; Radke-Yarrow, 1985; Teti, Gelfand, Messinger, & Isabella, 1995; Carter et al. 2001).

Martins & Gaffin (2000) conducted a meta-analysis of six studies examining the effects of maternal depression on infant attachment security. It was found that infants of depressed mothers were more likely to have insecure and disorganized attachment than their controls.

One reason that maternal depression may be associated with attachment is that depression can impact parenting. The effects of depression have been found to impact multiple domains of the mother-infant relationship. Three specific types of parenting have been identified in depressed mothers' interactions with their infants; mothers may be withdrawn or unavailable, hostile or intrusive (for review see Field, 2010), or they may express positive parenting behaviors in spite of experiencing depressive symptoms (Cicchetti & Toth, 1998; Cohn, Matias, Tronick, Lyons-Ruth, & Connell, 1986). As described earlier, parent-infant interactions contribute to the growth and development of the infant's capacity to respond optimally in both the social and cognitive domains. Positive parenting behaviors include responding in a warm, sensitive, and available way; these behaviors have been shown to significantly predict attachment security, sensitivity, emotion regulation, and social skills. Negative parenting behaviors such as lack of affect matching, frightening behavior, and intrusiveness are associated with insecure and disorganized attachment.

Maternal Depression and Child Development

The effects of maternal depression on child development have been widely documented in the literature (Field, 1995; Toth, Rogosch, Sturge-Apple, & Cicchetti, 2009). Goodman, Rouse, Connell, Broth, Hall, & Heyward (2011) conducted a meta-analytic review on 193 studies, seeking to further understand and extend the literature on explaining risk for maternal depression as well as its effect on children's development of psychopathology. The authors also further explored possible moderators found in the current literature between maternal depression

and child outcomes. Across studies, maternal depression was associated with children's later internalizing and externalizing behaviors, as well as development of psychopathology in later childhood and adolescence. This meta-analysis was consistent with the literature highlighting that (a) the younger the child during onset of maternal depression the more likely to be affected by the negative impact of the depression, and (b) older children may be buffered from the negative effects of maternal depression because of their ability to cognitively understand their mother's mental health.

Cicchetti, Rogosch, & Toth (1998) also found that depressed mothers reported higher levels of negative life events, parenting hassles, lower levels of social support, and decreased marital satisfaction compared to their non-depressed counterparts. Children of depressed mothers were more likely to have insecure attachment classifications in comparison to children of non-depressed mothers. It was also found that contextual risk did not mediate the relationship between depression and insecure attachment classification.

Beck (1998) conducted a meta-analysis examining the effects of PPD on cognitive and emotional development of children between ages 1-14. The results found that PPD had a significant effect on children's development. It was found that depressed mothers had children with higher levels of behavior problems and lower levels of cognitive functioning than their non-depressed counterparts; this effect was small but significant across all ages.

School aged children of depressed mothers have been found to have increased rates of behavioral issues (both externalizing and internalizing) compared to their peers (Downey & Coyne, 1990). Kersten-Alvarez et al. (2011) examined early schooling outcomes that have been cited in the literature to be predictive of school adjustment and psychological functioning in later years. Compared to children whose mothers did not suffer from PPD, children whose mothers

were affected by PPD showed decreased levels of the ability to regulate and cope with stress, social competence with peers, and adjustment to school routines. This study supports the literature showing lasting negative effects of PPD's impact on later school functioning and social competence.

Other differences in children of depressed parents have been identified in the literature. Carter et al. (2001) found gender differences in interactions between mother and infant. Maternal depressive symptoms were found to be related to problem behaviors for boys, rather than girls. Also, it was found that the quality of early interactions was most important for girls over boys. Weinberg, Olson, Beeghly, & Tronick (2006) investigated interactions between mothers with a range of depressive symptoms and their 3-month old infants. This investigation included 133 mothers and infants, who were taking part in a longitudinal study. Using the Face-to-Face Still Face Procedure (Tronick, Als, Adamson, Wise, & Brazelton, 1978), among mother- son dyads with higher depressive symptomatology, more negative interactions in the reunion episode of the procedure were found. Also, in these dyads, a significant increase was found in negative shared affect between mothers and sons. These findings support the possibility of gender differences in interactions with mothers and their infant children; more specifically male infants may have more difficulty recovering from negative interactions with depressed mothers than female infants.

Edhborg, Lundh, Seimyr, & Widstrom (2001) conducted a study on postnatally depressed mothers and interactions with their infants. As a part of a larger study on maternal depression and child development, the authors aimed to examine the long term effects of postnatal depressive symptoms. At two months post partum, mother's depression was assessed. Then mother-infant interactions were assessed at approximately 15-18 months of age. The interaction

consisted of a structured task, free play task, and separation/reunion task. Both the structured task and free play task were coded using the Parent-Child Early Relational Assessment Scale (PCERA) (Clark, 1985). This scale includes 29 parent variables, 28 child variables, and 8 dyadic variables. It was found that in the free play task infants of mothers with higher depressive symptoms displayed lower levels of interest in their mother's actions. During the structured task, mothers with higher levels of depressive symptoms were found to have lower levels of emotional availability.

Parenting Interventions: Depression and Attachment

A large body of evidence suggests that maternal depression is a risk factor for poor parenting, insecure attachment, and poor child outcomes. As a result, many interventions have been developed for mothers suffering from depression. Therapists working with parents and infants together have many ports of entry – they can choose to support the parent-infant relationship by directly targeting depression, with the assumption that reductions in depressive symptoms will result in more sensitive parenting or they can target parenting more directly, as in Infant Parent Psychotherapy.

Cicchetti, Toth, & Rogosch (1999) evaluated a child parent psychotherapy program attempting to promote secure attachment in young toddlers of depressed mothers. This psychotherapy program targeted issues that affected the mother-child relationship as a result of being clinically depressed. During baseline assessments of the 108 toddler participants it was found that levels of insecure attachment between the intervention and control groups were similar. Throughout the intervention mothers and infants participated in guided therapy sessions that focused on the mother's mental representations of relationships that were rooted in her past experiences. Post-intervention it was found that the percentage of children exhibiting secure

attachments in the intervention group increased, while the level of maternal depressive symptoms did not change. Based on this study, one may conclude that sensitive parenting results in secure infant attachment and that it can occur even in the context of maternal depression. It is not clear from this study the mechanism by which parent sensitivity was impacted. In Child Parent Psychotherapy (CPP), clinicians offer reflective developmental guidance, model appropriate behavior, interpret parent and infant feelings and actions, provide emotional support, and offer concrete assistance (Lieberman & VanHorn, 2005; 2009). Is any one of these components of CPP responsible for promoting sensitivity and secure attachment? Is it possible that this intervention increases sensitivity by impacting a mother's 1) own attachment representations, 2) ability to think about how her own feelings drive her behavior, 3) ability to think about the feelings or emotions underlying her child's behavior, which in turn impacts her behavior toward her child, or is it that the therapist is simply teaching the mother sensitive behaviors? There is reason to believe that the therapist, by interpreting parent and infant feelings, is indirectly influencing sensitivity and attachment.

Within the current literature, researchers have identified multiple factors that support a parent's ability to be sensitive. These factors include: theory of mind (Meins, 2002), mind mindedness (Rosenblum et al., 2008), empathy (Kiang et. al, 2004), emotion regulation (Cassidy, 1994), and reflective functioning (Fonagy & Target, 2005; Slade, 2005; Steele & Steele, 2008). All of these concepts are related in that they recognize the importance of a parent's ability to identify emotions in themselves and others. Parental reflective functioning is also is a mechanism that has been proposed to explain the transmission gap of attachment (Slade et. al, 2005).

Understanding the way in which CPP influences sensitivity and practice has implications for interventions. For example, along with fidelity measures it could help clinicians understand which components of CPP are most important in promoting sensitive parenting and a secure child attachment within the context of maternal depression.

Parental Reflective Functioning, Sensitivity, and Attachment

Parental Reflective Functioning (RF) is defined as a parent's capacity to reflect upon her child's internal experience understanding that mental states underlie behavior and by using this knowledge the parent is able to anticipate and respond in a sensitive and appropriate manner to her child's cues (Fonagy, Steele, Steele, & Higgitt, 1991; Fonagy & Target, 2005, Slade, 2005). Mental states are defined as thoughts, feelings, beliefs, intentions, and desires (Fonagy et al., 1998). This capacity drives the parent's behavior in attempting to read and understand their infant's cues, which is necessary for sensitive behaviors. In order to understand and communicate with others, it is necessary that individuals know how to interpret and respond to others' internal feelings (Steele & Steele, 2008). Parents aid in their children's early development of understanding their own and others' minds. Evidence suggests that parental reflective functioning is a relatively stable construct, meaning that without intensive therapy, levels of reflective functioning remain the same across time (Steele & Steele, 2008). In 2008, Ensor & Hughes examined verbal and social interactions between mothers and their children at multiple time points during early childhood. They found that mothers who held engaging conversations with their children and discussed mental states, had children with a greater understanding of internal mental states and cognitive concepts at age four. Suggesting that by keeping in mind their own and their child's mental states, mothers were able to promote higher levels of emotional understanding and cognitive capacity in their young children. This capacity

exhibits the landmark abilities of being reflective, and supports the idea that by modeling understanding of mental states, mothers promote children's later ability to understand and interpret others mental states. In addition to supporting children's emotional competence, parental RF has been found to be associated with parental sensitivity and infant attachment. Slade and colleagues (2005) found that maternal reflective functioning assessed using the Parent Development Interview at 10 months of child age was predictive of infant's attachment status assessed using the Strange Situation (Ainsworth et al., 1978) at 14 months. Mothers of securely attached infants had higher reflective ability compared to their insecure and disorganized counterparts. The results of this study again provide evidence supporting the idea that the ability for a parent to be reflective about their child's thoughts, feelings, beliefs, desires, and intentions, plays a crucial role in the development of her child's attachment style. The link between parental RF, parenting, child attachment and social emotional competence has prompted interventions focused on increasing parents RF.

Within the literature on RF, most studies have focused on mental health issues related to borderline personality (Fonagy, Target, & Gergely, 2000; Fonagy, Gergely, Jurist, & Target, 2005), with only a few interventions focusing on trauma (Schechter et al., 2006; Schechter et al., 2008), substance abuse (Suchman, DeCoste, Castiglioni, McMahon, Rounsaville, & Mayes, 2010) and depression (Vrieze, 2011). The question remains, are those with low parental RF in these samples more prone to developing parental psychopathologies?

Parental Reflective Functioning & Attachment

One important intervention that has attempted to address parental reflective functioning and attachment is the Minding the Baby Program (MTB) that was developed at the Yale Child Study Center. It has been identified as one of the primary intervention programs that aim at

improving mother and infant attachment, as well as mental health, and positive developmental outcomes for high risk samples of mothers and infants. With an interdisciplinary focus the MTB program provides a combination of in home support from nurse practitioners, mental health professionals, and clinical social workers. During pregnancy participants were visited in home on a weekly basis that continued through one year post partum. The main goal of all practitioners in the intervention is to support the mother in learning how to be reflective in order to better understand her own and her infant's mental, physical, and emotional needs. Promoting reflective functioning in mothers happens directly through the clinician's ability to model taking a reflective perspective. They question themselves about what parents and infants may be feeling, and how those mental states underlie their behaviors. These clinicians constantly encourage the mother to be aware of her own and her infant's mental states.

In a doctoral dissertation study conducted by Miller (2008), the MTB program was evaluated in order to see if it was effective in changing maternal RF over the course of the intervention. Maternal RF was assessed before and after the intervention using semi-structured clinical interviews. It was found that the MTB program did increase maternal reflective functioning from pre intervention to post intervention. From this study, it is important to note that with focused long term intervention it is possible to increase levels of maternal reflective functioning and in turn impact representations of the infant as well as caregiving behaviors. This idea holds promising results for future interventions and attempting to combat the effects of mothers' unresolved histories as well as the negative effects of psychopathology and daily life stressors.

Although there have been other programs created in order to address similar issues, Slade (2006) notes that none of these programs explicitly aim at improving parental reflective

functioning. Slade (2006) argues that the existing programs that emphasize parent-infant psychotherapy and attachment focused interventions, have resulted in altering parental representations of the child because they are ultimately altering levels of reflective functioning. By doing this, the parent is able to focus on their relationship with their child and in turn alter their caregiving practices.

Despite growing amounts of research on reflective functioning, parenting, and attachment, some questions remain unanswered. Maternal depression has been identified as a risk factor to not only maternal well being, infant attachment, and the mother-infant relationship, but has also been found to indirectly impact later child development outcomes that are needed to foster healthy, autonomous children. This thesis hopes to address some of the issues that these topics have brought into question.

Current Study

This study seeks to further understand the role that reflective functioning plays in parenting and attachment when there are varying symptoms of maternal depression.

More specifically, the current study aims to:

- 1) Replicate findings from other studies with regard to the relationship between reflective functioning, parenting and attachment. Based on findings from previous studies, it is hypothesized that:
 - a) RF will be correlated with positive parenting (operationalized as a composite of Maternal Engagement, Flexibility, Warmth, Positive Affect, Behavioral Sensitivity, and Affective sensitivity).
 - b) Mothers whose children are classified as secure will demonstrate significantly higher positive parenting scores than those whose children are classified as

insecure. Further, Mothers whose children are classified as disorganized will demonstrate significantly lower positive parenting scores than those whose children are classified as having an organized attachment.

- c) There will be significant differences in maternal RF between children classified as secure vs. insecure and disorganized vs. organized; securely attached children will have mothers with the highest RF scores and disorganized children will have mothers with the lowest RF scores.
 - d) Positive Parenting will mediate the relationship between RF and attachment.
- 2) Understand the relationship between depression, reflective functioning, parenting, and attachment. Based on previous research, it is hypothesized that:
- a) Depressive symptoms will not be correlated with RF. According to theory, reflective functioning is a trait-like psychological construct that begins to develop in early childhood, beginning with the development of theory of mind. While no studies have tested this relationship, this study hypothesizes that depression does not significantly impact a person's ability to reflect on the mental states and intentions of the self and other.
 - b) Depressive symptoms will be negatively associated with positive parenting.
 - c) Maternal symptoms of depression will be associated with the infant's attachment classification. Compared to securely attached children, those with insecure attachments will have mothers with higher levels of depressive symptomatology. Children classified as disorganized will have mothers with higher symptoms of depression than children who are classified as having an organized attachment.

- 3) Determine if RF moderates the relationship between depressive symptoms and parenting. As noted in hypothesis 2b, it is expected that a significant relationship does not exist between depressive symptoms and reflective functioning; parents who are depressed, but have high levels of reflective functioning, will be better able to 1) reflect on and recognize their own feelings and 2) understand how their feelings impact their desire to respond and how that in turn, impacts their child. According to Mary Ainsworth (1978) these are two of the three conditions that comprise sensitivity. She suggested that in order for a mother to be sensitive, she must be able to first acknowledge that her child has a need, then interpret that need correctly, and finally respond in a timely and appropriate manner. As a result, it is hypothesized that for mothers with high levels of depressive symptoms, high levels of RF will act as a buffer to the negative effects of depressive symptoms on positive parenting.

CHAPTER 2

Methods

Procedure

Participants in this study include a subsample of women and children who participated in the Maternal Anxiety in the Child-bearing Years (MACY) study (PI, Muzik). The MACY study is a longitudinal cohort study that includes women that experienced a traumatic event and their infants from pregnancy to 18 months postpartum. The study uses a mixed methods approach and collects quantitative, qualitative and biological data, to examine the role that the caregiving environment has on child outcomes. Data were collected via phone interview, home visits and laboratory visits when infants were 4, 7, 12, and 15-18 months old. At four months postpartum, mothers were interviewed via telephone; they were given instructions on participating in the MACY project, and were also sent surveys about current life stressors, levels of anxiety and depression, available social support, and their infant's current behaviors and levels of parenting stress. During this interview the first seven month follow-up home visit was scheduled. At seven months, two home visits were conducted. During the first visit researchers reviewed the protocol and mothers were given the opportunity to ask any questions, or mention any concerns about participating. Following this review, three video-taped interactions were recorded; these interactions included the Still-Face Paradigm (Tronick, Als, Adamson, Wise, & Brazelton, 1978), a 5 minute free play task, and two 3 minute teaching tasks. Infant's saliva and mucus samples were also collected. During the second seven month follow up home visit mothers were asked about their infant's behavior, food preferences, as well as given a semi-structured interview pertaining to her traumatic experience. At 15-18 months mothers and their infants participated in an interaction task, the Strange Situation Procedure (Ainsworth et al., 1978) and a

semi-structured interview to assess parental reflective functioning. It is important to note that although this was the protocol for each of the visits and every effort was made to obtain complete data visits may not have been conducted as discussed. Many issues were encountered during data collection, missing data could be due to any of the following reasons; a) mothers leaving the study prior to completion, b) mothers not returning take home measures, c) visits lasting longer than anticipated therefore leaving certain measures incomplete, and d) mothers unwillingness to come to the lab which resulted in missing attachment data.

Participants

The current study includes a sub sample of 101 mother-infant dyads from the MACY study who participated in the 15-18 month lab visits where reflective functioning and infant attachment were assessed. Mothers range in age from 18-45 years ($M = 29.44$, $SD = 5.96$). The range of the annual household income falls between under \$5,000 to above \$100,000. Just under two-thirds of the mothers are Caucasian (65.94%, $n = 62$), 22.3% of mothers are African-American ($n = 21$), 5.3% of mothers identified as Asian or Pacific Islander ($n=5$), 3.1% as Latino ($n=3$), 1% as Bi-Racial ($n=1$) and 2.1% identified as other ($n=2$).

Mother's self-report of education varied. Four mothers had less than a high school degree (4.25%), 10 mothers (10.6%) reported having a high school degree or GED, 16 mothers had some college (17%), six mothers earned an Associates degree (6.3%), three mothers reported having a vocational degree (3.1%), 33 mothers reported earning a Bachelors degree (35.1%), 14 mothers reported having earned a Master's degree (14.8%), and eight mothers reported earning a Doctoral degree (8.5%). Just over two thirds of mothers were married ($n = 67$, 70.5%), 24 were single and never married ($n = 24$, 25.2%), three mothers were living with the birth father ($n=3$, 3.1%), and one was separated ($n=1$, 1%). It is important to note that five mothers did not report

their age, seven did not report their race and education level, and six did not report their marital status. Eight mothers did not report their total household income. Of the infants (57 males and 39 females), 56.2% are Caucasian (n=54), 20.8% are African American (n=20), 4.1% are Latino (n=4), 3.1% are Asian or Pacific Islander (n=3), 11.4% are Bi-Racial (n=11), and 2.1% identified as other (n=2). The gender of five infants and race of seven infants was not reported. Demographic information presented above is also available in Table 2.

Measures

Demographics. Demographic information was assessed at the first seven month home visit. Participants provided information about their race, age, education level, marital status, total household income, and their infant's race and gender.

Post Partum Depression Scale. The Post Partum Depression Scale (Beck & Gable, 2000) was used to assess post partum depression (PPD). This scale is appropriate for mothers who experience depression up to one year after birth. It is a 35-item scale that seeks to specifically evaluate depressive symptoms in mothers. Mothers are asked to rate on a scale of one to five, how much they agree or disagree with the statement given. Items are grouped together on seven different dimensions that seek to understand the mother's experience with depression. The seven dimensions of the scale include, sleeping/eating disturbances ($\alpha = .83$), anxiety/insecurity ($\alpha = .83$), emotional liability ($\alpha = .89$), cognitive impairment ($\alpha = .91$), loss of guilt/shame ($\alpha = .89$), and contemplating hurting oneself ($\alpha = .93$). Using the PDSS it is possible to look at depression via severity (depressed versus not depressed and chronic versus not).

Totals are calculated by summing responses for each scale and for a total scale; total scores range from 35-175. Cutoff scores above 80 are representative of major depressive

disorder. Using a cutoff score of 80, the PDSS is representative of 94% sensitivity, 98% specificity, and positive predictive value of 90% (Beck & Gable, 2001).

Attachment. The Strange Situation Procedure (SSP) was used to assess infant attachment classifications. Created by Mary Ainsworth (1978), the procedure allows observers to identify infant attachment classification based on infant behavior during eight distinct episodes. During these episodes the parent-infant dyad is invited into a laboratory room, in which they experience two separation episodes, two reunion episodes, along with free play and a stranger appearance. The aim of the procedure is to slowly activate the attachment system, in order to be able to examine attachment behaviors. Each SSP was recorded, and then coded using Ainsworth et al. (1978) criteria, as well as adding Main & Solomon (1986) criteria for assessing disorganized attachment. Coders were trained to reliability on a gold standard set of videos by June Sroufe. The two main coders established 95% reliability on a previous data set. For the current study, 10 cases were double coded, and reliability on all four classifications was 90%. Discrepancies between the two coders were discussed, and if a consensus was not met the tape was sent to a third coder. Consensus scores were used in the analyses.

Maternal Behavior. Multiple dimensions of maternal interactive behavior shown to predict attachment in later infancy was assessed from video tapes of a five-minute mother-infant free play session administered in the home setting when the infants were seven months old. Mothers were given a standard set of age appropriate toys and asked to play with their infant as they normally would. The videotaped interactions were coded using the MACY Infant-Parent Coding System (MIPCS, Earls, Muzik, & Beeghly, 2009). The MIPCS includes 14 maternal, 10 infant, and 4 dyadic rating scales. For this study, six of the maternal rating scales were used: Behavioral Sensitivity, Engagement, Affective Sensitivity, Flexibility, Positive Affect, and

Warmth. Each dimension of maternal behavior was rated on a 5-point Likert scale with higher scores indicating higher levels of a particular behavior (e.g. a higher score on the behavioral sensitivity scale indicates a higher level of behavioral sensitivity). Based on results from a principal components analysis, a “Positive Parenting” composite score was computed by averaging scores from these six interrelated maternal rating scales. The standardized Cronbach’s alpha for the Positive Parenting composite was .85, and scores ranged from 1.63 to 4.58 ($M = 3.40$, $SD = .65$). To assess inter-coder reliability, trained coders independently scored 40 randomly selected videotapes and the correspondence between these scores and the original scores was evaluated using intra-class correlations (ICC). The average ICC’s for the six maternal scales was .85, indicating excellent inter-coder reliability overall. The ICC’s for the individual scales were as follows: Behavioral sensitivity (ICC= .85), Engagement (ICC=.86), Affective Sensitivity (ICC=.86), Flexibility (ICC=.77), Positive Affect (ICC=.93), and Warmth (ICC=.84).

Reflective Functioning. Reflective Functioning was assessed using the Parent Development Interview-Revised (PDI-R, Slade, Aber, Bresgi, Berger, & Kaplan, 2004). It is a 45-item semi-structured interview that assesses the parent’s ability to reflect on their own and their child’s thoughts, feelings, beliefs, desires, and intentions. The PDI-R is scored using the adapted version of reflective functioning coding system (Slade et al., 2005) to determine overall levels of reflective functioning. The PDI-R consists of both permit and demand questions, the demand questions are those that demand a parent attempt to reflect on their own or their child’s experience (i.e. when your child is upset, what does he do and how does that make you feel?). Responses are scored on an 11 point scale (from -1 to 9), with higher scores being indicative of higher levels of reflective functioning. Responses to all demand questions are scored and then the interview as a whole is given a typicality score, which is used in the analyses. Indices of high

reflective functioning are denoted by four different types of reflective capacity: (1) displaying an awareness of the nature of mental states, (2) explicitly attempting to tease out mental states underlying behavior, (3) recognizing developmental aspects of mental states, and (4) mental states in relation to the interviewer (Fonagy et al., 1998; Slade et al., 2005). The fourth type emphasizes the individual's ability to understand that although they may have feelings about past events or experiences, that the interviewer too, may have their own feelings about hearing about the experiences. More detailed information about the coding system is available in Slade (2005). Low reflective functioning scores (1-2) denote the lack of ability to acknowledge and discuss mental states (thoughts, feelings, beliefs, intentions, and desires) of their own or their child's. A score of three represents a parent's ability to acknowledge mental states; however the ability to link mental states to behavior is inconsistent. A score of five represents a parent's consistent ability to link mental states and behaviors. Parents at this level are considered average, and are able to understand that their infant's feelings underlie their behavior. Scores six and above are considered high levels of reflective functioning, at these levels parents are giving a more complex, in-depth narrative of their own and their child's internal experience. Coders were trained to reliability using a gold standard set of transcripts from the author of the measure. 31.7% of transcripts were double coded; disagreements were handled by conferencing together and coming to a consensus about scores. Consensus scores are used in the analyses. Inter-rater reliability of overall classifications was 83%, $p < .001$.

Risk Composite. To better understand risk in the current sample, a risk composite was created using four variables assessed at the first seven month home visit. An age risk variable was created by selecting cases in which the mother's age was 21 years or younger. The variable was dummy coded with zero representing mothers older than 21 and one representing 21 years or

younger. A household income risk variable was created by selecting cases in which the total household income was below \$29,999 per year. Again, zero represented having a household income above that amount and one representing having a household income below. The third variable created was the parenting risk variable, this was created by dummy coding cases with married parents receiving a zero, and single parents receiving a one. The fourth and final risk variable created was a race risk variable. African American mothers were given a code of one, and all others were coded zero. A total risk composite was created by summing the four risk variables, higher scores on this variable indicated greater risk. Descriptive statistics for this variable can be found in Table 3.

Statistical Analyses

Data were analyzed using the statistical software, IBM SPSS statistics version 17. To begin, data were examined for input accuracy, plausible means and standard deviations, outliers, assumptions and missing data. Next, a series of t-tests and cross tabulations were conducted to assess differences in study variables for data that were missing. A t-test and cross tabulation was conducted to examine differences in depressive symptoms, parenting, attachment, and risk for parents who did and did not have reflective functioning scores. A second t-test and cross tabulation were conducted to identify differences in parenting, attachment, reflective functioning, and socio-demographic risk between those missing and those with complete depressive symptoms. The third t-test and cross tabulation were used to identify differences in depressive symptoms, reflective functioning, parenting, and risk between mothers of children with attachment classifications and those without attachment classifications. Then, bi-variate correlations between variables of interest were conducted in order to get preliminary results and to assess whether socio-demographic risk would be used as a covariate in the analyses.

Study aim one sought to replicate findings from previous studies concerning parenting and reflective functioning. Bi-variate correlations were conducted in order to identify relationships between parenting, attachment, and reflective functioning. In order to identify significant differences in parenting and reflective functioning among children with different attachment classifications, t-tests were conducted looking at both secure versus insecure classifications and organized versus disorganized classifications. Mediation analyses were conducted to examine if parenting mediated the relationship between reflective functioning and attachment.

Study aim two examined the relationship between depression, reflective functioning, parenting, and attachment. To investigate the relationship between the proposed variables, t-tests were conducted to identify if securely attached children had mothers with lower levels of depressive symptomatology compared to their insecurely attached counterparts.

The third and final aim sought to determine if reflective functioning moderated the relationship between depression and parenting. This was examined using a series of regression analyses and a test of simple slopes.

CHAPTER 3

Results

Data Cleaning and Descriptive Analyses

All study variables were checked for accuracy of input by examining individual ranges of each variable. In order to inspect uni-variate outliers, z-scores were computed, individuals cases with scores beyond ± 3.29 ($p < .001$, two-tailed test) were considered to be outliers. There were no identified uni-variate outliers. Next, a missing variable analysis was conducted. It was found that both depression symptoms at 7 months and infant attachment status at 15 months were missing data for six dyads. These cases were deleted.

In order to examine study variables for non-normality, histograms were checked for skew and kurtosis. Once examined, z-scores were also computed by taking the value of the skew or kurtosis and dividing by its standard error, in order to further verify the departure from normality ($z > 1.96$). Depressive symptoms was the only skewed variable (skewness = 3.36, $SE = .261$). A log transformation returned depressive symptoms back to normality (skewness = 1.18, $SE = .261$). For all of the remaining analyses, with the exception of the descriptive statistics, the transformed depression variable will be used.

In order to determine if mothers who were missing reflective functioning data differed in any way from those who had complete data, a series of t-tests and a cross tabulation were run. Results revealed that there were no differences in depression symptomatology, parenting, or infant attachment classification among those who completed the PDI and those who did not complete the PDI. Mothers who did not complete the PDI ($M = 1.27$, $SD = 1.35$) had significantly higher levels of risk compared to those who did complete the PDI ($M = .817$, $SD =$

1.28), $t(170) = -2.24, p < .05$. Because the PDI was assessed in a laboratory session, it may be that mothers with higher risk did not come to the visit.

In order to determine if mothers who were missing depression scores were different than those with complete depression data on reflective functioning, parenting, infant attachment, and risk a series of t-tests and a cross tabulation were used. No differences in reflective functioning or parenting were found for those with complete and incomplete depression data. Differences were found in attachment classifications and risk. Mothers who were missing depression data ($M = .25, SD = 0.71$) did differ significantly from those who had depression data on infant attachment classification ($M = 1.25, SD = 0.98$), $t(70) = 2.80, p < .01$. Finally mothers who did not have complete depression data had significantly higher risk ($M = 1.73, SD = 1.62$) than mothers who did have complete depression data ($M = .76, SD = 1.25$), $t(89) = -2.32, p < .01$.

Finally, those missing attachment classifications were also examined using t-tests and a cross tabulation to see if there were significant differences in depression symptoms, parenting, reflective functioning, and risk. Compared to mothers whose children participated in the Strange Situation Procedure mothers of children missing attachment classifications did not differ significantly on depression, parenting, or reflective functioning. However mothers of children missing attachment classifications ($M = 1.36, SD = 1.49$) did have significantly higher levels of risk compared to those who were not missing attachment classifications ($M = .724, SD = 1.23$), $t(89) = -2.00, p < .05$

Preliminary Analyses

Descriptive Findings. Despite having experienced a traumatic event in their lifetime, the current sample had surprisingly low levels of socio-demographic risk. At seven months 5.9% of mothers were identified as having high levels of socio-demographic risk (all 4 risk factors),

while 64.3% of mothers were identified as having little to no risk (0-1 risk factors) and 19.8% of mothers were rated as having moderate levels of risk (2-3 risk factors). Results of the PDSS at 7 months indicate that 23.5% of mothers had depressive symptom levels above the major depressive disorder cutoff level (score of 80). Depressive symptom scores ranged from 35-132, ($M = 64.55$, $SD = 24.00$). The average parenting score was 3.40. Reflective functioning scores ($M = 4.45$, $SD = 1.42$) were similar to the average scores in low risk samples and higher than RF scores in more at-risk samples. Among children who completed the Strange Situation Procedure, just over one-half (56.9%, $n = 41$) of children were classified as securely attached, whereas 43.1% ($n = 31$) of children were classified as insecurely attached. Majority of the children were classified as having organized attachment classifications (81.9%, $n = 59$), whereas 18.1% ($n = 13$) of children were classified as having disorganized attachment. Descriptive statistics and frequencies for all study variables are presented in Table 3. Correlations of study variables can be found in Table 4. As can be seen in this table risk was found to be significantly negatively correlated with secure attachment classification, parenting, and reflective functioning. As a result, it is included as a covariate in subsequent analyses.

Aim One: Reflective Functioning, Parenting, and Attachment

Aim one sought to replicate previous findings by understanding: 1) if reflective functioning is correlated with parenting, 2) if there are significant differences in parenting across attachment classifications, 3) if there are significant differences in reflective functioning across attachment classifications, and 4) if parenting mediates the relationship between reflective functioning and attachment.

In order to test the first hypothesis that reflective functioning is correlated with parenting, bi-variate correlations between reflective functioning scores and parenting were assessed. As it

was hypothesized, reflective functioning was found to be significantly correlated with positive parenting, $r(94) = .352, p < .01$ (See Table 4)

To test the second hypothesis t-tests were conducted to identify if there were significant differences in parenting among children with different attachment classifications. It was found that there were significant differences in parenting among children with secure and insecure attachment classifications. Securely attached children had mothers with significantly higher levels of positive parenting ($M = 3.61, SD = .514$) than insecurely attached children ($M = 3.21, SD = .804$), $t(70) = -2.63, p < .05$. A second t-test was conducted in order to identify differences in parenting between children classified as disorganized and organized. The findings support the hypothesis that children classified as disorganized have mothers with significantly lower levels of positive parenting ($M = 2.91, SD = .849$) compared to their organized counterparts ($M = 3.56, SD = .586$), $t(70) = 3.25, p < .05$.

In order to assess whether reflective functioning varied by attachment classification t-tests were conducted. Results reveal that there were significant differences in reflective functioning scores, $t(70) = -3.147, p < .05$. Mother's whose children were classified as secure had significantly higher reflective functioning ($M = 5.00, SD = 1.40$) than mothers whose children were classified as insecure ($M = 3.97, SD = 1.35$). A second t-test revealed that mothers whose children were classified as disorganized ($M = 3.62, SD = 0.87$) had significantly lower reflective functioning than mother's whose children were classified into organized attachment categories ($M = 4.76, SD = 1.50$), $t(70) = 2.66, p < .01$.

The fourth hypothesis that parenting mediates the relationship between reflective functioning and attachment was tested using a bootstrapping procedure designed for small samples that also accommodates dichotomous dependent variables (Indirect, Preacher & Hayes,

2008). This technique produces point estimates and bias-corrected and accelerated confidence intervals. The Preacher and Hayes' (2008) SPSS macro, Indirect, was used to estimate the significance of the mediation. According to the authors, if the 95% CI does not include zero then the effect is said to be significant at $p < .05$. Four mediation analyses were run, the first without statistically controlling for risk and the second controlling for risk using those classified as secure. The third without statistically controlling for risk and the fourth controlling for risk using coded disorganized.

In the first model that was run without controlling for risk, there was a significant effect of reflective functioning on both parenting ($B = .173$, $p < .05$) and secure attachment ($B = .555$, $p < .05$). However, there was a non-significant effect of parenting on secure attachment ($B = .660$, $p = .117$). After controlling for the effect of parenting, the direct effect of reflective functioning on attachment decreased ($B = .453$, $p < .05$). To test whether the mediation itself was statistically significant a bootstrapping procedure was used. This procedure provides a formal test of the hypotheses that the effect of reflective functioning on attachment is operating indirectly via parenting. The point estimate of this mediation effect (using 5000 bootstrap re-samples) was .114 ($SE = .104$), 95% CIs $[-.014, .372]$. The overall mediation was found to be non-significant.

The second model included risk as a covariate, it was found that there was a significant effect of reflective functioning on both parenting ($B = .122$, $p < .05$) and secure attachment ($\beta = .471$, $p < .05$). However, there was a non-significant effect of parenting on secure attachment ($B = .708$, $p = .163$). After controlling for the effect of parenting, the direct effect of reflective functioning on attachment decreased, but was found to be non-significant ($B = .395$, p

= .06). Again, a bootstrapping procedure was used. The point estimate of this mediation effect (using 5000 bootstrap re-samples) was .086 (SE= .088), 95% CIs [-.025, .326]. These results support an overall non-significant mediation.

Each of these mediations were conducted again, using disorganized vs. organized attachment as the dependent variable. The third model found a significant effect of reflective functioning on parenting ($B = .173, p < .05$) and disorganized attachment ($B = -.622, p < .05$). A significant effect of parenting on attachment was found ($B = -1.03, p < .05$). After controlling for the effect of parenting, the direct effect of reflective functioning on disorganized attachment got weaker ($B = -.455, p = .09$). Generally a decrease in significance level from the predictor to the outcome variable indicates mediation, however, the point estimate of this mediation effect (using 5000 bootstrap re-samples) was $-.1792$ (SE= .131), 95% CIs [-.518, .006], which suggests that the overall mediation is non-significant.

The fourth and final mediation model included risk as a covariate. A significant effect of reflective functioning on both parenting ($B = .122, p < .05$) and disorganized attachment ($B = -.578, p < .05$) were found. A non-significant effect of parenting on attachment was found ($B = -.937, p = .097$). Once parenting was controlled, the direct effect of reflective functioning on disorganized attachment got weaker ($B = -.462, p = .091$). Using 5000 bootstrap re-samples, the point estimate of this mediation effect was $-.114$ (SE= .122), 95% CIs [-.434, .046] suggesting the finding of a non-significant overall mediation.

Aim 2: Depression, Reflective Functioning, Parenting, and Attachment

Aim 2 sought to understand the relationship between depressive symptoms, reflective functioning, parenting, and attachment. As hypothesized, reflective functioning was not

correlated with depression symptoms, $r(83) = .110, p = .316$ (see Table 4). However, is was negatively correlated with parenting, $r(82) = -.283, p < .05$. T-tests were conducted to assess the relationship between maternal depressive symptoms and infant attachment. Results revealed that mothers of insecurely attached children ($M = 69.96, SD = 22.05$) did not differ significantly on depressive symptoms compared to mothers of securely attached children ($M = 62.77, SD = 24.00$), $t(62) = 1.19, p = .237$. Furthermore, depressive symptoms in mothers of children classified as disorganized ($M = 66.09, SD = 17.10$) were not significantly different from depressive symptoms found in mothers whose children were classified as organized ($M = 65.33, SD = 24.61$), $t(62) = -.096, p = .924$.

Aim 3: Reflective Functioning as a Moderator of the Relationship between Depression and Parenting

Aim 3 sought to understand if reflective functioning moderated the relationship between depression symptoms and parenting. A moderated regression was conducted in order to examine this relationship. Before running the analyses, new centered variables were created for reflective functioning and depression symptoms in order to account for issues of multi-collinearity. Then, an interaction variable was created using the centered reflective functioning variable and centered depression variable. Next, two regression analyses were done using the respective variables. The first block of the regression analyses used the parenting variable as the dependent variable, and the centered reflective functioning and centered depression as the independent variable. In order to account for risk, the total risk composite variable was also centered, and then added as an independent variable. The second block kept parenting as the dependent variable, and added in the interaction variable. The results suggest that reflective functioning moderates the relationship between depression symptoms and parenting. Overall, the model was

significant, $\Delta R^2 = .032$, $F(1, 75) = 4.37$, $p < .05$, see Table 5. The test of simple slopes for reflective functioning at one standard deviation above the mean showed that maternal depressive symptoms was not predictive of positive parenting, unstandardized $B = -.80$, $p > .05$. In contrast, when reflective functioning was one standard deviation below the mean, higher levels of maternal depressive symptoms were associated with lower levels of positive parenting, unstandardized $B = -2.16$, $p < .05$ (see Figure 2). Therefore the results suggest that at high levels of reflective functioning and high levels of depressive symptoms, mothers appear to be buffered from the negative effects of depression on positive parenting.

CHAPTER 4

Discussion

The first aim of this study was to replicate and extend findings pertaining to reflective functioning, infant attachment, parenting, and maternal depression as well as to understand if reflective functioning acts as a protective factor in the mother-infant relationship.. Consistent with expectations the results suggest that reflective functioning is associated with positive parenting; in this sample mothers who have high levels of reflective functioning have higher levels of positive parenting and infants classified as securely attached. Despite these relationships, parenting did not mediate the relationship between reflective functioning and attachment. Further, depressive symptoms were not associated with reflective functioning. Contrary to expectations, depressive symptoms were not associated with infant attachment. However, as expected, reflective functioning did moderate the relationship between depressive symptoms and parenting. Despite the theoretical notion that reflective functioning may support parenting among depressed women, this is the first study to assess this relationship.

Replication of Previous Findings: Reflective Functioning, Parenting and Attachment

The first step in this study was to understand whether reflective functioning was correlated with parenting and attachment as it is in previous studies. Our findings are consistent with other studies, which suggests that mothers with higher levels of reflective functioning also demonstrate more sensitive parenting behaviors (Slade, 2006; Suchman, DeCoste, Castiglioni, Legow & Mayes, 2008; Suchman DeCoste & Mayes, 2009) and have infants who are more likely to be classified as having a secure attachment (Fonagy et al., 1991; Fonagy, Steele, & Steele, 1991). Following the work of Mary Ainsworth who suggested that parental sensitivity requires a parent to first be aware that their infant has a need, then must correctly interpret the

infant's need, and finally responds in a way that meets the need. To be sensitive, a parent must have insight into what her infant is thinking and feeling and what caused those thoughts or feelings. Mothers high in reflective capacity demonstrate an ability to take a developmental perspective about their child's cognitive, verbal, and motor abilities and are able to infer thoughts and feelings based on their infants' non verbal cues (Slade, 2005, 2006; Suchman, Decoste, Leigh, & Borelli, 2010). They are also able to fully experience their own and their child's emotions without becoming overwhelmed or shutting down, allowing them to respond in a sensitive manner (Slade, 2005).

Limited evidence suggests that reflective functioning is related to attachment through parenting. That is, the reason that reflective functioning predicts attachment is because of its effect on parenting (Grienenberger, Kelly, Slade, 2005). Although the current study found that parenting was associated with both constructs, the analyses yielded a non-significant mediation even while accounting for risk, which suggests that while reflective functioning is associated with parenting, it also has a direct effect on infant attachment. These results may have been found for a wide variety of reasons. First, it may be that parenting only partially mediates the relationship between reflective functioning and attachment and that there is a direct effect between parent reflective functioning and attachment. Fonagy, Steele, Moran, Steele, & Higgitt (1991) found that parental reflective functioning prenatally predicted infant attachment security at 12 months. It could also be that the timing and measurement of sensitivity in this sample is not associated with attachment. Ward & Carlson (1995) also did not find evidence for the link between maternal sensitivity and infant attachment organization. The authors proposed that a possibility for this finding may be that there is another stronger link that impacts infant attachment security, such as maternal states of mind. Their findings provide evidence supporting

the results that were found in the current study, that there could be a direct effect of reflective functioning on infant attachment status. More specifically, it could be that mother's mental states and ability to be reflective more strongly impacts the intergenerational transmission of attachment over parenting behaviors. Another possibility for this finding may be due to the measurement and timing of assessments, similar to what was proposed by Atkinson et al. (2000). While reflective functioning is thought to remain stable over time (Steele & Steele, 2008), research suggests that parenting can change over time and across developmental shifts, for example as children become mobile and more verbal. As parenting changes so can children's attachment classification (Juffer, Bakermans-Kranenburg, & van IJzendoorn, 2005; Cicchetti, Toth, & Rogosch, 1999). In this study parenting was measured approximately 8 months before attachment classifications were assessed which may have decreased and negatively impacted the effect size of findings. A solution to this issue may be to utilize a parenting variable that was assessed at the 15 month time point when reflective functioning and attachment were also assessed. Other issues that may have impacted the null findings include insufficient power due to limited sample size, and discrepancies between the quality of PDI interviewers. Although research assistants received extensive training in the administration of the PDI, one research assistant did not probe when parents gave vague or short answers. This issue made it nearly impossible for these transcripts to receive a score of above 3. It was not until these interviews were transcribed that the research team became aware of these differences. To assess whether this may have been the case a post hoc analysis of reflective functioning scores by administrator will be run. Further replications of this mediation are needed in order to gain a better understanding of the relationship between levels of reflective functioning, attachment, and parenting.

Depression, Reflective Functioning, and Parenting

In addition to replicating findings from other studies regarding the mediating role of parenting on the relationship between reflective functioning and attachment this study sought to understand how depressive symptomatology was associated with reflective functioning. Following research by Toth, Rogosch, and Cicchetti (2008) and Cohen et al. (1990) it was hypothesized that depressive symptoms would be negatively correlated with reflective functioning and parenting. In this study, reflective functioning was not related to depressive symptoms. This finding replicates a recent finding by Vrize (2011) that reflective functioning did not differ among depressed and non-depressed parents of toddlers. That is, those who have high levels of reflective functioning are still susceptible to depression. It is likely that these mothers are better able to think about how their symptoms of depression impact their thoughts and feelings towards their children and as a result can respond to their infants needs despite feeling depressed. It could also be that we could not uncover a relationship that exists because of discrepancies in interviewer technique. Transcripts lacking proper amounts of probing become difficult to accurately code.

The most interesting finding in the current study was that reflective functioning was found to moderate the relationship between depression symptoms and parenting even after accounting for socio-demographic risk. In sum, when controlling for levels of risk, women with high symptoms of depression and high levels of reflective functioning displayed higher levels of positive parenting compared to women with higher symptoms of depression and low levels of reflective functioning. This finding supports the theory that the capacity to think reflectively in regards to one's own and their child's mental states acts as a protective factor promoting optimal infant development even in the face of adverse effects of depressive symptoms. The increased

levels of sensitivity that are related to thinking reflectively may allow mothers to better cope with their difficult life situations, and in turn positively affect their parenting behaviors. By equipping mothers who are suffering from depression with the capacity be reflective, clinicians give mothers the ability to interpret their child's needs as a function of their mental states, this capacity also allows the mother to further understand her child's mind. As the mother is able to imagine and acknowledge her own and her child's internal states, she is more capable of promoting more optimal and intimate relationships with others (Fonagy et al., 2005; Slade, 2005). Based on both past literature and the current study, reflective functioning holds much promise for future interventions, it is becoming a widely studied topic because of its positive implications for intervention with mothers of psychopathology and substance abuse issues (Suchman, Decoste, Rosenberger, & McMahon, 2012; Pajulo et al. 2012)

The toddler- parent psychotherapy program (TPP) used by Cicchetti, Toth, & Rogosch (1999) was one of the first of its kind to begin to address the promotion of secure infant attachment through guided therapy sessions via enhancing maternal mental representations of the child. This program held promise for improving the ability for depressed mothers to promote optimal socio-emotional development in their infants. This intervention prompted the current authors to investigate reflective functioning as a means improving infant attachment status for infants of mothers experiencing depressive symptoms. The findings of the current study support the idea that reflective functioning should be used in future interventions for promoting healthy and secure relationships between mothers and their infants. Intimate guided therapy sessions, with both mother and infant may provide more support than the more traditional therapy practice. Future studies should further investigate the promotion of reflective functioning in mothers who are suffering from other types of psychopathology.

Limitations

One limitation to the current study was that it assumed that the construct of reflective functioning remained stable across time points. Although Steel & Steele (2008) supported this claim, more research is needed to truly identify if this is the case. If reflective functioning does truly remain stable over time, this further supports that interventions should be created and executed as early as possible. If mothers suffer from depression or other psychopathology prior to the birth of their child, interventions may be able to enhance their ability to think reflectively about their child prior to their birth and improve the environment for their unborn children.

In sum, the main focus of the current study was to replicate and extend the current research on parental reflective functioning and its relation to maternal depressive symptoms and infant attachment classification. Although the sample size was limited, the findings have suggested the importance of reflective functioning as a protective factor for mothers who suffer from depression.

Table 1

List of visits and constructs collected

Visit	Constructs Collected
4 month Telephone Interview	Trauma/PTSD
	Depression
	Bonding
	Infant Behaviors
	Current life stressors
	Available social support
	Levels of parenting stress
	Infant Temperament
	Demographics
	Parent-infant interaction (Still Face Paradigm)
7 month Home Visit #1	Free play
	Teaching tasks
	Infant saliva/mucus samples
	Infant behavior
	Food preferences
7 month Home Visit #2	Anxiety and depression levels
	Trauma experience (Trauma Meaning Making Interview)
	Strange Situation Procedure
	Mother & Infant saliva/mucus samples
	Secure Base Script
15 month Lab Visit	Parent Development Interview

Table 2
Descriptive Statistics
All Study Variables

Child Characteristics	Mean (SD)	Percentage	Sample Size	Range
Male	1.59 (2.00)	56.4	96	
Child Race			96	
Caucasian		56.2		
African American		20.8		
Latino		4.1		
Asian or Pacific Islander		3.1		
Bi-Racial		11.4		
Other		2.1		
<i>Maternal Characteristics</i>				
Mother's Race			94	
Caucasian		65.9		
African American		22.3		
Latino		3.1		
Asian or Pacific Islander		5.3		
Bi-Racial		1.0		
Other		2.1		
Mother's Age	29.44 (29.00)		96	
Mother's Martial Status			95	
Married		70.5		
Living with Birth Father		3.1		
Separated		1.0		
Never Married		25.2		
Mother's Education			94	
Less than high school		4.25		
HS Degree or GED		10.6		
Some College		17.0		
Associates Degree		6.3		
Vocational/ Technical		3.1		
Bachelors Degree		35.1		
Masters Degree		14.8		
Doctoral Degree		8.5		
Total Household Income			93	
Less than \$5,000		3.0		
\$5,000-9,999		3.0		
\$10,000-14,999		5.0		
\$15,000-19,999		7.9		
\$20,000-24,999		3.0		
\$25,000-29,999		2.0		
\$30,000-34,999		6.9		

\$35,000-39,999		3.0		
\$40,000-44,999		5.0		
\$45,000-49,999		5.9		
\$50,000-54,999		3.0		
\$55,000-59,999		4.0		
\$60,000-64,999		1.0		
\$65,000-69,000		3.0		
\$70,000-74,999		1.0		
\$75,000-79,999		1.0		
\$80,000-84,999		3.0		
\$85,000-89,999		3.0		
\$90,000-94,999		3.0		
\$95,000-99,999		2.0		
More than \$100,000		23.8		
Reflective Functioning (PDI)	4.45 (1.42)		101	1 - 8
Depression Symptoms (PDSS)	64.55 (24.00)		85	35 - 132
Parenting (Free Play)	3.40 (0.65)		96	1.63 - 4.58

Table 3
Risk Composite

Percentages

Number of Risk Factors	N	Percentage
0	58	57.4
1	7	6.9
2	11	10.9
3	9	8.9
4	6	5.9

Table 4

*Correlation Matrix of Study Variables: Depression Symptoms,
Attachment Classification, Parenting, Reflective Functioning, and Risk*

	1	2	3	4	5
1 Depression Symptoms					
2 Coded Secure	-.179				
3 Coded D	.048	-.540**			
4 Positive Parenting	-.247*	.299**	-.362**		
5 Reflective Functioning	.105	.352**	-.304**	.352**	
6 Risk Composite	-.090	-.239**	.229	-.525**	-.372**

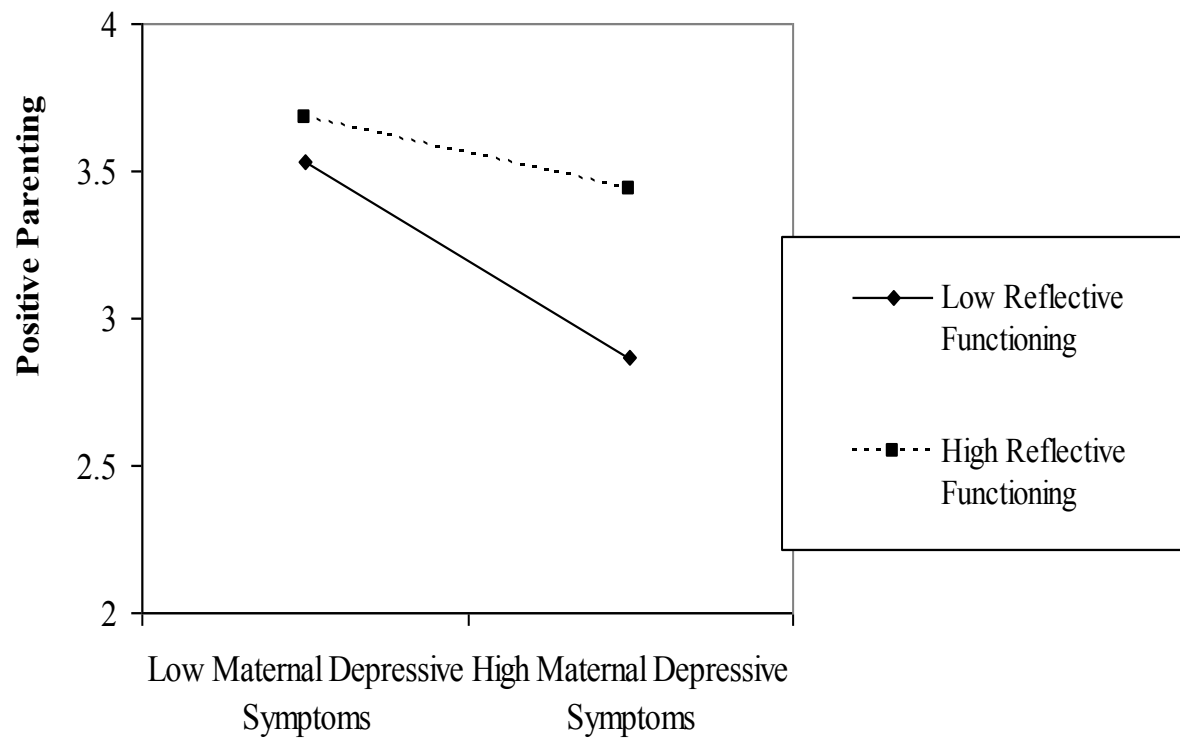
Note: * $p < .05$, ** $p < .01$,

Table 5
Regression Table

Variable	B	SE B	β
Depression	-1.48**	.370	-.347
Reflective Functioning	.126*	.043	.247
Risk Total	-.239**	.050	-.447
Depression x Reflective Functioning	.477*	.228	.181

* $p < .05$, ** $p < .001$

Figure 2. Interaction between Reflective Functioning and Depressive Symptoms.



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ABSTRACT**A STUDY OF THE EFFECT OF MATERNAL DEPRESSIVE SYMPTOMS ON THE MOTHER-INFANT RELATIONSHIP AND PROTECTIVE ASPECTS OF MATERNAL REFLECTIVE FUNCTIONING**

by

KRISTYN WONG

August 2012

Advisor: Dr. Ann Stacks**Major:** Psychology (Cognitive, Developmental, Social)**Degree:** Master of Arts

This study sought to replicate and extend findings on the effect of maternal depressive symptoms and their impact on the mother-infant relationship with regard to reflective functioning. The current sample included 101 mother-infant dyads who participated in a longitudinal study seeking to understand the effects of a traumatic childhood and how those experiences impact parenting. Measures included an assessment of depressive symptoms, an interview assessing reflective functioning capacity, and observation of mother-infant interaction. Previous findings were replicated with regard to significant correlations between parenting and reflective functioning. The current study did not find evidence for parenting mediating the relationship between reflective functioning and attachment. However, the present study did find evidence of reflective functioning being a moderator in the relationship between depression and parenting when controlling for risk. Findings of this study support the need for further research to understand how and why reflective functioning may be an important focus for future interventions.

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