1-1-2017

Maternal Attachment Representations Of The Infant In The First Year Of Life: The Influence Of Prenatal Factors.

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MATERNAL ATTACHMENT REPRESENTATIONS OF THE INFANT IN THE FIRST YEAR
OF LIFE: THE INFLUENCE OF PRENATAL FACTORS.

by

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DISSERTATION

Submitted to the Graduate School

of Wayne State University,

Detroit, Michigan

in partial fulfillment of the requirements

for the degree of

DOCTOR OF PHILOSOPHY

2017

MAJOR: PSYCHOLOGY (Educational psychology)

Approved By:

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Advisor   Date

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DEDICATION

"In the name of God, the Most Compassionate, the Most Merciful"

I would like to dedicate this work to the greatest individuals in my life who have always

supported me and helped me to pursue my goals.

To the treasures of my life, my mother Nuzha Aljishi and my father Hussain Alismail, for their

care, love, belief, and prayers.

To my nearest and dearest sisters, Jumana, Iman, Kareemah, and Sukaynah, and my brothers,

Muhammad and Ahmed, for their unconditional love and support.

To my aunt, Ameira Aljishi, for being loving and caring.

To my beloved, my husband Ali Alramadhan, for helping me reaching my goal, and to my

bundles of joy, my sons Alhassan and Muhmmad, thank you for bearing with me!

I love you all.

ACKNOWLEDGMENTS

I would like to start by thanking God for giving me such great blessings people in my life. I would like to acknowledge my amazing parents, my mother, Nuzha, and my father, Hussain, for their endless emotional and financial support throughout my life. Without you, this work would have been impossible. Your prayers have reached my soul and they have strengthened me wherever I go, and your investment in me made me proud of myself, of who I am, and, most of all, proud of having such a loving family. To my sisters and my brothers, thank you for checking on me: "Are you done yet? Do you need any help?" Every time you asked me, it made me realize that this work is not a personal achievement, but a shared one. This feeling is extended to my aunt, Ameria Aljishi, for her consistent love, care, and support. Thank you for making my life joyful during the most stressful time! To my husband, Ali, thank you for supporting me throughout our life together, and for supporting every part of my dream and being an active part of it.

Great thanks to my friend Ebtessam Alhabeeb, I will never forget your wise suggestions, and your thoughtful and creative ideas that helped make our graduate journey such a rewarding one. To my friend, Halaimah Alhashem, thank you for being a sister! And to Alia Altawaigi's amazing family, thank you for taking great care of my kids. The kindness and love you showed to my kids helped me to overcome the discomfort of being away from them.

I would also like to acknowledge the Ministry of Higher Education of Saudi Arabia for awarding me with the King Abdullah Ben Abdul Aziz Al-Saud's Scholarship and sponsoring my education for the first five years of my study. I would also like to extend my thanks to the College of Education at Wayne State University, in particular, to the Hubert and Elsie Watson Endowed Memorial Scholarship – your reward made a difference!

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CHAPTER 1: INTRODUCTION

Introduction and Statement of Problem

During pregnancy, women begin to develop their identities as mothers; they begin to experience a relationship with their babies and develop fantasies about how their babies will act and look. During this period, women become prepared to build ongoing relationships with their babies as soon as they are born. The quality of these relationships will profoundly influence their children's development into adulthood (Raby, Roissman, & Fraley, 2015). Both parenting in the postpartum (Dayton, Levendosky, Davidson, & Bogat, 2010; Theran, Levendosky, Bogat, & Huth-Bocks, 2005) and the child's pattern of attachment (Benoit, Parker, & Zeanah, 1997; Huth-Bocks, Theran, Levendosky, & Bogat, 2011; Madigan, Hawkins, Plamondon, Moran, & Benoit, 2015) can be predicted from a mother's internal working model of her infant during pregnancy. This internal working model remains stable into the infant's first year of life and continues to predict parenting and attachment. Yet little is known about how maternal prenatal depression and relational factors influence a mother's working model of her infant.

Ilicali and Fisek (2004) suggest that the period of pregnancy is a unique opportunity for intervention as maternal working models can be modified to help mothers become well-prepared to create optimal representations of their children, and such mothers have better behavioral interactions with their children than mothers with poor maternal representations. Understanding factors that are associated with maternal internal working models may help identify women in need of preventative interventions during pregnancy and also identify targets for intervention beyond the working model.

Theoretical Background

According to Bowlby (1969/1982), internal working models are mental representations people have of themselves and others in relationships that are built over time through interactions with attachment figures. Attachment theory posits that infants inherit a behavioral system called "attachment behavior." Attachment behavior is defined as an infant's biological tendency to keep proximity to the mother, with an overall function of increasing infants' survival by protecting them from danger (Bowlby, 1969/1982). This behavior is accompanied by two behavioral systems: fear and exploratory systems (Cassidy, 2008). The exploratory system motivates infants to explore their environment. However, while exploring, when infants encounter stressful situations, the fear system becomes activated, causing the attachment system to become activated. Upon activation, infants either employ "signaling behavior" or "approach behavior" to communicate their need regarding their mothers' proximity (Bowlby, 1969/1982). Based on their daily experiences with their caregivers, infants develop a "mental representation" or "working model" of their relationships with their caregivers, which reflects the infant's perception of "who his attachment figures are, where they may be found, and how they may be expected to respond" (Bowlby, 1973, p. 203). Infants' mental representations also guide their perceptions of how attachment figures will respond, and their representations will impact how they respond to the attachment needs of others in future relationships (Bowlby, 1973; Holmes, 1993).

As children grow and become adults, a shift occurs that takes an individual from one who is receptive and anticipating care and protection to an individual who is motivated to provide care. According to attachment theory, it is postulated that women inherit a biologically driven behavioral system called "caregiving behavior." This behavioral system is reciprocal to children's attachment behavior and it motivates mothers to provide protection, care, and comfort

when their children's attachment systems are activated, or when mothers perceive their children are in danger or discomfort (Bowlby, 1969/1982). In the context of attachment and daily experiences, mothers' caregiving behavior becomes internalized and peaks during their transition to motherhood (Solomon & George, 1996). This mental representation of caregiving, or the "working model," is reflected in mothers' perceptions and subjective experiences of their children and their relationships with their children (Mayseless, 2006). This internal working model of caregiving is related to mothers' own histories of attachment and it is believed to guide their behavior toward their children (Solomon & George, 1996).

To understand maternal representations of caregiving or the working model, researchers have employed structured and semi-structured interviews to examine mothers' perceptions of their children, their relationships with their children, or both (Mayseless, 2006). One commonly used interview is the Working Model of the Child Interview (WMCI), which assesses a caregiver's subjective experience of the child and his/her relationship with the child (Benoit, Zeanah, Parker, Nicholson, & Coolbear, 1997) Based on the WMCI, a woman's representation is classified into one of three typologies that reflect different qualities of her perceptions: balanced, distorted, or disengaged. Several studies have administered the WMCI prenatally and postnatally and have found prenatal representations to be stable from pregnancy to postpartum, especially balanced representations (Benoit et al., 1997; Theran et al., 2005; Vreeswijk, Rijk, Maas, & Bakel, 2015). There is a high level of concordance between WMCI classifications and infant attachment classifications when the WMCI is assessed in pregnancy (Benoit et al., 1997; Huth-Bocks et al., 2011) and when it is assessed concurrently (Benoit et al., 1997). Further, several studies have documented the relationship between maternal mental representations and the quality of mother-child interactions. Together, these studies suggest that mothers who hold

balanced representations have more stable qualities in their perceptions of their infants, and such qualities are reflected in their positive interactions with their infants, than mothers who hold non-balanced representations (Dayton et al., 2010; Sokolowski, Hans, Bernstein, & Cox, 2007; Theran et al., 2005).

A limited number of studies have documented the association between some risk factors and the maternal working model of caregiving. For example, studies revealed that mothers who experience psychological distress, relational conflicts (Soklowski et al., 2007), domestic violence (Huth-Bocks, Levendosky, Theran, & Bogat, 2004), low social support, feelings of incompetence, and have more than one child are more likely to hold non-balanced representations (Vreeswijk et al., 2015). Additionally, risk factors such as lower income, being single, experiencing physical abuse, and symptoms of mental health diagnoses are associated with the stability of mothers' working models of caregiving over time (Theran et al., 2005; Vreeswijk et al., 2015). Less is known about the predictive contribution that additional factors during pregnancy have on maternal WMCI classifications in the first year postpartum.

Cross-sectional studies have demonstrated that maternal depression may be associated with maternal working models. For example, in clinical samples of mothers there are lower rates of balanced representations than there are in non-clinical samples (Vreeswijk, Maas, & Van Bakel, 2012). Mothers with non-balanced classifications have higher depressive symptoms and higher PTSD symptoms than mothers with balanced classifications (Rosenblum, McDonough, Muzik, Miller, & Sameroff, 2002; Schechter et al., 2005; Wood, Hargraves, & Marks, 2004).

Representational factors assessed in pregnancy are known to be associated with mothers' own history of attachment, including their capacity for reflection and their romantic attachment style, and may also be associated with WMCI classifications. However, associations between

reflective functioning, romantic attachment style and WMCI classifications have not yet been studied. Parental reflective functioning is a parent's capacity to understand her own and others' behavior in terms of underlying mental states and intentions (Slade, 2005). This capacity is developed in attachment relationships during childhood and is therefore closely associated with adult attachment classifications (Slade, Grienberger, Bernbach, Levy, & Locker, 2005), parenting sensitivity (Rosenblum, McDonough, Sameroff, & Muzik 2008; Stacks et al., 2014), and infant attachment security (Stacks et al., 2014; Slade et al., 2005). Despite theoretical reasons to assess associations between reflective functioning and working model classifications, only one study has investigated this relationship. Schechter and colleagues (2005) found that parents with balanced representations had the highest levels of reflective functioning, whereas parents with disengaged representations had the lowest level of reflective functioning. This study was limited in that reflective functioning and working models were assessed using the same interview, and it was conducted on an at-risk sample, with limited variability in reflective functioning scores.

Like reflective functioning, adult attachment style in romantic relationships is associated with adults' attachment to their caregivers (Roisman, Collins, Sroufe, & Egland, 2005; Shaver, Belsky, & Brennan, 2000), parenting behavior, such as parents' sensitivity and supportiveness (Mills-Koonce et al., 2011; Rholes, Simpson, & Blakely, 1995; Selcuk et al., 2010), and could predict maternal representations of their infants. Nonetheless, no studies have examined romantic attachment and maternal working models of caregiving.

Gaps in the Literature

Previous studies have examined mothers' internal working models of their children, utilizing the WMCI. These studies have documented the importance of the quality of maternal representations on several aspects of mother-child relationships, including parenting sensitivity, infant attachment security, and child emotion regulation. These studies have found important links between maternal depression and PTSD and internal working models that are consistent with other research on maternal mental health, parenting, and infant outcomes. However, the studies were limited in several ways, including using cross-sectional designs with homogenous samples and a failure to include theoretically important predictors such as reflective functioning and adult attachment in romantic relationships.

First, the majority of the previous studies that examined maternal characteristics in relation to the WMCI were cross-sectional in nature (Huth-Bocks et al., 2004; Schechter et al., 2005; Soklowski et al., 2007), which highlights the relations between the variables included in each study, but does not explain the developmental nature of the associations. Further, most studies that used the WMCI were conducted using predominately Caucasian middle-class participants, homogenous, or clinical samples, which limits the external validity of the studies' findings. Only one study examined prenatal risk factors and their association with postnatal WMCI classifications (Vreeswijk et al., 2015). However, risk factors were measured via one assessment tool that was completed by a health care professional and these results need to be replicated.

Second, previous studies have acknowledged that maternal RF develops during pregnancy and should theoretically be related to maternal attachment representations of the child, yet no known study has taken the initiative of examining prenatal reflective functioning and

maternal representations postpartum. Third, despite strong theoretical reasons to study the associations between adult attachment style in romantic relationships and maternal representations, no known studies have examined romantic attachment style during pregnancy and its relation to mothers' maternal internal working models after the children are born. Fourth, while an extensive body of literature has documented the negative impact of poor maternal mental health, namely postpartum depression, on the quality of parent-child relationships and child attachment classification, only one study has examined the effect of prenatal depression on mothers' maternal representations of their children. However, the study had a very small sample size and used only a clinical sample (Wood, et al., 2004).

Significance of the Study

This study is important for theoretical and clinical reasons. Theoretically, both maternal reflective functioning and romantic attachment styles are attachment constructs linked to an individual's history of attachment, her children's attachment security, and mother-child interactions. Maternal mental representations, on the other hand, were also linked to an individuals' history of attachment, her children's attachment security, and parenting. However, little is known about the relationship between maternal mental representations and these attachment constructs. Understanding this link will add to the literature and aid in understanding the continuity of individuals' mental representations.

Clinically, it is well known that the quality of mother-child interactions is driven by the mother's mental representation of attachment. A mother's mental representation is linked to herchild's attachment security (Benoit et al., 1997; Huth-Bocks et al., 2011; Zeanah, Benoit, Hirshberg, Barton, & Regan, 1994), which is known to influence the child's outcomes (Sroufe, Egeland, Carlson, & Collins, 2005). Previous studies have documented that the quality of

mothers' mental representations could be influenced by several factors, yet these studies are limited in number and in the factors that were examined. Understanding the relationships between prenatal factors, such as maternal depression and relationships factors, could inform therapists in the field of attachment-based therapy and in applying preventive intervention strategies, particularly during pregnancy.

Purpose of the Study

The current study was designed to address the previous studies' limitations by filling gaps in the research and contributing to the body of knowledge regarding maternal representations. The current study is a longitudinal, non-experimental design study that aims to assess the impact of prenatal factors, including depression and relational factors (reflective functioning and romantic attachment), on the classification of mothers' postnatal maternal representations of their infants. It also aims to understand the unique contribution of each of these prenatal factors in predicting the classification of mothers' postnatal internal working models of their infants and their relationships with their infants.

Research Questions

To achieve the current study's main goal and other related goals, the following questions were developed:

1. Does prenatal depression predict maternal WMCI classification?

2. Does prenatal maternal reflective functioning affect the probability of mothers being classified as balanced, disengaged or distorted?

3. Can prenatal attachment style predict maternal WMCI classification?

4. Do prenatal depression, reflective functioning, and romantic attachment style contribute uniquely to the WMCI classification?

Definition of Terms

The following concepts were used in this study:

Caregiving Behavior: Refers to a biologically driven behavioral system that aims to secure infants' proximity to their mothers (Bowlby, 1969/1982) by motivating mothers to provide care and protection when the child's attachment system is activated (Cassidy, 2008). This system is organized and guided by internal mental representations "Working Models" (Solomon & George, 1996).

Internal Mental Representation of Caregiving: Zeanah and Benoit (1995) define the maternal internal mental representation as " the "meaning" a child has for his or her parents and … the caregiver's perceptions and subjective experience of who their infant is and why he or she behaves in particular ways" (as cited in Benoit et al, 1997, p. 109).

The Working Model of the Child Interview (WMCI): The WMCI is a semi-structured interview developed as "a means of assessing parents' perceptions and subjective experience of their infants and relationships with their infants" (Zeanah & Benoit, 1995, p. 540).

Reflective Functioning: Reflective functioning is defined as "the capacity to understand one's own and others' behavior in terms of underlying mental states and intentions" (Slade, 2008, p. 214).

CHAPTER 2: LITERATURE REVIEW

"At the end of the day, the most overwhelming key to a child's success is the involvement of parents" (Hull, n.d.). The *quality* of involvement, as early as infancy, sets the stage for optimal development in childhood, and it can be predicted as early as pregnancy. However, not all infants experience quality interactions with their mothers, due in part, to their mothers' own representations of attachment and caregiving and more proximal influences, like stress, mental health, and aspects of adult relationships. These representations and experiences can either enable or interfere with mothers' ability to balance their own needs with their infants' needs and provide quality care. However, we know very little about how mental health and relational factors in pregnancy influence mother's caregiving representations of their infant. When maternal caregiving is insensitive, infants are at risk of developing an insecure attachment relationship and less optimal outcomes in childhood. This study fills an important gap in the literature and informs early clinical interventions by examining mental health and relational predictors of the classification of mothers' postnatal internal working models of their infants.

Attachment as a Theoretical Framework for the Study

Caregiving representations, including those assessed by the WMCI are a central construct in attachment theory. In his theory of attachment, Bowlby (1969/1982) postulated that human attachment and caregiving behaviors have a specific goal and adaptive function to protect the young. Both parents and children organize their behavior to maintain proximity to one another in times of stress and threat, which serves a protective function. A childhood attachment figure's contingent responsiveness to one's needs for safety and exploration are the basis for internal working models, or representations of caregiving. In early adulthood these representations are stable, predictive of parenting behavior and their own children's attachment classifications.

Behavioral Systems in Attachment Theory

According to Bowlby, infants are born with an attachment behavioral system, a biological and evolutionary drive to seek proximity to their mother in times of threat to increase their survival by protecting them from danger or stressful conditions (Bowlby, 1969/1982). This behavior is operated by two behavioral systems: the fear system and the exploratory system (Cassidy, 2008). The exploratory system is activated in novel situations and motivates children to explore and learn about their environment. When children face stressful situations (internal or external) during exploration, the fear system gets activated, thereby activating attachment behavior. Upon activation, children either employ signaling behavior or approaching behavior to communicate a need for their mothers' proximity. Because the fear and exploratory systems are incompatible, children strive to keep a balance between the desire to explore and the desire to be close to their mothers (Bowlby, 1969/1982). As children grow, they encounter a developmental shift from being someone who is predisposed to receive care and protection from the caregiver to an individual who is predisposed to provide care and protection to the offspring (Solomon & George, 1996).

Analogous to the child behavioral system, Bowlby proposed that mothers inherit a caregiving system, a biologically inherited behavioral system that motivates mothers to provide care and protection by securing proximity to the child to ensure the infant's survival (1969/1982). Like the child attachment system, the caregiving system is activated when the caregiver perceives, internally or externally, a threat to the child's safety or comfort. Conversely, the system is relatively deactivated by the child's display of signs of comfort (Bowlby, 1969/1982), or by the mother's physical or psychological connection with the child. Should a state of comfort be achieved, the mother feels pleasure and joy, but in the case that the mother is unable to protect

or comfort her child, feelings of disappointment or sadness could result (George & Solomon, 1999).

While the caregiving behavioral system prompts the mother to provide comfort and care to her young, Bowlby (1969/1982) noted that in addition to this system, mothers have other competing (e.g., household responsibilities) or incompatible (e.g., maternal emotional status) behavioral systems, or interests that force them to balance between attending to the child's needs and meeting their own. When the caregiving system is activated, a mother's decision to provide care and protection (to intervene) conveys flexibility, an ability to balance between these behavioral systems (Solomon & George, 1996), as well as her perception of the degree of the child's discomfort and care needed (George & Solomon, 1999). However, just as the child develops a strategy to meet her/his need to explore by either under-activating or over-activating her/his attachment system in response to unavailability and responsiveness (Shaver & Mikulincer, 2007), Solomon and George (1996) proposed that when caregivers struggle to balance between the caregiving systems and other behavioral systems the caregivers may compromise the quality of caregiving behavior by either minimizing or heightening the child's need for them (George & Solomon, 1999).

In addition to the task of balancing the behavioral systems, Solomon and George (1999) postulated that the mother's perception of her child's needs is influenced by several factors such as the intensity of the child's attachment behavior, prior experience as a caregiver, and her own attachment history, culture, support, and family context (George & Solomon, 1996; George & Solomon, 1999), all of which impact the caregiver's quality of the care provided.

Internal Working Models in Attachment and Caregiving

Internal working models underlie both the attachment and caregiving behavioral systems. Throughout the pattern of daily interaction with the caregiver, infant behaviors not only become organized (goal-corrected) toward reaching proximity to their mothers, but they also become internalized. Based on a history of interaction with the caregiver, infants develop a mental representation, or working model, of their relationship with their caregivers that reflects their perception of who "the attachment figures are, where they may be found, and how they may be expected to respond" (Bowlby, 1973, p. 203). The internal working model "provides rules for the direction and organization of attention and memory, rules that permit or limit the individual's access to certain forms of knowledge regarding the self, the attachment figure, and the relationship between the self and the attachment figure" (Main, Kaplan, & Cassidy, 1985, p.77)

Children develop not only a working model of attachment that best fits their need for proximity to their caregivers, but also a working model of caregiving itself. Solomon and George (1996) proposed that caregiving behavior is developed at a representational level during adolescence. However, this constructive representation reaches its peak during the transition to parenthood, which includes the period of pregnancy and the baby's birth. It is during this period, that the individual shifts from being someone who receives care and protection to a caregiver who is internally motivated to provide care. They also proposed that the quality of care and protection that the mother provides is guided by her internal working model of caregiving (Solomon & George, 1996).

Assessing Internal Working Models of Attachment Relationships

Initially, Mary Ainsworth's interest in observing the quality of dyadic interaction enabled documentation of empirical evidence of child attachment behavior (Bretherton, 1992) via the

development of the Strange Situation Procedure (Ainsworth, Blehar, Waters, & Wall, 1978). Infant behavior in the Strange Situation procedure demonstrates how infants organize or balance their attachment systems (fear and exploratory) (Ainsworth et al., 1978; Weinfield, Sroufe, Egeland, & Carlson, 2008), regulate their emotions, employ a defensive process to accommodate their caregivers' behavior, and use their caregivers as a secure base from which to explore (Ainsworth et al., 1978; Bowlby, 1988). This procedure could also be seen as a means of accessing the infant's internal working model of attachment (Main et al., 1985). Based on the Strange Situation Procedure, the quality of infant attachment is classified into one of four types: secure, anxious, avoidant (Ainsworth et al., 1978; Greenberg, Cicchetti, & Cummings, 1993), or disorganized (Main & Solomon, 1990).

The typologies are based on the strategies infants use to maintain proximity to a caregiver when the attachment system is activated. Behaviorally, securely attached infants have experienced their caregiver as consistently sensitive and responsive, and are confident about their caregivers' availability (Weinfield et al., 2008). They construct a working model of themselves as being loved and worthy of support (Bretherton, 1990). In the Strange Situation, they are able to use their caregiver as a secure base from which to explore when the attachment system is not activated and signal their caregivers when their attachment system is activated; they are able to be comforted by their caregivers. Ambivalent infants, however, have experienced caregivers to be inconsistently sensitive; therefore, they perceive their caregivers to be inconsistent and untrustworthy, and accommodate by increasing the intensity of their own behavior in hopes of gaining their caregivers' attention (Holmes, 1993). Avoidant infants have experienced caregivers who reject close physical contact and are less affectionate; thus, they perceive themselves as being unloved (Bretherton, 1990). In order to deal with the rejection while maintaining proximity

to their mother, these infants learn how to minimize their need for the caregivers by avoiding him/her at the time of need (Holmes, 1993). These three types of classification are considered organized because infants learn to accommodate their strategies to maintain proximity to their caregiver when needed while infants with disorganized attachment have failed to organize their behavior to gain proximity to their caregivers (Holmes, 1993).

There is a well-established relationship between infant patterns of attachment and adult patterns of childhood attachment (van IJzendoorn, 1995; George & Solomon, 1996). In an attempt to understand this link, George, Kaplan, and Main (1985) developed the Adult Attachment interview (AAI). In the same way that the Strange Situation Procedure is used to assess an infant's internal working model of attachment, seen at the behavioral level, the AAI interviews are designed to assess adults' internal working models of attachment relationships at the representational level. The AAI reflects the adult's current state of mind, how they organize and present their experiences with their own caregivers (i.e., their parents) and perceive the influence of their early relationship. Individuals are asked challenging questions on topics such as their history with their caregiver, their perception of the reason for certain behaviors of their caregivers, and any traumatic experience or experience of loss. Individuals' answers are analyzed based on patterns of speech and on how their strategy for organizing their experience influences their attention and their emotional regulation (Main, Hesse, & Goldwyn, 2008).

Similar to how child attachment is classified, the AAI is classified based on the flexibility of the adult's perception of the care received as a child (Main, 2000), the balance between the ability to communicate openly about her attachment experience in an unbiased way, and his/her adherence to the principle of cooperative conversation (Main, 2000). Like the strange situation, the AAI yields four attachment classifications: a) secure-autonomous, referring to individuals

who describe their experience with their caregivers and its influence in a coherent way; b) dismissing, referring to individuals who avoid being attentive to their attachment experience and tend to minimize its influence, analogous to the avoidant pattern in infants; c) preoccupied, describing individuals who are express some confusion about their experience and tend to show its strong impact. It is analogous to the ambivalent/resistant pattern of infant attachment; and d) unresolved attachment, relating to experiences of loss or abuse, and analogous to the infant disorganized/disoriented classification (George & Solomon, 1996; Main, Goldwyn, & Hesse, 2003; Main et al., 2008; Main, 2000).

The development of the AAI inspired other groups of researchers to design similar interviews (Zeanah & Benoit, 1995) that directly assess the parent-child relationship and tap into the adults' working model of caregiving (Maysless, 2006). According to Zeanah and Anders (1987) the working models guides both their perception of the infants behavior and their caregiving response. These interviews assess representational aspects of caregiving and include questions about the child's personality, behavior, emotions, and the caregivers' emotions related to parenting (Maysless, 2006).

One of the commonly used interviews is the Working Model of the Child Interview WMCI (Zeanah & Benoit, 1995). The WMCI is a semistructured interview used to assess a caregiver's perception and subjective experience of her/his child and the relationship with the child (Zeanah & Benoit, 1995). The interview asks caregivers several questions about their perception of the infant's and their own experience including: their emotions in relation to being pregnant, the infant's personality, the caregiver's relationship with the infant, the infant's difficulties, the caregiver's reactions to the infant's behavior and distress, and hopes they have for the future (Zeanah & Benoit, 1995). Similar to the AAI, the WMCI focuses on the content of

"what is said" and the process of "how it is said" (Rosenblum, Dayton, & McDonough, 2006). The interview is rated based on the quality of the information, the content, and the affective tone of the responses to the questions. Like the AAI and the Strange Situation, the interview can be used to classify the caregiver's working model into one of three categories:

- Balanced. Parents with a balanced classification are characterized by an ability to: a) provide a coherent description of their child and the relationship, b) acknowledge and accept the positive and negative aspects of the relationship, c) be sensitive and empathic, d) be involved in the relationship, and e) experience much joy and pride in their relationship. Balanced representations are considered optimal (Zeanah & Benoit, 1995) and are concordant with infant attachment security (Benoit et al., 1997; Huth-Bocks et al., 2011; Madigan et al., 2015; Zeanah et al., 1994) and a balanced classification on in the AAI (Atkinson et al., 2009; Madigan et al., 2015).

- Disengaged. Parents classified as disengaged are characterized by a sense of emotional distancing, less awareness and less acceptance of the child as an individual and of the child's experience; instead they may describe the child or the relationship with the child on a cognitive level and tend to dismiss the child's feelings (Zeanah & Benoit, 1995). There is a concordance between mothers' disengaged representations on in the WMCI and their infants' classification as insecure- avoidant in the Strange Situation (Benoit et al., 1997; Huth-Bocks et al., 2011).

- Distorted. Parents with a distorted representation present a high level of involvement in the relationship with the child, but they are confused, anxious, or

distracted by other concerns in their life; they may present themselves as insensitive, as having unrealistic expectations of the child, and may be anxious, angry, or present disappointment (Zeanah & Benoit, 1995). Maternal distorted representations are concordant with the Infant Strange Situation classification as insecure ambivalent/resistant (Benoit et al., 1997; Huth-Bocks et al., 2011).

Stability and Predictive Validity of the Working Model of Caregiving

Maternal caregiving representations theoretically emerge prior to actualization of the relationship with the child (George & Solomon, 1999). Following attachment theory, these working models should also remain stable, and predict both parenting quality and child outcomes. To assess the stability of caregiving representations, Benoit et al., (1997) assessed 80 mothers using the WMCI in pregnancy and 12 months postpartum. Results of the study revealed a high rate of concordance (89%) in the balanced representations; and there was an 85% concordance in distorted representations. However, disengaged representations were not stable. Theran et al. (2005) replicated these findings in a larger sample of pregnant mothers who experienced domestic violence. Like Benoit et al. (1997), balanced representations were the most stable; 79% of mothers with balanced representations during pregnancy also had balanced representation at 12-months postpartum. In line with these findings, a recent study conducted by Vreeswijk et al. (2015) found that mothers' prenatal representations tended to be stable when assessed at 6 months postpartum. These results confirm that maternal representations, especially balanced representations, tend to remain stable over time.

In addition to measuring stability, other researchers established the predictive validity of maternal working models of caregiving by assessing the relationship between maternal working models, infant attachment security and parenting quality. Three research groups have

demonstrated a concordance between mothers' WMCI classifications and their infants' attachment classifications. As noted above, Benoit et al. (1997) established the concordance between mothers' working models assessed prenatally and their infants' attachment classification at 12 months. They found that 91% of the mothers with balanced classifications during pregnancy had infants who were classified as secure. When maternal working models and infant attachment were assessed concurrently, 88% of the mothers with balanced classification had infants who classified as secure. Similarly, in a relatively high-risk sample of 173 pregnant mothers, Huth-Bocks et al. (2011) reported that when maternal WMCI was collapsed into balanced/non-balanced classifications, 60% of the sample demonstrated concordance over time. Among this sample, 63% of mothers who held balanced representations had infants with secure attachment and 57% of mothers who held non-balanced representations had infants with insecure attachment. The results of these studies indicate that concordance between the caregiving working model and child attachment is stronger among balanced/secured pairs than in non-balanced representations, and that concordance may be higher in lower risk samples. Additionally, the maternal prenatal WMCI was found to predict children's attachment at 11 months postpartum (Madigan et al., 2015).

Several other studies have established the association between the maternal working model and the quality of maternal-child interactions. For example, Dayton et al. (2010) reported that mothers with balanced representations during pregnancy demonstrated significantly more positive parenting than mothers who held non-balanced representations at one-year postpartum. Positive parenting included the ability to perceive and accurately interpret their child's signals, respond to their child's signals promptly, experience joyfulness, and to express verbal and behavioral affection toward them. On the other hand, mothers classified as distorted showed

significantly higher levels of hostile parenting than mothers classified as balanced. Finally, mothers classified as disengaged displayed significantly higher levels of controlling behavior than mothers classified as balanced and they interacted with their child in a way that interfered with their child's goals during playtime. In a cross-sectional study that used a high-risk sample of 100 African-American mothers and their 18-month-old children, Sokolowski et al. (2007) found mothers with disengaged representations to be significantly less sensitive/responsive to their infants, more passively withdrawn, and to use less encouragement/guidance with their infants, than the two other types of representations (balanced and distorted).

Although the maternal working model of caregiving was demonstrated to be relatively stable, researchers found that when the classification of the WMCI changed from pregnancy to postpartum, some qualities of balanced classification remained stable. For example, in the context of domestic violence, with a large sample of 180 mothers and their infants, Theran et al. (2005) examined how change in maternal working models from pregnancy to one-year postpartum impacts the mother-child interactions at one year postpartum. Findings from this study demonstrated that mothers who had non-balanced representations during pregnancy yet became balanced at one year postpartum seemed to express joyfulness in their relationships with their infants but were nevertheless less sensitive, more disengaged, and less warm with their infants than mothers with continuously balanced representations. On the other hand, mothers who held balanced representations yet became non-balanced at one year postpartum showed more sensitivity, less controlling behavior, and more joy than mothers who were continuously non-balanced.

Taken together, these studies suggest that mothers who hold balanced representations either prenatally or postnatally, demonstrate better quality interactions with their infants than

mothers who hold non-balanced representations. Findings also suggest that while some mothers'

representations seem to be less stable, mothers whose classification has changed from balanced

during pregnancy and later become non-balanced have a quality of interacting with their infants

that seems to be better than the quality of mothers who become balanced during the postpartum

period.

The Internal Working Model of Caregiving and Risk Factors

Along with examining the stability and predictive validity of the WMCI, a limited

number of studies aimed to understand how some risk factors are related to the maternal working

model of caregiving. Two lines of research are presented: one focuses on the impact of risk

factors on the classification of the working model while the other focuses on the impact of these

factors on the stability of the working model. Findings from these studies revealed that these risk

factors do relate to the maternal working model of caregiving measured via the WMCI and do

influence its stability. For example, Soklowski et al. (2007) found that mothers with non-

balanced representations had higher psychological distress scores than those with balanced

representations. A further examination of the WMCI scales revealed that mothers with non-

balanced representations conveyed more disappointment, anger, difficulty, and less joy,

acceptance, sensitivity, and involvement with their children. In addition to the psychological

distress, the results revealed that maternal relational conflicts with both their own mother and

with the child's father significantly increased the odds of having a non-balanced representation.

Specifically, verbal conflict with one's own mother related to maternal disengaged representation

while verbal conflict and violence with the infant's father were found to be related to distorted

representation.

Similarly, in a cross-sectional study, Huth-Bocks, Levendosky, Theran, and Bogat (2004) examined the impact of domestic violence on the maternal working model and found that mothers who experienced domestic violence during pregnancy were significantly more likely to be classified as non-balanced (disengaged or distorted) than mothers who had not experienced domestic violence. An examination of the scales revealed that these mothers were less open to change, less coherent, less sensitive, less accepting of the child, perceived greater infant difficulty, had less joy, and more anger, anxiety, and depressive affect. Consistent with these findings, Vreeswijk et al. (2015) examined the impact of prenatal risk factors on the maternal working model prenatally and postnatally, and found that having more than one child increased the odds of having disengaged representations both during the prenatal and postnatal periods. Additionally, the presence of high prenatal risk factors (demographic variables, recent life events, the want for pregnancy, exposure to abuse, social support, feelings of competence, and psychological treatment) increased the odds of having prenatal distorted representations and postnatal disengaged representations. This study is the only one that predicts WMCI classifications from prenatal risk factors and needs to be replicated.

While these studies provide evidence for the relationship between risk factors and the maternal working model, other researchers found that some risk factors could impact the stability of the classification. For example, when comparing mothers who were balanced during pregnancy and remained balanced at one year postpartum to the mothers who became non-balanced, Theran et al. (2005) found that non-balanced mothers were more likely to have lower income, be single, and experience physical abuse than mothers who remained balanced. Moreover, when comparing mothers who became balanced at one year to mothers who remained non-balanced from pregnancy to postpartum, those who became balanced had fewer depressive

symptoms, were less likely to be single, and had a higher income. Similar to Theran et al. (2005), Vreeswijk and colleagues' (2015) findings revealed that fewer prenatal risk factors were related to women having balanced representations prenatally and at 6 months postpartum. Mothers whose representations changed from non-balanced to balanced had fewer risk factors in comparison to mothers whose representations remained non-balanced.

The previous studies examined the WMCI as a predictor of parenting behavior documented that the existence of several risk factors such as maternal demographics, relational conflict, and psychological distress are related to the quality of the maternal working model. The majority of the previous studies were cross-sectional in nature, which implies a relationship between these variables, but not the direction of it. Empirical studies of prenatal predictors of WMCI classifications, however, are extremely limited. Moreover, less is known about the predictive contribution that additional environmental and relational factors during pregnancy have on maternal WMCI classification in the first year postpartum.

Predictors of Maternal Representations Across the Transition to Parenthood

During pregnancy mothers go through more than just a series of biological changes. They also undergo a profound process of psychological transformation in their identities as mothers and in their perception of being the caregivers in an emerging relationship with the baby. This process, in addition, includes the emergence of fantasies about the fetus, the activation of their childhood attachment relationship, and carries an alteration in their internal working model of caregiving system (Pines, 1972; Slade, Cohen, Sadler, & Miller, 2009; Solomon & George, 1996; Zeanah, Keener, & Anders, 1986).

Several studies have documented that the developing quality of the internal working model of caregiving during pregnancy influences the quality of the parent-child relationship after

the birth of the child. However, during pregnancy mothers may encounter several factors that can hinder or support their ability to maintain balance and flexibility in their perceptions or caregiving ability (Solomon & George, 1999). Depression is a well-established factor that could present during pregnancy and hinder the woman's ability to provide the optimal care for her infant. Other factors, including reflective functioning and romantic attachment style, are relational factors that develop in the context of caregiving relationships, as does the working model of caregiving. These factors have also been linked to parenting and optimal classification of the working model of caregiving, which could support women during the transition to parenthood. However, less is known about the impact of these factors during pregnancy on the maternal working model of caregiving after the transition to parenthood, which is the focus of the current study.

Maternal Depression, Parenting, and Internal Working Models of Attachment Relationships

Women experience a dramatic range of emotions during pregnancy (Slade et al., 2009), some of which can be symptoms of depression (Goodman, Rouse, Shuang, & Brand, 2011). Although an estimated 8.5% - 11% of pregnant women experience antenatal depression at different times during pregnancy (Gaynes et al., 2005), it often goes undetected because hormonal imbalances and mood changes that normally occur during pregnancy can mimic depressive symptoms (Reminick, Cohen, & Einarson, 2013). Depression is not exclusive to pregnancy. According to Gaynes et al. (2005) 6.5% to 12.9 % of women experience postpartum depression, with symptoms including low pleasure and energy, a change in appetite and/or in sleep, and feelings of guilt or worthlessness, (American Psychiatric Association, 2013). Depressive symptoms not only impact mothers directly, but also can hinder their ability to care

for their newborn by implementing unhealthy feeding and sleep practices, (Paulson, Dauber, & Leiferman, 2006), being less attentive to the child's safety (McLearn, Minkovitz, Strobino, Marks, & Hou, 2006), or by having thoughts about hurting the baby (Field, 2010).

There is strong evidence that postpartum depression is associated with parenting quality and some evidence that maternal depressive symptoms are associated with infant attachment insecurity. Despite these links and the links between maternal working models of caregiving, parenting quality and infant attachment classifications, research on the relationship between antenatal depression and maternal working models of caregiving remains limited. Furthermore, studies examining depression and working models of caregiving are inconclusive.

Maternal depression and parenting. Empirical studies document that postpartum depression is modestly associated with lower parenting quality (Lovejoy, Graczyk, O'Hare, & Neuman, 2000; Paulson et al., 2006). For example, studies that compared clinically depressed to non-depressed mothers found that depressed mothers were less sensitive to infants' cues, expressed fewer empathic responses, and expressed more rejection in response to their infant's behavior (Murray, Fiori-Cowley, Hooper, & Cooper, 1996). Similarly, Campbell, Cohn, and Meyers (1995) found that mothers with chronic clinical depression were less positive with their infants, less competent during feeding, showed less positive affect during toy play, and had infants who displayed significantly less positive affect compared with mothers in the subclinical or remitted groups. In another study, Campbell et al. (2004) examined the association between postpartum depressive symptoms and maternal sensitivity (over 36 months postpartum) in a large sample of 1077 mother-child pairs. The results of the study suggested that mothers who never experienced depression were significantly more sensitive than mothers who experienced chronic symptoms of depression. Consistent with Campbell's findings, a study by Trapolini, Ungerer,

and McMahon (2008) utilizing a middle class, low-risk sample of 92 mothers with their infants, reported that mothers who never experienced depression demonstrated significantly higher sensitivity scores than mothers in the chronically depressed group. In the context of preterm infants, Korja et al. (2008) found that mothers with depressive symptoms showed less positive affective involvement and positive communication compared to mothers without depressive symptoms. They also found that these qualities of interaction were continuously present not only when their infants were 6 months old, but also when they were measured at one year old.

Unlike these studies that documented associations between chronicity of depression and poorer quality parenting behavior, McLearn et al. (2006) and Lovejoy et al. (2000) found that concurrent maternal depressive symptoms had a greater effect than earlier depressive symptoms on negative parenting behavior and self-reported maternal discipline practices when the children were 30-33 months old. McLearn et al. (2006) reported that mothers with depressive symptoms during the first four months of the child's life reported comparable discipline practices (at 30-33 months) as mothers without depressive symptoms. However, when comparing women who experienced concurrent depressive symptoms (at 30-33 months) to those without depressive symptoms, results revealed that mothers with depressive symptoms reported higher use of harsh discipline, including slapping the child in the face or spanking with an object than mothers who have no depressive symptoms.

Additionally, in a meta-analysis study, Lovejoy et al. (2000) reported that mothers who experienced depression displayed significantly higher levels of disengaged behavior, including ignoring and withdrawal. They also displayed negative behavior including hostility and intrusion with their children compared to non-depressed mothers. Additionally, the results revealed that depressed mothers displayed significantly lower levels of positive behavior, including interacting

with the children in a pleasant way, than non-depressed mothers. The study also showed that the timing of depression moderated the relationship between maternal depression and negative parenting behavior, such that mothers with current depression exhibited higher levels of negative parenting behavior than mothers with a lifetime history of depression.

Most studies on depression and parenting assess both constructs after the birth of the infant. Yet, antenatal and postnatal depression are highly correlated, and antenatal depression may also impact parenting. Using a nonclinical sample, Flykt, Kanninen, Sinkkonen, and Punamäki (2010) found that antenatal depressive symptoms exert a stronger impact on maternal unresponsiveness than postnatal depressive symptoms and that high levels of depressive symptoms during both periods exert the greatest impact on maternal responsiveness. Additionally, the presence of depressive symptoms during both periods has a stronger impact on the child-mother relationship. Since depression is associated with parenting and parenting is associated with infant attachment, depression may exert a direct effect on infant attachment.

Maternal depression and child attachment. Previous studies have established a relationship between prenatal depression and infant attachment (Coyl, Roggman, & Newland, 2002; Martins & Gaffan, 2000; Toth, Rogosch, Sturge-Apple, & Cicchetti, 2009). For example, in a sample of depressed and non-depressed mothers, 62% of the toddlers of depressed mothers were classified as insecure, compared to only 26% of the toddlers of mothers in the non-depressed comparison group (Murray et al., 1996). Consistent with this study, Cicchetti, Toth, and Rogosch (1999) also found that maternal depression is related to insecure attachment relationships. Specifically, among mothers who were non-depressed, 55% of their children were classified as secured, while the percentage of children of depressed mothers classified as secure was significantly lower. Campbell and colleagues (2004) also found that mothers who reported

either chronic or intermittent symptoms of depression were more likely to have insecurely attached children than mothers who reported early or late depressive symptoms. Antenatal depression also exerts an independent influence on infant attachment. Hayes, Goodman, and Carlson (2013) found that infants who were classified with disorganized attachment at 12 months old had mothers with a higher mean of antenatal depressive symptoms. Further, this relationship was not moderated by postnatal depression.

Taken as a whole, the studies above suggest a) a concordance between maternal working models of attachment and infant attachment, and b) that symptoms of depression, whether assessed antenatally or postnatally, affect the quality of parenting and infant attachment security. However, few studies have examined the relationship between antenatal depression and maternal working models of attachment.

Depression and maternal working model. While studies linking maternal depression and the working model of caregiving are limited, a meta-analysis suggests that maternal clinical status, including psychiatric disorder and a history of abuse, is linked to the working model of caregiving. Findings from the meta-analysis, which included 912 participants, suggest that maternal WMCI classifications differ significantly based on maternal clinical status. In the non-clinical group, 53% of the mothers held balanced representations, 21% were disengaged, and 26% were distorted. However, in the clinical group, only 34% of mothers were classified as balanced, with 23% classified as disengaged, and 43% as distorted (Vreeswijk et al., 2012). Additionally, Vreeswijk et al. (2015) found that the presence of psychological or psychiatric treatment as a risk factor was related to mothers' non-balanced representations. While this study examined working models in the context of clinical diagnosis more broadly, a handful of studies have examined the relationship between maternal depression and working models more directly.

Findings from studies that examined the relationship between postpartum depression and mothers' working model of caregiving using the WMCI are inconsistent. Some studies found significant differences in depressive symptomatology among working model classifications. For example, Korja et al. (2009) assessed maternal depression in a non-clinical sample and in the context of prematurity. Depressive symptoms were assessed at 6 months, and mothers' working model was assessed using the WMCI at 12 months postpartum. Results revealed that mothers who held distorted representations were found to have had higher levels of depression compared to mothers who held balanced or disengaged representations. Similarly, Rosenblum et al. (2002), in a study that included a non-clinical sample of 100 mothers, found that mothers who held distorted representations had significantly higher levels of depressive symptoms than did mothers in the balanced category.

Other studies have not found differences in depressive symptomatology among working model classifications. In a community sample of African-American mothers and their 18-month-olds, Sokolowski et al. (2007) reported that depressive symptoms did not increase the odds of having a non-balanced classification. However, they found that experiencing feelings of hostility increased their likelihood of having a non-balanced representation (distorted and disengaged representations), and they suggested that symptoms of hostility might be a manifestation of depression.

Although largely unstudied, chronicity of depressive symptoms during pregnancy could also influence the quality and the stability of the maternal working model. Depressive symptoms could impair mothers' cognitive connection with their fetus (McFarland et al., 2011) and may be correlated with other factors in life, such as SES, which is known to impact maternal working models of attachment (Theran et al., 2005). Consistent with studies of depression and parenting,

studies assessing depression and working model classification found that chronicity of depression from pregnancy to postpartum was associated with higher rates of non-balanced classifications. A study by Wood et al. (2004) examined a small sample of eight middle-class clinically depressed mothers. Mothers' symptoms of depression were assessed during pregnancy and again when their infants were 3 months old, and caregiving representations were assessed via the WMCI at 3 months postpartum. The results of the study revealed that less than 50% of the mothers held balanced representations compared to normative, non-clinical populations. Although all of the mothers had depression during pregnancy, only the mothers who were depressed during both assessment times had non-balanced classifications. The results imply that chronicity of depression is a risk factor for mothers who have non-balanced representations.

Other studies suggest that depression is associated with the concordance and stability of the WMCI. For example, when Huth-Bocks et al. (2011) examined the impact of depression in relation to the concordance between prenatal maternal representation and child attachment at one year, their results showed that experiencing depression at 2 months postpartum differentiated non-balanced/secure dyads from non-balanced/insecure dyads. Specifically, mothers in the non-balanced/secure group had fewer depressive symptoms than did mothers in the non-balanced/insecure group. Another study conducted by Theran et al. (2005) examined the stability of maternal representation during the transition from pregnancy to parenthood and reported that having fewer depressive symptoms during pregnancy does impact the stability of maternal representation.

Taken together, findings from these studies demonstrate that maternal depression is related to a) parenting, b) child attachment, and c) the maternal WMCI classification, yet only one of these studies examined depression antenatally. Previous studies have also demonstrated

that maternal reflective functioning and adult romantic attachment are associated with parenting and child attachment. Nevertheless, their link to maternal WMCI is limited.

Relational Factors as Predictors of Internal Working Models of Attachment Relationships

While maternal depression during pregnancy may be a risk factor for non-balanced representations of caregiving, other factors may promote balanced maternal representations of the infant. Two factors that may be associated with maternal working models of caregiving are maternal reflective functioning and maternal romantic attachment. Both constructs develop in the context of attachment relationships with caregivers and are associated with maternal sensitivity and infant attachment classification, so theoretically they should also be associated with the maternal working model of caregiving, yet these relationships have not been adequately studied.

Maternal reflective functioning. Maternal reflective functioning refers to the mother's capacity to recognize her own and the child's mental states (feelings, desires, attention, wants) and the ability to acknowledge the connection of the mental sates with her own and with the child's behavior (Slade, 2005). Mothers with higher levels of reflective functioning are also curious about the minds and intentions of their infants and make an effort to understand their infants' internal experiences, which may not always be clear. They also understand that both their own and their infant's internal experiences can change as a function of time and development. According to Fonagy, Steele, Steele, and Moran (1991), reflective functioning develops in the context of the mother's childhood relationships with her caregivers. Mothers with autonomous (secure) representations of past attachment relationships have significantly higher levels of reflective functioning than mothers with insecure and unresolved representations of attachment (Slade et al., 2005). The studies reviewed below provide evidence of maternal reflective functioning's association with infants' attachment, and parenting behavior.

Maternal reflective functioning, parenting, and child attachment. Findings from several studies suggest that maternal reflective functioning is directly associated with parenting and attachment, and that parenting mediates the relationship between maternal reflective functioning and infant attachment. For example, in a study conducted by Rosenblum et al. (2008) with a heterogeneous sample of 95 mothers and 7-month-old infants, maternal reflective functioning was associated with maternal behavioral interaction with infants. Specifically, mothers with higher reflective functioning were less intrusive, anxious, rejecting and angry, and more sensitive toward their infants. Similarly, Stacks and colleagues (2014) reported that maternal reflective functioning was positively associated with maternal behavioral and affective sensitivity and a negatively associated with parenting negativity, including hostile, intrusive, and controlling interactions. Mother-child affective communication is also associated with reflective functioning. Grienenberger, Kelly, and Slade (2005) found that maternal reflective functioning of their infant was 10 months old was negatively associated with disrupted affective communication, including maternal withdrawal, intrusiveness, and simultaneous conflicting affective cues (smiling while talking in an angry tone) during the Strange Situation Procedure, when the infant was 14 months old.

Studies conducted in both high and low sociodemographic risk samples suggest that maternal reflective functioning is associated with infant attachment. Slade et al. (2005) reported a significant relationship between maternal RF at 10 months and infant attachment security at 14 months. In this study, mothers whose infants were classified as secure had significantly higher reflective functioning scores than mothers whose infants were classified resistant or disorganized. However, mothers whose children were classified as avoidant had RF scores that were not different from mothers who had secure attachment. Stacks et al. (2014) also found that

children with a secure attachment classification had mothers with significantly higher RF scores in comparison to children with avoidant or disorganized attachment. Both Slade et al. (2005) and Stacks et al. (2014) found that the relationship between maternal reflective functioning and child attachment security was mediated by parenting.

Maternal reflective functioning, maternal working model, and risk factors. The previous studies provided evidence that women with higher numbers of risk factors are more likely to have suboptimal representations of caregiving and reflective capacity. For example, the mother's general clinical status (Reeswijk et al., 2012), PTSD (Schechter et al., 2005), depressive symptoms (Korja, 2009; Rosenblum et al., 2002; Wood et al., 2004), education level (Sokolowski et al., 2007), and high-risk scores (Vreeswijk et al., 2015) were found to be related to a non-balanced classification of caregiving. Similar variables in pregnancy were found to be associated with RF. For example, Smaling and her colleagues (2015) assessed reflective functioning in 162 pregnant women and found that mothers with high-risk factors, including more psychiatric disorders, maternal age, educational level, and the level of support significantly predict lower levels of reflective functioning. Similarly, Stacks and colleagues (2014) found that cumulative risk was negatively correlated with parental reflective functioning. In general, findings from studies revealed that higher-risk samples have lower mean reflective functioning scores in comparison to samples with lower risk (Pajulo et al., 2012; Sadler et al., 2013; Schechter et al., 2008; Suchman et al., 2010). Although reflective functioning and working models of caregiving are both established in the context of early relationships with attachment figures and both predict parenting and child attachment, studies that examined the relationship between these two constructs are lacking.

Maternal reflective functioning and working models of caregiving. Only one study has examined the link between reflective functioning and maternal working model of caregiving via the WMCI. Using a very small sample of women with PTSD, Schechter et al. (2005) found that mothers with balanced representations had the highest reflective functioning scores and mothers with non-balanced classifications had the lowest reflective functioning scores. Among the non-balanced classifications, mothers classified as disengaged had the lowest reflective functioning scores. These results suggest that at least in the context of trauma, mothers with higher reflective functioning scores could have a greater ability to regulate their emotions and to develop a more balanced perception of their children than mothers with lower reflective functioning scores.

All of the studies reported above measured reflective functioning postnatally, yet reflective functioning can be measured during pregnancy and may predict maternal representations of caregiving. Understanding this relationship could have important implications for early intervention because reflective functioning can be changed with intervention (Bammens, Adkins, & Badger, 2015; Pajulo et al., 2012). Assessing the association between maternal reflective functioning in pregnancy and representations of caregiving in the child's first year of life is an important precursor to parenting and child mental health intervention/prevention research. Similar to maternal reflective functioning adult attachment style also develops in the context of attachment relationships with caregivers. It is linked to early attachment history and the quality of maternal parenting, and could be related to the maternal working model of caregiving.

Adult Romantic Attachment Style. Adult attachment style is a construct rooted in Bowlby's attachment theory. Hazan and Shaver (1987) conceptualized the romantic love experience, or adult romantic experience, as an "attachment process" that forms a bond similar to

the emotional bond that develops between the infant and the caregiver. The romantic experience varies in quality based on an individual's attachment history with his/her caregivers, which is driven by the individual's working model. In their initial studies to assess adult romantic love, in which Hazan and Shaver adapted Ainsworth's typologies of attachment, they reported that 56% of their subjects were classified as secure, 24% as avoidant, and 20% as anxious/ambivalent (Hazan & Shaver, 1987).

Following this conceptualization, their study evidenced that based on their attachment style, individuals experience their relationship differently. Secure individuals describe their relationship as friendly, supportive, and trusting; avoidant individuals express fear of intimacy, experience feelings of jealousy and emotional fluctuation; and anxious/ambivalent individuals experience sexual attraction, the wish to have a stronger connection with their partners, and emotional fluctuation (Hazan & Shaver, 1987). Findings from their studies have inspired other researchers in the field to develop similar self-report assessments of romantic attachment. Some are dimensional approaches utilizing self-report questionnaires, and others are based on categorical approaches using either self-report or interview techniques (see Ravitz, Maunder, Hunter, Sthankiya, & Lancee, 2010, for review). When the dimensional approach to attachment style is applied, individuals are rated on dimensions of attachment avoidance and anxiety. Similar to the child avoidance classification, a high score on the avoidance dimension reflects a "negative sense of other,"while a higher score in the anxiety dimension is similar to the child ambivalence classification and reflects a "negative sense of self" (Ravitz et al., 2010, p. 421). Low scores on both scales reflect secure attachment. Like the maternal working model of attachment, adult attachment style has been linked empirically with individuals' attachment histories (adult childhood attachment, and children's attachment) and the quality of parenting.

Adult attachment style, early attachment histories, and caregiving behavior. Previous studies provide preliminary evidence that women's early attachment history foreshadows their relationship with their romantic partner. For example, in a study conducted on 138 middle and working class women, Shaver et al. (2000) examined the association between women's attachment relationship with their caregivers using the AAI coding scales and their self-report of romantic attachment scales. The results of the study revealed a significant association between the women's state of mind with regard to their attachment relationships with their own caregivers and the romantic relationships scales. Specifically, the results showed that the women's feelings of comfort with closeness in a romantic relationship were associated with the women's level of coherence of the transcript and the coherence of mind. Additionally, a woman's ability to depend on her partner in times of need was significantly associated with the absence of involving anger toward her mother and the father, no lack of memory for childhood experience with parents, no passivity of speech, coherence of transcript, and coherence of mind. Additionally, the anxiety scale was associated with poor metacognitive monitoring, a fear of loss of the child, low coherence of the transcript, and low coherence of mind.

Similarly, a study conducted by Behringer, Reiner, and Spangler (2011) on 77 pregnant women examined the concordance between mothers' AAI and their attachment representations of their romantic partners, referred to as an individual's state of mind regarding the current relationship with the partner, measured via an interview that parallels the AAI interview. The results of the study revealed significant concordance between the mothers' AAI classification and their attachment representation of their romantic partners during the last trimester of pregnancy. Specifically, among those classified as secure on the AAI, 37% were classified as secure on the CRI: of those classified as insecure-dismissing on the AAI 66% were classified as

insecure-dismissing on the CRI; and among those classified as insecure preoccupied on AAI, 53% classified as insecure-preoccupied on CRI. Consistent with this finding, Roisman et al. (2005) found significant concordance between attachment security in childhood classification based on the Strange Situation and of adult romantic relationships.

In addition to examining the relationship between adults' attachment style and their early attachment histories, researchers in the field of adult attachment have argued that in a romantic relationship, adults function in a way that represents both the caregiving system and attachment systems (Collins & Ford, 2010). That is, both partners alternate between being the caregiver who provides comfort and support to the other partner and the partner who seeks comfort and support. Following this line of thinking, researchers examined the relationship between adult attachment style and adults' behavior, both with romantic partners and with their children. Studies have shown that secure adults are better able to express both attachment behavior and caregiving behavior, which encompass the ability to express emotion and provide support to the partner when the need arises. For example, Behringer et al. (2011) conducted a longitudinal study to examine the association between the mother's attachment style based on her representation of her current relationship with her partner and the trajectory of her emotions during the transition to motherhood. Maternal attachment style was measured during the third trimester of pregnancy and emotions were assessed during pregnancy and through 6 months postpartum. The study revealed that although secure mothers reported an increase of their experience of sadness/anxiety from the prenatal period to the first 2 weeks postpartum, they evidenced a greater decline of this emotion at 2 months postpartum in comparison to insecure mothers. These findings suggest that mothers who have secure mental representations of their romantic partners are more able to express difficult emotions during the transition period and better able to regulate their emotions.

While the previous study suggests that individuals with a secure attachment are able to express their attachment needs, another line of research focuses on the caregiving behavior within the romantic relationship. Women classified as having a secure romantic attachment rate their relationship as closer and more positive than insecure women. Further secure women perform better on a conflict and collaboration task (Roisman et al., 2005). Findings suggest that secure romantic relationships are also associated with higher quality relationships. For example, Feeney and Collins (2001) were concerned with the caregiving behavior in romantic attachment, defined as the ability to be supportive and responsive to the other partner in their times of need. The study was conducted with 202 couples using self-report measures of attachment style. Findings from the study revealed an association between the individuals' attachment style and their caregiving behavior. Specifically, adults with high avoidance and high anxiety scores reported less quality of caregiving style toward their partner. Specifically, adults with high levels of attachment avoidance reported less responsiveness and more controlling behaviors, while adults with high levels of attachment anxiety reported more compulsive behavior, like being overinvolved in their partner's problems, and more controlling behavior when trying to help their romantic partner.

Feeney and Collins (2001) further examined the relationship between adult attachment style and adults' observable caregiving responsiveness when their romantic partners experienced stressful conditions. In this study, they created a condition where one partner was assigned the role of caregiver, and the other one was assigned a role of supportive other. Results of the study showed a negative association between both attachment avoidance and anxiety, and the quality caregiving toward one's romantic partner. Additionally, adults' caregiving behavior, specifically emotional support increased, as they perceived an increase in the need of their partners for

emotional support. Similarly, their partner rated the emotional support they received as high when their distress increased. When the attachment style was examined in relation to the degree of the adults caregiving behavior, the results showed that adults who rated themselves as avoidant caregivers were observed to provide instrumental support when they perceived their partners as less emotionally distressed. However, when they perceived them as more distressed, their level of support decreased. Their partners, on the other hand, perceived them as being relatively unsupportive when their distress was high in comparison to the low-stress group.

In addition to being associated with caregiving behavior toward a romantic partner, adult attachment style is also associated with caregiving toward one's child at behavioral and cognitive level. In regard to the behavioral level, studies showed that adult attachment style was associated with caregiving behavior with the child, such as parents' sensitivity and supportiveness (Mills-Koonce et al., 2011; Rholes et al., 1995). For example, Selcuk et al. (2010) examined an association between romantic attachment style and caregiving behaviors in 85 mothers and their young children aged 10 to 50 months and found that mothers' scores in avoidance and anxiety scales were negatively associated with observed global maternal sensitivity scores. Further examination of the mothers' scores in the two dimensions (avoidance and anxiety) revealed that these scores were associated with specific caregiving behavior themes. Specifically, mothers' attachment avoidance scores were associated with mothers' observation of discomfort with child contact, non-synchronicity in interactions, inaccessibility and inability to satisfy the child's need. Mothers' attachment anxiety scores were associated with their observable interfering behavior with the child's desire to explore, missing the child's cues, and conflict when interacting with the child. In line with the Selcuk et al. findings, Edelstein et al. (2004) examined the association and predictability of adult attachment style on parental responsiveness, and child distress during

stressful medical events on children 3-7 years old. Results of the study revealed that parents with high scores on avoidance had children who displayed a higher level of stress in comparison to parents with lower avoidance scores. Additionally, these parents showed less responsive behavior toward their child's distress, especially when the child's level of distress was high. Moreover, high avoidance scores were found to be associated with global unsupportive maternal behavior (Rholes et al., 1995).

In a slightly larger longitudinal study with mothers and their 6 to 12 month-old infants, a study found that mothers who rated themselves as consistently secure reported less parenting stress and were observed to be more sensitive when they interacted with their children in comparison to mothers who were consistently insecure-avoidant. Mothers who reported attachment insecurity during at-least one or both time points were observed to be more intrusive with their infants and reported more parenting stress (Mills-Koonce et al., 2011).

Taken together, the previous studies suggest that adults' romantic attachment style is associated with their quality of caregiving behavior with both their romantic partner and their child. Both types of caregiving security are associated with more sensitive caregiving, while insecurity, particularly avoidance, is associated with less sensitive caregiving.

Adult attachment style and the adults' parenting cognitions. Additional studies investigating the association between adults' attachment style and their cognition or perception of parenting reported that adult attachment style is associated with the way parents feel and think about their children and parenting. For example, studies revealed that mothers with higher avoidance scores were more likely to report low levels of closeness to the child (Rholes et al., 1995). Additionally, a study conducted on couples during the transition to parenthood showed that parents with high scores in the avoidant scale, reported less desire to be a parent (Rholes,

Simpson, & Friedman, 2006), and less desire to have children in comparison to secure adults (Rholes et al., 1995). Consistent with these findings, Rholes et al. (1995) found that individuals with a higher score either in avoidance or in anxiety reported feelings of uncertainty regarding their ability to be a good parent. While these studies suggest an association between the adult's attachment style and their perception of various aspects of parenting, understanding its link with the working model of caregiving, which reflects both the perception of and the relationship with the child, is completely lacking. Because the previously reviewed studies demonstrated an association between adult attachment style and the adult's attachment history and parenting, examining its association with the WMCI is important.

In conclusion, the previous studies suggest that mothers' own histories of attachment predict their working models of caregiving, which in turn are associated with both parenting quality and child attachment classification. Further, cross-sectional studies suggest that both demographic risks, like trauma, depression, and education may be associated with working models of caregiving, yet no study has assessed whether some risk factors, including depressive symptoms in pregnancy, predict maternal working models of caregiving. Theoretically, adult attachment style and parental reflective functioning in pregnancy should also predict working models of attachment, but this has not been tested empirically.

CHAPTER 3: METHOD

Research Design

The current study is a longitudinal, non-experimental design that examined the impact of prenatal variables including: maternal depression, reflective functioning, and romantic attachment style on maternal representations of the infant and the relationship with the infant via the Working Model of The Child Interview (WMCI) conducted when the infant was 7 months old.

The study aimed to answer the following questions:

1. Does prenatal depression predict maternal WMCI classification?

2. Does prenatal maternal reflective functioning affect the probability of mothers being classified as balanced, disengaged or distorted?

3. Can prenatal attachment style predict maternal WMCI classification?

4. Do prenatal depression, reflective functioning, and romantic attachment style contribute uniquely to the WMCI classification?

Method

Procedure

This study utilized a subsample of mothers from the Parental Representations During Pre- and Postnatal Periods Linked to Early Outcomes study (PuRPLE; PIs: Stacks and Beeghly). The PuRPLE study aimed to understand how pre-and postnatal maternal representations influence parenting and infant behavior and development. The PuRPLE study recruited mothers from the Perinatal Imaging of Neural Connectivity study (PINC; PI: Thomasen), which used functional MRI to examine fetal brain connectivity. PINC participants were recruited from an obstetrics clinic at a university hospital. Women who provided consent for the PINC study were scheduled

for their first fMRI scan. At their first scan they also completed basic demographic information and a battery of self-report measures, including mental health, stress, health practices, substance use, experience in relationships.

Participants in the PuRPLE study were recruited from the PINC study either by phone or during their first PINC study visit. Women who provided consent for the PuRPLE study were asked to participate in 3 visits. At the first study visit, which took place during the third trimester of pregnancy, the women completed a series of self-report measures and were interviewed to assess reflective functioning. Participants received a $25 gift card to a grocery superstore for their participation. The second study visit was conducted in the participants' homes within one month of their infants' birth. A newborn neurobehavioral assessment was conducted with the infant and parents received a $25 gift card to a grocery superstore and a sample of baby bath products. The third study visit took place in a research laboratory when the infants were 6.5 to 7.5 months old. During the lab visit mothers and their infants participated in a parent-child interaction, mothers completed self-report measures and participated in another interview to assess their reflective functioning and their working model of caregiving. Finally infant development was assessed. Mothers and infants also provided saliva that was used to assess cortisol reactivity and genetic data. Mothers received a $75 gift card for their participation.

Participants

The participants for the current study included a subsample of 47 mothers who participated in the prenatal and 7-month PuRPLE study visits. As seen in Table 1, maternal age ranged from 19 – 40 years ($M = 25.73$, $SD = 5.09$). Of the participants, 53% were single and 46% were married or had partners. The majority of the participants (80.4 %) were African American, 13.0% were Caucasian, 2.20% Asian- American, and 4.30% rated themselves as other

races. Mother's education was rated as the following: 17.4% had no GED, or high school diploma, 28.3% had GED or high school diploma, 45.7% had some college education, and 08.7% had 4 year college degree and higher. The majority (65%) of the mothers reported household incomes at or below $20,000. Nearly half (40%) reported a total household income of less than $10,000, 25.0% reported a household income of $10,000 - $20,000) and only 17.5% reported household incomes greater than $30,000 per year.

Table 1

The participants' Demographic Characteristics

Demographic Variables	N	Mean (*SD*)	Percentage
Mother's Age	47	25.73 (5.09)	
Mother's Martial Status	45		
Single	24		53.3
Married/Partnered	21		46.7
Mother's Race	46		
Caucasian	6		13.0
African- American	37		80.4
Asian- American	1		2.20
Other	2		4.30
Mother's Education	46		
No GED / No H.S Diploma	8		17.4
GED/ High School Diploma	13		28.3
Some College	21		45.7
4 year College Degree and higher	4		08.7
Mother's Total Household Income	40		
Less than 10,000	16		40.0
10,000-20,000	10		25.0
21,000-30,000	7		17.5
31,000-40,000	2		5.00
41,000-50,000	1		2.50
51,000-60,000	2		5.00
61,000-80,000	2		5.00

Note. N = 47

Measures Used in the Current Study

  Demographic questionnaire. A self-report questionnaire was developed by the principle investigators of PINC and PuRPLE studies to gather information regarding demographic variables, including age, race, marital status, and level of education.

  Maternal depression. The Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden, & Sagovsky, 1987) was utilized to assess prenatal depressive symptoms. The EPDS is a 10-item self-report scale that is commonly used to screen for depressive symptoms prenatally and postnatally (Bergink et al., 2011). Respondents were asked to select the answer that best describes their feelings during the past week ranging from not at all to often/most of the time. The scale takes about five minutes to complete, and the scores range from 0 (absence of depressive symptoms) to 30 (maximum severity of depressive symptoms). A cutoff score of 9 indicates possible depression and 10 is used in the third-trimester of pregnancy to indicate that a pregnant woman is suffering from depression (Bergink et al., 2011).

  The EPDS has been validated as an appropriate measure for postnatal depressive symptoms with good psychometric properties. Based on the original study completed by Cox et al. (1987), the EPDS has good sensitivity (85%) and specificity (77%), high split-half reliability (0.88), and a standardized coefficient (0.87). It is also sensitive to changes in depressive symptoms over time. The EPDS also has good psychometric properties during the prenatal period. The reliability estimate is (Cronbach's α = .84), and test-retest reliability during the third trimester was estimated based on the correlation between the EDS scores of the 24 and the 36 weeks $r = 0.63$ ($p < .01$), and high concurrent validity estimates ($r > 0.50$; $p < .001$) has been established between the EPDS and the SCL-90 (anxiety and somatization) (Bergink et al., 2011). In the current study, the EPDS had acceptable internal consistency (Cronbach's α = .82).

Maternal reflective functioning. The Pregnancy Interview-Revised (PI-R) (Slade, Grunebaum, Huganir, & Reeves, 1987) was administered to assess maternal prenatal reflective functioning. The PI-R is a semi-structured interview consisting of 22 questions that examine a woman's emotional experience of pregnancy, representation of herself as a mother, representation of her partner and the unborn child, and relationship with her unborn child. The interview also examines the mother's expectations, thoughts, and feelings about her future relationship with the baby, the baby's father, and her own parents, while also assessing her ideas regarding parenting.

The interview is conducted during the third trimester of pregnancy and takes 60 to 90 minutes. Responses to the interview are audio recorded and transcribed verbatim. The transcripts are coded with an adapted version of the Reflective Functioning Scale (Fonagy, Target, Steele, & Steele, 1998; Slade, 2005). The coding scale ranges from low (-1) to high (9), and scores from -1 to 0 are very rare and indicate bizarre and incoherent responses. Scores of 1 and 2 indicate that the participant lacks the ability to acknowledge and think about her unborn infant's and her own mental states (thoughts, feelings, desires, beliefs and intentions). A score of 3 indicates that the participant is able to acknowledge her own mental states, yet her ability to link the mental states to the behavior is lacking. A score of 5 indicates that the mother has an average ability of reflective functioning, and a mother with this score recognizes that feelings underlie his/her behavior. A score of 6 indicates that the mother is able to present a complex and in-depth recognition of her own internal experiences and makes an effort to understand others' internal experiences, understands that mental states change as a function of development and also over time. A score of 7 and above indicates that the mother is able to consistently link her own

behavior and mental states and coherently present the complex relationship between her child's and her own behavioral and mental states (Slade et al., 2005).

The interviews were coded by two reliable coders (the primary investigator and a doctoral student) who were blind to the coding of other study variables. The coders were trained by Arietta Slade and established reliability using a gold-standard set of transcripts. For the current study, Intraclass Correlation Coefficient on the overall reflective functioning scores was excellent (ICC = .833; $p < .001$). Disagreements between the coders were conferenced, and only consensus scores were used in the analyses.

Romantic attachment style. The Experiences in Close Relationships – Revised (ECR-R) (Fraley, Waller, & Brennan, 2000) is a 36-item self-report measure that was administered during pregnancy to assess each woman's romantic attachment style. The ECR-R questionnaire was revised from the original measure, the ECR (Brennan, Clark, & Shaver, 1998). The ECR-R has two sections: attachment-related anxiety and attachment-related avoidance. The anxiety section (18 items) reflects the level of insecurity, availability, and responsiveness that is perceived about the attachment partner. The avoidance section (18 items) reflects the level of being comfortable in a close relationship and the ability to be dependent on one's partner. When administered, individuals are asked to rate how they generally experience their relationships on a 7-point Likert scale, from 1 (strongly disagree) to 7 (strongly agree). Each dimension (anxiety and avoidance) is calculated by averaging the responses of the items. The ECR-R has good established reliability and validity. In previous studies, the internal consistency estimate was high for both anxiety and avoidance (α = .94 and .93, respectively) (Fraley et al., 2000). The construct validity was demonstrated by the negative correlation between ECR-anxiety with social support (r = -.43), and the positive correlation between anxiety with worry (r =.38) and loneliness (r =.53). The

ECR-avoidance dimension has a negative correlation with safe-haven touch (r = -.41), affectionate proximity (r = -.51), and social support (r = -.45) and a positive correlation with touch avoidance (r = .51) and loneliness (r = .36) (Fairchild & Finney, 2006). In the current sample, the ECR-R had good internal consistency for both the anxiety and avoidance scales (Cronbach's α = .93 and .91, respectively). Additionally, in the current study, the ECR-avoidance scale and anxiety scale were highly correlated (r = .80). Therefore, the author of the measure, R.C. Fraley was consulted and he suggested that the scales be combined to represent a simple secure versus insecurity dimension (personal communication, October 3, 2016).

Maternal attachment representations of the infant. The Working Model of the Child Interview (WMCI; Zeanah, Benoit, Barton, & Hirshberg, 1996) was administered at 7 months postpartum to measure the mothers' internal working models of caregiving. The WMCI is a semi-structured interview that assesses parents' perceptions and subjective experiences of their children and their relationships with their children. The predictive validity of the WMCI was established based on the concordance between the WMCI classifications with the infant Strange Situation classifications (Benoit et al., 1997; Huth-Bocks et al., 2011) and parenting behavior (Dayton et al., 2010; Sokolowski et al., 2007). The interview takes about one hour to complete and the interviewer strictly follows the questions and standard probes. During the interview, a mother's thoughts and feelings are elicited while asking her about several questions including her infant infant's personality (e.g., Can you pick three words to describe your child's personality?), development, and difficulties and about the relationship, and experience (e.g., What has it been like caring for a boy? / girl?). The interview was audio recorded, transcribed verbatim, and coded.

When coding the interview, the coder reads the transcript and attends to the content (what is described), the qualitative aspects of the narrative (how is it described), and the affective tone of the narrative. Following Zeanah et al. (1996) and Rosenblum et al. (2006) each qualitative feature is coded on a 5-point scale with scores ranging from 1 (never) to 5 (extreme) based on the coder's judgment of the extent to which the features are present during the interview. Zeanah et al. (1996) original dimensions are as follows:

Richness of Perceptions. This dimension measures how rich a mother's perception is regarding her infant's personality, behavior, and feelings and her relationship with the infant. A mother who scores high on this scale conveys a richly detailed, yet succinct picture of who the infant is, and how she is aware and attentive to the infant's characteristics and preferences. A mother who scores lower on this scale provides poorly detailed descriptive information about her infant's personality, behavior, and feelings and her relationship with the infant. She also has a narrow focus on her infant's needs, or has nothing to say regarding her infant's characteristics and preferences. Another demission *Caregiving Sensitivity* reflects the mother's ability to recognize and respond to her infant's biological and emotional needs. A high score on this scale represents a mother's ability to recognize and respond to a wide range of her child's needs in a consistent way. Mothers who score low on this scale fail to acknowledge their infants' needs, are inconsistent when responding to their infants, or demonstrate inappropriate responses when interacting with their infants. *Intensity of Involvement* dimension measures the degree of a mother's psychological involvement and preoccupation with her infant. Mothers who score high on this scale demonstrate a clear and intense preoccupation with their infants and their relationships with their infants. Mothers who score low on this scale show a lack of involvement with their infants, due to being preoccupied with other concerns, such as other relationships or

work responsibilities. *The Openness to Change* dimension refers to a mother's flexibility in being accepting and willing to discover new information about her infant and consider that her infant will change throughout his/her development. Mothers who receive high scores on this scale display a high sense of acceptance and flexibility regarding new information about their infants. Mothers who receive low scores present a rigid description of their infants and lack the ability to accept new information or accommodate changes. The *Acceptance of the Infant* dimension is used to assess the degree of a mother's acceptance of her infant's challenges, her responsibilities, and the mother-infant relationship. Mothers who receive low scores on this scale display a sense of rejection, and they may not enjoy the relationship with the infant. Mothers who receive high scores present a high level of acceptance and delight regarding their infants. *Infant Difficulty* dimension measures mothers' perceptions of infants' difficulties as revealed directly or indirectly. Regardless of the infants' psychological or physical conditions and challenges, mothers who receive low scores perceive their children to be easy to take care of, while high scores convey that mothers view their children as somewhat burdensome. The affective tone scale takes into account the affective theme that colors mothers' representations of their infants, which includes joy, anger, anxiety, indifference, sadness, guilt, and irrational fears for infant safety.

Rosenblum et al. (2006) describe using the following scales in their dimensional coding. *Internal Consistency of the Narrative* (Fiese et al., 1999). This dimension refers to the internal consistency of the interview. Mothers who score low on this scale present a high level of unrecognized or unexplained contradictions in their theory about the infants, or they may present a lack of personal examples that could support the theory. Mothers who receive high scores on this scale present a supported theory that is internally consistent about their children and their

relationships with their children, including personal examples. Such mothers also explain and recognize contradictions when they are presented. The *Organization of the Narrative* dimension (Fiese et al., 1999) measures the degree of organization of the response provided, which includes how the narrative is organized and oriented with a clear sense of what is coming next and the identification of what and about whom the interview is discussing. Mothers who score low on this scale present a narrative that is difficult to understand with a low quality of organization, including several stops and starts, incomplete thoughts, excessive details, and missing references. Mothers who receive high scores on this scale present a narrative that is succinct, oriented, self-corrected, ordered, and provides references (e.g., who and where). *Reflective Parenting Scale* (Rosenblum et al., 2008) measures a mother's ability to recognize and acknowledge her own and her infant's mental states/psychological processes (e.g., thoughts, beliefs, desires, intentions, goals, and feelings) and their connection to behaviors and perceptions. Mothers who receive low scores rarely acknowledge mental states or feelings, display a low recognition of the influence of mental states on their behaviors or perceptions, may focus on behaviors rather than emotions, may not link mental states to behaviors, and may use defenses (e.g., splitting, denying, distorting) to reason about mental states. Mothers who receive high scores are able to recognize mental states and tolerate the complex link between mental states and both their and their infants' behaviors. Such mothers are able to understand how mental states influence their perceptions. *Helplessness in Parenting* dimension (Rosenblum et al., 2006) measures the degree of feeling helpless, in respect to being a parent and responding to infants' needs. This includes feelings of inadequacy, powerlessness as a mother, and possibly perceiving infants as controlling or rejecting their mothers. Mothers who receive a high score display role-reversed relationships with their infants, or may perceive their infants as controlling or powerful. Mothers who receive

low scores demonstrate affection, are able to cope with parenting challenges, and seek support without feeling rejected by their infants. The *Resentment of Parenting* dimension (Rosenblum, et al., 2006) refers to the degree of resentment or acceptance a mother has regarding her responsibility to take care of and parent her child. A high score on this scale refers to a mother's rejection of taking responsibility and caring for her child, while a low score refers to a higher degree of acceptance of both the infant and the parenting role. Both the Zeanah and Benoit (1995) and Rosenblum et al. (2006) scales were used to classify mothers' representations into one of the following three categories:

Balanced representation. Mothers with balanced representations display high-quality relationships with their infants. These mothers are consistently sensitive to their children's emotional and physical needs and provide rich descriptions of the infants' personalities and the mother-infant relationship. Their narrative is coherent and organized. In their relationships with their infants, they acknowledge and accept the infants' difficulties; they are involved mothers and enjoy their relationships with their infants. Such mothers respect and appreciate their infants as individuals with subjective experiences and show empathy and appreciation to their children. A mother in this classification exhibits a range of affect.

Disengaged representation. Mothers with disengaged representations have narratives that are characterized by several features, including minimal descriptions of their infants; a sense of emotional distancing (excessive intellectual descriptions of their infants); indifference or aversion toward their infants; emotional coolness; lack of acknowledgment of the infants' subjective experiences; infants' needs are not recognized; a lack of genuine interest regarding their infants; and a lack of involvement with their infants and the mother-infant relationship. When describing their infants, mothers minimize infant difficulty and convey a sense of minimal

engagement with their infants, with some negative affect and less enjoyment experienced in the mother-infant relationship.

   Distorted representation. Unlike the detachment that is present in disengaged representations, mothers with distorted representations have narratives that include strong feelings and highly detailed descriptions of their infants and the mother-infant relationship. Such mothers have a lot of things to say, yet their descriptions are inconsistent and disorganized. These women have high a level of involvement with their infants' lives. In their descriptions, they may seem insensitive to their infants' needs, present a bizarre description of their infants, have unrealistic expectations for their infants' development, or be unable to understand their infants' needs. They seem confused about their roles and overwhelmed by their infants' difficulties and the responsibilities involved in parenting. They may focus on their role as mothers more than they focus on their infants.

   To establish inter-rater agreement of the WMCI, Inter-rater Cohen's Kappa was utilized to determine the consistency of the classification of the WMCI between two raters while taking into account chance agreement. According to Landis and Koch (1977), a Kappa of 0.21 - 0.40 is fair; k = 0.41 - 0.60 is moderate; k = 0.61-0.80 is substantial; and k = 0.81-1.00 is almost perfect. In this study 55% (N = 26) transcripts were double-coded by trained coders who had previously established reliability on a gold standard set of transcripts and were blind to the other interview codes. Reliability for the current study was (k = .78). Disagreements were conferenced and consensus codes were used in the analyses.

Table 2

Research Questions, Hypotheses, and Statistical Analysis

Research Question/ Hypotheses	Variables	Statistical Analysis
1. Does prenatal depression predict maternal WMCI classification?		
H_1 Mothers with higher depression scores will have a higher probability of being classified as having a distorted or disengaged representation. H_0 Prenatal depression will not increase the probability of being classified as having a distorted or disengaged representation. H_{12} Mothers with lower depression scores will have a higher probability of being classified as having a balanced representation. H_{02} Low prenatal depression scores will not decrease the probability of mothers being classified as having a distorted or disengaged representation.	Predictor variable: Prenatal Depression Criterion variable: Maternal Working Model: • Balanced • Distorted • Disengaged	A multinomial logistic regression was used to predict women's WMCI classifications based on the prenatal depression.
2. Does prenatal maternal reflective functioning affect the probability of mothers being classified as balanced, disengaged or distorted?		
H_2 Mothers' prenatal reflective functioning scores will be associated with working model classifications such that higher prenatal reflective functioning will increase the probability of mothers being classified as balanced and lower scores will increase the probability of being classified as distorted or disengaged. H_0 Prenatal reflective functioning scores will not be associated with the probability of being classified as balanced, distorted, or disengaged.	Predictor variable: Prenatal reflective functioning Criterion variable: Maternal Working Model: • Balanced • Distorted • Disengaged	A multinomial logistic regression was used to predict WMCI classifications from prenatal reflective functioning.

Research Question/ Hypotheses	Variables	Statistical Analysis
3. Can prenatal attachment style predict maternal WMCI classification?		
H_3 Mothers' prenatal attachment style will be associated with working model classifications, such that lower prenatal avoidance and/or anxiety scores will increase the probability of mothers being classified as balanced and higher scores will increase the probability of mothers being classified as distorted or disengaged. H_0 Prenatal attachment avoidance and anxiety scores will not be associated with the probability of being classified as balanced, distorted or disengaged.	<u>Predictor Variable:</u> Prenatal reflective functioning <u>Criterion variable:</u> Maternal Working Model: • Balanced • Distorted • Disengaged	A multinomial logistic regression was used to predict the WMCI classifications based on the romantic attachment style.
4. Do prenatal depression, reflective functioning, and romantic attachment style contribute uniquely to the WMCI classification?		
H_{41} Maternal symptoms of depression will uniquely predict working model classifications, such that higher maternal depressive symptoms will predict non-balanced representations, and lower depressive symptoms will predict balanced-representations when maternal attachment style and reflective functioning are held constant. H_{42} maternal reflective functioning will uniquely predict working model classifications, such that higher reflective functioning scores will increase the probability of mothers being classified as balanced when depression and attachment style are held constant. H_{43} Adult attachment style will uniquely predict maternal working model classifications, such that low levels of avoidance and anxiety will predict balanced classifications and high levels of avoidance and/or anxiety will predict non-balanced classifications when depression and reflective functioning are held constant.	<u>Predictor variables:</u> • Maternal depression • Prenatal reflective functioning • Romantic attachment style <u>Criterion variable:</u> Maternal Working Model: • Balanced • Distorted • Disengaged	A multinomial logistic regression was performed to measure the contribution of the predictor variables on the criterion variable

Data Analysis

Examining the Data.

The data were examined for error entry, missing data, outliers, and normal distribution. First, error entry was examined by reviewing the range and frequency of the variables. Second, missing data were evaluated visually and by computing a Missing Value Analysis (MVA) to examine the degree and the extent of the missing data for individual cases and individual variables. With regard to the individual cases, there was one case that was missing 40% of the data (only demographic data, including education, race, marital status, and annual household income, was missing). Although examining the demographic variables was not part of the main hypotheses of this study, this case was not be included when exploring demographic variables in relation to the outcome variable of mothers' maternal working model of their infants (n = 46). With regard to the individual variables, only participants who had complete data from the Prenatal Pregnancy Interview and the seven-month WMCI were included in the analyses (n = 47). Therefore, there is no missing data in these variables. With respect to the other variables, the MVA showed that 15% of data were missing for annual household income; the other variables, including marital status, race, and education, were missing less than 5% of the data. Depression and romantic attachment style had no missing data.

Third, boxplots were conducted to detect outliers. According to the results, there were no outliers in the data for maternal reflective functioning or romantic attachment style. However, there were outliers (n = 2) for the maternal depression and household income variables. Therefore, univariate outliers were examined by calculating z-scores for maternal depression and household income. According to the results, the score ranges were less than +/- 3.25; therefore, the variables were not considered outliers and remained in the analysis.

Finally, the study's independent variables (depression, reflective functioning, attachment-related anxiety, and attachment-related avoidance) and the demographic variables, including annual household income and maternal age, were examined for normal distribution. To check normality, the skewness and the kurtosis scores for each continuous variable was divided by its standard error $Z = \frac{Skewness}{Std.Error}$, and the value was considered non-normal when the $z > 1.96$. Using this method, there were three variables that were identified as positively skewed: maternal depression (skewness = 1.02, SE = 0.35), maternal age (skewness = .77, SE = .37), and annual household income (skewness = 1.43, SE = .37). Square root transformations were applied to convert the data to a normal distribution for depression (skewness = -.229, SE = .35) and age (skewness = .57, SE =. 34), but it did not convert the mothers' annual household income to a normal distribution (skewness = .94, SE = . 37). Therefore, a ($\log_{10}$) transformation was applied (skewness = .47, SE = . 37), which converted the distribution to normality.

The descriptive statistics are presented based on the non-transformed data. However, data transformation for depression, annual household income, and age was utilized and additional data transformations were applied for other variables to meet the assumption for each test. When the appropriate transformation failed to fix normality, the data were analyzed using nonparametric statistics. Testing the hypotheses was performed using multinomial logistic regression. This statistical procedure does not assume a normal distribution of the variables. Therefore, non-transformed data were utilized. The analyses for the current study were performed using the Statistical Package for the Social Sciences (SPSS), software version 22.

CHAPTER 4: RESULTS

The current study aimed to examine the association between prenatal variables, including maternal depression, reflective functioning, and romantic attachment style (attachment-related anxiety and attachment-related avoidance), and mothers' maternal representations of their infants and their relationships with their infants via the Working Model of The Child Interview (WMCI) at seven months postpartum. The results are presented in three steps: 1) descriptive analyses, 2) examining the relationships between the mothers' demographic characteristics and the study variables, and 3) testing the hypotheses.

Preliminary Analyses

Descriptive Analyses

Univariate analyses were conducted to examine the study's variables (depression, reflective functioning, attachment-related anxiety, and attachment-related avoidance) and the frequencies for the categorical variables (mothers' maternal attachment representations of their infants). As seen in Table 3, maternal depression scores ranged from 0 to 18 ($M = 5.23$, $SD = 4.44$), and 19.1% of the mothers met the cut-off score for prenatal depression. Maternal prenatal reflective functioning scores ranged from 0 to 6 ($M = 3.02$, $SD = 1.30$); attachment-related anxiety scores ranged from 1 to 4.72 ($M = 2.41$, $SD = 1.12$); attachment-related avoidance ranged from 1 to 4.56 ($M = 2.45$, $SD = 1.14$); and the attachment style-combined scales ranged from 1.00 - 4.47 ($M = 2.43$, $SD = 1.08$). The distribution of the mothers' maternal representations in the current sample was as follows: 16 balanced (34%), 19 distorted (40%), and 12 disengaged (25%).

Table 3

Descriptive Statistics for The Study Independent Variables

The Independent Variables	N	*M (SD)*	Percentage
Maternal Depression	47	5.23 (4.44)	
No Depression	38		80.9
Possible Depression	9		19.1
Maternal Reflective Functioning	47	3.02 (1.30)	
Maternal Romantic Attachment Style			
Attachment-related anxiety	47	2.41 (1.13)	
Attachment-related avoidance	47	2.45 (1.15)	
Combined Security Scale	47	2.43 (1.08)	
Maternal Representations	47		
Balanced	16		34.0
Distorted	19		40.4
Disengaged	12		25.5

Note. N = 47

Relationships among Demographic Variables and Study Variables

In this section, the relationships between the demographic variables and (a the study independent variables (depression, reflective functioning, and romantic attachment) and (b the dependent variable (the Working Model of the child interview) were examined in order to control for any relationships.

Associations among demographic variables and independent study variables. To examine the relationship between mothers' demographic characteristics and the study's independent variables, bivariate correlations, Spearman's rank-order correlation, one-way ANOVA, independent-samples t-test, Kruskal-Wallis H test, and chi-square tests were conducted based on the type of data. First, the relationships among the metric variables (annual household income and maternal age) were examined in relation to a) depression, b) reflective functioning, c) attachment-related anxiety, and d) attachment-related avoidance using bivariate correlation. According to the results, annual household income and age were not associated with depression, reflective functioning, attachment-related anxiety, or attachment-related avoidance (see Table 4). Next, a Spearman's rank-order correlation was run to assess the relationships between maternal education and a) depression, b) reflective functioning, c) attachment-related anxiety, and d) attachment-related avoidance. The results showed a positive correlation between maternal reflective functioning and education, $r = .31$, $p = .04$. The results are presented in Table 4.

Table 4

Correlation Matrix for the Study Variables

Variables	N	1	2	3	4	5	6	7
1. Attachment-related anxiety	47							
2. Attachment-related avoidance	47	.80**						
3. Prenatal reflective functioning	47	.03	.03					
4. Mother's Age	47	-.16	-.11	.02				
5. Prenatal Depression	47	.22	.12	-.13	.13			
6. Annual Household Income	40	-.16	-.10	.07	.99**	.15		
7. Education*	46	-.16	-.16	.31*	.11	.05	.36*	
8. Attachment style-C	47	.95**	.95**	.04	.04	.23	-.15	-.15

Note. *Education was based on Spearman's rho.
Attachment style-C= Attachment style-combined scales
* $p < 0.05$, **$p < 0.01$.

To examine the relationships between marital status and a) maternal depression, b) parental reflective functioning, c) attachment-related anxiety, and d) attachment-related avoidance, four sets of t-tests of independent samples were administered. The first independent-sample t-test was run to determine if there were differences in depression scores based on the mothers' marital status. Although depression scores for each level of marital status were normally distributed, as assessed by z-scores of skewness and kurtosis, there were two outliers in the data (one in married/partnered mothers and the other in single mothers). The two outliers were within the normal range of the depression scores; thus, they were kept in the analysis. The results revealed that there was homogeneity of variance, as assessed by Levene's test for equality of variances, $p = .945$. There were no statistically significant differences in depression based on marital status, $t(43) = -.45$, $p = .66$. To examine the impact of the outliers, the test was re-run

after removing the two outliers and the statistically non-significant result was maintained, t (41) = .81, p = .42.

The second independent-sample t-test was run to determine if there were differences in reflective functioning based on the mothers' marital status. There were no outliers in the data, reflective functioning scores for each level of marital status were normally distributed, as assessed by z-scores of skewness and kurtosis, and there was homogeneity of variance, as assessed by Levene's test for equality of variances, p = .73. Married/partnered mothers had higher reflective functioning (M = 3.33, SD = 1.32) than single mothers (M = 2.70, SD = 1.20). However, there were no statistically significant differences in reflective functioning based on marital status, t (43) = -1.80, p = .08.

The third independent-sample t-test was run to determine if there were differences in attachment-related anxiety based on the mothers' marital status. There were no outliers in the data, attachment-related anxiety scores for each level of marital status were normally distributed, as assessed by z-scores of skewness and kurtosis, and there was homogeneity of variance, as assessed by Levene's test for equality of variances, p = .55. There were no significant differences in attachment-related anxiety scores for single (M = 2.48, SD = 1.04) or married/partnered mothers (M = 2.46, SD = 1.21), t (43) = .06, p = .95.

The fourth independent-sample t-test was run to determine if there were differences in attachment-related avoidance scores between single and married partnered mothers. There were no outliers in the data, attachment-related avoidance scores for each level of marital status were normally distributed, as assessed by z-scores of skewness and kurtosis, and there was homogeneity of variance, as assessed by Levene's test for equality of variances, p = .98. There

were no differences in attachment-related avoidance between single mothers (M = 2.62, SD = 1.12) and married mothers (M = 2.40, SD = 1.16), t (43) = .64, p = .52.

An additional independent-sample t-test was run to determine if there were differences in attachment style (attachment related anxiety and avoidance, combined scales) based on the mothers' marital status. There were no outliers in the data, attachment style scores for each level of marital status were normally distributed, as assessed by z-scores of skewness and kurtosis, and there was homogeneity of variance, as assessed by Levene's test for equality of variances, p = .83. There were no significant differences in attachment style scores for single (M = 2.54, SD = 1.00) or married/partnered mothers (M = 2.42, SD = 1.14), t (43) = .37, p = .71.

Associations among Demographic Variables and Working Model Classifications. Another two sets of one-way ANOVAs were conducted to determine whether there were statistically significant differences in mother's income, or age based on the maternal attachment representations of the infant via the WMCI classifications. The first one-way ANOVA was conducted to determine if maternal household income was related to the mothers' attachment representations of their infants. The data had four outliers and were not normally distributed for each representation: Distorted (skewness = 1.63, SE = .56; kurtosis = 3.29, SE =1.09); Disengaged (skewness = 2.45, SE = .72; kurtosis = -6.33, SE = 1.40). Therefore, a square root transformation was performed, but the data had outliers and were not normally distributed. Therefore, the Kruskal-Wallis H test, a non-parametric test, was used instead to determine if there were differences in maternal household income between mothers' attachment representations of their infants. The results revealed no significant differences in mothers' income based on their attachment representations, H (2) = 3.62, p = .16.

The second one-way ANOVA was conducted to examine maternal age in relation to the mothers' maternal attachment representations. The results revealed some outliers, and the data were not normally distributed among the maternal attachment representations: Distorted (skewness = 1.05, SE = .52; kurtosis = 1.09). Therefore, a square root transformation was applied. While it converted the data to normality for distorted representations (skewness = .93 , SE = .564; kurtosis = 1.23, SE = .14), it became not normally distributed for Disengaged representations (skewness = 2.114, SE =. 72; kurtosis = 4.61, SE = 1.40). Therefore, log_{10} was performed and it did convert the data to normal distribution (skewness = .682, SE = .64; kurtosis = -.89, SE, 1.23). Because transformations did not return the age variable back to a normal distribution among those classified as distorted, both parametric and non-parametric tests were run. The one-way ANOVA revealed no statistically significant differences in maternal age among the maternal attachment representations from the WMCI, F = (2.43) .14. p = .87. Therefore, a Kruskal-Wallis H test, a non-parametric test, was used instead to determine if there were differences in mothers' ages between mothers' attachment representations via the WMCI. The results revealed no significant differences in mothers' ages based on their WMCI classifications, H (2) = .17, p = .94.

Next, two sets of chi-square tests of independence were conducted to examine the relationship between mothers' education and marital status, and the WMCI. The first chi-square test was conducted to examine mothers' education and the WMCI. All of the expected cell frequencies were less than five, which violated the assumption of the test. When the variables were first collapsed into three categories (less than high school, high school graduate, some college), the cell frequencies were still less than five. Therefore, the variables were further collapsed into two categories (high school or less and some college or a college degree), and all

of the expected cell frequencies were greater than five. However, there was no statistically significant association between maternal education and the WMCI classifications X^2 (2) = 3.15, p = .21).

The second chi-square test of independence was conducted between marital status and the WMCI. All of the expected cell frequencies were greater than five, and the results revealed no statistically significant association between marital status and the WMCI classifications X^2 (2) = 1.19, p = .55. To summarize, the aforementioned results indicated that there was no relationship between the demographic variables and a) the study's dependent or b) independent variables.

Hypothesis Testing

Based on findings in preliminary analyses, which suggested that demographic variables were not associated with the WMCI classifications or the independent variables, demographic variables were not controlled for when testing the study hypotheses. To test the hypotheses, Multinomial logistic Regression (MLR) was used to examine the predictability of the following prenatal variables on maternal representations via the WMCI: maternal depression, reflective functioning, and attachment-related anxiety and avoidance. Multinomial logistic regression is an extension of Binomial logistic Regression, and is an appropriate statistical technique because it can be used to predict the odds (probability or maximum likelihood) of category membership (with more than two categories), given one or more independent variables (continuous or nominal). On the WMCI, mothers are classified as balanced, disengaged, or distorted.

Each time the multinomial logistic regression was conducted, it allowed for comparison between two of the WMCI classifications in reference to one of the WMCI classifications (a reference group). The balanced classification is considered to be " high quality" and the others (distorted and disengaged) are a suboptimal one; thus, two sets of multinomial logistic regression

analyses were performed for each aim. During the first set, the balanced representation was used as a reference category to allow for comparison between balanced and either distorted or the disengaged representations. During the second set, the disengaged representation was assigned as a reference category to allow for the comparison between the distorted and the disengaged representations.

Aim One: Prenatal Depression and Maternal Representations.

It was hypothesized that mothers with higher prenatal depression scores would be more likely to have a distorted or disengaged representation in comparison to mothers who have a balanced representation, and mothers with lower depression scores will be more likely to have a balanced representation. Multinomial logistic regression was used to test the hypothesis. First, the balanced classification was used as a reference category. According to the results, the goodness of fit was not significant X^2 (26), 28.25, $p = .35$, indicating that the model is acceptable for the data. The model fit was not significant x^2 (2) = .12, $p = .94$, indicating that the full model did not predict the WMCI classifications better than the null model. The multinomial logistic regression model was not statistically significant x^2 (2) = .12, $p = .94$, Nagelkerke, pseudo-R^2 = .003; the parameter estimate was not statistically significant for the distorted $b = .02$, Wald x^2 (1) = .04, $p = .85$. OR = 1.01, 95% CI [.87 - 1.18], or disengaged representation $b = -.02$, Wald x^2 (1) = .03, $p = .87$. OR = .99, 95% CI [.82 - 1.17], which indicates that prenatal depression is not associated with mothers likelihood of being classified as disengaged or distorted, compared to balanced. Second, the model was re-run and the disengaged representation was used as a reference category, to allow the comparison between the distorted and disengaged representations. According to the results, the multinomial logistic regression model was not statistically significant, x^2 (2) = .12, $p = .94$, Nagelkerke-pseudo $R^2 = .003$, indicating that the full

model did not predict the WMCI classifications better than the null model. The parameter estimate for a distorted representation was $b = .03$, Wald $x^2(1) = .12$, $p = .73$. OR $= 1.03$, 95% CI [.87 - 1.22], indicating that maternal depression did not influence the mothers' odds of having a distorted instead of disengaged representation. Taken together, maternal depression did not influence the mothers' likelihood of being classified as balanced, distorted, or disengaged.

Aim Two: Prenatal Reflective Functioning and Maternal Representations.

It was hypothesized that mothers' prenatal reflective functioning scores would significantly influence the mothers' likelihood of having balanced, disengaged, or distorted WMCI representations, such that mothers with the highest prenatal reflective functioning scores would be more likely to be classified as balanced than mothers with lower scores, and mothers with lower reflective functioning scores would be more likely to be classified as distorted or disengaged. To test this hypothesis, multinomial logistic regression was used. First, the balanced representation was used as a reference category, and each of the other two classifications (distorted and disengaged) were compared to this reference category. According to the results, the goodness of fit was not significant, indicating that the model fits the data well $x^2(10) = 17.11$, $p = .07$. The multinomial logistic regression model was statistically significant, $x^2(2) = 6.91$, $p = .032$, Nagelkerke-pseudo $R^2 = .15$, indicating that the full model predicted the WMCI classifications better than the null model. As seen in Table 5, mother's with lower RF scores more often had a disengaged than a balanced representation, $b = -.89$, Wald $x^2(1) = 5.46$, $p = .02$. OR $= .41$, 95% CI [.19 - .87] and the model explained 34.0% of the cases correctly. However, the parameter estimate for a distorted representation was not significant, $b = -.37$, Wald $x^2(1) = 1.68$, $p = .20$, indicating that maternal reflective functioning did not significantly influence the odds of having a distorted versus balanced representation. Second, the model was

re-run and the disengaged representation was used as a reference category to allow the comparison between the distorted and disengaged representations. The parameter estimate was not significant, $b = .53$, Wald x^2 (1) $= 2.19$, $p =. 14$, indicating that maternal reflective functioning did not impact the odds of having a distorted versus a disengaged representation. To summarize, the results revealed that mothers with high reflective functioning scores were significantly more likely to be classified with balanced representations when compared to disengaged representations. However, maternal reflective functioning scores did not significantly increase the mothers' likelihood as having balanced versus distorted, or distorted versus disengaged representations.

Table 5

The Multinomial Logistic Regression: Examining the Predictability of Maternal Reflective Functioning on the WMCI Classifications.

						95% CI	
WMCI Classifications	*b*	*SE*	*Wald*	*p*	*OR*	*LL*	*UL*
Disengaged vs Balanced	-.89	.38	5.46	.02	.41	.19	.87
Distorted vs Balanced	-.37	.28	1.68	.20	.69	.39	1.21
Distorted vs Disengaged	.53	.36	2.19	.14	1.69	.84	3.40

Note. N = 47: balanced (n = 16), distorted (n = 19), and disengaged (n = 12).
CI = confidence interval; LL = lower limit; UL = upper limit.
OR= the odds ratios for the predictors.

Aim Three: Attachment Related Anxiety and Avoidance and Maternal Representations.

It was hypothesized that: a) lower prenatal attachment-related anxiety scores would increase the likelihood of mothers being classified as balanced, compared to disengaged or distorted and b) lower prenatal attachment-related avoidance scores would increase the likelihood of mothers being classified as balanced compared to disengaged or distorted. It was

also hypothesized that a) higher prenatal attachment-related anxiety scores would increase the likelihood of mothers being classified as distorted or disengaged, and b) lower prenatal attachment-related avoidance scores would increase the likelihood of mothers being classified as balanced compared to disengaged or distorted.

To test the relationship between attachment-related anxiety and maternal attachment representations, the balanced representation was used as a reference category, and each of the other two classifications (distorted and disengaged) were compared to this reference category. According to the results, the goodness of fit was not significant, indicating that the model fits the data well x^2 (64), 75.46, p = .15. The multinomial logistic regression was marginally significant x^2 (20) = 5.69, p = .06, Negelkerke-pseudo R^2 =. 13, indicating that the null model fits the data better. However, the Wald statistic was statistically significant for the disengaged representation, b = .83, Wald x^2 (1) = 4.34 p = .04. As seen in Table 6, mothers with higher attachment-related anxiety scores more often had a disengaged than a balanced representation, OR = 2.29, 95 % CI [1.05 - 4.97]. Attachment-related anxiety did not significantly influence the odds of having a distorted versus a balanced representation, b = .65, Wald x^2 (1) = 3.26 p = .07. The model was re-run to examine the relation between attachment-related anxiety in distorted and disengaged representations. The disengaged representation was assigned as the reference category. According to the results, the parameter estimate was not significant for distorted versus disengaged representations, b = -.18, Wald x^2 (1) = .29, p = .59, indicating that maternal attachment-related anxiety did not impact a mother's odds of having a distorted versus a disengaged representation.

To test the relationship between the attachment-related avoidance and maternal attachment representations, the balanced representation was first used as a reference category.

According to the results, the goodness of fit was not significant, indicating that the model is acceptable for the data x^2 (70) = 87.24, p = .80. The multinomial logistic regression was not statistically significant x^2 (2) = 4.92 p = .09, Nagelkerke-pseudo R^2 = .11, and the model predicted 48.9% of the cases correctly. However the Wald statistic was statistically significant for disengaged representation, b = .78, Wald x^2 (1) = 4.39, p =. 04, indicating that mothers with higher attachment avoidance more often had a disengaged representation, OR = 2.18, 95% CI[1.05 - 4.53]. The parameter estimate for a distorted representation was not significant, b = .32, Wald x^2 (1) = 0.96, p = .33, indicating that maternal attachment-related avoidance did not influence the mothers' odds of having a distorted instead of balanced representation. Next, the model was re-run and the disengaged representation was used as a reference category to allow the comparison between the disengaged and distorted representations in relation to attachment-related avoidance. According to the results, the multinomial logistic regression was not statistically significant, x^2 (2) = 4.92, p = .86, Nagelkerke-pseudo R^2 = .11. The parameter estimate for a distorted representation was not significant, b = -.46, Wald x^2 (1) = 1.88, p = .17, indicating that maternal attachment-related avoidance did not influence the mothers' odds of having a distorted instead of disengaged representation.

Taken together, a high maternal attachment-related anxiety score significantly increased the likelihood of mothers being classified as disengaged and marginally increased the likelihood of mothers being classified as having a distorted representation. Lower attachment-related anxiety scores, on the other hand, significantly increased the likelihood of mothers having a balanced representation when compared to disengaged representation, and marginally increased the likelihood of mothers having a balanced versus a distorted representation.

Table 6

The Multinomial Logistic Regression: Examining the Predictability of Prenatal Romantic Attachment Related Anxiety and Avoidance on the WMCI classifications.

WMCI Classifications	*b*	*SE*	*Wald*	*p*	*OR*	95% CI LL	UL
Attachment-related anxiety							
Disengaged vs Balanced	.83	.39	4.34	.04	2.29	1.05	4.97
Distorted vs Balanced	.65	.36	3.26	.07	1.91	.95	3.87
Distorted vs Disengaged	-.18	.33	.29	.59	.84	.44	1.59
Attachment-related avoidance							
Disengaged vs Balanced	.78	.37	4.39	.04	2.18	1.05	4.53
Distorted vs Balanced	.32	.33	.96	.33	1.38	.73	2.61
Distorted vs Disengaged	-.46	.34	1.88	.17	.63	.33	1.22

Note. N = 47: balanced (n = 16), distorted (n = 19), and disengaged (n = 12).
CI = confidence interval; LL = lower limit; UL = upper limit.
OR= the odds ratios for the predictors.

According to the earlier analyses, there was an *unexpectedly* high correlation between the adult attachment related anxiety scale and the attachment-related avoidance scale (r = 0.80). Therefore, the author of the measure, R.C. Fraley, suggested that the scales be combined to represent a simple secure versus an insecure dimension (personal communication, October 3, 2016). Therefore, the two scales were combined to form a single adult attachment style security score and the relationship between adult attachment style on maternal WMCI representations was re-examined in two multinomial logistic regression analysis. In the first, the balanced representation was used as a reference category. According to the results, the goodness of fit was not significant, indicating that the model is acceptable for the data x^2 (72) = 79.45, p = .26. The

multinomial logistic regression approached significance x^2 (2) = 5.60, p = .06, Nagelkerke-pseudo R^2 = .13, and the model predicted 46.8% of the cases correctly. However, the Wald statistic was statistically significant for disengaged representation, b = .89, Wald x^2 (1) = 4.78, p =. 03, indicating that mother's with higher attachment insecurity more often had a disengaged representation, OR = 2.44, 95% CI [.84 – 3.50] than a balanced representation. The parameter estimate for the distorted representation was not significant, b = .54, Wald x^2 (1) = 2.18, p = .14, indicating that maternal attachment insecurity did not influence the mothers' odds of having a distorted instead of balanced representation. In the second set, the model was re-run and the disengaged representation was used as a reference category to allow the comparison between the disengaged and distorted representations in relation to attachment insecurity. According to the results, the multinomial logistic regression was not statistically significant, x^2 (2) = 5.60, p = .61, Nagelkerke-pseudo R^2 = .13. The parameter estimate for a distorted representation was not significant, b = -.36, Wald x^2 (1) = 1.03, p = .31, indicating that maternal attachment insecurity did not influence the mothers' odds of having a distorted instead of a disengaged representation. The results are presented in Table 7.

Table 7

The Multinomial Logistic Regression: Examining the Predictability of Maternal Romantic attachment Style- combined scales on the WMCI Classifications.

						95% CI	
WMCI Classifications	*b*	*SE*	*Wald*	*p*	*OR*	*LL*	*LL*
Disengaged vs Balanced	.89	.41	4.78	.03	2.44	1.09	5.43
Distorted vs Balanced	.54	.36	2.18	.14	1.71	.84	3.47
Distorted vs Disengaged	-.36	.35	1.03	.31	.70	.35	1.39

Note. N = 47: balanced (n = 16), distorted (n = 19), and disengaged (n = 12).
CI = confidence interval; LL = lower limit; UL = upper limit.
OR= the odds ratios for the predictors.

Aim Four: Maternal Depression, Reflective Functioning, Attachment-Related Anxiety, and Avoidance and Maternal Attachment Representations.

To understand the unique contribution of the variables shown to significantly predict WMCI classifications in earlier analyses, reflective functioning, attachment-related anxiety, and attachment-related avoidance were entered into a multinomial logistic regression. It was hypothesized that all variables would uniquely predict WMCI classifications. However, maternal depression was excluded because it did not show relationships in the earlier analysis. To test this hypothesis, first, the balanced representation was used as a reference category, and each of the other two classifications (distorted and disengaged) were compared to this reference category. According to the results, the goodness of fit was not significant, indicating that the model fits the data well x^2 (86) = 84.24, p = .53. The model fit was significant, indicating that the full model fit significantly better than did the null model x^2, (6) = 17.42, p = .01, Nagelkerke-pseudo R^2 =. 35. The multinomial logistic regression model showed that of the predictors, only maternal reflective functioning had a unique contribution to the model, x^2 (2) = 9.11, p = .01 and the model correctly classified 53.2 % of cases.

According to the parameter estimate, only maternal reflective functioning was statistically significant in predicting the maternal WMCI attachment representations (as shown in Table 8). In particular, increasing reflective functioning was associated with a decreased likelihood of being classified as disengaged versus balanced, b = -1.19, Wald x^2 (1) = 6.80, p = .01, OR = .31, 95% CI [.13 - .74]. Maternal reflective functioning; however, did not influence a mother's odds of having a distorted versus a balanced representation, b = -.41, Wald x^2 (1) = 1.80, p = .18. The model was re-run to examine the unique contribution of the prenatal variables in distorted versus disengaged representation, and disengaged representation was assigned as a

reference category. According to the Wald statistics, maternal reflective functioning and maternal attachment–related avoidance showed marginally significant results as depicted in Table 8.

Table 8

The Multinomial Logistic Regression: Examining the Predictability of each of the Prenatal Variables on the WMCI.

WMCI Classifications	b	SE	Wald	p	OR	95% CI LL	UL
Disengaged vs Balanced							
Maternal RF	-1.19	.46	6.80	.01	.31	.13	.74
Attachment-related anxiety	.59	.65	.83	.36	1.81	.50	6.50
Attachment-related avoidance	.63	.65	.939	.33	1.87	.53	6.61
Distorted vs Balanced							
Maternal RF	-.41	.31	1.80	.18	.66	.36	1.21
Attachment-related anxiety	1.04	.61	2.96	.09	2.83	.86	9.30
Attachment-related avoidance	-.48	.59	.67	.41	.62	.196	1.96
Distorted vs Disengaged							
Maternal RF	.78	.41	3.63	.06	2.17	.98	4.82
Attachment-related anxiety	.45	.57	.63	.43	1.57	.52	4.75
Attachment-related avoidance	-1.10	.597	3.42	.07	.33	.10	1.07

Note. N = 47: balanced (n = 16), distorted (n = 19), and disengaged (n = 12).
CI = confidence interval; LL = lower limit; UL = upper limit.
Maternal RF = Maternal reflective functioning.
OR= the odds ratios for the predictors.

Additionally, when the adult attachment related anxiety and avoidance scales were combined, the analysis was re-run to test the unique contribution of the variables shown to significantly predict WMCI classifications in earlier analyses. In this analysis, attachment style and reflective functioning were entered into the model. The balanced representation was used as a reference category. According to the results, the goodness of fit was not significant, indicating that the model fits the data well x^2 (86) = 84.48, p = .53. The model fit was significant, indicating that the full model fit significantly better than did the null model x^2, (4) = 14.41, p = .01, Nagelkerke-pseudo R^2 = .30. Unlike the previous analysis, in this analysis the multinomial logistic regression model showed that both maternal reflective functioning x^2 (2) = 8.23, p = .01, and attachment style x^2 (2) = 7.50, p = .02, had a unique contribution to the model, and the model correctly classified 38.3 % of cases.

According to the parameter estimates, maternal reflective functioning was statistically significant in predicting the attachment representation. In particular, increasing reflective functioning was associated with a decreased likelihood of being classified as disengaged versus balanced, b = -1.13, Wald x^2 (1) = 6.67, p = .01, OR = .32. Maternal reflective functioning did not influence a mother's odds of having a distorted versus a balanced representation, b = -.43, Wald x^2 (1) = 1.99, p = .16. Additionally, the parameter estimates showed that maternal attachment style was also significant in predicting the attachment representations. In particular, increasing maternal attachment insecurity was significantly associated with an increase likelihood of mothers being classified as disengaged versus balanced. b = 1.19, Wald x^2 (1) = 6.10, p = .01, OR = 3.32. Moreover, the results revealed that neither maternal reflective functioning, nor adult attachment insecurity influenced the mothers' odds of being classified with as distorted versus a balanced representation.

This model was re-run to examine the contribution of these prenatal variables in distorted versus disengaged representation. The disengaged representation was assigned as a reference category. Wald statistics suggest that only maternal reflective functioning b = .71, Wald x^2 (1) = 3.24, p = .07, OR = 2.03, 95% CI [.94 - 4.47] was marginally significant, indicating that as mothers reflective functioning increase so the mothers' odds of being classified with a distorted versus a disengaged representations. Adult attachment style b = -.64, Wald x^2 (1) = 2.26, p = .13, OR = .53, 95% CI [.23 - 1.21] did not increased the mothers' likelihood of being classified as distorted versus disengaged. The results is depicted in Table 9.

Table 9

The Multinomial Logistic Regression: Examining the Predictability of Prenatal Reflective Functioning and Maternal Romantic Attachment Style-combined scales on the WMCI Classifications.

WMCI classifications	*b*	*SE*	*Wald*	*p*	*OR*	*95% CI*	
						LL	UL
Disengaged vs Balanced							
Maternal RF	-1.13	.44	6.67	.01	.32	.14	.76
Attachment style-C	1.19	.48	6.10	.01	3.29	1.28	8.48
Distorted vs Balanced							
Maternal RF	-.43	.30	1.98	.16	.66	.36	1.18
Attachment style-C	.56	.36	2.41	.12	1.75	.86	3.53
Distorted vs Disengaged							
Maternal RF	.71	.39	3.25	.07	2.03	.94	4.37
Attachment style-C	-.64	.42	2.26	.13	.53	.23	1.21

Note. N = 47: balanced (n = 16), distorted (n = 19), and disengaged (n = 12).
CI = confidence interval; LL = lower limit; UL = upper limit.
Attachment style-C= Attachment style-combined scales
Maternal RF = Maternal reflective functioning.
OR= the odds ratios for the predictors.

CHAPTER 5: DISCUSSION

The current study examined whether prenatal factors, including maternal depression, reflective functioning, and romantic attachment style, predicted mothers' maternal representations of their infants and their relationships with their infants via the Working Model of The Child Interview (WMCI) at seven months postpartum. The importance of the current study is due to its focus on a critical period in mothers' lives, the time during which women's mental representations of their babies emerge and continue to develop after their babies are born. The quality of mothers' maternal representations remains stable during the infants' first year of life and predicts parenting and attachment classifications. Representational quality could be impacted by several factors, and the studies that examined these factors remain limited in number and the types of factors they examined. In fact, only the study conducted by Vreeswijk et al. (2015) examined prenatal factors in relation to maternal postnatal representations. Understanding the variables associated with maternal mental representations during pregnancy creates a unique opportunity to identify women in need of preventive care.

The current study examined the predictability of each factor on maternal mental representations, and then all of the significant factors were examined together to determine their individual contribution in predicting maternal mental representations. The results of the current study suggested that prenatal reflective functioning and romantic attachment styles predict maternal representations at seven months postpartum, and that both prenatal reflective functioning and romantic attachment (security score) have a unique contribution to the prediction of maternal representations of the child and the relationship with the child at seven months postpartum. However, maternal depression was not predictive of maternal representations.

In the current sample, the distribution of maternal mental representations was inconsistent with the majority of the studies that have examined maternal mental representations using nonclinical samples. A meta-analysis by (Vreeswijk et al., 2012) reported that in a nonclinical population, 53% of mothers have balanced representations, while in a clinical population, most mothers' representations are classified as non-balanced. In the current study, 34% of the women's representations were classified as balanced, while the majority of the women's representations (40%) were classified as distorted.

Because the current sample is a non-clinical community sample, the high distribution of non-balanced representations could be attributed to two things. First, the current sample demonstrates a range of demographic risk factors, including low levels of education, higher rates of single parenting, and low socioeconomic status, compared to other non-clinical samples. While some families in this study were college graduates and/or lived above the poverty threshold, the demographic characteristics of much of this sample are similar to other at-risk samples. For example, with regard to education, in the study completed by Huth-Bocks et al. (2004), 54% of the sample had high school or less for their education, 36% attended some college, 20% were married, and 55% had monthly incomes of less than $1,500. In the current study's sample, 45.7% of the women had attended some college, 46.7% were married or had a partner, and 40% had yearly incomes of less than $10,000. Previous studies show an association between demographic risk factors and maternal WMCI classifications (Theran et al., 2005; Vreeswijk et al., 2015). Additionally, studies on children attachment suggest that demographic risk factors have an indirect impact on children's attachment via maternal behavioral interaction with the child (Raikes & Thompson, 2005; Fish, 2001).

Second, because the distributions of the WMCI classifications in the current sample resemble the samples from other studies that had clinical or at-risk samples, which included mothers with posttraumatic stress disorder (PTSD), or mothers who experienced domestic violence (Huth-Bocks et al., 2004; Schechter et al., 2005), it could be that the current sample had some risk factors that were not considered in the study. For example, in the context of domestic violence, Schechter et al. (2005) found that 17% of mothers in their sample were classified as balanced, 24% as disengaged, and 56% as distorted. Similarly, in the study completed by Huth-Bocks et al. (2004), of the women who reported domestic violence, 33% were classified as balanced, 41% were classified as disengaged, and 26% were classified as distorted. When considering balanced in relation to non-balanced classifications, this distribution was very similar in proportion to the distribution of the current sample (balanced = 34%; distorted = 40.4%; and disengaged = 25.5%).

Maternal Demographic Factors and Maternal Representations of the Child

Although establishing relationships among maternal demographic characteristics and mother's mental representations was not an aim of the current study, they were explored to determine whether these factors should be controlled for in future analyses. The results suggested that maternal demographic characteristics, including marital status, income, education, and age, were not related to maternal mental representations. This finding is relatively inconsistent with the previous studies that suggest risk factors are related to maternal representations. With respect to income and marital status, Theran et al. (2005) found that maternal income and marital status were related to the stability of maternal representations in the first year postpartum. Vreeswijk and colleagues (2015) suggested that prenatal risk factors, including demographic variables, increase the likelihood of having non-balanced maternal representations, and Huth-Bocks et al.

(2004) also suggested that prenatal risk factors, including low socioeconomic status and single parenting, are related to maternal non-balanced representations. However, both Vreeswijk et al. (2015) and Huth-Bocks et al. (2004) used a single score to represent the risk factor instead of measuring each factor individually.

With regard to mother's education, the findings from this study are inconstant with previous studies. For example, Sokolowski and colleagues (2007) found that mothers with balanced representations had more years of education in comparison to mothers with disengaged representations. The current study's finding, however, was consistent with the findings made by Korja et al. (2009) and Schechter et al. (2005) who reported that maternal education was unrelated to mothers' representations. Most previous studies suggested that maternal age is not associated with their representations of their infants and the findings here are consistent with those, including Schechter et al. (2005), Sokolowski et al. (2007), and Korja et al. (2009).

Maternal Demographic Factors and Independent Variables

The associations between mothers' demographic characteristics and the study's independent variables, including maternal depression, reflective functioning, and attachment-related anxiety and avoidance, were examined. The results suggested that in the current sample, these variables were not associated with demographic characteristics, including annual household income, education, marital status, and age. However, only maternal education was associated with maternal reflective functioning. This association is consistent with the results from other studies, which suggested that maternal risk, including low educational levels, is negatively associated with reflective functioning (Smaling et al., 2015; Stacks et al., 2014; Suchman et al., 2010).

Prenatal Depression and Maternal Representations of the Child

No known studies have examined prenatal depression in a non-clinical community sample in relation to maternal postpartum representations. Based on studies examining the relationship between depression and working model classification, when both variables were measured in the postpartum period, it was hypothesized that prenatal depression would predict mothers' mental representations, such that a high level of depressive symptoms would increase the likelihood of mothers being classified with non-balanced representations. This hypothesis was not supported and the results suggested that prenatal depressive symptoms do not predict maternal mental representations at seven months postpartum. The current study's findings are also inconsistent with the finding of the meta-analysis by Vreeswijk et al. (2012), which suggests that maternal clinical status, including psychiatric disorders, is linked to the working model of caregiving, and Vreeswijk et al. (2015) also suggests that the presence of risk factors, including psychological or psychiatric treatment is related to mothers' non-balanced representations. More specifically, among clinically depressed women, Wood et al. (2004) suggested that less than 50% of depressed mothers had balanced representations when compared to the non-depressed population, and women who were depressed, both during pregnancy and postnatally, were all classified with non-balanced representations. Further, Rosenblum et al. (2002) found that in a community sample, mothers with distorted representations reported higher levels of postnatal depressive symptomology in comparison to mothers with balanced representations. Similarly, Korja et al., (2009) suggest that when examining non-clinically depressed women, higher levels of postnatal depressive symptoms are associated with distorted representations in comparison to balanced or disengaged representations, and that having fewer depressive symptoms during pregnancy impacts the stability of maternal representations during the transition to parenthood

(Theran et al., 2005). Only one study suggests that depressive symptoms do not increase the likelihood of having a non-balanced classification (Sokolowski et al., 2007).

WMCI classifications are concordant with children's attachment classifications in the Strange Situation. The findings from the current study were also inconsistent with these child attachment studies that suggested mothers with depression have a high frequency of children who are classified with insecure attachment in comparison to non-depressed mothers (Murray et al., 1996; Cicchetti et al., 1999; Campbell et al., 2004). Additionally, Hayes et al. (2013) suggest that mother's antenatal depressive symptoms are related to infants' classification of disorganized at 12 months postpartum.

The inconsistency in findings between the current study and earlier studies could be attributed to several reasons: low depressive symptoms, a small sample size, and the timing of the assessment. First, in the current sample, maternal depressive symptoms were low, ($M = 5.23$, $SD = 4.44$), and the scores were scattered, with only 19.1% (N = 9) of the mothers meeting the clinical cutoff score for depression. This could limit the power to clearly examine the relationship between depression and maternal representations. It should be mentioned that when exploring the association between the maternal representations of mothers who met the cutoff score of depression with the maternal representations of mothers who did not, using the frequency (cross tabulations), the association was not significant. Nevertheless, when exploring mothers who met the cutoff score to mothers who did not, among the mothers who did not, there were almost an equal number of mothers whose representations were classified as balanced (36.8%) and distorted (39.5%). Among the women who met the cutoff score of depression, 22.2% of their narratives were classified as balanced, 44.4% were distorted, and 33.3% were disengaged. It seems that both mothers whose classifications were balanced and distorted

experienced low depressive symptoms that were not significantly different from each other. However, among mothers with higher depressive symptoms, 44% were classified as distorted and only 22.2% were balanced. This could suggest that with a larger sample and more power, a significant association would have been discovered. However, due to the lack of significant results, this suggestion cannot be assumed, but can be examined in future studies.

The second reason for the current study's lack of association could be due to its small sample size, which did not allow for the presentation of a range of depressive scores enable a better examination of the relationship between depressive symptomology and maternal representations. Additionally, Reminick et al., (2013) suggest that women may not accurately detect their depressive symptoms because symptoms of depression can mimic the hormonal imbalances and mood changes that are experienced during pregnancy. Therefore, it could be assumed that the reported symptoms could be underestimated during pregnancy and such symptoms could be attributed to pregnancy symptoms.

Third, in addition to the previously mentioned reasons, in the current study, information about whether or not the mothers sought treatment for depression during pregnancy was not collected. Infant mental health programs are widely available in the county where the study took place and mothers' participation in such treatment programs would provide services to treat depression and support balanced representations. Lastly, most of the previous studies measured mothers' depressive symptoms either postnatally or concurrently, which limits the ability to determine the effect of prenatal depression on mothers' postnatal representations.

Prenatal Reflective Functioning and Maternal Representations of the Child

It was hypothesized that mothers' prenatal reflective functioning scores would influence the probability of mothers having balanced, disengaged, or distorted WMCI representations, such

that mothers with higher prenatal reflective functioning scores would be more likely to be classified as balanced than distorted or disengaged, and mothers with lower reflective functioning scores would be more likely to be classified as distorted or disengaged. This hypothesis was *partially* supported and thus showed that as prenatal reflective functioning increases so does the likelihood of mothers' representations being classified as balanced relative to disengaged. Maternal reflective functioning scores, however, did not impact the mothers' likelihood of having distorted versus balanced representations, and when the study examined the mothers with disengaged versus distorted representations, the result suggested that maternal reflective functioning scores did not impact the probability of mothers having distorted versus disengaged representations. In other words, prenatal reflective functioning scores were similar among non-balanced representations.

It should be mentioned that this is the first study to examine the predictability of prenatal reflective functioning in relation to postnatal WMCI representations. This study finding is in line with Schechter and colleagues (2005) who found that mothers with balanced representations had the highest reflective functioning scores and that mothers with disengaged representations had the lowest reflective functioning scores. It is also consistent with the findings from Slade et al. (2005) that autonomous mothers had higher reflective functioning scores than dismissing, preoccupied, and unresolved mothers. Further, findings from this study are also consistent with Slade et al. (2005) and Stacks et al. (2014), who suggested that regardless of the socio-demographic level of the parents, maternal reflective functioning is directly associated with child attachment; such that high levels of maternal reflective functioning are significantly associated with children being classified as secure versus insecure.

Previous studies have already established the concordance between maternal

representations as measured by the WMCI and children's attachment classifications in the Strange Situation Procedure (Benoit et al., 1997; Huth-Bocks et al., 2011; Madigan et al., 2015). The current study adds to the literature and suggests that prenatal reflective functioning can predict postnatal maternal mental representations via the WMCI and that reflective functioning could be essential for optimal maternal representations (Schechter et al., 2005).

In the current study, the association between lower levels of maternal reflective functioning and mothers' disengaged representations was expected and consistent with the finding from Schechter et al. (2005). This finding can be understood based on George and Solomon's (1996) proposition that at the level of caregiving representation, mothers of avoidant children employ "cognitive deactivation" or a "defensive exclusion" strategy, which helps them keep their representations organized and protect themselves from negative feelings by excluding unpleasant information and feelings from their awareness. In the current sample, a majority (66.7%) of the mothers with disengaged representations showed low levels of reflective functioning, ranging from 1-2, reflecting this deactivation strategy around powerful emotions experienced during pregnancy. Scores under 3 represent an inability to talk about thoughts, feelings, beliefs and emotions even when asked directly to do so. This strategy limits their connection to their children at the psychological and physical levels.

The current study's findings also demonstrated that when comparing mothers with balanced representations to mothers with distorted representations, maternal reflective functioning did not significantly influence the likelihood of mothers having a distorted versus a balanced representation. While this finding was unexpected, it is consistent with the finding reported by Schechter et al. (2005), which suggests that high levels of maternal RF did not seem to protect mothers from having distorted representations. Schechter et al. (2005) attributed this to

the possible impact of trauma on their high-risk sample, such that while these mothers are able to have appropriate levels of reflective functioning, they can become dysregulated by their emotions in a way that prevents them from forming balanced representations or responding to their infants' attachment-related needs.

In the current sample, this finding could be attributed to two reasons: first, the low mean scores of reflective functioning among the current sample could affect the differentiation between balanced and distorted. The current study's sample demonstrated a lower mean of reflective functioning score in comparison to other studies that examined community samples. In a low-risk sample, Slade (2005) found that the average reflective functioning score among parents whose children were classified as secure was 5.64, and in a high-risk sample, the average reflective functioning score was 4.81, among mothers whose children has secure attachment (Stacks et al., 2014), and 4.43 among mothers with balanced classifications (Schechter et al., 2005). Unlike the previous studies, in the current study the distribution of reflective functioning scores among mothers with balanced representations had a wide range of reflective functioning scores, from 2 to 6, with a low mean ($M = 3.56$, $SD = 1.413$); mothers with distorted representations had the widest reflective functioning scores, ranging from 0 to 5 ($M = 3.00$, $SD = 1.374$). This low mean could be due to the significant association between reflective functioning and maternal educational attainment, as the current sample demonstrates low educational attainment in comparison to other community samples, or it could be due to a combination of demographic factors. For example, the study completed by Stacks et al. (2014) was conducted using a community sample of women with histories of child maltreatment, with varying demographic risks and a proportion of the sample with little to no demographic risk. In the sample, the majority of the participants were married (75.90%), 25.30% had yearly

incomes of \$100,000 or more, and 38.60% had at least a bachelor's degree (Stacks et al., 2014).

The second reason for the lack of differentiation of the reflective functioning levels between balanced and distorted classifications could be attributed to the coding of the reflective functioning interviews. Mothers with distorted representations differ from mothers with balanced representations in their emotional regulation and defensive processing. For example, mothers with resistant children are highly attuned to their children, highly involved parents, and keep their children close (George & Solomon, 2008) in order to "detect caregiving and attachment signals" (p. 2644). However, they lack the ability to deactivate their emotions or integrate their experiences due to their overwhelming memories or feelings, which are expressed in their worry and confusion (George & Solomon, 2008). When determining their reflective functioning, mothers' overwhelmed emotional expressions might not be captured when coding their ability to attribute mental states to themselves and their children, which results in higher scores than mothers who deny their emotions.

It should be mentioned that although the reflective functioning score did not significantly differentiate between balanced and distorted representations, there was an indication that the direction of the result suggests that as reflective functioning increases, the likelihood of mothers' being classified as distorted decreases (b = -.37) in relation to balanced. However, this assumption cannot be confirmed but could be tested in future studies with larger samples that also demonstrate a larger range of reflective functioning or higher mean of the reflective functioning scores.

This finding has important implications. As Schechter et al. (2005) suggested, reflective functioning could be a prerequisite for the development of balanced representations. In this

study, this suggestion implies that the mothers' emerging capacity to a) understand their own mental states, including thoughts and emotions related to the pregnancy and their relationships with the father of the baby and their own mother, b) their relationship with their unborn child and c) being able to imagine the joys and difficulties of parenting could aid them in developing an optimistic perception of the infant and the relationship with the infant during the first year of life. It also highlights important treatment strategies for mothers with distorted representations. Unlike mothers with disengaged representations who distance themselves and may appear unable to acknowledge their children's emotional needs, mothers with distorted representations are able to inconsistently acknowledge their children's mental states, be sensitive, and/or overly involved, yet they are confused by other things in their life. Mothers with distorted representations and higher reflective functioning, need different clinical strategies that help them regulate their emotions, whereas mothers with disengaged representations require clinical strategies that focus on helping them recognize and make meaning of mental states.

Lastly, when examining the data closely, among mothers who had distorted representations, there were only 2 women who had scored in the high range for RF. These mothers may be better able to regulate their emotions and develop more flexible perceptions of their infants, but because of experiencing some risk factors, they struggle with their representation. For example, when Theran et al. (2005) examined how change in maternal working models from pregnancy to one-year postpartum impacts the mother-child interactions at one year postpartum, they found mothers who had balanced representations yet became non-balanced at one year postpartum demonstrated more sensitivity, less controlling behavior, and more joy than mothers who were non-balanced at the two points of the assessment. Perhaps these non-balanced mothers with high reflective functioning would have been classified as balanced

during pregnancy and show more sensitivity than other non-balanced mothers with lower reflective functioning scores. Future research should further examine this finding.

Prenatal Romantic Attachment and Maternal Representations of the Child

This is the first study to assess the relationship between romantic attachment style in pregnancy and mothers' attachment representations of their infants, assessed with the WMCI. Theory and research suggest an intergenerational transmission of attachment, such that mothers' own histories of attachment, their parenting quality, their children's patterns of attachment, and their own representations of caregiving are all interrelated (Atkinson et al., 2009; Benoit et al., 1997; Dayton et al., 2010; George & Solomon, 1996; Huth-Bocks et al., 2011; Madigan et al., 2015; Sokolowski et al., 2007; van IJzendoorn, 1995). Further, research suggests a relationship between adults' attachment relationships with their caregivers, their childhood attachments, and their romantic attachment styles (Behringer et al., 2011; Roisman et al., 2005; Shaver et al., 2000). Finally, romantic attachment styles have been associated with parenting (Edelstein et al., 2004; Feeney & Collins, 2001; Mills-Koonce et al., 2011; Rholes et al., 1995; Selcuk et al., 2010).

As a result, in this study, romantic attachment style was used as a proxy for maternal attachment representations. It was hypothesized that mothers' romantic attachment styles would predict maternal representations as measured by the WMCI, such that: a) low-level attachment-related anxiety scores would increase the likelihood of mothers being classified as having balanced representations and higher scores would increase the likelihood of mothers being classified as having non-balanced representations; and b) low-level attachment-related avoidance scores would increase the likelihood of mothers being classified as having balanced representations and higher avoidance scores would increase the likelihood of mothers being

classified as having non-balanced representations. As noted in the results section, maternal attachment-related anxiety and avoidance scales were highly correlated ($r = .80$); as a result, the scales were combined to represent one score (with higher scores representing insecurity), and additional analyses were run to examine whether a single security score predicted WMCI classifications.

The original hypotheses were *partially* supported and suggested that low prenatal attachment-related anxiety scores increase the probability of mothers being classified as balanced when compared to disengaged representations. However, attachment-related anxiety did not influence the mothers' probability of having a distorted versus a balanced representation, or a disengaged versus a distorted representation. Further, the results suggest that low prenatal attachment related avoidance scores increase the likelihood of mothers being classified as balanced when compared to disengaged representations. However, attachment-related avoidance did not influence the mothers' likelihood of having a distorted versus a balanced representation, or a disengaged versus a distorted representation.

The finding that mothers with higher attachment security (low anxiety and low avoidance) are more likely to have balanced representations than disengaged representations was expected. This finding is in line with studies that examined the relationship between adults' romantic attachments and their feelings and perceptions of their children and of their role as parents. For example, Rholes et al. (1995) suggest that adults with insecure attachments (high avoidance and anxiety) reported concerns about being good parents. Adults with high avoidance reported less desire to have children in comparison to less avoidant adults, even before having children (Rholes et al.). Further, Rholes et al. (2006) found that mothers with higher prenatal avoidance

reported less postnatal parental satisfaction and less desire to be parents in comparison to mothers with lower avoidance.

Furthermore, the current study's findings are consistent with and extend two related lines of research related to attachment style, parenting, and WMCI classifications. First, in regard to romantic attachment style and parenting, Mills-Koonce et al. (2011) suggest that mothers with a secure attachment style were more sensitive to their children than mothers who had an insecure avoidant attachment style. Further, Feeney and Collins (2001) found that parents with high avoidance scores showed less responsive behavior toward their children, especially when the children showed high levels of distress (Edelstein et al., 2004), and high avoidance scores were associated with unsupportive maternal behavior (Rholes et al., 1995). Selcuk et al. (2010) stated that mothers with both high anxiety and avoidance scores predicted maternal insensitivity. Additionally, mothers' attachment avoidance scores were associated with their discomfort with child contact and their inability to satisfy their children's needs. Mothers' attachment anxiety scores, on the other hand, were associated with conflict in interactions, difficulty reading their children's signals, and interference with child exploration (Selcuk et al., 2010).

Second, parenting quality is associated with the working model classifications. For example, Dayton et al. (2010) found that mothers with balanced representations demonstrated more sensitive and responsive behavior, and expressed affection and experienced joyfulness with their children, in comparison with non-balanced representations. Mothers who had distorted representations, on the other hand, presented higher levels of hostility in comparison to mothers with balanced representations; and mothers who had disengaged representations demonstrated higher levels of control and interference with their children in comparison to mothers with balanced representations. Additionally, mothers with disengaged representations were less

sensitive/responsive to their infants and were more withdrawn than mothers with distorted or balanced representations (Sokolowski et al., 2007).

Following these two lines of research, the current findings seem to fit with Hazan and Shaver's (1987) conceptualization that adults' states of mind with regard to childhood attachment experiences drive their romantic attachment style, which in turn is associated with parenting and parents' representations of their relationships with their infants. In this study, mothers with high avoidance attachment style or high anxiety scores seemed to compromise the quality of their caregiving behavior (Solomon & George, 1996) by developing disengaged representational working models. Security in romantic relationships, on the other hand, enhanced mothers' perceptions of their children and their relationships with them and helped them to adopt balanced representations.

The finding that mothers' attachment-related avoidance scores were predictive of maternal disengaged representations was not surprising and it can be understood based on the way in which both children and adults construct their working models and employ strategies to regulate their emotions. Children with insecure-avoidant attachment classification and adults with dismissing attachment both tend to under-activate their emotions and needs for the caregiver as a way of regulating their emotions. Similarly, adults with higher attachment style avoidance report self-reliance strategies (for review, see Cassidy, 2000; Shaver & Mikulincer, 2007), which is also consistent with the characteristics of mothers with disengaged representations. Such mothers experience a sense of emotional distancing and a tendency to dismiss their children's feelings (Zeanah & Benoit, 1995).

Further, the study's findings showed that maternal attachment-related avoidance did not influence the mothers' probability of having a distorted versus a disengaged representation. This

finding was somewhat expected because both representations represent an unbalanced quality of caregiving representations. However, mothers with distorted and disengaged representations perceive their children and their relationships differently based on their working models, so it could be expected that their relations to the attachment-related avoidance scale are different than mothers with balanced represenations. The lack of differences could be due to the high correlation between the ECR scale scores, or to the small sample size. When the results were examined closely, they indicated that as avoidance increased, the likelihood for mothers to be classified as distorted versus disengaged decreased (b = -.46), yet this needs to be investigated in future studies.

The results also showed that mothers' attachment-related avoidance scores did not influence their likelihood of having a distorted versus a balanced representation. While maternal attachment-related avoidance was expected to be unrelated to distorted representations due to a distinct working model, it was also unexpected to have on impact in the mothers' likelihood of being classified as distorted in relation to balanced due to the insecure (high avoidance) quality. However, while the results were nonsignificant, there was a trend that as maternal attachment-related avoidance increased, so didthe mothers' likelihood of being classified as distorted versus balanced (b = .32).

When examining maternal attachment-related anxiety, the finding that mothers' attachment related-anxiety predicted maternal disengaged representations instead of balanced representations was consistent with the expectation that insecure attachment styles would be associated with unbalanced representations. Again, because attachment-related avoidance and attachment-related anxiety are distinctly different from one another, and they are assumed to have differently constructed working models of their relationship, it was unexpected that

maternal adult attachment anxiety predicted maternal disengaged representations. Theoretically, one would expect that anxiety would predict distorted representations. Further, the results showed that maternal attachment related anxiety did not influence the mothers' likelihood of having a distorted versus a balanced representation. While this was unexpected, the result was marginally significant ($p = .07$), indicating that as maternal attachment related anxiety increased so did the mother's likelihood of being classified with distorted representation instead of balanced representations. Additionally, the results showed that maternal attachment related anxiety did not affect a mother's likelihood of having a distorted versus a disengaged representation.

To summarize, the results showed that both low maternal attachment-related anxiety and avoidance were predictive of balanced representations, and high scores of maternal attachment-related anxiety and avoidance were predictive of disengaged representations. Maternal attachment related anxiety was a marginally significant predictor of maternal distorted representations. Both maternal avoidance and anxiety were not predictive of distorted versus disengaged representations.

When the attachment style ECR scales were combined to form one security score, the results were maintained and suggested that lower scores, which indicate greater security, increased the probability of mothers being classified as balanced versus disengaged. Similar to the previous analysis, mothers' attachment styles did not influence their probability of having a distorted versus a disengaged representation. Previously, the association between maternal attachment anxiety and maternal distorted versus balanced representations was marginally significant, when the attachment style scales were combined, higher insecurity was not a significant predictor of maternal distorted representations. The current findings suggested that

secure adult attachment styles predicted maternal balanced representations versus disengaged representations, which was consistent with the aforementioned literature. However, higher security scores did not seem to differentiate mothers with distorted versus balanced representations. While this finding was unexpected, it could be attributed to a low variance in attachment style scores and sample size.

The current participants showed a small range of scores in relation to both adult attachment related anxiety (1.00 - 4.72) and avoidance (1.00 - 4.56), compared to the full scale, which ranges from 1-7. When examining the security scores among the three WMCI representations, balanced representations seemed to have the lowest average (*M* = 1.98, *SD* = 1.11), followed by distorted (*M* = 2.51, *SD* = 1.03) and disengaged (*M* = 2.90, *SD* = 0.96). Further, there is an indication that as maternal insecurity levels increased, the likelihood of mothers being classified as distorted versus balanced also increased (*b* = .54). Perhaps the relationship would be significant in a larger sample. Additionally, this finding could also be due to the high correlation between the two attachment scales.

Maternal Depression, Reflective Functioning, and Adult Attachment Style and Maternal Attachment Representations

It was hypothesized that all of the study's variables, including maternal depression, reflective functioning, and maternal attachment style (both avoidance and anxiety), would uniquely predict the WMCI classifications. In examining this hypothesis, maternal depression was excluded from the analysis because it did not predict the WMCI classifications in previous analyses. When both maternal reflective functioning and the continuous adult attachment style scales (avoidance and anxiety) were examined in relation to the WMCI, the results showed that only maternal reflective functioning had a unique contribution to the WMCI classification.

Specifically, as maternal reflective functioning increases, so does a mother's probability of being classified as having a balanced versus a disengaged representation, which is consisted with the previously discussed literature in parenting (Dayton et al., 2010; Sokolowski et al., 2007) and attachment (Benoit et al., 1997; Huth-Bocks et al., 2011; Madigan et al., 2015). Further, when the distorted representation was compared to the disengaged representation, the results suggest that maternal reflective functioning was marginally significantly predicted of mothers' distorted representations instead of disengaged representations ($p = .06$), which means that as reflective functioning increases, so do a mother's probability of being classified as having a distorted versus a disengaged representation. However, maternal prenatal reflective functioning did not affect a mother's likelihood of having a distorted versus a balanced representation. These findings suggest that high maternal reflective functioning score did not protect the mothers from being classified as distorted. Nevertheless, the result showed an indication that as maternal reflective functioning increases it decreases the likelihood for mothers being classified as distorted versus balanced, which could be examined further in future study.

The impact of mothers' attachment related anxiety and avoidance on maternal caregiving representation conversely, was diminished when it was examined in conjunction with maternal reflective functioning. These results suggest that maternal reflective functioning had a unique contribution to her WMCI classification above and beyond the impact of the maternal attachment style (attachment-related avoidance and attachment-related anxiety).

After combining the attachment style scales (ECR: attachment-related avoidance and attachment-related anxiety), the analyses were rerun to examine if the maternal reflective functioning and the security of attachment style would uniquely predict the WMCI classifications. The results suggest that each variable had a unique contribution to the maternal

representation of the child via the WMCI. The conclusion that maternal reflective functioning increases a mother's likelihood of being classified as having a balanced versus a disengaged representation was maintained and consistent with the previously discussed literature. Further, maternal reflective functioning did not influence the likelihood of a mother being classified as having a distorted versus a disengaged representation, or distorted versus a balanced representation.

Furthermore, the results show that maternal attachment style was also significant in predicting the maternal representations. Particularly, increasing maternal attachment insecurity was associated with an increased likelihood of a mother being classified as having a disengaged versus a balanced representation. Nevertheless, attachment insecurity did not influence the likelihood of a mother being classified as having a distorted versus a disengaged representation, and as maternal attachment insecurity increases, the likelihood for mothers being classified as balanced versus disengaged decreases. Again, both maternal reflective functioning and attachment style did not influence the odds of mothers being classified as having disengaged versus distorted representations or balanced versus distorted representations.

Limitations

The current study is the first known study to measure the predictability of prenatal maternal depression, reflective functioning, and adult attachment style on maternal WMCI representations at seven months postpartum. While the study has limitations, which are described below, the study also has important strengths that stem from its methodology. First, the study utilized a non-clinical, yet high demographic risk community sample that varied in its demographic characteristics, which will add to the existing literature regarding exclusive clinical populations or populations with restricted demographic characteristics. Furthermore, the study

utilized a semi-structured interview, a rigorous method, to measure maternal reflective functioning and maternal WMCI classifications, based on two distinct parts of the data that were coded by trained, blind coders who had high inter-rater reliability. Additionally, the self-report screening tool had high internal consistency.

While the study's findings add important contributions to the literature, particularly with regard to prenatal reflective functioning, the study is not without limitations. First, the current sample is a non-random sample, which limits the generalizability of the findings to a similar population. Second, the sample is relatively small, which restricts the statistical power of the results as well as limits the statistical procedures used with the current data. Third, information about additional variables that could alter the study's findings was not acquired, such as receiving mental health services and experiencing domestic violence or trauma. Such information could further aid the interpretation of the lack of association between maternal depression and the WMCI classifications, and/or the existing association between maternal reflective functioning, attachment style, and WMCI classifications. This information could be considered in future studies. Fourth, maternal depressive symptoms were measured based on a self-report screening tool. Using a diagnostic tool in addition to the self-report screening tool, such as a clinical interview, could help in teasing out pregnancy-related symptoms versus depressive symptoms. Fifth, the WMCI only yields three classifications of maternal representations. The current sample showed high distributions of mothers who were classified as distorted in comparison to other non-clinical community samples. It could be that among the current sample, the high percentage of distorted representations reflects the lack of a fourth classification, which is equivalent to disorganized attachment (Crawford et al., 2009). Lastly, the current study's sample showed an unexpectedly low average score of maternal reflective

functioning in comparison to a non-clinical, low-risk population and an unexpected high correlation between the two adult romantic scales. Restricted range can impact the ability to detect relationships when they actually exist. It could also be that the restricted scores could be related to unmeasured risk factors in the current study's population, such as domestic violence or other mental health concerns, which are important to consider in future studies.

Clinical Implications and Future Studies

The findings from this study have important theoretical and clinical implications. *Theoretically,* the finding that maternal prenatal reflective functioning predicts maternal WMCI representations supports its construct validity measured during pregnancy. It also supports Schechter et al. (2005) suggestion that maternal reflective functioning is a prerequisite for an optimal quality of caregiving mental representations, and it could explain the intergenerational transmission of attachment (van IJzendoorn, 1995). During pregnancy, a mother's internal representations of caregiving emerge (Solomon & George, 1996; Zeanah et al., 1986); during this time, a higher maternal reflective capacity appears to enhance a mother's ability to develop a balanced and flexible perception of her child when her child is seven months old. Mothers who had higher reflective functioning during pregnancy also had mental representations of their 7-month old infants that were characterized by rich, coherent, and organized descriptions of their children and their relationships with them; they were consistently and adequately sensitive and they accepted their children's characteristics. They were involved in their relationships and enjoyed them. This quality of mental representations seems to be translated to optimal parenting skills (Dayton et al., 2010; Sokolowski et al., 2007) and to more security in childhood (Benoit et al., 1997; Huth-Bocks et al., 2011; Madigan et al., 2015).

Mothers' low level of prenatal reflective functioning, on the other hand, seems to compromise their mental representations of their children and their relationships with them. At seven months postpartum, these mothers' representations of caregiving are characterized by emotional distancing and coolness, insufficient acknowledgment of their children's needs, less interest in their subjective experience, involvement, and joy.

In addition to prenatal reflective functioning, the findings suggested that adult attachment style could be a proxy for maternal attachment representations. Mothers with lower maternal attachment related anxiety and avoidance scores often have balanced representations. It seems that during pregnancy, mothers who perceive their romantic partners as available, responsive, and dependable have working models that allow them to have more flexible and balanced representations of their relationships with their children, which have been found to be empirically translated in their behavior with their children (Dayton et al., 2010; Sokolowski et al., 2007). Conversely, mothers who perceive their romantic partners as unavailable, unresponsive, and undependable, or when they themselves are uncomfortable being close to their romantic partners, more often have disengaged representations. It seems that their insecurity in their romantic relationships (their working models) continues to influence their mental representations of their children and their relationships with them. The strategies used to manage emotions in relationships with romantic partners may parallel strategies used to manage emotions associated with parenting. For example distancing in the face of strong emotions with partners, in someone who scores high in avoidance might translate to distancing and less interest in their children and their relationships. (Edelstein et al., 2004; Dayton et al., 2010; Feeney & Collins, 2001; Mills-Koonce et al., 2011; Rholes et al., 1995; Selcuk et al., 2010; Sokolowski et al., 2007).

In regard to *clinical* implications, first, although maternal depressive symptoms were not predictive of maternal caregiving representations, the results showed an indication that depressive symptoms were higher among mothers who were classified with distorted representations. This could be further examined in future studies. Second, the findings from the current study suggested that prenatal reflective functioning is a prerequisite for maternal representation. In two dissertations by Crumbley (2009), and Wong, (2016) reported that reflective functioning tends to be stable over time, and with clinical intervention, it can be improved (Muzik et al., 2015; Suchman et al., 2010). Empirical studies have also provided evidence of its relationships with parenting and security in children's attachment. Therefore, the current study's findings support the existing attachment-based interventions that target maternal reflective functioning or mentalization, such as Minding the Baby project (Slade, 2002), and emphasize that by applying early intervention during pregnancy, maternal representations are expected to be optimal, especially in the case of low reflective functioning and dismissing representations.

While the current findings show that maternal reflective functioning was higher among mothers who were classified with balanced representations than distorted representations, it did not significantly discriminate between them. Therefore, this finding could inform clinicians about appropriate strategies that help mother be better in self-regulation. Mothers with distorted representations, like adults with high attachment-related anxiety, and children with insecure-ambivalent attachment employ hyperactivating strategies (Mikulincer, Shaver, & Pereg, 2003). Thus, they are overly involved with their children, enjoy being with them, are able to attend to the children's needs, yet they are overwhelmed, inconsistent and confused, especially around negative feelings, which restrict them from being able to "integrate or deactivate" their emotions

(George & Solomon, 2008). This mean that while it is important to target maternal reflective functioning, focusing on the strategies that enable mothers with distorted representation to better regulate their emotions is equally important.

Third, although the current sample was a community, non-clinical sample, it showed some characteristics of an at-risk population. For example, the low level of income and education, the distribution of maternal representations and the high correlation between attachment styles requires additional examination of the needs of these populations. Fourth, maternal attachment style could be assessed prenatally to determine mothers' needs regarding preventive interventions. Based on current knowledge, there is no known intervention that aims to alter a particular attachment style. However, there are some interventions that share the same focus with attachment and that target romantic relationships, such as Emotionally Focused Therapy (Johnson, 2000), which may be optimal in modifying mothers' current working models. Lastly, future studies could replicate the current study in a larger sample, using a randomized sample method.

REFERENCES

Ainsworth, M. D. S., Blehar, M. C., Waters, E., & Wall, S. N. (1978). *Patterns of attachment: A Psychological Study of the Strange Situation*. Psychology Press. New york.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders*, fifth edition (5th ed) (DSM-V). Washington, DC: American Psychiatric Association.

Atkinson, L., Leung, E., Goldberg, S., Benoit, D., Poulton, L., Myhal, N., & ... Kerr, S. (2009). Attachment and selective attention: Disorganization and emotional stroop reaction time. *Development and Psychopathology, 21*(1), 99-126. doi:10.1017/S0954579409000078

Bammens, A. S., Adkins, T., & Badger, J. (2015). Psycho-educational intervention increases reflective functioning in foster and adoptive parents. *Adoption & Fostering*, *39*(1), 38-50.

Behringer, J., Reiner, I., & Spangler, G. (2011). Maternal representations of past and current attachment relationships, and emotional experience across the transition to motherhood: A longitudinal study. *Journal of Family Psychology, 25*(2), 210-219. doi:10.1037/a0023083

Benoit, D., Parker, K. H., & Zeanah, C. H. (1997). Mothers' representations of their infants assessed prenatally: Stability and association with infants' attachment classifications. *Child Psychology & Psychiatry & Allied Disciplines, 38*(3), 307-313. doi:10.1111/j.1469-7610.1997.tb01515.x

Benoit, D., Zeanah, C. H., Parker, K. H., Nicholson, E., & Coolbear, J. (1997). 'Working Model of the Child Interview': Infant clinical status related to maternal perceptions. *Infant Mental Health Journal, 18*(1), 107-121. doi:10.1002/(SICI)1097-0355(199721)18:1<107::AID-IMHJ8>3.0.CO;2-N

Bergink, V., Kooistra, L., Lambregtse-van den Berg, M. P., Wijnen, H., Bunevicius, R., van

    Baar, A., & Pop, V. (2011). Validation of the Edinburgh Depression Scale during

    pregnancy. *Journal of psychosomatic research*, *70*(4), 385-389.

Bowlby, J. (1969/1982), *Attachment and Loss*, *Vol. 1: Attachment*. New York: Basic Books.

Bowlby, J. (1973). *Attachment and Loss, Vol. 2: Separation*. New York: Basic Books.

Brennan, K. A., Clark, C. L., & Shaver, P. R. (1998). Self-report measurement of adult

    attachment: An integrative overview. In J. Cassidy & P.R. Shaver (Eds.), *Handbook of

    Aattachment: Theory, Rresearch, and Clinical Applications* (pp. 434-465). New York:

    Guilford.

Bretherton, I. (1990). Communication patterns, internal working models, and the

    intergenerational transmission of attachment relationships. *Infant Mental Health Journal,

    11*(3), 237-252. doi:10.1002/1097-0355(199023)11:3<237::AID-

    IMHJ2280110306>3.0.CO;2-X

Bretherton, I. (1990). Open communication and internal working models: Their role in the

    development of attachment relationships. In R. A. Thompson, R. A. Thompson (Eds.) ,

    Nebraska Symposium on Motivation, 1988: *Socioemotional Development* (pp. 57-113).

    Lincoln, NE, US: University of Nebraska Press.

Bretherton, I. (1992). The origins of attachment theory: John Bowlby and Mary Ainsworth.

    Developmental Psychology, 28, 759-775.

Campbell, S. B., Brownell, C. A., Hungerford, A., Spieker, S. J., Mohan, R., & Blessing, J. S.

    (2004). The course of maternal depressive symptoms and maternal sensitivity as

    predictors of attachment security at 36 months. *Development and Psychopathology,

    16*(2), 231-252. doi:10.1017/S0954579404044499

Campbell, S. B., Cohn, J. F., & Meyers, T. (1995). Depression in first-time mothers: Mother-infant interaction and depression chronicity. *Developmental Psychology, 31*(3), 349-357. doi:10.1037/0012-1649.31.3.349

Cassidy, J. (2000). Adult romantic attachments: A developmental perspective on individual differences. *Review of General Psychology, 4*(2), 111-131. doi:10.1037/1089-2680.4.2.111

Cassidy, J. (2008). The nature of the child's ties. In J. Cassidy, P. R. Shaver, J. Cassidy, P. R. Shaver (Eds.) , *Handbook of attachment: Theory, research, and clinical applications*, (2nd ed). (pp. 3-22). New York, NY, US: Guilford Press.

Cicchetti, D., Toth, S. L., & Rogosch, F. A. (1999). The efficacy of toddler-parent psychotherapy to increase attachment security in offspring of depressed mothers. *Attachment & Human Development, 1*(1), 34-66. doi:10.1080/14616739900134021

Collins, N. L., & Ford, M. B. (2010). Responding to the needs of others: The caregiving behavioral system in intimate relationships. *Journal of Social and Personal Relationships, 27*(2), 235-244. doi:10.1177/0265407509360907

Cox, J. L., Holden, J. M., & Sagovsky, R. (1987). Detection of postnatal depression: Development of the 10-item Edinburgh Postnatal Depression Scale. *The British Journal of Psychiatry*, *150*, 782-786. doi:10.1192/bjp.150.6.782

Coyl, D. D., Roggman, L. A., & Newland, L. A. (2002). Stress, maternal depression, and negative mother-infant interactions in relation to infant attachment. *Infant Mental Health Journal, 23*(1-2), 145-163. doi:10.1002/imhj.10009

Crumbley, A.H. (2009). *The relationship specificity of the reflective function: An empirical Database*, Wayne State University. Detroit. US.

Dayton, C. J., Levendosky, A. A., Davidson, W. S., & Bogat, G. A. (2010). The child as held in the mind of the mother: The influence of prenatal maternal representations on parenting behaviors. *Infant Mental Health Journal, 31*(2), 220-241. doi:10.1002/imhj.20253

Edelstein, R. S., Alexander, K. W., Shaver, P. R., Schaaf, J. M., Quas, J. A., Lovas, G. S., & Goodman, G. S. (2004). Adult attachment style and parental responsiveness during a stressful event. *Attachment & Human Development, 6*(1), 31-52. doi:10.1080/146167303100001659584

Fairchild, A. J., & Finney, S. J. (2006). Investigating Validity Evidence for the Experiences in Close Relationships-Revised Questionnaire. *Educational and Psychological Measurement, 66*(1), 116-135. doi:10.1177/0013164405278564

Feeney, B. C., & Collins, N. L. (2001). Predictors of caregiving in adult intimate relationships: An attachment theoretical perspective. *Journal of Personality and Social Psychology, 80*(6), 972-994. doi:10.1037/0022-3514.80.6.972

Field, T. (2010). Postpartum depression effects on early interactions, parenting, and safety practices: A review. *Infant Behavior & Development, 33*(1), 1-6. doi:10.1016/j.infbeh.2009.10.005

Fiese, B. H., Sameroff, A. J., Grotevant, H. D., Wamboldt, F. S., Dickstein, S., Fravel, D. L., & ... Schiller, M. (1999). The stories that families tell: Narrative coherence, narrative interaction, and relationship beliefs. *Monographs of the Society for Research In Child Development, 64*(2), 1-162. doi:10.1111/1540-5834.00017

Fish, M. (2001). Attachment in low-SES rural Appalachian infants: Contextual, infant, and maternal interaction risk and protective factors. *Infant Mental Health Journal, 22*(6), 641-664. doi:10.1002/imhj.1024

Flykt, M., Kanninen, K., Sinkkonen, J., & Punamäki, R. L. (2010). Maternal depression and

dyadic interaction: the role of maternal attachment style. *Infant and Child

Development*, *19*(5), 530-550.

Fonagy, P., Steele, M., Steele, H., Moran, G. S., & Higgitt, A. C. (1991). The capacity for

understanding mental states: The reflective self in parent and child and its significance

for security of attachment. *Infant Mental Health Journal, 12*(3), 201-218.

doi:10.1002/1097-0355(199123)12:3<201::AID-IMHJ2280120307>3.0.CO;2-7

Fonagy, P., Target, M., Steele, H., & Steele, M. (1998). *Reflective Functioning Manual for

Application to Adult Attachment Interviews, Version 5.0.* London: University College

London.

Fraley, R. C., Waller, N. G., & Brennan, K. A. (2000). An item response theory analysis of self-

report measures of adult attachment. *Journal of Personality and Social Psychology*,

78(2), 350-365. doi:10.1037/0022-3514.78.2.350

Gaynes, B. N., Gavin, N., Meltzer-Brody, S., Lohr, K. N., Swinson, T., Gartlehner, G., ... &

Miller, W. C. (2005). Perinatal depression: Prevalence, screening accuracy, and screening

outcomes: Summary. In: *AHRQ Evidence report summaries. Rockville (MD): Agency for

Healthcare Research and Quality (US)*; 1998-2005. Retrieved from : https://www-ncbi-

nlm-nih-gov.proxy.lib.wayne.edu/books/NBK11838/

George, C., & Solomon, J. (1996). Representational models of relationships: Links between

caregiving and attachment. *Infant Mental Health Journal, 17*(3), 198-216.

doi:10.1002/(SICI)1097-0355(199623)17:3<198::AID-IMHJ2>3.0.CO;2-L

George, C., & Solomon, J. (1999). The development of caregiving: A comparison of attachment theory and psychoanalytic approaches to mothering. *Psychoanalytic Inquiry, 19*(4), 618-646. doi:10.1080/07351699909534268

George, C., & Solomon, J. (2008). The caregiving system: A behavioral systems approach to parenting. In J. Cassidy, P. R. Shaver (Eds.) , *Handbook of attachment: Theory, research, and clinical applications,* (2nd ed) (pp. 833-856). New York, NY, US: Guilford Press.

George, C., Kaplan, N., & Main, M. (1985). *The Adult Attachment Interview*. Unpublished

Goodman, S. H., Rouse, M. H., Long, Q., Ji, S., & Brand, S. R. (2011). Deconstructing antenatal depression: What is it that matters for neonatal behavioral functioning?. *Infant Mental Health Journal, 32*(3), 339-361. doi:10.1002/imhj.20300

Greenberg, M. T., Cicchetti, D., & Cummings, E. M. (1993). *Attachment in the preschool years: Theory, research, and intervention*. Chicago, IL, US: University of Chicago Press.

Grienenberger, J., Kelly, K., & Slade, A. (2005). Maternal reflective functioning, mother-infant affective communication, and infant attachment: Exploring the link between mental states and observed caregiving behavior in the intergenerational transmission of attachment. *Attachment & Human Development, 7*(3), 299-311. doi:10.1080/14616730500245963

Hayes, L. J., Goodman, S. H., & Carlson, E. (2013). Maternal antenatal depression and infant disorganized attachment at 12 months. *Attachment & Human Development, 15*(2), 133-153. doi:10.1080/14616734.2013.743256

Hazan, C., & Shaver, P. (1987). Romantic love conceptualized as an attachment process. *Journal of Personality And Social Psychology, 52*(3), 511-524. doi:10.1037/0022-3514.52.3.511

Holmes, J. (1993). *John Bowlby and attachment theory* (1st ed.). New Yourk, US. Routledge.

Hull, D.J (n.d.) AZQuotes.com. Retrieved from: http://www.azquotes.com/author/7027-Jane_D_Hull

Huth-Bocks, A. C., Levendosky, A. A., Theran, S. A., & Bogat, G. A. (2004). The Impact of Domestic Violence on Mothers' Prenatal Representations of Their Infants. *Infant Mental Health Journal, 25*(2), 79-98. doi:10.1002/imhj.10094

Huth-Bocks, A. C., Theran, S. A., Levendosky, A. A., & Bogat, G. A. (2011). A social-contextual understanding of concordance and discordance between maternal prenatal representations of the infant and infant–mother attachment. *Infant Mental Health Journal*, *32*(4), 405-426. doi:10.1002/imhj.20304

Ilicali, E. T., & Fisek, G. O. (2004). Maternal Representations During Pregnancy and Early Motherhood. *Infant Mental Health Journal, 25*(1), 16-27. doi:10.1002/imhj.10082 *investigation* (Doctoral Dissertation). Retrieved from ProQuest Dissertation & Theses

Johnson, S. M. (2009). Attachment theory and emotionally focused therapy for individuals and couples: Perfect partners. In J. H. Obegi, E. Berant, J. H. Obegi, E. Berant (Eds.) , *Attachment theory and research in clinical work with adults* (pp. 410-433). New York, NY, US: Guilford Press.

Korja, R., Savonlahti, E., Ahlqvist-Björkroth, S., Stolt, S., Haataja, L., Lapinleimu, H., & ... Lehtonen, L. (2008). Maternal depression is associated with mother-infant interaction in preterm infants. *Acta Paediatrica, 97*(6), 724-730. doi:10.1111/j.1651-2227.2008.00733.x

Korja, R., Savonlahti, E., Haataja, L., Lapinleimu, H., Manninen, H., Piha, J., & Lehtonen, L. (2009). Attachment representations in mothers of preterm infants. *Infant Behavior & Development, 32*(3), 305-311. doi:10.1016/j.infbeh.2009.04.003

Landis, J.R., Koch, G.G. (1977). The measurement of observer agreement for categorical data. *Biometrics*. *33*,159-174.

Lovejoy, M. C., Graczyk, P. A., O'Hare, E., & Neuman, G. (2000). Maternal depression and parenting behavior: A meta-analytic review. *Clinical Psychology Review, 20*(5), 561-592. doi:10.1016/S0272-7358(98)00100-7

Madigan, S., Hawkins, E., Plamondon, A., Moran, G., & Benoit, D. (2015). Maternal representations and infant attachment: An examination of the prototype hypothesis. *Infant Mental Health Journal, 36*(5), 459-468. doi:10.1002/imhj.21527

Main, M. (2000). The organized categories of infant, child, and adult attachment: Flexible vs. inflexible attention under attachment-related stress. *Journal of the American Psychoanalytic Association, 48*(4), 1055-1096. doi:10.1177/00030651000480041801

Main, M., & Solomon, J. (1986). Discovery of an insecure-disorganized/disoriented attachment pattern. In T. B. Brazelton, M. W. Yogman, T. B. Brazelton, M. W. Yogman (Eds.) , *Affective development in infancy* (pp. 95-124). Westport, CT, US: Ablex Publishing.

Main, M., Goldwyn, R., & Hesse, E. (2003). *The adult attachment interview: Scoring and classification system, version 7.2.* Unpublished manuscript, University of California at Berkeley.

Main, M., Hesse, E., & Goldwyn, R. (2008). Studying differences in language usage in recounting attachment history: An introduction to the AAI. In H. Steele, M. Steele, H. Steele, M. Steele (Eds.) , *Clinical applications of the Adult Attachment Interview* (pp. 31-68). New York, NY, US: Guilford Press.

Main, M., Kaplan, N., & Cassidy, J. (1985). Security in infancy, childhood, and adulthood: A move to the level of representation. *Monographs of the Society For Research in Child Development*, 50(1-2), 66-104. doi:10.2307/3333827

manuscript, University of California at Berkeley.

Martins, C., & Gaffan, E. A. (2000). Effects of early maternal depression on patterns of infant–mother attachment: A meta-analytic investigation. *Journal of Child Psychology and Psychiatry, 41*(6), 737-746. doi:10.1111/1469-7610.00661

Mayseless, O. (2006). Studying Parenting Representations as a Window to Parents' Internal Working Model of Caregiving. In O. Mayseless (Eds.), *Parenting representations: Theory, research, and clinical implications* (pp. 3-40). New York, NY, US: Cambridge University Press. doi:10.1017/CBO9780511499869.002

McFarland, J., Salisbury, A. L., Battle, C. L., Hawes, K., Halloran, K., & Lester, B. M. (2011). Major depressive disorder during pregnancy and emotional attachment to the fetus. *Archives of Women's Mental Health, 14*(5), 425-434. doi:10.1007/s00737-011-0237-z

McLearn, K. T., Minkovitz, C. S., Strobino, D. M., Marks, E., & Hou, W. (2006). The timing of maternal depressive symptoms and mothers' parenting practices with young children: implications for pediatric practice. *Pediatrics*, *118*(1), e174-e182.

Mikulincer, M., Shaver, P. R., & Pereg, D. (2003). Attachment theory and affect regulation: The dynamics, development, and cognitive consequences of attachment-related strategies. *Motivation and Emotion, 27*(2), 77-102. doi:10.1023/A:1024515519160

Mills-Koonce, W. R., Appleyard, K., Barnett, M., Deng, M., Putallaz, M., & Cox, M. (2011). Adult attachment style and stress as risk factors for early maternal sensitivity and negativity. *Infant Mental Health Journal, 32*(3), 277-285. doi:10.1002/imhj.20296

Murray, L., Fiori-Cowley, A., Hooper, R., & Cooper, P. (1996). The impact of postnatal depression and associated adversity on early mother–infant interactions and later infant outcomes. *Child Development, 67*(5), 2512-2526. doi:10.2307/1131637

Muzik, M., Rosenblum, K. L., Alfafara, E. A., Schuster, M. M., Miller, N. M., Waddell, R. M., & Kohler, E. S. (2015). Mom Power: Preliminary outcomes of a group intervention to improve mental health and parenting among high-risk mothers. *Archives of Women's Mental Health, 18*(3), 507-521. doi:10.1007/s00737-014-0490-z

Pajulo, M., Pyykkönen, N., Kalland, M., Sinkkonen, J., Helenius, H., Punamäki, R., & Suchman, N. (2012). Substance-abusing mothers in residential treatment with their babies: Importance of pre- and postnatal maternal reflective functioning. *Infant Mental Health Journal, 33*(1), 70-81. doi:10.1002/imhj.20342

Paulson, J. F., Dauber, S., & Leiferman, J. A. (2006). Individual and combined effects of postpartum depression in mothers and fathers on parenting behavior. *Pediatrics*, *118*(2), 659-668.

Pines, D. (1972). Pregnancy and motherhood: Interaction between fantasy and reality. *British Journal of Medical Psychology, 45*(4), 333-343. doi:10.1111/j.2044-8341.1972.tb02216.x

Raby, K. L., Roisman, G. I., Fraley, R. C., & Simpson, J. A. (2015). The enduring predictive significance of early maternal sensitivity: Social and academic competence through age 32 years. *Child Development, 86*(3), 695-708. doi:10.1111/cdev.12325

Raikes, H. A., & Thompson, R. A. (2005). Links between risk and attachment security: Models of influence. *Journal of Applied Developmental Psychology, 26*(4), 440-455. doi:10.1016/j.appdev.2005.04.003

Ravitz, P., Maunder, R., Hunter, J., Sthankiya, B., & Lancee, W. (2010). Adult attachment measures: A 25-year review. *Journal of Psychosomatic Research, 69*(4), 419-432. doi:10.1016/j.jpsychores.2009.08.006

Reminick, A., Cohen, S., & Einarson, A. (2013). Managing depression during pregnancy. *Women's Health*, *9*(6), 527-535.

Rholes, W. S., Simpson, J. A., & Blakely, B. S. (1995). Adult attachment styles and mothers' relationships with their young children. *Personal Relationships, 2*(1), 35-54. doi:10.1111/j.1475-6811.1995.tb00076.x

Rholes, W. S., Simpson, J. A., & Friedman, M. (2006). Avoidant Attachment and the Experience of Parenting. *Personality and Social Psychology Bulletin, 32*(3), 275-285. doi:10.1177/0146167205280910

Roisman, G. I., Collins, W. A., Sroufe, L. A., & Egeland, B. (2005). Predictors of young adults' representations of and behavior in their current romantic relationship: Prospective tests of the prototype hypothesis. *Attachment & Human Development, 7*(2), 105-121. doi:10.1080/14616730500134928

Rosenblum, K. L., Dayton, C. J., & McDonough, S. (2006). Communicating Feelings: Links Between Mothers' Representations of Their Infants, Parenting, and Infant Emotional Development. In O. Mayseless (Eds.) , *Parenting representations: Theory, research, and clinical implications* (pp. 109-148). New York, NY, US: Cambridge University Press. doi:10.1017/CBO9780511499869.005

Rosenblum, K. L., Mcdonough, S. C., Sameroff, A. J., & Muzik, M. (2008). Reflection in thought and action: Maternal parenting reflectivity predicts mind-minded comments and

interactive behavior. *Infant Mental Health Journal, 29*(4), 362-376.

doi:10.1002/imhj.20184

Rosenblum, K. L., McDonough, S., Muzik, M., Miller, A., & Sameroff, A. (2002). Maternal

representations of the infant: Associations with infant response to the Still Face. *Child*

Development, 73(4), 999-1015. doi:10.1111/1467-8624.00453

Sadler, L. S., Slade, A., Close, N., Webb, D. L., Simpson, T., Fennie, K., & Mayes, L. C. (2013).

Minding the baby: Enhancing reflectiveness to improve early health and relationship

outcomes in an interdisciplinary home-visiting program. *Infant mental health*

journal, 34(5), 391-405.

Schechter, D. S., Coates, S. W., Kaminer, T., Coots, T., Zeanah Jr, C. H., Davies, M., ... &

McCaw, J. E. (2008). Distorted maternal mental representations and atypical behavior in

a clinical sample of violence-exposed mothers and their toddlers. *Journal of Trauma &*

Dissociation, *9*(2), 123-147.

Schechter, D. S., Coots, T., Zeanah, C. H., Davies, M., Coates, S. W., Trabka, K. A., & ... Myers,

M. M. (2005). Maternal mental representations of the child in an inner-city clinical

sample: Violence-related posttraumatic stress and reflective functioning. *Attachment &*

Human Development, 7(3), 313-331. doi:10.1080/14616730500246011

Selcuk, E., Günaydin, G., Sumer, N., Harma, M., Salman, S., Hazan, C., & ... Ozturk, A. (2010).

Self-reported romantic attachment style predicts everyday maternal caregiving behavior

at home. *Journal of Research in Personality, 44*(4), 544-549.

doi:10.1016/j.jrp.2010.05.007

Shaver, P. R., & Mikulincer, M. (2007). Adult attachment strategies and the regulation of emotion. In J. Gross (Eds.), *Handbook of emotion regulation(1ˢᵗ ed.)*, 446-465. New York The Guilford.

Shaver, P. R., Belsky, J., & Brennan, K. A. (2000). The adult attachment interview and self-reports of romantic attachment: Associations across domains and methods. *Personal Relationships, 7*(1), 25-43. doi:10.1111/j.1475-6811.2000.tb00002.x

Slade, A. (2005). Parental reflective functioning: An introduction. *Attachment & Human Development, 7*(3), 269-281. doi:10.1080/14616730500245906

Slade, A., (2008). Working with parents in child psychotherapy: Engaging the reflective function. In F. N. Busch (Ed.) *Mentalization: Theoretical considerations, research findings, and clinical implications* (pp. 207-234). Mahwah, NJ: Analytic Press.

Slade, A., Cohen, L. J., Sadler, L. S., & Miller, M. (2009). The psychology and psychopathology of pregnancy: Reorganization and transformation. In C. J. Zeanah, C. J. Zeanah (Eds.) , *Handbook of infant mental health*, (3ʳᵈ ed) (pp. 22-39). New York, NY, US: Guilford Press.

Slade, A., Grienenberger, J., Bernbach, E., Levy, D., & Locker, A. (2005). Maternal reflective functioning, attachment, and the transmission gap: A preliminary study. *Attachment & Human Devlopment*, *7*(3), 283-298.

Slade, A.,, Grunebaum, L., Huganir, L. & Reeves, M. (1987). *The Pregnancy Interview*. Unpublished manuscript, The City University of New York.

Smaling, H. A., Huijbregts, S. J., Suurland, J., Heijden, K. B., Goozen, S. M., & Swaab, H. (2015). Prenatal reflective functioning in primiparous women with a high-risk profile. *Infant Mental Health Journal, 36*(3), 251-261. doi:10.1002/imhj.21506

Sokolowski, M. S., Hans, S. L., Bernstein, V. J., & Cox, S. M. (2007). Mothers' representations of their infants and parenting behavior: Associations with personal and social-contextual variables in a high-risk sample. *Infant Mental Health Journal, 28*(3), 344-365. doi:10.1002/imhj.20140

Solomon, J., & George, C. (1996). Defining the caregiving system: Toward a theory of caregiving. *Infant Mental Health Journal, 17*(3), 183-197. doi:10.1002/(SICI)1097-0355(199623)17:3<183::AID-IMHJ1>3.0.CO;2-Q

Sroufe, L. A., Egeland, B., Carlson, E. A., & Collins, W. A. (2005). *The development of the person: The Minnesota study of risk and adaptation from birth to adulthood*. New York: Guilford Press.

Stacks, A. M., Muzik, M., Wong, K., Beeghly, M., Huth-Bocks, A., Irwin, J. L., & Rosenblum, K. L. (2014). Maternal reflective functioning among mothers with childhood maltreatment histories: Links to sensitive parenting and infant attachment security. *Attachment & human development*, *16*(5), 515-533.

Suchman, N.E., DeCoste, C., Castiglioni, N., McMahon, T.J., Rounsaville, B., & Mayes, L. (2010). The Mothers and Toddlers Program, an attachment-based parenting intervention for substance using women: Post-treatment results from a randomized clinical pilot. *Attachment & Human Development, 12*(5), 483-504. doi: 10.1080/14616734.2010.50198

Theran, S. A., Levendosky, A. A., Bogat, G. A., & Huth-Bocks, A. C. (2005). Stability and change in mothers' internal representations of their infants over time. *Attachment & Human Development, 7*(3), 253-268. doi:10.1080/14616730500245609

Toth, S. L., Rogosch, F. A., Sturge-Apple, M., & Cicchetti, D. (2009). Maternal depression, children's attachment security, and representational development: An organizational perspective. *Child Development, 80*(1), 192-208. doi:10.1111/j.1467-8624.2008.01254.x

Trapolini, T., Ungerer, J. A., & McMahon, C. A. (2008). Maternal depression: Relations with maternal caregiving representations and emotional availability during the preschool years. *Attachment & Human Development, 10*(1), 73-90. doi:10.1080/14616730801900712

Van IJzendoorn, M. (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. doi: 10.1037/0033-2909.117.3.387

Vreeswijk, C. M., Maas, A. M., & van Bakel, H. A. (2012). Parental representations: A systematic review of the Working Model of the Child Interview. *Infant Mental Health Journal, 33*(3), 314-328. doi:10.1002/imhj.20337

Vreeswijk, C. M., Rijk, C. H., Maas, A. J., & Bakel, H. J. (2015). fathers' and mothers'representations of the infant: associations with prenatal risk factors. *Infant mental health journal*, *36*(6), 599-612.

Weinfield, N. S., Sroufe, L. A., Egeland, B., & Carlson, E. (2008). Individual differences in infant-caregiver attachment: Conceptual and empirical aspects of security. In J. Cassidy, P. R. Shaver, J. Cassidy, P. R. Shaver (Eds.), *Handbook of attachment: Theory, research, and clinical applications*, (2nd ed) (pp. 78-101). New York, NY, US: Guilford Press.

Wong, K. M. (2016) *A study of stability: Maternal reflective functioning from pregnancy to seven months postpartum.* (Doctoral Dissertation). Retrieved from ProQuest. Dissertation & Theses Database, Wayne State University. Detroit. US.

Wood, B. L., Hargreaves, E., & Marks, M. N. (2004). Using the Working Model of the Child Interview to assess postnatally depressed mothers' internal representations of their infants: A brief report. *Journal of Reproductive and Infant Psychology, 22*(1), 41-44. doi:10.1080/02646830310001643058

Zeanah, C. H., & Anders, T. F. (1987). Subjectivity in parent-infant relationships: A discussion of internal working models. *Infant Mental Health Journal, 8*(3), 237-250. doi:10.1002/1097-0355(198723)8:3<237::AID-IMHJ2280080307>3.0.CO;2-H

Zeanah, C. H., & Benoit, D. (1995). Clinical applications of a parent perception interview in infant mental health. *Child and Adolescent Psychiatric Clinics of North America, 4*(3), 539-554.

Zeanah, C. H., Benoit, D., Barton, M. L., & Hirshberg, L. (1996). *Working Model of the Child Interview coding manual*. Unpublished manuscript.

Zeanah, C. H., Benoit, D., Hirshberg, L., Barton, M. L., & Regan, C. (1994). Mothers' representations of their infants are concordant with infant attachment classifications. *Developmental Issues in Psychiatry and Psychology, 1*, 1–14. doi: 10.1111/j.1469-7610.1997.tb01515.x

Zeanah, C. H., Keener, M. A., & Anders, T. F. (1986). Adolescent mothers' prenatal fantasies and working models of their infants. *Psychiatry: Interpersonal and Biological Processes, 49*(3), 193-203.

ABSTRACT

MATERNAL ATTACHMENT REPRESENTATIONS OF THE INFANT IN THE FIRST YEAR
OF LIFE: THE INFLUENCE OF PRENATAL FACTORS.

by

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MAY 2017

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Major: Educational Psychology

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The purpose of this study was to examine the predictability of prenatal factors, including maternal depression, reflective functioning, and romantic attachment style, on maternal mental representations at seven months postpartum. The participants were 74 mothers, a subsample of the Perinatal Imaging of Neural Connectivity study (PINC). Data from the current study were collected using semi-structured interviews, including the Pregnancy Interview-Revised (PI-R) (Slade, Grunebaum, Huganir, & Reeves, 1987) and the Working Model of the Child Interview (WMCI; Zeanah, Benoit, Barton, & Hirshberg, 1996); and self-report questionnaires, including the Edinburgh Postnatal Depression Scale (EPDS) (Cox, Holden, & Sagovsky, 1987) and the Experiences in Close Relationships-Revised (ECR-R) (Fraley, Waller, & Brennan, 2000). Data were analyzed using Multinomial Logistic Regression.

When the variables were examined separately, the results revealed that maternal depression was not related to maternal mental representations. However, both the prenatal reflective functioning and romantic attachment style scales predicted maternal representations at seven months postpartum. When maternal reflective functioning was examined in conjunction

with romantic attachment style, maternal reflectivity predicted maternal mental representations over and above the impact of romantic attachment style. Nevertheless, when the romantic attachment scales were combined to represent one single security score, the results revealed that both prenatal reflective functioning and romantic attachment (security scores) make unique contributions to mothers' maternal representations of their children and their relationships with them.

The findings from the study suggest that both maternal reflectivity during pregnancy and the security of their romantic attachment protect mothers from developing unbalanced representations, especially disengaged representations. The study has important contributions to the attachment literature by supporting the intergeneration transition of attachment. It also supports attachment-based therapy that aims to enhance mothers' reflectivity during pregnancy, and the authors made recommendations about specific therapeutic strategies to help women with distorted representations.

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