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MOTHER-INFANT ATTACHMENT: THE IMPACT OF MATERNAL
REPRESENTATIONS DURING PREGNANCY, MATERNAL RISK FACTORS,
AND SOCIAL SUPPORT

By

Alissa Christine Huth-Bocks

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ABSTRACT

MOTHER-INFANT ATTACHMENT: THE IMPACT OF MATERNAL
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The mother-child relationship during infancy is considered to be one of the
most important determinants of a child's social and emotional development by
clinical and developmental theorists. Because mother-infant attachment is so central to
children's well-being, it is critical to understand the mechanisms through which mother-
infant attachment is formed. The theoretical framework for this study is based on both
attachment theory and Daniel Stern's (1995) recent formulation about the transition to
motherhood. It examines the processes through which mother-infant attachment is
formed, by investigating the effects of both individual and environmental factors, in a
diverse and high-risk sample using a longitudinal research design. Two hundred and
seven women were interviewed during their last trimester of pregnancy, two months after
birth, and one year after birth. Participants were recruited throughout several counties in
mid-Michigan. During pregnancy, mothers' own experiences with caregivers during
childhood were assessed, as were mothers' thoughts and feelings about themselves as
mothers and their soon-to-be infants. Mothers' perceived level of social support and
experiences with violence, depression, and poverty were assessed at multiple time points.
Mother-infant attachment was assessed at 1 year postpartum using a well-known
laboratory procedure. Structural equation modeling results indicated that individual and

environmental variables measured during pregnancy and after birth had a significant impact on mother-infant attachment. The most important predictors were mothers' own attachment experiences during childhood, representations of the infant-to-be during pregnancy, and psychosocial risk factors. The results from this study expand the current level of understanding regarding the development of different patterns of mother-infant attachment. The results also have important clinical implications for the treatment of mothers and young children at risk for psychopathology.

Dedicated to the mothers and babies who participated in this study and taught me so much, to the little ones in my family who have given me so much joy, and to my husband who has loved and supported me throughout this work.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

Beginning with the work of John Bowlby (1944, 1969) and Mary Ainsworth

(Ainsworth, Blehar, Waters, & Wall, 1978), attachment theorists and researchers have

been studying the nature and quality of mother-infant attachment, including the

precursors and sequelae of different patterns of attachment. Empirical work has largely

focused on the infant's perspective of attachment with his/her mother by studying infant

behaviors in stressful and non-stressful situations, from which attachment quality is

inferred. More recently, theorists and researchers have begun to examine mother-infant

attachment from the parental perspective. In addition, there has been a trend to "move to

the level of representation" rather than to approach the study of attachment solely at the

behavioral level (Main, Kaplan, & Cassidy, 1985; Oppenheim & Waters, 1995).

Both clinical reports (e.g., Fraiberg, Adelson, & Shapiro, 1975) and recent

empirical research have indicated that there is a significant relationship between mothers'

representations of their own childhood attachment and mothers' attachment to their own

infants (Benoit & Parker, 1994; Fonagy, Steele, Moran, Steele, & Higgitt, 1993; Fonagy,

Steele, & Steele, 1991; Levine, Tuber, Slade, & Ward 1991; Slade & Cohen , 1996; Ward

& Carlson, 1995). However, few empirical studies have been conducted to help clarify

this continuity of attachment within families. Existing studies have suggested that

maternal representations of the infant and of the self-as-mother might explain the

relationship between mothers' own attachment during childhood and the attachment

formed with their infants (Ammaniti, 1991; Bretherton, Biringen, Ridgeway, Masline, &

Sherman, 1989; Fava Vizziello, Antonioli, Cocci, & Invernizzi, 1993; Zeanah, Benoit,

Hirshberg, Barton, & Regan, 1994). Unfortunately, most of these studies have been limited by small, primarily Caucasian and middle-class samples, as well as the use of different measures with no known psychometric properties.

In addition to the impact of maternal representations on mother-infant attachment, other researchers have suggested that attachment is influenced by external factors such as the amount and type of maternal social support. Empirical studies have shown inconsistent results (Crockenberg, 1981; Zeanah et al., 1993); however, findings from different studies suggest that social support may have a more indirect effect on mother-infant attachment through factors such as maternal behaviors or maternal self-efficacy (Crockenberg, 1988).

The current study examined possible mechanisms through which mothers' own attachment experiences could impact the attachment relationship with their infants, as well as the impact of environmental factors on this relationship, within a large, diverse, and high-risk sample. This study used a longitudinal research design and previously established measures, and was conducted in conjunction with a larger study examining the impact of domestic violence during pregnancy on women and infants. Maternal representations of attachment, of the infant, and of the self-as-mother were assessed during pregnancy, while self-efficacy and mother-infant attachment were measured at 12 months after birth. In addition, social support and several risk factors were measured both prenatally and postnatally. It was hypothesized that characteristics of both the mother and the mother's environment would predict the quality of attachment formed with her infant.

Because this study was largely based on attachment theory, an overview of this theory will be presented first in order to provide a framework for understanding the hypothesized model. Next, studies that have examined the relationship between mothers' own attachment during childhood and mothers' attachment to their infants will be reviewed. Although continuity of attachment has repeatedly been observed, possible mechanisms through which attachment is transmitted have generally been missing in the literature. Two possible mechanisms appear to be mothers' representations of their infants and representations of themselves as mothers, and the existing literature in these areas will be reviewed and critiqued. Since the present study also examined the relationship between social support and attachment, the few studies that have examined this relationship will be reviewed and their mixed findings will be discussed. Finally, because this study examined factors related to mother-infant attachment within a high-risk sample, literature that describes the relationship between a number of potential risk factors and mother-infant attachment will be explored.

CHAPTER 1: THEORETICAL BACKGROUND

Attachment Theory and the Mother-Infant Relationship

The mother-infant relationship has been of interest to psychoanalytic theorists since its inception. Sigmund Freud initially recognized the importance of the mother as an "object" that gratifies the infant's instinctual drives and frequently noted the profound effect that early relationships had on later functioning. It was not until the development of object relations theory, by key figures such as Donald Winnicott, William Fairbairn, and John Bowlby, that this relationship became a more central focus of inquiry. Unlike previous analytic theorists, object relations theorists maintained that the infant is primarily "driven" to establish relatedness and interactions with others as an end in itself. They purported that infants come "wired" or prepared for immediate human interactions, which form the foundation for the infant's developing sense of self and future relationships. In addition, clinical investigators such as Rene Spitz helped clarify the infant's role as an active participant in dyadic relationships, which furthered our understanding of self-object differentiation.

Drawing from evolutionary biology, cognitive psychology, and ethology, in addition to object relations theory, John Bowlby (1969, 1988) developed attachment theory to further explain the mother-infant relationship. Bowlby stated that the infant comes into the world with an innate predisposition toward social interaction as a means of survival and adaptation. Thus, the infant is driven to seek proximity with the primary caregiver, particularly when threat or danger is perceived, because s/he is unable to protect him/herself. According to Bowlby (1969), infants are born with a number of attachment behaviors that are used to regulate the attachment relationship with the

mother, including sucking, smiling, crying, and clinging, the main purpose of which are to attain or maintain proximity to a caregiver who is conceived as better able to cope with the world.

Bowlby proposed that attachment behaviors are part of a behavioral system that help maintain a sense of emotional homeostasis for the infant. Within this system, infant behaviors are activated when a distance threshold between the infant and caregiver is exceeded or another threat is perceived (Carlson & Sroufe, 1995). In a well-functioning system, parents contribute to this homeostasis by showing complementary attachment behaviors, which are of the caregiving type. While the infant behaves in ways that seek out help and protection, mothers behave in ways that protect and secure the infant. When proximity is achieved, infant attachment behaviors are deactivated. As will be described further, parents and infants can also develop more maladaptive attachment patterns during which infant security is compromised.

Mother-infant attachment appears to develop within the first few months of life (Bowlby, 1988), possibly because it is during this time that infant regulation (or dysregulation) has long-term effects on neural system development (Carlson & Sroufe, 1995). During the first 3 months of life, a synchrony related to physiological needs sets the tone for later psychological regulation. Between 3 and 6 months, the caregiver helps the infant maintain organized behaviors and affect regulation in the face of stress and arousal by making stress tolerable. This enables the infant to feel secure even when faced with negative feelings and to gain confidence that s/he can influence what happens to him/her. Around the ages of 6 to 9 months, the infant assumes a more active role in self-regulation and self-initiated activities due to increased development of motor and

cognitive abilities. With the onset of locomotion, additional attachment behaviors are added to the infant's repertoire such as purposeful approach to the mother, following the mother, and use of the mother as a secure base from which to explore (Ainsworth, 1967), all of which continue to serve the function of maintaining proximity to the mother when needed.

Development of Internal Working Models

By the end of the first year, Bowlby (1969, 1980) proposed that infants begin to develop "internal working models," which are mental representations of self and others based on early experiences with caregivers (a more elaborated version of what other psychoanalysts called "internal objects" or "internal world"). Internal working models are formed from the history of the infant's actions, infant-parent interactions, and the caregiver's responses to the infant, rather than from an objective picture of the parent (Main et al., 1985), and working models of self and other are believed to be separate, but complementary. Although internal working models are thought to consist of generalized representations, Bowlby preferred the term "internal working model" because it emphasizes the dynamic and functional aspects of representations (Bretherton, Ridgeway, & Cassidy, 1990).

Bowlby stated that the function of internal working models is to help the infant interpret and anticipate others' behaviors and to guide his/her own behaviors in relationships, which is adaptive to the individual. For example, the infant can operate internally by making a plan and selecting behaviors to achieve a goal before action is needed (Marvin & Britner, 1999). Although early internal working models are not necessarily fixed, they tend to show stability and resistance to change because a) they are

partly unconscious (Bowlby, 1973, 1980; Bretherton, 1990; Cassidy, 1990), b) they bias what individuals expect and perceive, leading to some distortion of incoming information (Bretherton, 1990; Bretherton & Munholland, 1999), and c) reconstruction requires significantly different emotional experiences that do not fit with the current working model (Bretherton et al., 1990; Ricks, 1985).

Bretherton and colleagues (1990, 1999) recently extended Bowlby's ideas about working models by considering advances in the cognitive sciences (e.g., memory research). She proposed that internal working models are best conceptualized as hierarchically organized schemas (or representations), with lower levels consisting of specific, interactional schemas and higher levels becoming more and more general as they subsume lower-level schemas. For example, beginning at the lowest level and proceeding to the highest level, one part of a working model might be: "When I fall down and cry, my mother picks me up," "When I am hurt, my mother comforts me," "My mother is there when I need her," and finally "My mother is a loving person."

Bretherton (1990) also stated that internal working models of self and others are probably several inter-linked hierarchies of representations, rather than a single hierarchy. In addition, she noted that there are individual differences in the degree of organization and consistency within and across levels, which have an effect on a person's interpretation of events and subsequent behaviors. For example, individuals who have representations that are not linked properly or are dissociated from one another will misinterpret signals from the environment and will be more likely to show contradictory behaviors. Further, incoming information may not be generalized throughout the hierarchies, which may lead to overly rigid working models. Individuals with such

distorted, "ill-organized" hierarchies are more likely to be insecurely attached than individuals with more well-organized and consistent representations.

Internal working models of the self are similar to other working models, i.e., of the attachment figure, as they are mental constructions based on actual experiences that guide appraisals, feelings, and behaviors (Cassidy, 1990). Working models of the self develop out of events and interactions and are believed to be generalized representations of the self. Further, working models of the self contain both cognitive and affective components, that is, ideas about self-image ("I am a hard worker") and self-esteem ("I am lovable") (Bowlby, 1979; Cassidy, 1990).

Based on internal working models of the self and of others, infants interact in certain ways with their mothers during times of perceived threat. Under stressful conditions, infants either have their attachment needs met or they find other ways to cope with their unmet needs, i.e., by exaggerating signals or suppressing their needs (Barnett & Vondra, 1999). Therefore, based on early experiences with caregivers, individual differences in attachment develop. Differences in attachment are believed to be finite and can be classified into several central patterns, which are "organized" in the sense that they reflect a consistent, coherent strategy for behaving in relation to the caregiver (Ainsworth et al., 1978; Main et al., 1985). These categories of attachment will be summarized next.

Categories of Attachment in Infancy

Mary Ainsworth, a student of John Bowlby's, made substantial contributions to attachment theory through her early observations of mother-infant dyads (Ainsworth, 1967). As a result of her work, she created a procedure to empirically study mother-

8

infant attachment called the Strange Situation (Ainsworth et al., 1978). This brief, mildly stressful, laboratory procedure consists of a series of interactions between the infant, the mother, and a stranger, during which the infant is separated and reunited with the mother twice. The infant's behaviors during reunion with the mother are believed to be indicative of the infant's internal working model of the relationship (Main et al., 1985), and therefore, quality of attachment is inferred from observed behaviors.

A *Secure Attachment* (Type B) is characterized by the infant's confidence that a caregiver will be available and responsive when in need. As attachment theory would suggest, research has shown that a secure attachment is associated with a history of consistent, sensitive, responsive care, which presumably gives rise to an internal working model of others, and the world in general, as dependable, comforting, and protective. Because these infants can rely on their caregivers, they are able to safely explore the environment and are likely to develop a sense of mastery and control. At the same time, securely attached children develop an internal working model of the self as valuable, worthy of love, and self-reliant. Based on these internal working models, securely attached children show unique behaviors in the Strange Situation. They are able to use the caregiver as a secure base from which to explore the room. Upon separation, these infants may be distressed and may be comforted by a stranger, but will show a clear preference for the mother and will seek contact with her upon reunion. In addition, these children will be readily comforted by the mother and often return to exploration and play (see Carlson & Sroufe, 1995; Weinfield, Sroufe, Egeland, & Carlson, 1999 for reviews). Research has shown that approximately 60-75% of low-risk infants display a secure pattern of attachment (van Ijzendoorn & Kroonenberg, 1988).

The internal working model of an infant showing an *Insecure-Avoidant Attachment* (Type A) is characterized by a lack of confidence in the caregiver and expectations of rejection. The caregiving history of these children include overt rejection, intrusive and controlling behaviors, as well as disengagement by the caregiver. Internal working models of the self likely include a view of the self as unworthy of care, but also possibly an extreme view of self-reliance in the context of a relationship in which the infant receives little care and comfort. Infants displaying this pattern of attachment in the Strange Situation show little distress at separation, no preference for the mother, and often actively avoid the mother upon reunion by ignoring her, looking or turning away, and resisting her initiation of contact. In fact, these infants show almost no affective responses at all and may appear indifferent. Avoidant behavior is believed to reflect a defensive strategy (namely repression) against emotional pain associated with prior parental rejection, as well as a strategy to prevent the direct expression of anger that might put the child at risk for alienating the attachment figure (Bowlby, 1980; Cassidy & Kobak, 1988). Evidence in support for this notion comes from studies showing a significantly higher level of reactivity in avoidant infants as measured by cortisol levels and cardiac functioning (e.g., Gunner, Mangelsdorf, Larson, & Hertsgaard, 1989). Approximately 15-25% of infants in the general population have an avoidant attachment.

Insecure-Ambivalent Attachment (Type C), seen in about 10-15% of low-risk samples, occurs when the infant is uncertain whether a parent will be available and responsive. Insecure-ambivalent infants generally lack confidence in the world because caregivers have been unresponsive and inconsistently available for meeting their children's attachment needs. As a result of such experiences, parallel internal working

models of self as unworthy and/or incompetent develop. During the Strange Situation, these children seem preoccupied with their caregivers and show a paucity of exploration and play. Upon separation, these infants show a high level of overt distress and are especially wary of strangers. Upon reunion, ambivalent infants are not able to be soothed and display anger and ambivalence toward the caregiver by seeking and resisting contact at the same time. Unlike avoidant infants who may suppress attachment behaviors and needs, ambivalent infants are believed to exaggerate attachment needs and signals in an effort to get a response from the caregiver and to ensure the mother's availability (see Cassidy & Berlin, 1994 for a review).

After a number of studies discovered that about 10-15% of infants could not be reliably classified into the A, B, or C patterns of attachment, a fourth pattern was identified by Main and Solomon (1990), which they termed *Disorganized-Disoriented Attachment* (Type D). Disorganized infants are believed to experience an unusually high degree of fear within the attachment relationship, and research has shown that these caregivers are often abusive, neglectful, and/or traumatized by their own experiences of loss or violence (Main & Hesse, 1990; Main & Solomon, 1990; Lyons Ruth, Bronfman, & Parsons, 1999). Unlike the three traditional groups, infants with this attachment pattern appear to lack a coherent strategy for coping with stress and interacting with their caregivers. Thus, their behaviors in the Strange Situation are idiosyncratic and may include apprehensive or depressed behavior, alterations between approach and avoidance toward the caregiver, strange behaviors such as freezing or stereotypies, and disorientation reflected by wandering, confusion, and rapid changes of affect (Main & Solomon, 1990).

Attachment Representations and Categories of Attachment in Adults

Although attachment has historically been studied at the behavioral level with mother-infant dyads, as in the Strange Situation, recent advances have made it possible to study attachment at the "level of representation" with older individuals (Main et al., 1985). Main et al. proposed that internal working models formed during infancy function as a "template" through which experiences are filtered. Thus, internal working models of self and others tend to be fairly consistent throughout childhood and into adulthood. On the basis of these aspects of attachment theory, Main and colleagues (George, Kaplan, & Main, 1985) developed the Adult Attachment Interview (AAI) to assess adults' representations of attachment or internal working models. These researchers suggested that internal working models influence feelings and behaviors, as well as attention, memory, and thinking processes as they relate to attachment. Therefore, individual differences in attachment representations will manifest themselves in the way one speaks about attachment experiences and the way in which one constructs narratives about early experiences with caregivers. Although most research in this area has used the AAI to measure adults' representations of attachment, it should be noted that several questionnaires have also been developed to measure adults' attachment experiences during childhood (e.g., Epstein, 1983; Lichtenstein & Cassidy, 1991).

Based on responses to the AAI, researchers are able to infer a person's overall state of mind with respect to his/her own attachment experiences. Emphasis is placed on the *way* in which a person recalls memories and experiences from childhood (the narrative process), rather than on *what* they recall (the content). Therefore, special attention is paid to the degree of coherence and integration of a person's narrative. The

AAI coding system, developed by Main and Goldwyn (1984a, 1998), allows people to be classified into one of four attachment categories.

Adults classified as *Autonomous* tend to produce consistent and coherent narratives and are able to integrate positive and negative aspects of feelings and experiences. In addition, autonomous adults tend to value attachment relationships and believe that they influence current behavior. *Dismissing* adults are likely to minimize attachment-related experiences and tend to give short, inconsistent responses. Although these adults often report highly positive experiences, they are unable to provide examples to support their favorable representations. It is not uncommon for dismissing adults to have trouble remembering aspects of their childhood, and some researchers have suggested that the dismissing style and tendency to idealize may reflect a defensive strategy against painful memories (Cassidy & Kobak, 1988). Adults classified as *Preoccupied* also display inconsistent and/or incoherent interviews; however, they seem preoccupied with past attachment experiences. They appear to be greatly influenced by earlier experiences in a rather negative manner (i.e., they display much anger or fear). Adults can also be classified as *Unresolved* if they fail to maintain an organized narrative or show striking lapses in reasoning or strange use of speech, particularly when discussing traumatic events (George et al., 1985; Hesse, 1999). Finally, these four groups are thought to parallel the four types of attachment observed in infants during the Strange Situation (secure, insecure-avoidant, insecure-ambivalent, and disorganized, respectively).

In sum, attachment theory suggests that infants develop internal working models, or representations of self and others, based on early interactions with caregivers.

Individual differences in working models exist, and subsequently, infants behave differently toward their mothers and display different patterns of attachment to their mothers, which may be more readily seen during times of stress. Attachment theory suggests that internal working models are relatively stable through childhood and into adulthood, and thus, adults maintain representations of attachment based on early experiences with caregivers. Some studies have further suggested that mothers "transmit" their own attachment patterns to their infants, demonstrating a stability of attachment across generations.

Based largely on attachment theory, Daniel Stern (1985, 1995) has recently developed a unique framework for understanding the process through which mother-infant attachment is formed and possibly transmitted intergenerationally. Stern (1995) proposes that mothers develop a unique, psychic organization during pregnancy, which he terms "the motherhood constellation," composed of a new set of fantasies, fears, action tendencies, and wishes never before experienced and directly due to becoming a mother. Stern believes that this psychological change begins during pregnancy, particularly after the first trimester of pregnancy when the fetus begins to move, and the reality of the baby becomes more apparent.

In addition to the mother's representations of self and other, which become activated and reworked during pregnancy, Stern (1995) suggests that the infant's developing representations are an important component of the mother-infant relationship. Like Bowlby and other attachment theorists, Stern emphasizes that the infant's representations are constructed from interactive experiences with the caregiver. However, he notes that rather than viewing representations as internalized events or

objects, representations are built from within, "from the experience of being with another." Similar to Bretherton's notion of multiple, hierarchically organized internal working models, Stern (1995) suggests that repeated interpersonal experiences (or "emergent moments") give rise to a network of schemas, which form an overall schema-of-being-with. Furthermore, he notes that schemas-of-being-with that are tied together by a common theme may be considered a "representation-of-being-with." Thus, Stern suggests that schemas-of-being-with are hierarchically ordered from actual interactions to more generalized internal working models, the latter of which ultimately guide behavior.

Consistent with attachment theory, Stern (1995) indicates that representations-of-being-with and internal working models are relatively stable throughout childhood and adulthood. Like other researchers, Stern also suggests that mothers' representations of attachment may be transmitted or passed on to their own infants, resulting in a continuity of attachment across generations. Empirical studies that have investigated the relationship between mothers' own representations of attachment and their attachment with their infants will be reviewed next, followed by a review of the literature examining the possible mediating role of other types of maternal representations, such as representations of the infant and of the self.

CHAPTER 2: MATERNAL REPRESENTATIONS

Maternal Representations of Attachment and Mother-Infant Attachment

Psychoanalytic theory and clinical papers have long suggested that there is an intergenerational pattern of parent-child relationships, that is, that history repeats itself (e.g., Freud, 1940; Bowlby, 1969, 1980; Fraiberg et al., 1975). Although Fraiberg et al. stated "history is not [necessarily] destiny," they convincingly described clinical cases that demonstrated how the conflicted past of the parents interfered with the relationship with their children. That in fact, a mother's own past experiences as a child were being repeated in striking detail with her own child. Early writings such as these, however, had little empirical work to support their assertions. No systematic investigations had been conducted to determine the factors that led to the repetition of the past or (in fewer cases) that blocked the repetition.

With the development of the AAI, researchers have been able to empirically examine the intergenerational patterns of relationships and the impact of mothers' own representations of attachment on mother-infant attachment. In several early studies, mothers' responses on the AAI and AAI attachment classifications were compared to infants' behaviors and attachment security observed during the Strange Situation (Grossman, Fremmer-Bombik, Rudolph, & Grossman, 1988; Main & Goldwyn, 1984b; Main et al., 1985). The Strange Situation was administered to middle-class, mother-infant dyads when infants were 12 months old (N ranged from 40 to 65 in different studies), and the AAI was later administered to the same mothers when their children were 5 to 6 years old. Main et al. (1985) found that mothers' own attachment security was significantly related to their infants' attachment security. Further, dismissive

mothers were more likely to be parents of avoidant infants, while preoccupied mothers were more likely to have ambivalent infants. Main and Goldwyn (1984b) also noted a striking similarity between a mother's own experiences of rejection, her rejection of her infant, and the infant's subsequent avoidant behaviors, suggesting that specific behaviors may also be repeated.

Grossman et al. (1988), using their own coding system for the AAI made up of four scales that were believed to reflect a parent's attachment representations, reported that mothers with a representation of their parents as supportive and mothers who were able to focus on attachment experiences in a non-defensive way (even if these experiences were negative) were significantly more likely to have secure infants, while mothers who presented defensive representations (i.e., unable to discuss experiences or to recall memories) were more likely to have insecurely attached infants. Thus, overall, these studies indicated that mother-infant attachment patterns tended to replicate mothers' own attachment experiences and representations.

The generalizability of results from these studies are limited by the predominately upper-middle class, educated, Caucasian sample. In addition, because the AAI was administered several years after the Strange Situation, it is more difficult to conclude that maternal representations led to infant attachment style. That is, it is possible that having children for a number of years somehow changed a mother's own representations of her relationship with a caregiver. However, attachment theory suggests that internal working models are fairly stable over time, and therefore, mothers' representations of attachment were presumably similar when infants were 12 months old.

Maternal Representations and Infant Attachment Measured Concurrently

Several other studies have examined the continuity of attachment by measuring

both mothers' representations of attachment and infant attachment concurrently

(Pederson, Gleason, Moran, & Bento, 1998; Zeanah et al., 1993). Researchers in both

studies administered the AAI and Strange Situation to a sample of 60 middle-class,

mostly married, Caucasian mothers with 1 year-old infants. Using the original AAI

coding system, both studies reported a significant degree of concordance between

mothers' own attachment representations and their infants' attachment categories (73%

agreement with a kappa = .56 and 75% agreement with a kappa = .62, respectively). By

collapsing insecure types, Pederson et al. found that the concordance rate between

autonomous-secure and nonautonomous-insecure groups increased to 80% (kappa = .60).

However, when examining specific types of attachment, the researchers found that

although there was a significant concordance between dismissive mothers and avoidant

infants (69% and 94%, respectively) and between autonomous mothers and secure infants

(81% and 87%, respectively), there was no significant relationship between preoccupied

mothers and ambivalent infants.

These studies suggest that the degree of concordance between mothers' and

infants' patterns of attachment may be unique to each type of attachment classification,

with more stability for the dismissive-avoidant and autonomous-secure groups and less

stability for the preoccupied-ambivalent groups, at least among a Caucasian, middle-class

sample. Pederson et al. (1998) attempted to examine the process through which

attachment was transmitted by assessing maternal sensitivity as a possible mediator.

They discovered that although maternal sensitivity was significantly related to mothers'

own security of attachment and to infant security of attachment, sensitivity accounted for less than 25% of the association between mother and infant attachment. Therefore, it seems important to continue to assess possible mechanisms that might help explain the intergenerational continuity of attachment patterns, as well as to examine these relationships in larger, more diverse samples.

Finally, in discussing the social transmission of parenting and attachment, Ricks (1985) examined the relationship between mothers' recollections of relationships with parents and current mother-infant attachment in a sample of 24 middle-class mother-infant dyads. Ricks used the Mother-Father-Peer Scale (Epstein, 1983), which is a questionnaire assessing the degree of parental acceptance/rejection, independence/overprotection, and idealization of parents, rather than the AAI, as the measure of maternal attachment. As expected, mothers of securely attached infants reported more positive recollections of childhood relationships including more acceptance, encouragement, and less rejection than mothers of insecurely attached infants. However, there were no differences between mothers on amount of idealization. Unfortunately, concordance rates between attachment categories were unable to be examined, as seen in other studies, due to the type of measure used in this study.

Existing studies that have assessed maternal representations of attachment concurrently or years after the assessment of mother-infant attachment have provided fairly strong empirical support for the continuity of attachment across generations. Furthermore, a few studies have shown a significant concurrent relationship between maternal representations based on the AAI and preschooler attachment security, suggesting that maternal representations may continue to influence young children's

developing representations of attachment after infancy (Bus & van Ijzendoorn, 1992;

Eiden, Teti, & Corns, 1995; Posada, Waters, Crowell, & Lay, 1995). However, a

growing number of research studies have utilized a prospective research design, by

examining maternal representations of attachment before the infant is even born and then

assessing mother-infant attachment at 1 year postpartum. In contrast to cross-sectional

studies, a prospective design beginning in pregnancy increases confidence in the

conclusion that maternal representations contribute to the development of mother-infant

attachment rather than simply being related correlationally.

Maternal Representations and Infant Attachment Measured Prospectively

One such study administered the AAI to a sample of 96 pregnant, Caucasian

women from middle to upper-middle class backgrounds and then administered the

Strange Situation when infants were 1 year old (Benoit & Parker, 1994). Using the four-

classification system, results revealed a significant degree of concordance between

mothers' representations of attachment during pregnancy and mother-infant attachment at

1 year (68% match, kappa = .46). Using three groups only (by reclassifying the

unresolved/disorganized type into one of the other insecure groups), the authors reported

an 81% concordance rate (kappa = .55). However, consistency across generations

seemed to differ for secure and insecure groups; 83% of autonomous mothers had secure

infants, while only 22% of dismissing mothers had avoidant infants, 57% of preoccupied

mothers had ambivalent infants, and 58% of unresolved mothers had disorganized

infants. Thus, the authors concluded that the highly significant rate of stability across

generations was primarily due to the autonomous-secure groups while insecure groups

seemed to be significantly less predictable over time.

Interestingly, Benoit and Parker (1994) also administered the AAI postnatally and found that AAI responses were significantly stable over time (77% match rate using the four groups and 90% using three groups), suggesting that mothers' states of mind about attachment experiences are highly stable. The authors also reported that concordance rates were slightly higher for the AAI measured concurrently with the Strange Situation (74% using four groups and 82% using three groups), compared to pregnancy AAIs, although this was again primarily due to the autonomous-secure groups. Finally, this study was the first to examine patterns of attachment across three generations by also administering the AAI to the pregnant women's own mothers. Results from these analyses revealed an overall concordance rate of 65% using the three classification groups across all three generations. Although the findings from this study are impressive in a number of ways (e.g., prospective design, sample size, and data from three generations), the results must be interpreted with caution due to the skewed distribution towards attachment security (76% of infants were secure using three groups) and the limited generalizability from a non-representative sample.

Fonagy and colleagues have also extensively studied the intergenerational continuity of attachment beginning with maternal representations during pregnancy (Fonagy et al., 1991; Fonagy, Steele, Steele, Moran, & Higgitt, 1991; Fonagy et al., 1993; Steele, Steele, & Fonagy, 1996). In an early study, they administered the AAI during the last trimester of pregnancy to a fairly large sample (N = 100) of Caucasian, well educated and mostly married women and then administered the Strange Situation when infants were 1 year old (Fonagy et al., 1991; Fonagy et al., 1991). They reported an overall match between the three original classifications of 66% (kappa = .38) and a 75% match

rate (kappa = .48) when two-way comparisons were made (secure-insecure). When examining concordance between specific groups, they found that 75% of autonomous mothers had secure infants, 68% of dismissive mothers had avoidant infants, but only 20% of preoccupied mothers had ambivalent infants. These findings are similar to those in other studies (Pederson et al., 1998; Zeanah et al., 1993), which suggest less stability for the preoccupied/ambivalent groups, and more generally, for insecure types of attachment.

In an effort to understand the discontinuity between preoccupied mothers and ambivalent infants, Fonagy et al. (1991) discovered that a number of mothers who later had insecure-ambivalent infants had a unique interview style during pregnancy. They found that many of these mothers initially presented an overall impression of security in their representations of attachment (and therefore were rated as being autonomous), but upon closer examination, tended to have a somewhat exaggerated sense of security in combination with difficulties adjusting to their new maternal role (i.e., less confidence in themselves). On the other hand, one-third of preoccupied mothers went on to have a secure attachment pattern with their infants, suggesting that positive changes in attachment representations are possible as well, perhaps even made more likely by becoming a parent. These are interesting hypotheses that need to be further examined in order to better understand the continuity and discontinuity of different attachment patterns.

Finally, Fonagy and colleagues have demonstrated that a parent's capacity for understanding the mental states of self and others (which they term reflective-self function) is related to both maternal and infant security (Fonagy et al., 1991; Fonagy et

al., 1993). In order to test this, they created a Reflective-Self Function scale to be coded from the AAI. As expected, autonomous mothers (as measured by the AAI during pregnancy) had significantly higher reflective-self scores than dismissive and preoccupied mothers, and mothers with higher reflective-self scores were also more likely to have securely attached infants at 1 year. Thus, a mother's ability to anticipate her infant's needs by being in tune with her infant's mental world presumably leads to more sensitive caregiving and more secure attachment.

Just as some mothers are aware of and in tune with their own and their infants' internal world, other mothers are unaware of such internal experiences. Fonagy et al. (1993) reported that mothers' incoherence in telling narratives about their childhood experiences on the AAI was the clearest predictor of infant insecurity 12 months later. The authors explained that incoherence was indicative of certain defenses, and indeed, there was also evidence of idealization, repression of affect, and splitting in these mothers' interviews. The authors concluded that the defensive strategies used by some mothers may explain an unconscious mechanism underlying the transmission of insecure attachment. In other words, a mother's own defenses against acknowledging certain experiences in her life make it difficult to respond empathically to her infant, which in turn, leads to the development of similar defensive strategies in the child. The studies conducted by Fonagy and colleagues provide strong empirical support for the clinical writings of Fraiberg et al. (1975), who noted early on that mother-child dyads frequently and *unknowingly* repeat "scenes" from the mothers' own childhood experiences with caregivers. Moreover, studies by Fonagy and colleagues support the notion of continuity of attachment across generations, especially for secure and dismissing/avoidant patterns.

The majority of studies examining the link between maternal representations of attachment and mother-infant attachment have been conducted with primarily Caucasian, well educated, and economically advantaged samples. This is problematic because of the limited generalizability of results and possible skewed distributions toward attachment security (including higher rates of concordance across generations due to the greater stability of security). However, two known studies have investigated the transmission of attachment in more high-risk samples (Levine et al., 1991; Ward & Carlson, 1995).

In these studies, the AAI was administered during pregnancy to adolescent mothers (N = 42 and 72, respectively) from diverse, ethnic backgrounds (majority were African-American) and later conducted the Strange Situation when infants were 15 months old. As expected, mothers had much higher rates of insecure representations of attachment (e.g., 21% autonomous, 48% dismissive, 7% preoccupied, 24% unresolved; Levine et al., 1991) compared to studies using low-risk samples. However, consistent with prior studies, results demonstrated a highly significant relationship between maternal representations of attachment and later mother-infant attachment. Levine et al. reported a 62% concordance rate using the four categories of attachment, and an 83% rate when all three insecure groups were combined for a two-group comparison, while Ward and Carlson (1995) reported a 78% concordance when using two-groups. Further analyses revealed a significant degree of concordance between autonomous mothers and secure infants (100% and 86%, respectively), dismissive mothers and avoidant infants (60% and 73%, respectively), and preoccupied mothers and ambivalent infants (66% and 60%, respectively). The studies did not find significant continuity of

24

unresolved/disorganized attachment across generations in these adolescent samples, with concordance rates of only 30% and 43%, respectively.

Taken together, preliminary results from studies with high-risk samples (e.g., adolescent mothers) are consistent with results from middle-class, well educated samples. They provide further support for the link between maternal attachment representations and mother-infant attachment as posited by attachment theory and clinical observations, as well as further evidence that there is relatively less stability (but still significant in some cases) among certain insecure groups. However, these results must be interpreted with caution because of the small sample sizes (e.g., only three mothers in the preoccupied group for one study). In addition, there is a clear need for more studies with different types of high-risk samples, i.e., low income or depressed mothers, since adolescent motherhood is qualitatively distinct from other risk factors.

In sum, it appears that maternal representations of attachment are a strong predictor of the types of attachment mothers form with their own infants. According to a recent meta-analysis of 18 studies and 854 subjects (van IJzendoorn, 1995), the effect size of this relationship was 1.06, which is comparable to a concordance rate of 75% (kappa = .49), using secure and insecure classifications. Interestingly, when the unresolved group was not used in studies, the dismissing and preoccupied classifications both predicted their respective infant groups (combined rs = .45 and .42, respectively); however, the preoccupied classification was only marginally related to the ambivalent group in infancy when the unresolved group was included in analyses. van Ijzendoorn (1995) also reported that only about 12% of the variation in maternal sensitivity, believed to be a possible mechanism through which attachment is transmitted, is explained by

maternal representations of attachment. Thus, other processes are likely occurring and further research needs to be conducted to more fully explain the continuities and discontinuities of attachment. That is, possible mechanisms through which attachment is (or is not) transmitted from one generation to the next must be measured and examined empirically, which unfortunately has been largely missing in the current literature.

The few mechanisms that have been suggested include maternal sensitivity and responsiveness, the degree of disorganization among a mother's internal working model which gives rise to contradictory behavior and faulty communication (Bretherton, 1990), and a mother's defensive strategies, evidenced by an inability to integrate past experiences and a tendency to distort current relationships, which may force an infant to rely on similar maladaptive defensive strategies (Cassidy & Kobak, 1988; Fonagy et al., 1993; Grossman et al., 1988; Main & Goldwyn, 1984b; Slade & Cohen, 1996). Other possible mechanisms of transmission that are consistent with attachment theory and appear to be promising explanations based on the available literature are maternal representations of the infant and representations of the self-as-mother.

Just as working models of the self develop along with working models of others during childhood, representations of the infant and representations of the self-as-mother develop together during pregnancy. A number of attachment researchers have shown that these representations are similar in both content and organization (e.g., Ammaniti et al., 1992). That is, the way mothers conceptualize themselves as mothers is similar to the way mothers think about their infants. Although some researchers believe representations of self and infant are distinct (Ammaniti et al., 1992; Stern, 1995), other attachment researchers conceptualize them as integrated "caregiving" representations

26

(George & Solomon, 1989, 1996). The current study proposes to examine

representations of self-as-mother and infant as complementary but distinct, just as

representations of self and other are complementary but distinct during childhood.

Therefore, the possible role of each type of representation as a mediator between

mothers' own attachment and mother-infant attachment will be considered separately,

and existing studies in each area will be reviewed next.

<p align="center">Maternal Representations of the Infant</p>

Although not as prevalent as the literature on maternal representations of

attachment to caregivers, some theorists and researchers have written about mothers'

representations of their infants, particularly during pregnancy. Bibring, Dwyer,

Huntington, and Valenstein (1961) were among the first to discuss the psychological

processes that occur during pregnancy including processes related to the "earliest mother-

child relationship." They noted that pregnancy seems to revive old psychological

conflicts, reorganize the new mother's relationship with her own mother, and causes the

mother to develop attitudes and representations of her developing infant. As the infant

begins to move and grow inside the mother, there is a shift from a focus on the self

("enhanced narcissism") to a focus on the infant as a separate object. Leifer (1977) also

reported that women gradually develop rich and specific representations of their infants

as pregnancy progresses, most often beginning in the second trimester, which prepares

them psychologically for motherhood. Similarly, Lumley (1982) reported that women in

their first trimester of pregnancy have difficulty imagining what the fetus might be like

and are more focused on their own bodily changes, but they increasingly develop

representations of their infants as the pregnancy progresses. For example, only 30% of

<p align="center">27</p>

mothers in her sample considered the fetus "a person" in the first trimester, but 63% and

92% of women in the second and third trimesters perceived them as separate individuals,

giving vivid descriptions of their babies.

Some researchers in the health professions, such as nursing, have also described

the process through which pregnant women begin to interact with their infants by

developing ideas and feelings for the unborn children. The majority of these studies have

assessed "prenatal attachment" through use of questionnaires and have found that

attachment (defined here as positive feelings toward the infant) increases during

pregnancy, with larger increases following quickening (see Muller, 1992 for a review). It

has been suggested by these researchers that early feelings toward the infant form the

basis for the mother's relationship with her child after birth.

Zeanah and colleagues have examined mothers' perceptions of their infants

during pregnancy in a number of studies with both low- and high-risk groups of women.

In one study, they administered infant temperament questionnaires and an interview

about maternal perceptions to 35 pregnant, Caucasian women from middle-class

backgrounds (Zeanah, Keener, & Anders, 1986a; Zeanah, Keener, Stewart, & Anders,

1985; Zeanah, Zeanah, & Stewart, 1990). They found that mothers had fairly stable

perceptions of their infants' temperament throughout pregnancy, which also predicted

their perceptions postnatally. They noted that women were able to give vivid, abstract

descriptions of their babies' personalities before birth, and perceptions during pregnancy

seemed to be strikingly positive. These authors replicated their findings in a sample of

adolescent, mostly Hispanic girls (N=24), by showing that maternal perceptions of infant

temperament were significantly stable from 32 weeks to 36 weeks gestation to 1 month

postnatally (Zeanah, Keener, & Anders, 1986b; Zeanah, Keener, Anders, & Vieira-Baker, 1987). Zeanah et al. (1986b) concluded that adolescent mothers also develop detailed perceptions of their infants, which likely impact the developing relationships with their children.

Similar to the work by Zeanah and colleagues, another group of researchers examined maternal perceptions of infants during pregnancy by administering an infant temperament questionnaire during the second and third trimesters, as well as postnatally, to 41 middle-class women (Mebert, 1989; Mebert & Kalinowski, 1986). Their results also indicated that mothers form stable perceptions of their infants during pregnancy and continuing after the baby is born. In addition, they found that first-time parents had significantly more negative views of their infants than multiparous parents.

In a number of reports, Zeanah and colleagues (Zeanah et al., 1986b; Zeanah et al., 1987; Zeanah & Carr, 1990) indicated that fetal movements contribute to the formation of mothers' initial perceptions of their infants which then develop into stable, detailed representations. Further, they suggested that fetal movements may act as a "projective stimulus," from which mothers form elaborate representations that are not simply made up randomly, but likely constructed from the mothers' own experiences in relationships. Since a mother's own relationship with her mother appears to be reactivated during pregnancy, it seems probable that this particular relationship may have an impact on the mother's developing representations of her infant.

Although the studies by Zeanah et al. (1985, 1986a, 1986b, 1987) and Mebert et al. (1986, 1989) described above provide interesting information about mothers' perceptions of their infants during pregnancy, they are limited by the sole focus on infant

temperament, the bias of self-report measures, and the atheoretical nature of their studies. For example, they do not address why mothers form vivid perceptions of their infants before birth, why these perceptions are so stable, or how mothers understand and experience their infants more generally. In contrast, more recent work on maternal perceptions during pregnancy has been guided by both attachment and psychoanalytic theories. In fact, Zeanah and colleagues were among the first to reframe earlier findings according to attachment theory (Zeanah & Anders, 1987; Zeanah & Barton, 1989), by suggesting that mothers form internal working models of their infants during pregnancy which, like other internal working models, are relatively stable and guide perceptions of their infants and behaviors toward them. Since that time, several groups of researchers have attempted to develop more theory-driven, qualitative measures to assess maternal representations of infants.

Maternal Representations of Attachment and Representations of the Infant

Ammaniti and colleagues (Ammaniti, 1991; Ammaniti et al., 1992) hypothesized that during pregnancy, representations of self and other are modified and reworked, particularly of self-as-mother and the "imaginary" child. Like others have suggested (Leifer, 1977; Zeanah et al., 1987), representational processes accelerate after the first 3 months when the infant becomes more subjectively real due to growth and movement. In order to investigate these psychological processes, they developed the *Interview of Maternal Representations During Pregnancy (IRMAG)*, a semi-structured interview about parents' reactions to and experiences of pregnancy, perceptions of their infants, and their own personal experiences during childhood. Similar to the AAI, they developed a coding system that emphasized content-free dimensions such as the coherence and

quality of the narrative (or *how* parents talked about their experiences). The authors administered this interview and several adjective checklists (asking mothers to rate themselves in various roles and their infants) to 23 middle-class, Italian women in their last trimester of pregnancy.

They found that women developed rich representations of themselves as mothers and of their babies during pregnancy, and that individual differences existed between women. In addition, content-free dimensions of their interviews (i.e., coherence, openness, richness) were highly related between representations of self and of infants. That is, the organization of women's narratives was consistent across domains of self and other, as would be expected based on attachment theory. Women also tended to rate their infants similarly to themselves on a number of characteristics measured by adjective checklists (although they were significantly different on some characteristics like sociability and independence). Overall, the authors concluded that women develop clear representations of themselves and their infants during pregnancy, and that these are complementary in both organization and content. Further, through a series of case studies, Ammaniti (1991) indicated that maternal representations of self and infant during pregnancy were related to mothers' own representations of attachment (according to the AAI) and to mother-infant attachment in the Strange Situation. These findings imply that prenatal representations may be one mechanism through which attachment is transmitted across generations, and it would be useful for future research to examine this with a larger, more heterogeneous sample.

In a similar study (Fava Vizziello et al., 1993), 51 pregnant women from middle to upper-middle class backgrounds were administered an interview about representations

of the self, their infants, and their own childhood experiences, as well as asked to make ratings along a number of bipolar-adjective lists. The content and organization of women's narratives produced during the interview were coded for several themes including: a) a desire to repair or compensate for previous experiences (not necessarily considered pathological), b) a defensive effort to maintain current functioning, c) intense fear stemming from maternal anxiety about the health and development of the child, and d) a lack of organization or consistent theme during the interview.

First, in analyzing the stability of representations over time, the authors reported that representations of women's own mothers were most stable, while representations of self-as-mother and of the infant were only somewhat stable from pregnancy to postpartum (according to adjective ratings). During pregnancy, fear themes seemed to dominate women's representations during interviews as compared to other themes; most mothers displayed conflicted fantasies of life and death and showed great concern for the babies' health. Women who displayed themes of a desire to repair or compensate or those unable to organize themes in the interview during pregnancy were significantly more likely to show similar themes after the birth. Like the findings reported by Ammaniti et al. (1991, 1992), these results suggest that women's representations during pregnancy are detailed and rich and relatively stable in organization. In addition, Fava Vizziello et al. (1993) found that representations of attachment from childhood predicted mothers' representations of themselves as mothers, but not representations of their infants. Again, it seems important to replicate these findings in other samples, as well as to validate these different interview techniques that are designed to assess maternal representations.

In an effort to better understand the role of prenatal representations in the transmission of attachment, Slade and Cohen (1996) developed and administered the *Pregnancy Interview*, a semi-structured interview for assessing women's internal working models of their infants, to 66 married, middle-class women in their last trimester of pregnancy. They also administered the AAI during pregnancy to assess maternal representations of attachment. Although analyses from the total sample were unfortunately not presented, the authors described the results from a number of case studies, which revealed a strong association between mothers' representations of attachment based on childhood experiences and their representations of their infants. Mothers tended to conceptualize and organize their relationship with their babies during pregnancy in ways that were similar to the way they conceptualized their relationships with their own mothers, evidenced by the degree of flexibility, coherence, and richness in their representations. In other words, mothers were beginning to repeat their own experiences during childhood with their infants (at the representational level) before the infants were even born. Although these findings are consistent with attachment theory and with previous findings (Ammaniti et al., 1992), the results should be interpreted with caution since they are based only on case studies using a different, unvalidated interview.

Another study empirically examined the relationship between maternal representations of attachment and representations of children in 32 middle-class, Caucasian mothers (George & Solomon, 1996). When children were 6 years old, mothers were administered the AAI and the *Experiences of Caregiving Interview*, designed to assess mothers' representations of themselves as parents and representations of their children (combined to form a "caregiving" representation). Scales were

developed to assess both the content and organization of mothers' responses, which resulted in general categories that were analogous to the four AAI categories. Results revealed a significant concordance between representations of attachment and representations of caregiving (69% match with a kappa = .58). There was a 77% match between categories for the three traditional attachment groups (autonomous, dismissing, preoccupied). Although this study examined internal working models among mothers of older children rather than infants who are not yet born, it makes an important contribution to the literature by demonstrating a statistically significant relationship between mothers' representations of attachment and representations of their children. Thus, it is important to assess these relationships among pregnant women and their infants in more diverse samples, in order to better understand how patterns of attachment are repeated through representational processes.

Overall, the current body of literature shows an association, albeit preliminary, between mothers' representations of attachment and representations of their own infants or children and also suggests that representations of the infant may be a mechanism through which attachment patterns are transmitted. Other researchers have focused on the second pathway in this process: the relationship between representations of the infant and mother-infant attachment. These studies will be reviewed next.

Maternal Representations of the Infant and Mother-Infant Attachment

In one such study, Bretherton et al. (1989) administered the *Parent Attachment Interview*, developed by the authors to assess mothers' thoughts and feelings about their infants and their relationships with their infants, as well as the Strange Situation to mothers (N = 37) of 2 year olds. One year later, they also administered an attachment

story completion task to measure attachment at age 3. Results revealed that mothers who demonstrated sensitivity and insight into their relationships with their children based on interview responses (and therefore, presumably had more "secure" representations of their children) were more likely to have securely attached children at age 2 and age 3.

Similarly, George and Solomon (1989, 1996) reported that mothers who displayed more secure representations of their 6 year-old children (defined as an understanding of the child's needs, as well as coherent organization of thought processes related to these issues) had more securely attached children during a separation-reunion procedure. In fact, secure maternal representations accounted for more than 50% of the variance in child security. Furthermore, the concordance between classifications for caregiving representations and attachment classifications was highly significant at 81% (kappa = .75). The authors concluded that the way in which mothers thought about their children and their relationships with their children had a significant association with the attachment pattern their children developed.

Although the results reported by Bretherton et al. (1989) and George and Solomon (1989, 1996) are consistent with attachment theory and provide empirical support for a link between maternal representations of caregiving and mother-child attachment, they are not necessarily generalizable to pregnant women or parents with young infants or to high-risk samples. In addition, like most other research in this area, they are limited by small samples and varying methods of assessment. Because each group of researchers tend to develop their own interviews to assess maternal representations of the child, it is difficult to compare results across studies because different constructs are being coded and analyzed. In addition, existing measures are not

being validated across different samples, making it unclear how useful these measures are.

In contrast, Zeanah and colleagues (Zeanah et al., 1994) have recently developed an interview that is being used more extensively, i.e., across different samples of both non-clinical and clinical groups, to measure mothers' representations of their infants. The *Working Model of the Child Interview (WMCI)* is a 1 hour structured interview that inquires about a mother's perceptions and subjective experiences of her infant and relationship with her infant. Interview responses are rated along a number of scales that assess qualitative (i.e., richness of representations, coherence, and openness to change), content (i.e., infant difficulty), and affective features (i.e., joy, pride, anger) of maternal representations. Coders then assign an overall classification to the narratives provided by the mothers based on the scale profiles. This classification system is consistent with attachment theory and with AAI and Strange Situation categories.

Balanced narratives include both positive and negative characteristics of the infant. They convey value for the infant's individuality and appreciation for the infant's subjective experience. The caregiver's perceptions are open to change and are at least moderately rich in detail about the infant and the caregiving experiences. *Disengaged* representations are characterized by emotional distance or indifference towards the infant. Caregivers are unable to recognize the infant's individuality, and if it is recognized, it is not valued. Details about the infant or parenting experience lack richness, are not flexible or open to new experience, and are emotionally unintegrated. Finally, *Distorted* representations reflect general inconsistencies. Caregivers may be preoccupied or overwhelmed by the infant or may have unrealistic expectations about the

36

infant. Unlike disengaged parents, distorted parents do not deny their impact on their infants. However, they often do not recognize how their behaviors may be detrimental to the infants. Much feeling is expressed toward the infants, but these emotions lack a sense of modulation or meaning.

In their original study, Zeanah et al. (1994) administered the WMCI to middle-class mothers of 12-month old infants (N = 45), as well as the Strange Situation to all mother-infant dyads. They found that WMCI categories were significantly related to Strange Situation categories, with an overall concordance rate of 69% (kappa = .50). Seventy-four percent of mothers with balanced representations of their infants had secure attachments according to the Strange Situation, while 73% of disengaged mothers had avoidant infants and 55% of distorted mothers had ambivalent infants. In addition, mothers of secure infants scored significantly higher on a number of WMCI subscales including richness of perceptions, openness to change, coherence, and caregiving sensitivity than mothers of insecure infants. Consistent with other interviews such as the AAI, content-free dimensions were especially important for distinguishing mothers of secure and insecure infants.

In a later study, these researchers administered the WMCI to 96 Caucasian, upper-middle class pregnant women and then readministered the WMCI along with the Strange Situation when infants were approximately 1 year old (Benoit, Parker, & Zeanah, 1997). First, they reported that WMCI categories were significantly stable from pregnancy to postpartum (80% agreement, kappa = .59), although this was accounted for by the stability of balanced (89%) and distorted (85%) mothers. The strong stability of working models over time is consistent with attachment theory, although results also suggested

37

that certain types of working models may be less stable across time. Results also revealed a 73% concordance rate between concurrent WMCI and Strange Situation categories, including an 88% match for balanced-secure groups, 100% match for disengaged-avoidant groups, but only 40% match for distorted-ambivalent groups. Similar to Zeanah et al. (1994), the high overall concordance was primarily due to the balanced and disengaged groups.

Perhaps most interestingly, Benoit et al. (1997) reported a significant concordance between mothers' representations of their infants during pregnancy and Strange Situation classifications at 1 year (overall match rate = 74%, kappa = .44), although this association was mainly explained by the balanced-secure groups (91% concordance) rather than the disengaged (30% concordance) and distorted groups (50%). One possible explanation for the lower concordance rates for disengaged and distorted groups is that continuity may not be specific to *type* of insecurity. That is, disengaged mothers may have ambivalent infants and vice versa. Therefore, it may be more useful to look at "secure" and "insecure" groups. Because the WMCI classifies representations into three categories (rather than four like the AAI and Strange Situation), studies using the WMCI are only able to compare classifications with the three original Strange Situation categories. Therefore, another possibility is that infants who might have been classified as disorganized on the Strange Situation were "forced" into one of the other categories, confounding the results for those groups.

Still, because the WMCI was administered prenatally rather than concurrently with the Strange Situation, the findings indicate that prenatal representations might influence the way in which mothers' perceive and interact with their children after they

are born, which in turn could impact the type of attachment formed. It will be important for more studies to use prospective designs such as this one to better understand the processes involved in the transmission of attachment. In addition, the relationship between WMCI and Strange Situation categories should be examined in more diverse and larger size samples. Overall, the results of studies using the WMCI indicate its usefulness as a tool for measuring maternal representations of infants, as well as for predicting mother-infant attachment.

In sum, a considerable amount of literature suggests that mothers develop internal representations of their infants well before birth and lasting into childhood. These representations, or internal working models, of infants appear to be influenced by mothers' representations of attachment based on their own childhood experiences. That is, mothers tend to think about and conceptualize their infants and the relationship they have with their infants in similar ways to how they think about their relationships with caregivers. Furthermore, a number of studies have indicated that maternal representations of infants, both before and after birth, predict the quality of mother-infant attachment. Thus, it seems possible that mothers' representations of their infants is one mechanism through which mothers' own attachment impacts the quality of attachment they form with their own infants.

Another possible mechanism, as mentioned earlier, is maternal representations of self-as-mother. Mothers' representations of attachment may influence representations of themselves, which may in turn impact the attachment formed with their infants. Studies that have examined the relationship between mothers' perceptions of themselves and mothers' own attachment experiences and their attachment with their infants will be

reviewed next, beginning with a brief theoretical introduction about representations of the self.

Maternal Representations of Self-As-Mother

As mentioned previously, because internal working models of self and others develop together in the context of early interactions with caregivers, they tend to be complementary (Bowlby, 1973; Bretherton, 1990; Bretherton & Munholland, 1999; Slade & Cohen, 1996). Therefore, a working model of the self as valuable and competent will develop in the context of a caregiver who treats the infant as valuable, i.e., who is emotionally available and sensitive. In contrast, a working model of the self as incompetent and unlovable will develop in the context of a rejecting or unempathic parent. This notion of complementarity has received empirical support; two studies to date have demonstrated that securely attached children are more likely to develop a positive working model of self, while insecurely attached children develop either a negative working model of self or idealized, distorted self-representations (Cassidy, 1988; Verschueren, Marcoen, & Schoefs, 1996).

More recently, attachment theorists have questioned whether this early sense of self determines one's global self-worth (in multiple areas and relationships), as attachment theory would suggest, or whether it determines one's working model of the self *in relation to the attachment figure* (Cassidy, 1990). Like attachment theory, Epstein's self-theory states that individuals develop beliefs about the self early in life that are more global, i.e., "I am worthy of love," and these beliefs are based in large part on interactions with caregivers (Epstein, 1973; Ricks, 1985). Because new information is assimilated into these global representations, they tend to be long lasting and resistant to

change. In contrast, other theories such as Bandura's self-efficacy theory (1977, 1989) propose that beliefs about oneself are situation-specific and change in response to different demands, situations, and individual developmental processes.

In the current study, representations of the self and self-efficacy beliefs will be considered separate constructs, although more general representations of the self are thought to influence self-efficacy beliefs more or less in different situations and roles. Because this study is examining representations of self-as-mother and self-efficacy in the caregiving role specifically, it is expected that representations will be strongly related to self-efficacy beliefs.

Maternal Representations of Attachment and Representations of Self-As-Mother

A number of theorists and researchers have proposed that during pregnancy, women begin to modify and rework representations of themselves as they prepare for motherhood. Stern (1995) stated that a mother's representations of herself as a woman, wife, daughter, career-person, and in other roles are activated and reorganized as she makes room for her role as a mother. Consistent with attachment theory, Rubin (1984) also suggested that women go through a process of redefining themselves as they form a "maternal identity." This is achieved when the woman sees herself in relation to her unborn child and is considered important to the woman's sense of competency in being a mother to her child. As previously mentioned, several groups of researchers have indeed demonstrated that pregnant women develop vivid representations of themselves as mothers throughout pregnancy and these representations are fairly stable over time (Ammaniti, 1991; Ammaniti et al., 1992; Slade & Cohen, 1996).

Within the framework of attachment theory, preliminary evidence also suggests

that mothers' representations of attachment based on experiences during childhood

influence the way in which they see themselves as mothers. That is, internal working

models developed early in life contribute to or guide the development of internal working

models of the self as mother. For example, several previously mentioned studies have

reported that mothers' representations of their own attachment experiences with their

mothers were highly related to their representations of themselves as mothers (Ammaniti,

1991; Ammaniti et al., 1992; Fava Vizziello et al., 1993). Several other studies also

reported that mothers' representations of attachment according to the AAI were related to

representations of themselves; mothers who had more secure representations tended to

see themselves in more positive ways and were more flexible and coherent when

describing themselves as mothers, while insecure mothers described themselves more

negatively and had more incoherent, distorted representations of themselves as mothers

(George & Solomon, 1996; Slade & Cohen, 1996).

Another study also investigated the relationship between mothers' experiences

with caregivers and their views of themselves as mothers (Meyer, 1988). Questionnaires

assessing childhood experiences and parenting efficacy were administered to 35 well-

educated, middle class mothers with infants who were approximately 14 months old.

Results revealed that positive experiences with caregivers during childhood were strongly

related to positive views of themselves as mothers and higher maternal self-efficacy.

Thus, mothers who reported having more caring and sensitive mothers were more likely

to see themselves as caring and sensitive and felt more competent in caring for their

infants compared to women who reported negative experiences with their mothers. It

should be noted that experiences with mothers during childhood were particularly important for maternal perceptions of efficacy compared with experiences with fathers, which were unrelated to the way mothers viewed themselves. Unfortunately, this study did not assess current mother-child attachment so it is unclear how maternal feelings of efficacy were related to mothers' relationships with their infants in this sample.

Maternal Representations of Self As Mother and Mother-Infant Attachment

In addition to those studies showing a relationship between mothers' experiences during childhood with attachment figures and their representations of themselves, a number of other studies have investigated the link between mothers' representations of themselves as mothers and their current attachment with their infants. Through several case studies, Ammaniti (1991) suggested that mothers' representations of themselves as mothers were related to mother-infant attachment observed during the Strange Situation. As expected, mothers who felt more confident and positive about their ability to parent were more likely to have infants who were securely attached. Similarly, George and Solomon (1989, 1996) reported that mothers who displayed more secure representations of themselves as mothers (characterized by a willingness and ability to provide safety and protection, a positive evaluation of abilities, and little self-doubt or confusion over caretaking) had more securely attached children during a separation-reunion procedure. Thus, these studies suggest that another possible mechanism through which mothers' own attachment impacts infant attachment is mothers' representations of themselves as (in)competent, (in)effective mothers. That is, representations of attachment from childhood may influence the development of working models of the self-as-mother, which in turn, impact the attachment that is formed with a mother's own infant.

Maternal Self-Efficacy and Mother-Infant Attachment

Although only a few studies have examined the impact of women's

representations of themselves on mother-infant attachment through interviews designed

to measure representations per se, a number of other studies have looked at the impact of

maternal self-efficacy on mother-infant relationships and specifically, mother-infant

attachment. It is believed that maternal self-efficacy, defined as a mother's perceived

ability to perform competently and effectively as a mother, is largely influenced by a

woman's representations of the self as mother. Therefore, it is argued that maternal self-

efficacy is directly related to representations of the self and is also likely related to

mother-infant attachment.

One study examined maternal self-efficacy, "attachment" (defined as maternal

feelings toward her infant), and overall self-esteem and depression in 121 medically high-

risk and 182 low-risk women during and after their pregnancies (Mercer & Ferketick,

1990). Results revealed that self-efficacy was the best predictor of attachment for both

groups of women; women who felt more capable of providing competent care felt closer

to and more involved with their infants. Similarly, Mercer and Ferketick (1994) reported

that self-efficacy was strongly related to experienced mothers' attachment to their infants,

but they reported no such relationship for inexperienced mothers. In another study, 238

women were interviewed during their last trimester of pregnancy and part of the sample

was again interviewed at 1 month postpartum (N = 86) and 2 years postpartum (N = 62;

Williams et al., 1987). Results from this study revealed that self-efficacy measured

prenatally and at 1 month predicted attachment at 1 month only, while self-efficacy at 2

years predicted the quality of the mother-child relationship at 2 years according to

maternal report. Unfortunately, all of these studies used maternal report questionnaires to assess "attachment" at different ages. It is likely that these instruments were measuring maternal attitudes and perceptions of the mother-child relationship rather than attachment behaviors and patterns as described by attachment theory. Thus, one can only conclude from these studies that maternal feelings of self-efficacy likely impact the way in which mothers view their relationships with their infants.

Only a few studies have actually assessed the relationship between self-efficacy and mother-infant attachment as measured by the Strange Situation. In one study, Spieker and Booth (1988) examined several potential predictors of mother-infant attachment in 35 high-risk (defined by few resources and low levels of support) mother-infant dyads. Questionnaires were administered to mothers prenatally and at 6 weeks and 3 months postnatally, and the Strange Situation was administered when children were 14 months old. The authors found that mothers of secure infants reported more confidence handling motherhood tasks shortly after birth, and therefore considered themselves more efficacious, than mothers of ambivalent infants. Self-efficacy ratings did not differ among mothers of secure and avoidant infants; however, the authors suggested that mothers of avoidant children might have been defensively reporting unrealistically high levels of self-efficacy (consistent with other defensive processes observed in mothers of avoidant infants). Although this study had a small sample size, the prospective design and high-risk nature of the sample make it an important and unique contribution to the literature. More studies need to be done to better understand how mothers' views of themselves and their maternal competence impact mother-infant attachment.

Donovan and colleagues (Donovan & Leavitt, 1989; Donovan, Leavitt, & Walsh, 1990) also measured maternal self-efficacy (through the attributional styles mothers used to describe the outcomes of their caregiving) in 40 white, married women with infants. In addition, the authors measured mothers' perceived control in an experimental paradigm. During this procedure, mothers listened to a tape-recorded infant cry and were given different options for responding to the crying. They were told that the procedure was a simulated child-care task and that after hearing the infant cry, they could choose whether or not to press a red button. Afterwards, mothers were asked to estimate how much control they thought they had over the termination of the cry. Because neither response was more effective than the other in reality, any perceived control that mothers reported was considered "illusion of control." Approximately one year later, the researchers also administered the Strange Situation to all mother-infant dyads.

The results showed that low self-efficacy was related to a high illusion of control. Furthermore, mothers of securely attached children reported higher self-efficacy and lower illusions of control (therefore, they were more realistic about their abilities), while mothers of insecurely attached children reported lower self-efficacy and higher illusions of control. The authors concluded that high illusory control may be a defensive strategy used by mothers to mask feelings of inefficacy. Thus, it seems important to distinguish between mothers who are realistically self-efficacious and those that are unrealistic in their perceptions of efficacy. The latter group may be at particular risk of parenting problems because their coping mechanism of illusory control may prevent them from acknowledging and improving their own limitations.

Because the quality of mother-infant interactions and specific maternal behaviors are the main contributors to specific patterns of attachment, it is important to note that a number of studies have also found a relationship between maternal self-efficacy and more sensitive, positive maternal behaviors. For example, several studies have reported that mothers who felt more competent and efficacious in the maternal role were actually more sensitive and responsive when interacting with their infants (Shea & Tronick, 1988; Teti & Gelfand, 1991). This relationship seems to be especially strong for first-time mothers, who do not have a previously established maternal identity (Walker, Crain, & Thompson, 1986). Conrad, Gross, Fogg, and Ruchala (1992) also found that mothers who were more confident in their parenting abilities demonstrated more positive interactions with their toddlers, although this was true only for mothers who were knowledgeable about child development. The authors concluded that accurate knowledge *and* confidence (or self-efficacy) were both important for the quality of maternal behaviors towards their children. Overall, most existing studies have suggested a link between self-efficacy and more positive maternal behaviors (with some exceptions, e.g., Zahr, 1991), but results need to be replicated since existing samples are small and consist mainly of white, middle-class, educated individuals.

In conclusion, the existing research suggests that mothers' representations of themselves, and in particular of themselves as mothers, are influenced by experiences they had with their attachment figures during childhood. More specifically, mothers who were sensitively cared for by their own mothers are more likely to view themselves as competent, caring mothers to their children, while mothers who had more problematic attachment relationships are less likely to feel confident in their abilities to parent.

Further, existing studies indicate that maternal perceptions and feelings of efficacy impact the quality of mother-child interactions and more importantly, the types of attachment they form with their infants. Therefore, it seems probable that another mechanism through which attachment patterns are repeated across generations is through mothers' representations of themselves as mothers.

Overall, it is likely that individual, intrapsychic factors like those that have been described thus far (e.g., representations of self and infant) have a considerable impact on the quality of attachment formed between a mother and her infant. However, it is probable that attachment is also influenced by external factors within the mother's and infant's environment. Therefore, the potential relationships between several ecological variables and mother-infant attachment will be reviewed next.

CHAPTER 3: ECOLOGICAL FACTORS RELATED TO ATTACHMENT

The impact of a number of ecological factors on attachment has been considered by attachment researchers, including factors at the individual, family, and community levels. For example, some researchers have examined the relationship between child maltreatment and mother-infant attachment (e.g., Crittenden, 1985), while other researchers have looked at more global factors such as socioeconomic status (e.g., Spieker & Booth, 1988). Therefore, studies which have investigated the relationship between different ecological factors and mother-infant attachment will be reviewed, beginning with the literature on maternal social support and attachment, followed by a review of the literature on several risk factors and attachment.

Maternal Social Support and Mother-Infant Attachment

One possible environmental factor related to mother-infant attachment is the amount and type of social support available to mothers. According to Stern's theory (1995), mothers need to create and maintain a support network so that they can accomplish the goals of motherhood; the support network buffers the mother from external demands, protects her physically, provides emotional and practical support, as well as instruction and advice. In all of these ways then, social support can have an indirect, beneficial effect on mother-infant attachment.

Some researchers have examined the impact of social support on attachment through an ecological model, assuming that factors at multiple system levels are important for explaining this aspect of the mother-infant relationship. In a review on social support and parenting, Crockenberg (1988) hypothesized various ways that social support can positively impact the parent-child relationship that are similar to those

mentioned by Stern (1995) including: a) reducing the number of stressful events that parents experience, b) buffering the effects of existing stressors, c) serving as a source of knowledge and competence, and d) serving as a model for positive, nurturing relationships which parents may then repeat with their own children. Crockenberg (1988) concluded that in some or all of these ways, social support contributes to more sensitive, responsive parenting and presumably to more secure patterns of attachment between mothers and infants.

Several empirical studies that have looked specifically at the impact of social support on mother-infant attachment provide support for the general assertions made by Stern (1995) and Crockenberg (1988). In one of the earliest studies of this kind, Crockenberg (1981) assessed the amount of perceived social support in the maternal role at 3 months postpartum in 48 mothers from intact, middle-class families and later assessed attachment in the Strange Situation at 12 months. Results showed that the infants of mothers with more social support displayed significantly fewer anxious behaviors in the Strange Situation. In addition, there was an interaction between infant irritability and maternal support; mothers with low social support were more likely to have insecure infants, but this was only true for babies rated (by mothers) as temperamentally "difficult." Thus, it seemed that low social support had a greater impact on the attachment with irritable babies than with "easy" babies, suggesting the importance of support in more stressed families.

In a number of other studies, the impact of social support on attachment has been examined in high-risk samples. In one longitudinal study (Spieker, 1986; Spieker & Booth, 1988), mothers who were defined as high-risk because of reportedly little social

support were followed from pregnancy through the infants' first year of life in order to determine contributors to parenting styles and quality of attachment. These researchers found that mothers of infants classified as having a disorganized attachment (believed to be "most" insecure) had significantly less support around the parenting role during pregnancy than mothers of infants classified as avoidant and had significantly less postpartum social support than mothers of securely attached infants. There were no other significant group differences on maternal social support during pregnancy or postpartum, possibly due to a lack of variance in level of support because of the inclusion criterion for this study. Unfortunately, this study did not look at possible mechanisms through which support might have affected attachment.

In another longitudinal study, Crnic, Greenberg, and Slough (1986) followed 36 mother-premature infant dyads and found that maternal support from partners, friends, and the community at 1 month postpartum predicted secure mother-infant attachment at 12 months as assessed by a modified Strange Situation (a shortened version with one separation and one reunion). In addition, life stress was significantly related to insecure infant attachment. Although social support buffered the effects of stress on some outcome measures (e.g., parenting satisfaction), this was not true for attachment. Overall, the findings from these two longitudinal studies appear to confirm the importance of looking at ecological variables such as social support when investigating factors related to mother-infant attachment. However, like those with low-risk samples, these studies are generally limited by their small sample sizes.

Using a larger sample size (N = 121), Crittenden (1985) evaluated the relationship between social support and attachment among low-income families, many of whom were

identified as abusive and/or neglectful by Child Protective Services. Regression analyses revealed that social support did not make a significant contribution to the explained variance in infant attachment after maltreatment status was accounted for (which explained 35% of the variance). When maltreatment status was not considered, Crittenden reported that the type or *quality* of support was related to mother-infant attachment security, while the *quantity* of social support (both the number of network members and total amount of support) was unrelated to attachment. More specifically, mothers who had stable, long-lasting relationships and who were frequently in contact with supporters had more securely attached infants, while mothers who had temporary, short-term relationships tended to have infants who were insecurely attached. The author interpreted these findings using attachment theory by suggesting that mothers' working models of relationships affected both the pattern of attachment formed with their infants *and* the types of relationships formed with other adults who may (or may not) serve as sources of support. That is, the relationship between social support and mother-infant attachment might be a result of a third variable, the mother's internal working models.

This study illustrates the importance of looking at different dimensions of social support including the network size, level of support, and duration and frequency of contact with supporters, as each dimension may be differentially related or unrelated to the quality of mother-infant attachment. Like previously mentioned studies, this study also suggests that social support does not necessarily have a clear, direct relationship with mother-infant attachment. Instead, the impact of social support on attachment may be more indirect, i.e., through maternal attitudes or behaviors, and/or may vary according to the nature of the sample being studied.

Although the studies described thus far suggest that social support, in one way or another, has a significant effect on mother-infant attachment, other studies suggest that social support is unrelated to the quality of attachment. For example, Belsky and Isabella (1988) followed 64 Caucasian, intact families beginning in pregnancy through the infants' first year of life in order to examine the determinants of infant attachment. They found that mothers of secure, avoidant, and ambivalent infants did not differ in their level of support from friends and family during pregnancy or postpartum, although mothers of secure babies perceived their neighborhoods (or "social milieu") as friendlier and more supportive during pregnancy than mothers of insecure babies. Similarly, Zeanah et al. (1993) reported no differences between attachment groups on maternal social support at 1 year postpartum in a middle-class sample. The results from another study with a relatively small (N = 43) middle-class, intact sample (Levitt, Weber, & Clark, 1986) also revealed no group differences in emotional or parenting support. In the latter study, however, the authors reported that low support was related to negative maternal affect, which was related to attachment quality, suggesting a possible indirect effect of social support. Interestingly, the studies which have concluded that no relationship exists between social support and attachment have all examined these variables in low-risk samples. It is possible that social support is less critical for mothers and infants who have other resources and who have less general life stress than those families in high-risk situations who have fewer resources and more stress.

There are a number of other possible reasons for the inconsistent results regarding the relationship between maternal social support and mother-infant attachment. One possible explanation is that studies use different definitions of social support and most

fail to specify what dimensions of support are being measured including the type and source of support, the quantity of support or number of network members, as well as the frequency of contact or duration of supportive relationships. As already mentioned, it is also possible that social support has a more indirect impact on mother-infant attachment through its impact on other factors, which are left unexamined in most existing studies.

As suggested by Crockenberg (1988), one possible mechanism through which social support influences mother-infant attachment is through a mother's feelings of self-efficacy in the maternal role. Crockenberg and others (Bandura, 1977; Leifer, 1977; Stern, 1995) reason that support can help a mother increase her parenting skills and knowledge, which in turn increase feelings of efficacy, can provide direct confirmation that she is capable and competent in caring for her infant, and can provide positive role models from which to learn. Indeed, several empirical studies have shown a significant relationship between maternal social support and maternal self-efficacy in both low and high-risk samples of women (Cutrona & Troutman, 1986; Shea & Tronick, 1988; Teti, O'Connell, & Reiner, 1996; Zahr, 1991). However, very few studies have examined the role of self-efficacy as a mechanism through which social support impacts attachment.

In one related study, Donovan and Leavitt (1989) showed that women who demonstrated a high "illusion" of control around parenting (in an experimental paradigm) due to feelings of inefficacy also reported low levels of social support and had infants who were more insecurely attached. Unfortunately, although inefficacy was related to both social support and attachment, the authors did not statistically test for mediation. Isabella (1994) reported that although social support was not directly related to security of attachment in 32 mother-infant dyads, maternal support had an indirect impact on

54

attachment through its impact on maternal role satisfaction, a construct presumed to be highly related to self-efficacy (e.g., Shea & Tronick, 1988). That is, support was related to higher satisfaction, which was in turn related to attachment security. Finally, Teti and Gelfand (1991) demonstrated that self-efficacy mediated the relationship between social support and sensitive maternal behaviors, which underlie secure attachment, in mothers of infants between the ages of 3 and 13 months.

In conclusion, it is still somewhat unclear if and how maternal social support affects the quality of mother-infant attachment. Existing results indicate that some dimensions or types of social support do influence attachment, however, it may be most appropriate to view social support as having an indirect impact on attachment rather than a direct impact (Belsky, 1999). As noted above, one mechanism through which social support may influence attachment is maternal self-efficacy, although there is currently little empirical work in this area. The literature on social support and parenting behaviors (rather than attachment per se) is somewhat more voluminous, and several reviews (Andersen & Telleen, 1992; Crockenberg, 1988) in this area suggest that: a) social support is related to more sensitive caregiving, b) emotional support and support with child care tasks are particularly important types of support for mothers, c) social support from family members is especially important compared to other sources of support, and d) mothers' perceived level of support is more important than the sheer number of supporters in her network. Because parenting behaviors and attachment are highly interrelated, it seems possible that these findings could help inform future studies examining the role of support on mother-infant attachment.

Risk Factors and Mother-Infant Attachment

In addition to maternal social support, the relationship between other ecological variables and mother-infant attachment has been examined by a number of researchers. For example, several potential environmental risk factors have been shown to negatively impact the quality of mother-infant attachment, indicating the need to consider risk factors in any study of attachment. In general, research has shown that there is a greater proportion of insecure attachment within high-risk samples (Spieker & Booth, 1988), as well as less stability of attachment quality over time (Vondra, Hommerding, & Shaw, 1999). Furthermore, research suggests that although a single risk factor may not distinguish secure from insecure infants, a clear and definite relationship between risk and attachment emerges when multiple risk factors are considered simultaneously (Belsky, 1999). Specifically, the more risk factors a family experiences, the more likely it is that mother-infant attachment will be insecure in one form or another. This is consistent with the cumulative-risk model described by Sameroff and colleagues (Sameroff, Seifer, Barocas, Zax, & Greenspan, 1987), as well as other researchers (Hannan & Luster, 1991; Luster & McAdoo, 1994), in that the *number* of risk factors may be more important for developmental outcomes in children than the *specificity* of risk factors.

Unlike the majority of studies on mother-infant attachment, which have been based on stable, intact, middle-class families, the current study examined factors related to mother-infant attachment in a more diverse, high-risk sample. More specifically, almost half of the women in the current study experienced domestic violence during their current pregnancy, and a large proportion of women were economically disadvantaged.

Very few studies have examined patterns of attachment across generations in high-risk samples, making it unclear whether the processes suggested by attachment theory are the same for both low and high-risk families. Therefore, a number of important and relevant risk factors were considered in the current study. The existing literature on the relationship between these risk factors and mother-infant attachment is reviewed next.

Domestic Violence and Attachment

The literature on domestic violence, defined as male to female violence between adult partners, and mother-infant attachment is sparse. However, research by Lyons-Ruth and colleagues (e.g., Lyons-Ruth et al., 1999; Lyons-Ruth & Jacobvitz, 1999) have suggested that mothers who are traumatized by past loss and/or experiences of abuse tend to show frightening or frightened caregiving behaviors, such as threatening gestures, unusual voice intonations, trance-like states, and fearful withdrawal from their infants. These behaviors, in turn, have been related to disorganized infant attachment. Although research has focused on maternal experiences of loss and abuse during childhood specifically, it seems probable that traumatizing experiences of abuse during adulthood with intimate partners might have the same effect on maternal behaviors and mother-infant attachment.

In the only empirical study to date, Zeanah et al. (1999) examined the relationship between domestic violence and mother-infant attachment in 72 low-income, mostly unmarried mothers and their 15-month old infants. They found that mothers who had not experienced domestic violence were significantly more likely to have securely attached children, while mothers who were currently in an abusive relationship were significantly more likely to have infants with insecure attachments, particularly disorganized

57

attachments. These results are consistent with the notion that mothers traumatized by abusive experiences are more likely to develop insecure patterns of attachment with their infants. However, more studies need to be done to replicate these findings before strong conclusions can be made.

Child Maltreatment and Attachment

Because child abuse occurs in about 35% to 70% of all homes characterized by domestic violence (Jouriles & Norwood, 1995; O'Keefe, 1995), the impact of abuse on attachment was also considered. In fact, child maltreatment is perhaps the most widely studied risk factor in relation to mother-infant attachment. Child maltreatment has repeatedly been shown to be highly related to the quality of mother-infant attachment, with infants from all maltreatment groups being more likely to develop insecure attachments (Crittenden, 1985; Crittenden, 1988; Egeland & Sroufe, 1981; Erickson, Egeland, & Pianta, 1989; Lyons-Ruth, Connell, Grunebaum, Botein, & Zoll, 1984; Lyons-Ruth, Connell, Zoll, & Stahl, 1987). Furthermore, maltreated infants are particularly at risk for developing disorganized attachments, which show marked stability through the toddler years, compared to other forms of insecure attachment (Barnett, Ganiban, & Cicchetti, 1999).

Maternal Depression and Attachment

Maternal depression was also examined in the current study because battered women have repeatedly been shown to experience significantly more depression than non-battered women (Cascardi & O'Leary, 1992; Levendosky & Graham-Bermann, 2001). The impact of maternal depression, an indicator of maternal psychological functioning, on mother-infant attachment has been investigated by several groups of

researchers. The overwhelming evidence indicates that depressed mothers are more likely to have insecurely attached infants than non-depressed mothers (Donovan & Leavitt, 1989; Radke-Yarrow, Cummings, Kuczynski, & Chapman, 1985; Spieker & Booth, 1988; Teti, Gelfand, Messinger, & Isabella, 1995), a finding that is not particularly surprising in light of the research that shows a strong relationship between maternal depression and unavailable, unresponsive, and/or rejecting maternal behaviors (see Gelfand & Teti, 1990 for a review).

Interestingly, based on a review of studies examining the relationship between depression and infant attachment, Belsky (1999) concluded that the severity and chronicity of exposure to maternal depression is also an important determinant of insecure attachment. Not only will infants who are exposed to a depressed mother be more likely to have an insecure attachment than infants never exposed to maternal depression, but infants who have more severely depressed mothers and/or mothers who are depressed for longer periods of time will be even more likely to display an insecure attachment than infants who have depressed mothers of lesser severity and/or duration.

Demographic Risk and Attachment

Low income and socioeconomic status (SES) have also repeatedly been linked to problems in parenting and caregiving behaviors (for a review, see Halpern, 1993). Because poverty produces a number of stressors on parents such as financial strain and unsafe and overcrowded communities, it tends to undermine parents' well-being, feelings of control and competence, and abilities to adequately care for children's physical and emotional needs. Poverty has been associated with less consistent, attentive caregiving, less emphasis on infant needs compared to personal or familial needs, parental

59

unavailability, and less responsiveness to infant emotional well-being, among other things (Bromwich, 1978; Norton, 1990). Overall, poverty and associated stressors tend to preoccupy parents in ways that interfere with their attentiveness to parenting and "preoccupation" with their infants (Halpern, 1993). Because low SES and income have been associated with these caregiving problems, it is likely that these risk factors impact the quality of mother-infant attachment as well.

Although fewer studies have been conducted in this specific area, there is some evidence to support a significant relationship between lower economic status and insecure infant attachment, particularly from the literature showing a link between maternal life stress and attachment (e.g., Crnic et al. 1986). Although some large-scale studies have reported no relationship between SES and mother-infant attachment (e.g., Spieker & Booth, 1988), this is likely due to the low variance in SES in these samples. That is, virtually all attachment studies have been conducted with an exclusively middle-class sample or exclusively lower-class sample, rather than samples with a range of economic classes, which makes it statistically difficult to find a relationship between SES and attachment, even if one actually exists.

Finally, because there is a large overlap between poverty and single parenthood (Halpern, 1993) and because single parenthood is related to a number of similar stressors, it is possible that single parenthood is related to the quality of mother-infant attachment. However, this relationship has yet to be investigated by attachment researchers. Although single parenthood and poverty are highly related, it seems important to consider single parenthood as an additional risk factor since Sameroff et al. (1987) suggest that the number of risk factors is more important than the specificity of risk.

CHAPTER 4: HYPOTHESES OF THE PRESENT STUDY

As mentioned previously, Daniel Stern (1995) has recently developed a theory to explain the process that women go through as they prepare for motherhood and as they form an attachment with their infants after birth. Much of Stern's theory has been based on the attachment literature reviewed in this paper, as well as extensive clinical experience with mothers and infants. According to Stern, a mother's mental representations of self and others ("networks of schemas-of-being-with") are reactivated and reworked throughout pregnancy, especially after the first trimester when the baby becomes more "real" to the mother. In particular, Stern indicates that three sets of representations are especially important for a woman during this time.

First, Stern (1995) suggests that a new mother's relationship with her own mother becomes reactivated (consciously or unconsciously) during pregnancy as the new mother forms her own ideas about caregiving. It is believed that preparation for motherhood and the daily acts of mothering provide a specific remembering context, in which memories from the mother's own childhood are evoked. Stern also asserts that a mother's experiences of being mothered is a major influence on the way in which she interacts with her infant and on the quality of attachment formed with the infant, and his conclusions are largely based on the empirical literature showing a significant relationship between mothers' representations of their own attachment with caregivers and the attachment formed with their infants.

During pregnancy, a mother also develops representations of her baby. Stern concludes from the available literature that there is an increase in richness and specificity of maternal representations of her fetus-as-infant around 4 months gestation, possibly

precipitated by the baby's movement and growth. Although Stern suggests that representations may decline during the last trimester of pregnancy in order to protect the mother and baby from a potential discrepancy between the real and imagined baby, existing studies actually indicate that women continue to have richly developed representations during their entire pregnancy, as well as postpartum (e.g., Fava Vizziello et al., 1993; Leifer, 1977). In addition, a number of studies indicate that representations of the infant may be a mechanism through which attachment is transmitted from mother to infant (e.g., Ammaniti, 1991).

Finally, another important representation during a woman's transition to motherhood is her representation of self as a mother. Stern (1995) hypothesizes that an important internal transformation takes place, as the mother shifts from being a daughter to her mother to being a mother to her daughter/son. As part of this transformation, a mother's representations of herself in various roles (e.g., wife, daughter, and mother) will be activated and reorganized as she makes psychological room for her role as a mother. Some empirical literature has indicated, in fact, that representations of self as mother and beliefs about caregiving efficacy are related to both representations of attachment and mother-infant attachment.

Stern (1995) also asserts that there are a number of important themes within the mother's psychological and external world as she makes the transition to motherhood. First, the mother is concerned with helping the infant grow and thrive physically. Second, the mother is concerned with establishing an emotional relationship with the baby, during which there is ideally a lessening of the mother's own subjectivity for the purpose of being acutely in tune with the infant. The mother also develops a need to

create and maintain a protecting support network so that she can accomplish the tasks of motherhood. This support network ideally provides the mother with physical and practical help, as well as with emotional and psychological support. Stern asserts that support from females specifically, and also females that have had experiences with motherhood, is especially important. Finally, the fourth theme concerns the mother's own representations of herself; as mentioned above, the mother must reorganize her identity to include representations of self-as-a mother, which are thought to be influenced by the mother's representations of being cared for during childhood.

Although there is a substantial amount of literature supporting Stern's (1995) ideas, no empirical study to date has integrated this literature in a way that has been theorized and described by Stern. Furthermore, neither Stern's theory nor most of the existing empirical studies have addressed processes related to the formation of mother-infant attachment in high-risk groups of women; instead, they have focused primarily on mother-infant attachment in well-educated, middle-class families. Therefore, this study will test many of Stern's ideas, which are also consistent with attachment theory, within a high-risk group of women through a longitudinal research design (see Figure 1 for hypothesized model).

Specific hypotheses for the current study were as follows:

1.   Mothers' representations of attachment during pregnancy, based on the recollection of experiences with caregivers, will be significantly related to mothers' representations of their infants during pregnancy. More secure representations of attachment will be related to more secure or "balanced" representations of infants during pregnancy.

63

Figure 1. Hypothesized Model of Prenatal and Postnatal Predictors of Mother-Infant Attachment at 12 months
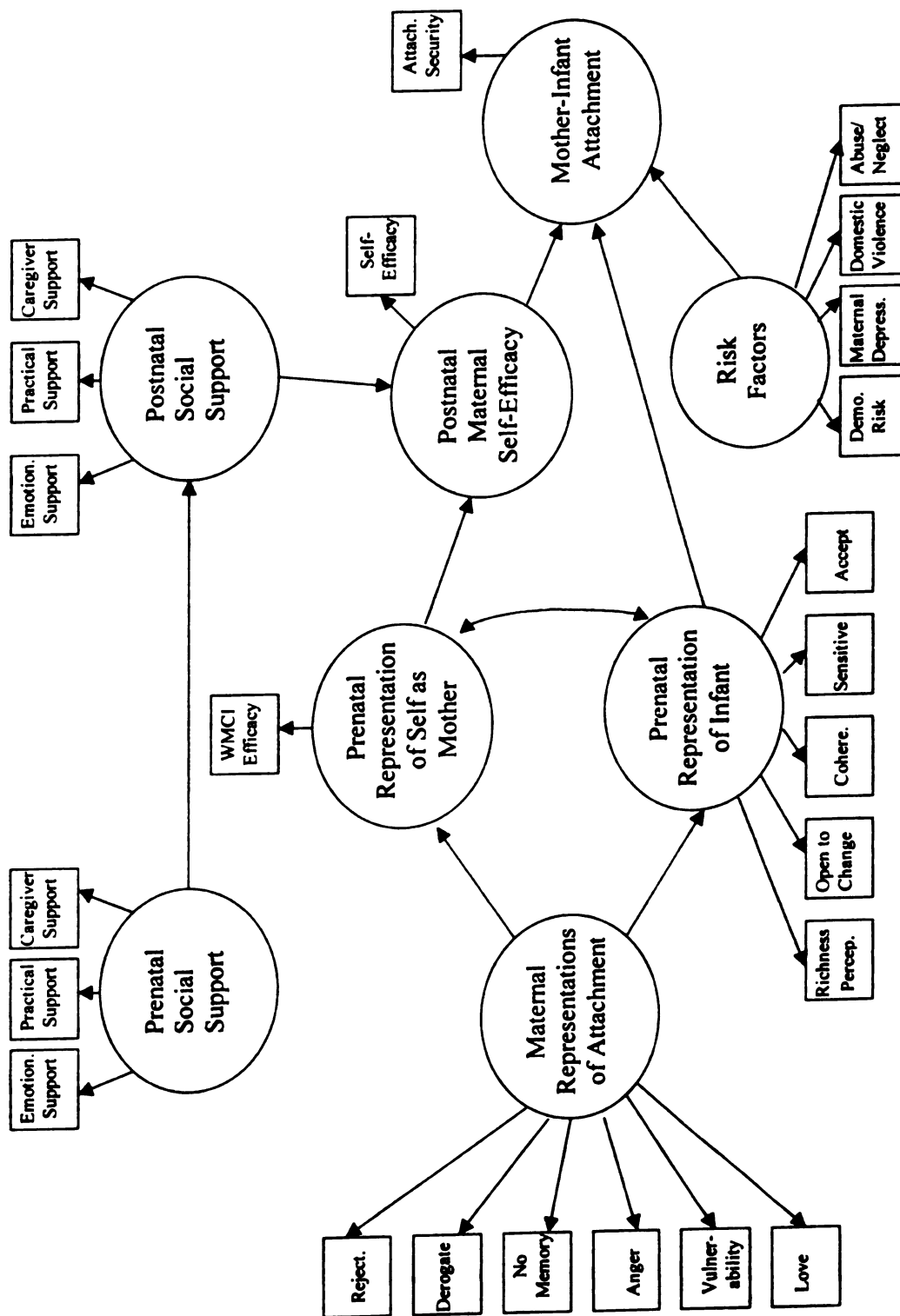
2.   Mothers' representations of attachment during pregnancy will be significantly

        related to the way in which mothers perceive themselves as caregivers during

        pregnancy. More secure representations of attachment will be related to more

        secure representations of the self as a mother, characterized by a confident, but

        realistic view of the self in the maternal role.

3.   Representations of the infant and representations of the self as a mother during

        pregnancy will be complementary, but distinct, constructs and will be

        significantly related to each other.

4.   Mothers' representations of the infant will be significantly related to mother-

        infant attachment security at 1 year postpartum. More secure, balanced

        representations of the infant during pregnancy will be related to greater infant

        security at 1 year. Thus, maternal representations of attachment will be indirectly

        related to mother-infant attachment at 1 year through its impact on representations

        of the infant.

5.   Representations of the self that emerge during pregnancy, as the women prepare

        for the motherhood role, will be significantly related to mothers' self-efficacy in

        the maternal role after the infant is born. More secure representations during

        pregnancy will be related to greater feelings of postnatal self-efficacy.

6.   Mothers' self-efficacy in the maternal role at 1 year postpartum will, in turn, be

        significantly related to infant attachment security. Greater feelings of efficacy will

        be related to greater attachment security. Thus, maternal representations of the

        self as a mother and postnatal self-efficacy will be another pathway through

which mothers' attachment will be indirectly related to infant attachment at 1

year.

7. Prenatal emotional support, practical support, and support with pregnancy-related

    issues from females specifically will be significantly related to postnatal, female

    support in the same three areas. That is, greater support during pregnancy will be

    related to greater support postpartum.

8. Postnatal support will, in turn, be significantly related to maternal self-efficacy,

    with more support from females related to greater feelings of self-efficacy. Thus,

    postnatal support will indirectly affect mother-infant attachment through its

    impact on maternal self-efficacy.

9. Several risk factors, including demographic risks, maternal depression, domestic

    violence, and child abuse and/or neglect, will be significantly related to mother-

    infant attachment, with more risk factors being related to less secure attachment.

Exploratory Analyses

In addition to testing Stern's theory as depicted in Figure 1, exploratory analyses

are proposed to assess the transmission of attachment over time using attachment

categories from the three attachment measures (mothers' representations of their own

attachment, representations of the infant, and mother-infant attachment at 1 year). The

degree of concordance between attachment categories is believed to be another important

way of examining the continuity or discontinuity of attachment patterns between mother

and infant.

CHAPTER 5: METHOD

<u>Participants</u>

Participants included 207 women, who were recruited and enrolled in conjunction

with a larger study at Michigan State University. Women initially enrolled in the study

during their last trimester of pregnancy (Time 1) and were interviewed again when their

infants' were approximately 2 months old (Time 2) and when their infants were

approximately 12 to 15 months old (Time 3). At Time 2, one woman had a reported

stillbirth and four women were unable to be located by research staff. At Time 3, one

woman who was missing at Time 2 was found and interviewed, another woman reported

that her child had died and an additional 12 women were unable to be located or refused

to participate. Thus, the retention rates were 98% and 92%, respectively.

Women were recruited with flyers (see Appendix A) throughout the Clinton-

Eaton-Ingham counties of Michigan at a number of agencies and clinics including:

Obstetric/Gynecology clinics or other women's health clinics (39%), flyers posted in the

community at libraries, laundromats, stores, and other similar public places (27%), a

number of social service programs such as FIA, WIC, Head Start, Jump Start, and

Maternal Infant Outreach Program (26%), childbirth classes (5%), the county

prosecutor's office (2%), and a local domestic violence shelter (1%).

General inclusion criteria included: 1) in the last trimester of pregnancy at the

time of the initial interview, 2) 18 to 40 years of age, and 3) involvement in a romantic

relationship for at least 6 weeks sometime during the pregnancy. Recruitment efforts

were made to include women who were ethnically and socioeconomically diverse. That

is, specific recruitment sites were chosen to include women with a variety of backgrounds

and experiences. See Table 1 for demographic information on the entire sample. There were no significant demographic differences between participants who completed Time 2 and Time 3 interviews ($\underline{n}$ = 190) and participants who did not complete follow-up interviews ($\underline{n}$ = 17), with the exception of family income; participants with missing data had significantly less income per month than participants with completed data ($\underline{t}$ = 3.91, $\underline{p}$ < .01).

Procedures

Women contacted the study office if they were interested in participating, at which time a research assistant conducted a brief screening to determine eligibility. The women were told the study was about women's relationships with the important people in their life, including partners, family members, and children, and that if they participated in the study they would be asked about their thoughts and feelings about relationships and recent life events, including domestic violence. They were also told that they did not necessarily need to have experienced domestic violence in order to be eligible for the study. If the potential participant met criteria and agreed to participate, an appointment was made.

Because the purpose of the larger study, with which this study was conducted, was to study the effects of domestic violence on women and infants, additional screening procedures and recruitment efforts were made to ensure that a reasonable number of subjects had in fact experienced domestic violence during the current pregnancy. After about half the sample had been recruited and interviewed ($\underline{n}$ = 96), the Conflict Tactics Scale (Straus, 1979) began to be administered over the telephone during the initial screening procedures in order to keep track of the number of battered and non-battered

Table 1

Demographic Characteristics of Study Participants (N = 207)

Age of Mother	$\underline{M} = 25.5$ ($\underline{SD} = 5.0$)
Gender of Child[a, b]	
Boy	104 (51%)
Girl	99 (49%)
Racial/Ethnic Group of Mother	
Caucasian	130 (63%)
African-American	53 (25%)
Latina, Hispanic	10 (5%)
Biracial	8 (4%)
Native American	2 (1%)
Asian American	1 (1%)
Other	3 (1%)
Racial/Ethnic Group of Child	
Caucasian	91 (44%)
African-American	47 (22%)
Latina, Hispanic	4 (2%)
Biracial	62 (30%)
Asian American	1 (1%)
Other	2 (1%)
Marital Status	
Never Married	104 (50%)
Married	83 (40%)
Divorced	10 (5%)
Separated	9 (4%)
Widowed	1 (1%)
Education Level of Mother	
High School	94 (45%)
Some College	80 (39%)
College Degree	16 (8%)
Graduate Degree	11 (5%)
Other	6 (3%)
Income/Month	$\underline{M} = \$1806.29$ ($\underline{SD} = \$1506.92$)
Socioeconomic Status	$\underline{M} = 32.13$ (SD $= 11.17$)

[a] 1 stillbirth

[b] 3 unknown

women. This screen was used to exclude women who had not experienced domestic

violence during pregnancy once it was determined that there were enough non-battered

women. After 137 participants had been recruited and interviewed, it was discovered that

many of the "non-battered" women had actually experienced domestic violence in a prior

relationship. Thus, the telephone screen was then also used to enroll women who had *never* experienced domestic violence, in addition to those who experienced violence in the current pregnancy. Overall, 161 women who called the project office to participate were not included for the following reasons: did not meet battering experience criteria (n = 102), gave birth before the interview or could not be found again to schedule an interview (n = 41), did not meet relationship criteria (n = 9), planned to give baby up for adoption (n = 3), did not meet age criteria (n = 2), did not speak fluent English (n = 2), or decided not to participate after the phone screen (n = 2). There were no demographic differences between these excluded women and participants.

<u>Time 1 Interview</u>

Eight undergraduate students and five graduate students were trained to administer all questionnaires and a semi-structured interview (see description below) before Time 1 interviews were conducted. Research assistants attended a weekly training meeting for one semester and did two to five practice interviews under supervision until they reached 95% reliability for standard administration of measures. That is, interviewers were required to perform administrations with at least 95% accuracy. Throughout the period of data collection, research assistants continued to attend a weekly training meeting during which procedures were reviewed and interview problems were discussed. In addition, supervisors reviewed all completed interviews to ensure questionnaires and interviews were being administered correctly.

During the Time 1 interviews, mothers were informed about anonymity and confidentiality and first completed an informed consent form (see Appendix B) that specified that her participation was voluntary and that she could withdraw from the study

without any negative consequences. Interviewers read all questionnaires aloud and marked down participant's responses in order to control for variation in the level of literacy among participants. The semi-structured interview was audiotaped for later transcription and coding. Interviewers were blind to the battering status of the women, which was ensured by administering violence questionnaires last. Confidentiality was maintained by assigning all participants an identification number, which was placed on all data rather than participant names, and participant names were kept apart from the data. Time 1 interviews took place in the woman's home or in the project office, whichever she preferred, and lasted approximately 3 hours. Participants were paid $50.00 and were given a list of community resources available for women and children.

Time 2 Interview

Participants were contacted by project staff approximately 1 week after the due date to confirm each infant's date of birth. Women were contacted again approximately 6 to 8 weeks after the infant's date of birth to set up the Time 2 interview, which nearly always took place between 2 and 3 months postpartum. During the first week of trying to contact women for this interview, research assistants made up to 10 calls to the participant's home and up to four calls to her work. If the participant could not be reached by telephone (due to a disconnected phone, for example), a letter was sent to her home requesting that she call the office. If, by the second week, participants had not been reached, research assistants made up to two visits to her home. If the woman was not at home, a letter was left requesting that she contact the project office. If necessary, the following week, efforts were made to contact women through 'recontact' people, whose names, addresses, and telephone numbers were provided by participants during

71

their first interview. Recontact people were both called (up to five times) and were

contacted directly through several visits to their homes. If recontact people were not at

home, letters were left asking them to forward the information to participants.

Eight research assistants were trained to administer the Time 2 interview by

conducting several practice interviews with each other, observing a supervisor conduct a

real interview, and doing their first interview with a participant under supervision.

During data collection, interviewers attended a weekly meeting to discuss difficulties that

arose during interviews, as well as strategies to reach women who were "missing." Time

2 interviews were primarily done over the telephone (less than 10 participants did the

interview in person because they had no phone) and lasted about 30 to 40 minutes.

Information about confidentiality was read aloud to participants before the interview

began (see Appendix C). All questionnaires were read aloud, and interviewers wrote

down women's responses. Women were given a baby gift worth $5.00 following the

completion of the interview.

Tracking Participants Over Time

After the Time 2 interview, women were followed through the infants' first year

of life every 90 days in order to stay in touch with women and minimize attrition. Thus,

they were contacted at about 5 months, 8 months, and 11 to 12 months postpartum. At

each follow-up point, a letter and information sheet (asking for the participant's current

address and phone numbers) were sent to the participant (see Appendix D), along with a

self-addressed stamped envelope. In addition to returned information sheets, the post

office sent a postcard to the project office with current addresses for those participants

who had moved and registered a new address. Participants were called directly if they

did not return the information sheet or if the post office did not send new information within 3 weeks. If participants were unable to be reached directly at that point, efforts were made to contact them through their recontact people. If all other tracking methods failed, research assistants went to the participants' and recontact people's homes.

Time 3 Interview

When participants' infants were approximately 11 to 12 months old, women were contacted using the same tracking procedures described above, to see if they were willing to participate in a follow-up interview with their infants. Although efforts were made to complete all Time 3 interviews within two weeks before or after the infant's date of birth, this was not always possible due to problems finding and scheduling participants within that time frame. Thus, 54% of the interviews were completed when infants were 11 to 12 months old, 39% were completed when infants were 13 to 14 months old, 5% were completed when infants were 15 to 16 months old, and 2% were completed when infants were 17 to 18 months old.

A total of 13 undergraduate students and three graduate students were trained to conduct the mother and infant assessments at Time 3. Training consisted of weekly meetings and outside activities over a 7-month period. Training activities included: 1) learning about infant development, assessment, and mother-infant attachment through readings and discussion, 2) as many practice interviews as was necessary to achieve an accuracy rate of at least 85% for administration of all measures, including interviews and videotaped procedures, and 3) observation of supervisors' conducting real interviews. In addition, approximately 20% of the interviews were observed by supervisors in order to control for drift in standard administration.

The Time 3 interview took place in the project office because video equipment was required for some laboratory procedures. Mothers first completed an informed consent form for herself and her infant (see Appendix E). Mothers and infants then participated in a standardized laboratory procedure together (described below) to assess the quality of their attachment. Afterwards, one research assistant met with the mother to administer interviews and questionnaires, while another research assistant administered a few tests to the infant in a separate room (for the purposes of the larger study). The entire Time 3 interview lasted about 3 to 4 hours. Women were paid $75.00 and given a baby gift worth approximately $8.00 after completion of the interview.

Measures

Maternal Representations of Attachment (Time 1)

Mothers' representations of attachment were assessed by the Perceptions of Adult Attachment Questionnaire (PAAQ, formerly called the Inventory of Adult Attachment; Lichtenstein & Cassidy, 1991), a 60-item self report that asks about experiences during childhood and the participant's perceptions of her mother as a caregiver, as well as the participant's relationship with her mother (see Appendix F). All items are rated on a 1 to 5 Likert scale ranging from Strongly Disagree to Strongly Agree. Items form eight subscales: 1) *Rejection* by mother (11 items), 2) *Loved* by mother (6 items), 3) *Role-Reversal* with mother (10 items), 4) *Anger* towards mother (5 items), 5) *Derogation* of attachment experiences (4 items), 6) *Forgiving* of childhood problems (7 items), 7) feelings of *Vulnerability* about relationship with mother (5 items), and 8) *No Memory* of childhood experiences (4 items). Scales 1-5 and 8 were designed to be equivalent to six

74

scales from the Adult Attachment Interview. Higher scores on each subscale indicate higher levels of the construct being measured, e.g., more rejection, more love, etc...

Lichtenstein and Cassidy (1991) indicated that the PAAQ scales are fairly internally consistent; alpha coefficients ranged from .62 (Derogation) to .90 (No Memory) in a sample of 247 college students and from .51 (Derogation) to .94 (No Memory) in a sample of 123 mothers. Test-retest reliabilities ranged from .64 to .86 in the college sample and were not reported for the mother sample. The authors compared PAAQ responses to AAI responses in the sample of mothers and found that equivalent scales were highly correlated ($p < .01$) with each other, with the exception of the Role-Reversal and Derogation scales. Thus, since the AAI is currently the "gold standard" for the measurement of adults' representations of attachment, it appears that most of the PAAQ scales have good concurrent validity.

Based on attachment theory and that underlying the AAI classifications, respondents can presumably be classified into Autonomous, Dismissive, and Preoccupied attachment groups based on their scores on the eight subscales. Theoretically, autonomous adults would report more experiences of love and feelings of forgiveness, dismissive adults would report more rejection, derogation, and a lack of memory of childhood experiences, and preoccupied adults would report role-reversal, angry feelings, and feelings of vulnerability (Hesse, 1999). However, a confirmatory factor analysis on the current sample revealed that six of the eight subscales loaded onto a more general attachment factor that measures a continuum of security rather than qualitatively distinct attachment styles (see the Results chapter for more details). Therefore, only those six subscales (*Rejection, Love, Anger, Derogation, Vulnerability,* and *No Memory*) were used

to measure maternal representations of attachment. Coefficient alphas for the current sample were: *Rejection* = .91, *Love* = .92, *Anger* = .79, *Derogation* = .49, *Vulnerability* = .65, *No Memory* = .93.

Finally, although the AAI is the gold standard for measuring maternal representations of attachment, the PAAQ was chosen in this study due to limited time and resources, as well as the inclusion of another labor-intensive clinical interview (see below). Despite the fact that a number of researchers have challenged the use of questionnaires to measure attachment representations, noting that it is difficult to assess defensive and narrative processes from questionnaire data (e.g., Crowell & Treboux, 1995), there is reason to believe that questionnaire data can be useful. For example, many adults can and do provide accurate information on their experiences, and conscious and unconscious processes often operate in a similar way to achieve the same goal (see Crowell, Fraley, & Shaver, 1999 for a review of these issues).

Prenatal Representations of Infant and of Self-As-Mother (Time 1)

The Working Model of the Child Interview (WMCI; Zeanah et al., 1994) was used to measure maternal representations of the infant and of the self-as-mother during pregnancy. This instrument is a 1 to 1 1/2 hour structured interview that inquires about a participant's perceptions and subjective experiences of her infant and relationship with her infant. Interviews were audiorecorded, transcribed, and rated by trained coders along 13 5-point Likert scales that assess qualitative (e.g., coherence of interview), content (e.g., infant difficulty), and affective features (i.e., anger, joy) of maternal representations. Higher scores indicate higher levels of the construct being measured.

Coders then assign an overall classification to the narratives provided by the mothers based on the scale profiles (with an emphasis on the qualitative scales).

Balanced narratives include both positive and negative characteristics of the infant and relationship with the infant. They convey value for the infant's individuality and appreciation for the infant's subjective experience. The caregiver's perceptions are open to change and are at least moderately rich in detail about the infant and the caregiving experiences. *Disengaged* representations are characterized by emotional distance or indifference towards the infant. Caregivers are unable to recognize the infant's individuality, and if it is recognized, it is not valued. Details about the infant or parenting experience lack richness, are not flexible or open to new experience, and are emotionally unintegrated. Finally, *Distorted* representations reflect general inconsistencies. Caregivers may be preoccupied or overwhelmed by the infant or may have unrealistic expectations about the infant. Unlike disengaged parents, distorted mothers do not deny their impact on their infants. However, they often do not recognize how their behaviors may be detrimental to the infants. Descriptions of infants and the relationship with the infant may be incoherent or contradictory. Much feeling is expressed toward the infant, but these emotions lack a sense of modulation or meaning.

Several studies have demonstrated predictive and concurrent validity for the WMCI by reporting highly significant relationships between WMCI classifications and infant attachment classifications assessed by the Strange Situation in the expected direction: Balanced-Secure, Disengaged-Avoidant, and Distorted-Ambivalent (Benoit et al., 1997; Zeanah et al., 1994). Another study provided more evidence for validity by showing a significant relationship between the disengaged and distorted representations

77

and high-risk/disordered infant status (Benoit, Zeanah, Parker, Nicholson, & Coolbear, 1997). Interrater agreement has ranged from .57 to .76 (Cohen's kappa) for different classifications in previous studies, and Benoit et al. (1997) reported a high degree of test-retest stability for the Secure and Distorted classifications (concordance over 1 year's time was 89% and 85% respectively). As of yet, there is no evidence of stability for the Disengaged classification.

In the present study, questions were changed to future tense to inquire about mothers' representations during pregnancy (see Appendix G). Benoit et al. (1997) has demonstrated that this is a valid technique for assessing prenatal representations. Those subscales that measured qualitative features (with some content features) of maternal representations were used to assess the mothers' representations of their infants, since these are believed to be most theoretically important. These included: 1) *Richness of Perceptions*, which measures the poverty or richness of representations of the infant and the degree to which the mother "knows" the infant, 2) *Openness to Change*, which measures the flexibility of the mother's representation to accommodate new information about the infant (compared to rigidity), 3) *Coherence*, which measures the overall organization of the mother's narrative about the infant and her relationship with the infant and the logical flow of her responses, 4) *Caregiving Sensitivity*, which assesses the degree to which the mother recognizes and responds adequately to the infant's own needs and experiences including a respect for the infant as a separate but dependent individual, and 5) *Acceptance*, which measures the degree to which the mother is open and accepting of responsibilities involved with adequate caretaking.

The author and another graduate student were trained to code scales and classify representations according to the coding system developed by Zeanah et al. (1994), with the assistance of another research group that has been trained by Zeanah. Adequate inter-rater reliability was established using weighted-kappa (or corrected-kappa) (Cohen, 1968; Fleiss, Cohen, & Everitt, 1969) for subscales and both percent agreement and Cohen's kappa for classifications. These were calculated based on 26 interviews that were coded by both trained coders (13% of the sample). Weighted kappas for the subscales used in this study were as follows: *Richness* = .68, *Openness* = .51, *Coherence* = .62, *Sensitivity* = .69, *Acceptance* = .77. Percent agreement for overall classification was 96%, with a kappa of .94 ($p < .001$).

In addition to the five scales assessing representations of the infant, mothers' responses on the WMCI were coded for representations of self-as-mother. This code was adapted from the Confidence and Competence scale from Slade et al.'s (1994) *Pregnancy Interview* Coding System. This subscale assesses the mother's representations of her own competence and self-efficacy in the maternal role and her expectations of herself as a mother along a 5-point Likert scale. Unlike the other qualitative scales developed by Zeanah et al. (1994), the middle point on this scale represents the most "balanced" or "secure" representation of self-as-mother; mothers who score low on this scale lack confidence in themselves, while mothers high on this scale are overly and unrealistically self-confident (which is believed to be a defensive response to underlying inefficacy). Thus, a balanced mother would recognize her strengths and limitations and acknowledge the challenges of motherhood, but would overall feel that she is able to make her baby feel happy, safe, and secure. For analyses, codes of 2 and 4 were collapsed and codes of

1 and 5 were collapsed so that the highest possible code was a 3, which represented the most balanced representations of self. Weighted kappa for this subscale was .63.

Maternal Self-Efficacy (Time 3)

The Maternal Efficacy Questionnaire (MEQ; Teti & Gelfand, 1991) was used to measure maternal self-efficacy, or the mother's perceptions about the degree to which she is able to perform effectively as a parent, when the infant was approximately 12 months old. This instrument is made up of 10 items, rated on a 4-point Likert scale, that tap feelings of efficacy related to a number of specific domains of parenting such as soothing the infant (see Appendix H). A total efficacy score is obtained by summing all items, and higher scores indicate greater self-efficacy. Teti and Gelfand (1991) originally administered the scale to 86 mothers, about half of whom were clinically depressed, with infants between the ages of 3 and 13 months. They reported a coefficient alpha of .86, indicating good internal reliability. Furthermore, they demonstrated good concurrent validity by reporting a high correlation between the MEQ and the Parenting Stress Index Sense of Competence Scale (r = -.75). Coefficient alpha in the current study was .65.

Mother-Infant Attachment (Time 3)

The Strange Situation (SS; Ainsworth et al., 1978) is a well-known laboratory procedure that was used to measure mother-infant attachment (see Appendix I). The procedure consists of eight episodes, each lasting about 3 minutes with the exception of the first episode, which lasts about 30 seconds. The entire procedure takes approximately 21 minutes and is videotaped and coded at a later time.

Infant behaviors during the SS are coded on four 7-point scales including proximity seeking, contact maintaining, avoidance, and resistance according to a coding

system developed by Ainsworth et al. (1978) and one 9-point scale for disorganization according to a coding system developed by Main and Solomon (1990). Infant behaviors during reunion episodes are particularly important. Based on patterns of infant behavior toward the caregiver, the quality of mother-infant attachment is also determined, and infants are classified into one of four general categories: Secure (Type B), Insecure-Avoidant (Type A), Insecure-Ambivalent (Type C), and Disorganized/Disoriented (Type D). Infants can be further classified within the three original categories; there are four types of Secure (B1 – B4), two types of Insecure-Avoidant (A1 and A2), and two types of Insecure-Ambivalent attachment (C1 and C2). See Table 2 for a description of each subgroup.

Reliability and validity of this instrument have been reported by numerous studies (i.e., Ainsworth et al., 1978; see Solomon & George, 1999 for a review). Overall, attachment classifications have been shown to be highly stable, with somewhat less stability in disadvantaged samples. Interrater reliability is very high (about 85% to 95%) for researchers trained by Ainsworth and her students. In addition, repeated studies have found a significant relationship between theoretically related variables and infant attachment such as maternal sensitivity and responsiveness, as well as between attachment and later expected outcomes such as mental health and social competence.

In the present study, SS videotapes were sent away and coded by trained, reliable coders at the University of Washington (under the direction of Dr. Susan Spieker, who has extensive experience coding SS tapes). Coders achieved a 90% agreement rate on overall classifications, with a kappa of .84 ($p < .001$), based on double-coding 11% of the sample. SS categories were then converted by the current investigator into a continuous

Table 2

Descriptions of Original Attachment Classifications by Subgroup

Classification	Description
Type B: Secure	
B_3	Most secure group. Strong proximity-seeking and contact maintaining. Little or no sign of avoiding or resisting caregiver.
B_1	Predominantly secure behaviors, with some evidence of avoidance. May greet mother, but no strong proximity-seeking. Little or no resistance.
B_2	Predominantly secure behaviors, with some evidence of avoidance. More proximity-seeking than B_1 but not as much as B_3. Little or no resistance.
B_4	Predominantly secure behaviors, with some evidence of preoccupation with caregiver and may show some resistance. Little or no avoidance.
Type A: Avoidant	
A_1	Most avoidant group, showing active avoidance of caregiver. Little or no proximity-seeking or contact-maintaining.
A_2	Predominantly avoidant behaviors, but with some tendency to greet caregiver or seek proximity.
Type C: Ambivalent	
C_1	Strong resistance and ambivalent behavior towards caregiver, combined with extreme distress and unmistakable angry quality.
C_2	Strong resistance and ambivalent behavior towards caregiver, combined with a high degree of passivity. Not as angry as C_1.

scale assessing the degree of felt security according to the conversion system suggested

by Bretherton and colleagues (Bretherton et al., 1989; Bretherton et al. 1990): B3 = 5;

B1, B2, B4 = 4; A2, C1 = 3; A1, C2 = 2; D = 1. This system is based on the findings of

Ainsworth et al. (1978), which showed that mothers of B3 infants are most sensitive, followed by mothers of B1, B2, and B4 infants, and so on, and is also consistent with the security continuum suggested by Cummings (1990).

There are a number of reasons why it is useful to assess attachment security along a continuum (see Cummings, 1990, for a review). First, not all mother-infant attachments fit neatly into "prototype" categories. Even when attachments are classifiable, there may be significant differences in felt security within the broad attachment classifications (within Type B, for example), which are generally used by researchers due to limited sample sizes. In addition, when classifications appear to be on the borderline between two groups, the use of a security continuum can reduce the possibility of measurement error. Cummings also argues that assessment along a continuum is conceptually justified because the infant's felt security comes from the attachment figure and is central to the function of attachment.

Maternal Social Support (Time 1 and Time 3)

The Norbeck Social Support Questionnaire (NSSQ; Norbeck, Lindsey, & Carrieri, 1981) was administered to women during their pregnancy and again at 12 months after birth to measure mothers' level of social support (see Appendix J). The NSSQ assesses multiple dimensions of social support including the quality of Emotional Support, Practical Support (or Aid), the size of the social support network (the number of supporters available to the participant), the duration of support, and the frequency of contact with supporters. Three items, which specifically asked about support related to pregnancy/preparation for motherhood (during pregnancy) and related to caregiving (at

83

12 months), were developed for this study and added to the original 10 items (see Appendix K for postnatal additional items).

Norbeck et al. (1981) originally tested internal consistency through item-intercorrelations based on a sample of college students. They reported correlations between .72 to .98, with items on the same subscale correlating more highly. Test-retest reliabilities ranged from .85 to .90 over a one-week period and .58 to .78 over a seven month period (Norbeck, Lindsey, & Carrieri, 1982). Norbeck et al. (1981, 1982) reported good concurrent validity by showing significant correlations between NSSQ scales and other well-known social support scales. In addition, Norbeck et al. (1982) reported evidence of construct validity by demonstrating that practical support served as a buffer between life stress and negative mood, as would be expected by theory.

All items are rated on a 0 to 4 scale (ranging from Not at all to A great deal). The authors suggest summing the amount of support received by each supporter on each item and then summing item totals for the Emotional Support and Practical Support scales, with the assumption that participants with larger networks receive a greater amount of social support (Norbeck, 1995). However, average satisfaction can also be calculated by dividing summed totals by the number of supporters and may be a better indicator of the *quality* of support. In the present study, the relationship of each supporter to the participant, as well as each supporter's gender, was obtained so that support from females specifically could be measured. Thus, average satisfaction from female supporters only was calculated for Emotional Support, Practical (Aid) Support, and Caregiving Support (support related to pregnancy and motherhood), and these scores were used to assess the quality of prenatal and postnatal social support.

Risk Factors (Time 1, Time 2, and Time 3)

Several risk factors were assessed at all three interviews in order to examine the

number and types of risk factors participants had experienced, as well as their impact on

mother-infant attachment. Risk factors included demographic risks (e.g., poverty),

maternal depression, domestic violence experiences, and child abuse and neglect.

In order to assess demographic risks, a demographic questionnaire (see Appendix

L) was administered during pregnancy to obtain basic information such as women's

ethnicity, education and occupation, family income, and family composition.

Socioeconomic status (SES) was computed according to Hollingshead Index (1975).

SES was calculated based on the participant only if she was unmarried and not living

with a partner, while SES was calculated based on both participant and partner if the

participant was either married or living with a partner. A demographic risk scale was

created from several demographic characteristics believed to put women and infants at

greater risk for problems. These characteristics included: a) income below the poverty

level (based on income and family size as defined by the U.S. Census bureau, 2001), b)

socioeconomic status in the lowest quartile of the sample, and c) single parenthood,

defined as unmarried or not living with a partner. Participants received one "point" for

each characteristic, thus, scores ranged from 0 to 3. For example, if a woman's income

was below the poverty level and she was a single parent, she would receive a score of 2.

The Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, &

Erbaugh, 1961), a 21-item self-report, was used to assess the severity of maternal

depression at several time points. The instrument covers a variety of symptoms of

depression such as depressed mood, pessimism, sleep disturbances, and changes in

appetite (see Appendix M). Each item consists of four statements that are ranked from neutral to severe, and values from 0 to 3 are assigned to each statement. For example, question 1 consists of the statements "I do not feel sad," "I feel sad," "I am sad all the time and I can't snap out of it," and "I am so sad or unhappy that I can't stand it." The total depression score is obtained by summing the answers of all 21 items. Possible scores range from 0-63, with scores of 0-9 indicating no depression, 10-15 indicating mild depression, 16-23 indicating moderate depression, and 24-63 indicating severe depression.

The BDI was originally designed for use in psychiatric populations. Beck et al. (1961) reported that split-half reliability estimates yielded a coefficient of .93 after a Spearman-Brown correction, indicating high internal consistency. They also examined the validity by comparing BDI scores to psychiatric ratings of depression and found a correlation coefficient of .67, which was highly significant. A later study (Bumberry, Oliver, & McClure, 1978) demonstrated the validity of the instrument in a university population. Using psychiatric ratings as the criterion, Bumberry et al. found a correlation coefficient of .77 between the BDI and interview ratings.

In the present study, depression was assessed at Time 1, Time 2, and Time 3. Coefficient alphas were .85, .89, and .85, respectively. Women who obtained a score of 16 or higher (moderately to severely depressed) were considered "at-risk," and a cumulative depression risk score was calculated, ranging from 0 to 3. Thus, if a woman scored 16 or higher at Time 2 only, she received a score of 1, while a woman with scores of 16 or higher at two points in time received a score of 2.

The Severity of Violence Against Women Scales (SVAWS; Marshall, 1992) was used to measure the type and severity of domestic violence, defined here as male-to-female violence in adult partners, experienced by mothers at multiple time periods. This self-report contains 46 items which make up nine dimensions of violence ranging from threats of mild violence to severe physical and sexual violence. In the original sample of community women, coefficient alphas ranged from .89 to .96, indicating high internal consistency within dimensions.

In the present study, women filled out the scale for several time periods including: a) during her pregnancy with the infant, b) the year before pregnancy, c) for a previous partner (all of these assessed at Time 1, see Appendix N), and d) during the first year of the infant's life (assessed at Time 3, see Appendix O). Coefficient alphas for each time period were: .95, .97, .98, and .95. Because it is believed that experiencing domestic violence in multiple relationships and/or for longer periods of time is more harmful for women and child witnesses than single, brief episodes of abuse, the experience of physical and/or sexual abuse within each time period was considered as a separate risk factor in order to calculate a cumulative domestic violence risk score. For example, a woman who reported abuse during pregnancy and during the infant's first year of life received a score of 2. Abuse is defined here as threats of moderate or severe violence, mild to serious violence, or sexual violence (as indicated by any item on the scale between 9 and 46). Scores ranged from 0 (no abuse at any time periods) to 4 (abuse at all four time periods).

Physical abuse and/or neglect of the participating infant were measured in two ways at Time 3. First, mothers completed the Parent Behavior Checklist (PBC; Fox,

1994), a 100-item questionnaire on parenting behaviors of infants and toddlers. Each item is rated on a 4-point Likert scale ranging from Never to Always. The scale comprises three subscales, however, only the Discipline subscale was used in the present study. This subscale includes 30 items and assesses the amount of physical punishment exerted by the parent (see Appendix P). Higher scores indicate better discipline techniques and less physical punishment. Fox (1994) reported good reliability and validity for the PBC; coefficient alpha for the Discipline subscale was .91, test-retest reliability was .87, all items had a loading of at least .30 for the Discipline factor, and the scale was highly correlated with previously-developed parenting questionnaires. In the present study, coefficient alpha for the Discipline subscale was .85.

A second way that child abuse/neglect was assessed in the current study was through a 30-item child neglect questionnaire developed for the larger study (Bogat & Levendosky, 1999) with which the present study was being conducted (see Appendix Q). Each item is rated on the same Likert scale as the PBC, and a total neglect score is obtained by summing all items, with higher scores indicating more neglect. The coefficient alpha for this scale was .66. For purposes of the present study, a child abuse risk score was calculated using both measures of abuse/neglect. Participants received one "point" if their scores on the PBC Discipline scale were among the lowest quartile of the sample and one point if their scores on the Neglect scale were among the top quartile of the sample. For example, if a woman's score on the Neglect scale only was among the highest quartile in the sample, she would receive a score of 1. Thus, higher scores indicated more child abuse risk.

CHAPTER 6: RESULTS

Missing Data

Due to attrition over time and a small number of data collection errors, several pieces of data were missing at all time periods. At Time 1, social support and WMCI data were missing for one participant because the interview was interrupted and the woman was never located to finish the interview ($n = 206$). WMCI data were also missing for four additional participants due to recording errors ($n = 202$). At Time 2, maternal depression was missing on five participants; researchers could not locate four women and one additional woman had a reported stillbirth ($n = 202$). All Time 3 variables were missing on 17 participants; one woman had a stillbirth, one woman's child died about six months after birth, nine women were unable to be located by researchers, and six women refused to do the interview ($n = 190$). Time 3 questionnaires about the child (PBC, MEQ) were missing on two additional women due to having no contact with their babies since shortly after birth (and thus, they could not fill out the measures in a valid manner) ($n = 188$). Finally, there were 10 additional missing Strange Situation videotapes; one was accidentally not recorded on tape, one woman refused to do the taped portions of the interview, one woman lost custody of her baby and could not bring the baby into the lab (although she filled out questionnaires about the child), and seven women lived out of state and were only able to complete questionnaires through the mail ($n = 178$).

In order to maximize statistical power, all missing data were estimated using the imputation method known as the "hot-deck" method from the Lisrel 8.5/Prelis 2.0 software (Jöreskog & Sörbom, 2001) after all recodings and data transformations. This

method of estimation substitutes real values for missing values. Real values are obtained

from another participant's responses that are most closely matched to the participant with

missing data on a set of specified matching variables. This procedure has several

advantages: 1) the values that are substituted into missing data points are within the

actual range of possible scores on that particular measure, and 2) the results of the

imputation are not affected by the order of cases in the database. In the current study,

missing data points were estimated based on the following set of matching variables in

the database: income, Time 1 maternal depression, Time 1 domestic violence scores (all

three time periods measured at Time 1), and Time 1 PAAQ subscales (all six).

Estimation was successful, evidenced by the very similar descriptive data for measures

both before and after estimation (see Table 3). Thus, measurement and structural model

testing was based on data from 207 participants.

Data Reduction

See Table 3 for descriptive data on all measures in the hypothesized model. As

the table shows, all measures had adequate variance with the possible exception of Time

3 self-efficacy, which was heavily skewed towards the positive end of the scale. All

variables had satisfactory distributions as evidenced by skewness and kurtosis values in

the appropriate ranges ($\pm$ 2 and $\pm$ 4), with the exception of Time 1 and Time 3 Emotional

Support. The latter support variables had elevated kurtosis scores above 4. Because the

cumulative risk variables were created from multiple measures and in order to help

illustrate the numbers and specific types of risk factors experienced by participants over

time, Tables 4 to 7 are provided. See Appendix R for the correlation matrix of model

variables.

90

Table 3
Descriptive Data for Measures in the Hypothesized Model (N = 207)

Measure	Mean (after estimation)	SD (after estimation)	Range of Scores	Possible Range	Mean (before est.)	SD (before est.)
PAAQ:						
1. Rejection	20.73	8.91	11-52	11-55	20.73	8.91
2. Love	23.47	5.89	6-30	6-30	23.47	5.89
3. Angry	11.41	4.77	5-25	5-25	11.41	4.77
4. Derogating	8.51	2.82	4-16	4-20	8.51	2.82
5. Vulnerable	14.31	3.96	5-25	5-25	14.31	3.96
6. No Memory	10.16	4.67	4-20	4-20	10.16	4.67
WMCI:						
7. Richness of Perceptions	2.83	.99	1-5	1-5	2.84	.99
8. Openness to Change	3.15	.98	1-5	1-5	3.16	.98
9. Coherence	2.85	.94	1-5	1-5	2.86	.94
10. Sensitivity	3.20	.97	1-5	1-5	3.21	.97
11. Acceptance	3.16	1.02	1-5	1-5	3.17	1.02
12. Rep. of self as Mother	2.29	.60	1-3	1-3	2.30	.61
MEQ:						
13. Total score	34.82	2.59	27-40	10-40	34.92	2.60
Time 1 Social Support:						
14. Emotional Support	12.99	2.24	0-16	0-16	13.09	2.22
15. Practical Support	5.53	1.68	0-8	0-8	5.51	1.50
16. Caregiving Support	7.58	2.36	0-12	0-12	7.09	2.06

91

Table 3 (cont'd).

Time 3 Social Support:						
17. Emotional Support	13.31	2.57	0-16	0-16	13.47	2.08
18. Practical Support	5.89	1.80	0-8	0-8	5.97	1.52
19. Caregiving Support	8.23	2.64	0-12	0-12	7.97	2.27
Risk Variables:						
20. Demographic Risk	1.00	1.03	0-3	0-3	1.00	1.03
21. Maternal Depression	.37	.70	0-3	0-3	.38	.73
22. Domestic Violence	1.59	1.30	0-4	0-4	1.56	1.31
23. Child Abuse/Neglect	.54	.70	0-2	0-2	.52	.69
Strange Situation:						
24. Attachment Security	3.29	1.22	1-5	1-5	3.32	1.21

Table 4
Breakdown of Participants Experiencing Demographic Risks

Number of Risk Factors	Frequency
0	88 (42%)
1	53 (26%)
2	44 (21%)
3	22 (11%)

Table 5
Breakdown of Participants Experiencing Depression

Number of Times	Frequency
0	154 (74%)
1	34 (17%)
2	15 (7%)
3	4 (2%)

Table 6
Breakdown of Participants Experiencing Domestic Violence

Number of Times	Frequency
0	52 (25%)
1	56 (27%)
2	46 (22%)
3	31 (15%)
4	22 (11%)

Table 7
Breakdown of Participants with Child Abuse/Neglect Risk

Number of Risk Factors	Frequency
0	121 (58%)
1	61 (30%)
2	25 (12%)

<u>Measurement Models</u>

Before testing the overall model shown in Figure 1, confirmatory factor analyses (CFA) were conducted for each latent construct with more than one indicator, in order to determine the adequacy of the measurement models. In general, all CFA models were specified so that the residual variances of the factors and indicators were estimated, assuming that both factors and indicators had some measurement error. Residual covariances were freed as needed, when this led to a significantly improved model fit. All measurement model estimation was done using the Unweighted Least Squares (ULS) method, and models were specified on the y-side. A good fit was determined by: a non-significant chi-square value and/or a chi-square value that was less than two times the degrees of freedom, a Root Mean Square Error of Approximation (RMSEA) value of less than .05, and a Goodness of Fit Index (GFI) and Adjusted Goodness of Fit Index (AGFI) between .90 and 1.00 (Hoyle & Panter, 1995; Schumacker & Lomax, 1996; Ullman, 1996). Lisrel 8.5 was used for all measurement models.

The first CFA was conducted for the construct *Maternal Representations of Attachment*. This factor had six indicators, which were the six subscales of the PAAQ. In order to obtain a good model fit, residual covariances were freed for the following indicators: Derogation and No Memory, Rejection and Love, Anger and Vulnerability, Rejection and No Memory, and Rejection and Anger. Subsequently, the model had an excellent fit according to several goodness-of-fit indices. The $\underline{X}^2$ value was 4.25, df = 4, with $\underline{p}$ = .37. The RMSEA was .02, GFI = 1.00, and AGFI = 1.00. All factor loadings were significant. See Appendix S.

The second CFA examined the construct *Prenatal Representation of the Infant.* This factor had five indicators, which included the five qualitative and content subscales of the WMCI. The model fit was excellent. Chi-square = 6.64, df = 5, $\underline{p}$ = .25, RMSEA = .04, GFI = 1.00, and AGFI= 1.00. No residual covariances needed to be estimated. All factor loadings were significant. See Appendix T.

The third and fourth CFA analyses examined the *Prenatal Social Support* and *Postnatal Social Support* constructs. Both factors had three indicators each, which included Female Emotional Support, Female Practical Support, and Female Caregiving support as measured by the Time 1 and Time 3 NSSQ. Both measurement models were initially saturated, so in order to obtain more parsimonious models, residual variances for the first and third indicators were set equal. The resulting model for prenatal support showed a very good fit: $\underline{X}^2$ = 1.99, df = 1, $\underline{p}$ = .16, RMSEA = .07, GFI = 1.00, and AGFI = 1.00. All factor loadings were significant. See Appendix U. The model for postnatal support was not as strong with only some indices showing a good fit: $\underline{X}^2$ = 10.72, df = 1, $\underline{p}$ < .05, RMSEA = .22, GFI = 1.00, and AGFI = .98. All factor loadings were significant. See Appendix V.

Finally, a CFA was conducted for the *Risk Factors* construct. This factor initially had four indicators including the demographic risk scale, maternal depression risk scale, domestic violence risk scale, and the child abuse/neglect risk scale. The model had an excellent fit according to several indices: $\underline{X}^2$ = 3.90, df = 2, $\underline{p}$ = .14, RMSEA = .07, GFI = 1.00, and AGFI = .98. No residual covariances needed to be freed. All factor loadings were significant. See Appendix W.

After the full model was tested and modified (see full description below), the risk construct was changed to include only Time 1 risk factors. Thus, the demographic risk scale was unchanged, the maternal depression scale was changed to a dichotomous variable for presence/absence of depression at Time 1, the domestic violence scale was changed to a 0 to 3 scale by eliminating Time 3 domestic violence (thus, only including the three time periods of: pregnancy, year before pregnancy, and previous partner), and the child abuse/neglect scale was eliminated completely. The means and standard deviations for the new depression and violence scales were M = .20, SD = .40 and M = 1.29, SD = 1.05, respectively. Skewness and Kurtosis values were within the appropriate ranges. The new frequencies for these risk variables are shown in Table 8. A CFA was then conducted on this new *Risk Factors* construct, which included three indicators of Time 1 risks. The model was initially saturated, so the residual variances for the first and second indicators were set equal in order to obtain a more parsimonious model. Subsequently, the model fit was good: X^2 = 4.68, df = 2, p = .09, RMSEA = .08, GFI = .98, and AGFI = .95. No residual covariances needed to be freed. Factor loadings were significant except for 'bdirisk', which was almost significant (t = 1.38). See Appendix X.

Table 8
Breakdown of Participants Experiencing Depression and Domestic Violence at Time 1

Number of Times	Frequency
Depression:	
0	166 (80%)
1	41 (20%)
Domestic Violence:	
0	58 (28%)
1	66 (32%)
2	49 (24%)
3	34 (16%)

Full Structural and Measurement Model

Model testing was guided by the theoretically-derived model shown in Figure 1. The model included 8 latent variables and 24 indicators, all of which were defined as endogenous variables. Model testing was based on the covariance matrix of the indicators, using Lisrel 8.5 (Jöreskog & Sörbom, 2001). The matrix of factor loadings was specified as full, indicating an asymmetric matrix and allowing for reciprocal relationships between variables. The theta-epsilon matrix (indicator residuals) and the psi matrix (factor residuals) were specified as symmetrical and fixed. Residual variances of the factors and indicators were estimated, assuming that both factors and indicators had some measurement error. Criteria for a good model fit were the same as those used to evaluate the measurement models.

The method of estimation used was Maximum Likelihood (ML), which is the most frequently used and recommended method of estimation for SEM analyses (Ullman, 1996). This method maximizes the likelihood for parameter estimates given the data and performs well under less than optimal conditions (Hoyle & Panter, 1995). Results initially revealed that the data poorly fit the model. The $\underline{X}^2$ value was 563.72, df = 243, $\underline{p}$ < .05. In addition, the RMSEA was .11. Although the GFI = .92 and the AGFI = .90, other fit indices such as the Non-Normed Fit Index and the Comparative Fit Index had negative values. Overall, these indices indicated significant problems with the model.

The modification indices provided by the program were used to guide modifications to the model, along with a determination about whether or not a modification made theoretical sense. One of the first modifications to the model was changing the two-way arrow between prenatal representations of the infant and of the self

97

as mother to a one-way arrow predicting representations of the self from representations of the infant. The next major modification was to eliminate the estimated parameter between the Risk Factors construct and the Mother-Infant Attachment construct. Instead, the data suggested that Risk Factors more strongly predicted Prenatal Representations of the Infant. However, this posed conceptual problems because the predictor, Risk Factors, included variables measured at Time 3, while Representations of the Infant was measured at Time 1. Temporally, it would be impossible for a Time 3 variable to predict a Time 1 variable. Therefore, the Risk Factors construct was changed to only include Time 1 variables (see description of the new measurement model above). Subsequently, the pathway from Risk Factors to Prenatal Representations of the Infant was freed and estimated. These changes substantially improved the model (see Appendix Y for the revised correlation matrix of variables with the new risk variables, upon which the final model was based).

In order to obtain a good model fit according to the criteria defined above, several other modifications were made. Because there were three factors with only one indicator, several residual values were set to a fixed value of 1 (for the observed variables postnatal self efficacy and infant attachment security). In addition, covariances between the following pairs of latent constructs were freed: 1) Maternal Representations of Attachment and Prenatal Social Support, 2) Postnatal Social Support and Mother-Infant Attachment, and 3) Prenatal Representations of Infant and Mother-Infant Attachment. Finally, a number of residual covariances between pairs of observed variables were freed and estimated[1]. Although more modifications were suggested by the program to further improve the model fit, no modifications were made after a good fit was established.

The final model consisted of eight latent factors and 23 indicators (See Figure 2). The method of estimation was Maximum Likelihood and model testing was based on the covariance matrix. Parameter values for the first indicator of each construct, including the single indicators for Prenatal Representation of the Self, Postnatal Self-Efficacy, and Mother-Infant Attachment, were fixed estimates, and therefore, cannot be interpreted in terms of significance testing. All other observed variables had significant loadings on their respective factors, indicating a very strong measurement model. Residual values for observed and latent variables can be found in Appendix Z.

All paths between the latent constructs were also significant in the expected direction, with the exception of the paths between Maternal Representations of Attachment and Prenatal Representations of Self as Mother and between Postnatal Self-Efficacy and Mother-Infant Attachment. Thus, as hypothesized: a) more insecure, negative maternal representations of attachment were related to less secure representations of infants during pregnancy, b) more balanced representations of the infant were significantly related to more balanced representations of the self as a mother, c) more secure representations of the infant during pregnancy were related to more secure mother-infant attachment, d) more secure or balanced representations of the self during pregnancy were related to greater feelings of self-efficacy after birth, and e) greater prenatal social support from females was related to greater postnatal social support from females, which in turn was related to greater feelings of self-efficacy postnatally. Finally,

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[1]Residuals for the following pairs of observed variables were estimated: 22 and 1, 20 and 1, 22 and 3, 6 and 4, 5 and 3, 6 and 1, 3 and 1, 22 and 5, 18 and 15, 22 and 2, 20 and 3, 14 and 22, 14 and 17, 22 and 21, 21 and 6, 13 and 21, 9 and 19, 20 and 21, 7 and 22, 5 and 7, 7 and 23, 7 and 19, 4 and 14, 3 and 16, 5 and 21, 3 and 21. Refer to Table 3 for the names of these variables.

Figure 2. Best Fitting Model Depicting Prenatal and Postnatal Predictors of Mother-Infant Attachment at 12 months
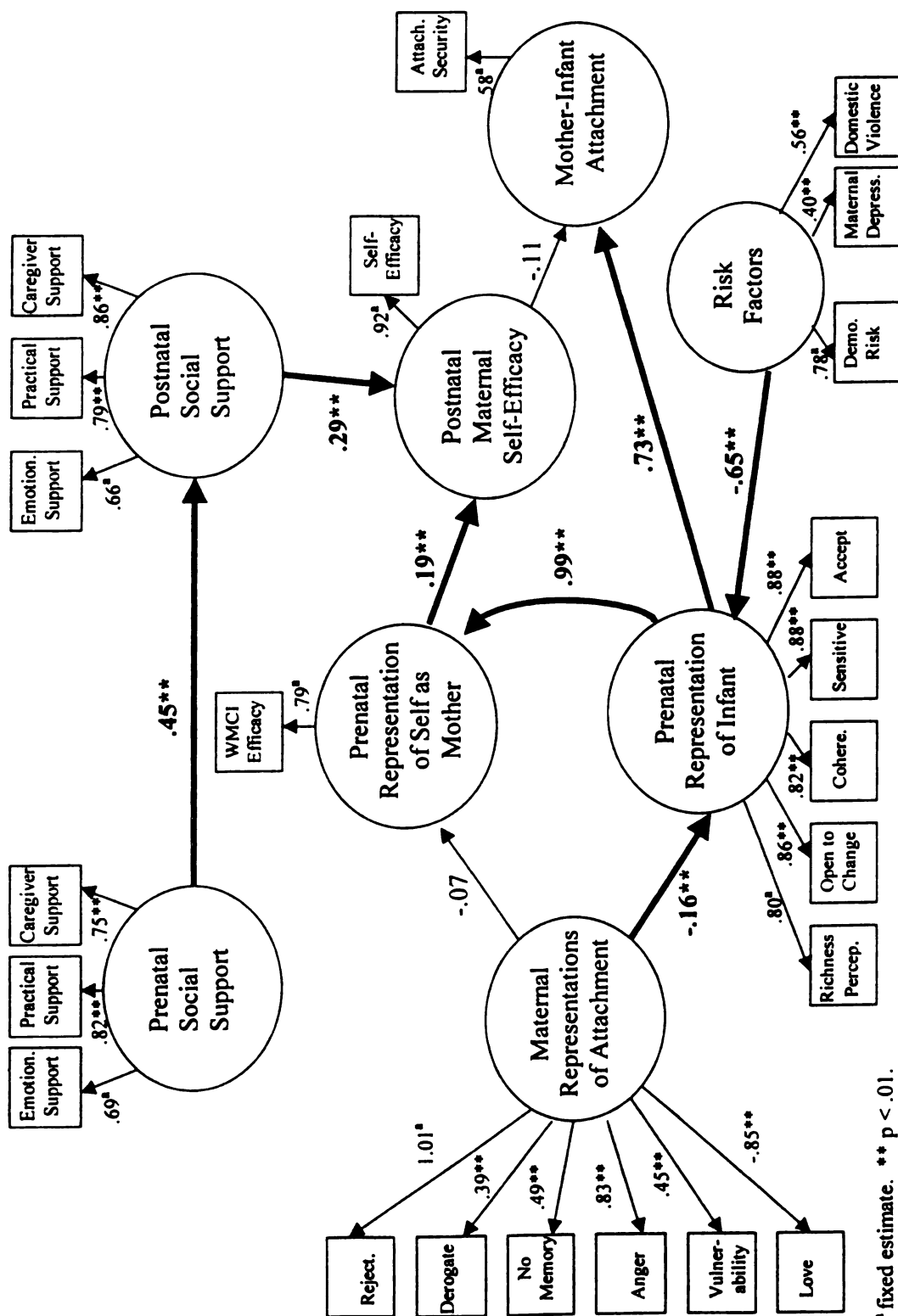
more risk during pregnancy was related to less balanced or less secure prenatal representations of the infant.

The iterations generally converged to show that the final model fit very well with the data. Although the $\underline{X}^2$ value of 242.03 with df = 194 was significant ($\underline{p}$ = .01), $\underline{X}^2$ was well below two times the degrees of freedom. The RMSEA = .04 and the GFI = .91. Although the AGFI was .87, slightly below the cut off of .90, several other fit indices were well above .90. Finally, the plot of standardized residuals suggested a nice fit, evidenced by small discrepancies between the observed and estimated residuals and by few outliers. See Appendix AA for the final model syntax, Appendix BB for a complete listing of goodness of fit indices, and Appendix CC for the residual plot.

The original model and the final model were compared to see if the final model was significantly better than the original model. The difference in chi-square values between the two models ($\Delta \underline{X}^2$) was 321.69, while the difference in degrees of freedom (Δ df) was 49. This difference was statistically significant, indicating that the respecified model was significantly better than the original model.

Exploratory Analyses: Concordance Between Attachment Groups

In addition to examining the relationship between mothers' and infants' attachment patterns through SEM and with continuous variables, exploratory analyses were conducted to examine the concordance between mothers' and infants' attachment classifications over time. Although the PAAQ should theoretically yield three attachment classifications that parallel those described in the WMCI and the SS, the CFA conducted in this study showed that the PAAQ yields only one general 'attachment security' factor.

Thus, it was only possible to examine the concordance between WMCI and SS classifications.

First, the concordance between the three main groups was examined: Balanced-Secure, Disengaged-Avoidant, and Distorted-Ambivalent. Because the WMCI does not have a fourth category that is parallel to the SS Disorganized classification, all disorganized infants and their mothers were dropped from these analyses. Chi-square analyses revealed no significant concordance between classifications, that is, mothers' attachment classifications during pregnancy were not significantly related to infant attachment classifications 1 year later, when three groups were used. The overall concordance rate was 49% (kappa = .10), with 68% of Balanced mothers having Secure infants, 26% of Disengaged mothers having Avoidant infants and 22% of Distorted mothers having Ambivalent infants. See Table 9.

Table 9
Concordance Between Three WMCI and SS Classifications

| | WMCI | | | |
	Balanced	Disengaged	Distorted	Total
SS				
Secure	**57**	23	13	93 (63%)
Avoidant	15	**11**	5	31 (21%)
Ambivalent	11	8	**5**	24 (16%)
Total	83 (56%)	42 (28%)	23 (16%)	148 (100%)

$\underline{n}$ = 148; 29 missing SS^2, 26 disorganized infants not included, 4 missing WMCI classifications.
$\underline{X}^2$ = 3.01, df = 4, $\underline{p}$ = .55, kappa = .10.

102

In order to increase the sample size and include the disorganized infants, all Disengaged and Distorted mothers were collapsed into an Insecure WMCI group, while all Avoidant, Ambivalent, and Disorganized infants were collapsed into an Insecure SS group. A 2 X 2 cross tabulation was then conducted to examine the concordance between Secure and Insecure groups. Results revealed a significant relationship between the WMCI and SS classifications when only two groups were used (60% concordance, kappa = .19). See Table 10 below. Thus, mothers who were classified as Secure/Balanced on the WMCI during pregnancy were more likely to have securely attached infants 1 year later, while mothers who were classified as Insecure were more likely to have insecure infants.

Table 10
Concordance Between Two WMCI and SS Classifications

	Balanced	WMCI Insecure	Total
SS			
Secure	57	36	93 (53%)
Insecure	34	47	81 (47%)
Total	91 (52%)	83 (48%)	174 (100%)

$\underline{n}$ = 174; 29 missing SS[2], 4 missing WMCI classifications.
$\underline{X}^2$ = 6.47, df = 1, $\underline{p}$ = .01, kappa = .19.

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[2] Although numerical scores based on the SS were estimated for missing subjects in the SEM analyses described above, overall classifications were not estimated and thus were not included in these analyses. It was believed that estimating classifications posed a greater risk to data interpretation if errors were made.

CHAPTER 7: DISCUSSION

This study was designed to test Stern's (1995) theory about the psychological processes involved in the transition to motherhood, as well as the effects of both intrapsychic and environmental factors on mother-infant attachment as described in the attachment literature. It was hypothesized that: a) mothers' representations of attachment would impact representations of the infant and of the self as a mother, b) the latter two sets of representations would be related to one another but remain distinct constructs, c) representations of the infant during pregnancy would be related to mother-infant attachment at 1 year, d) representations of the self as a mother would be related to postnatal self-efficacy, which would in turn, be related to mother-infant attachment, e) social support from females would be related to mother-infant attachment through its impact on self-efficacy, and f) maternal risk factors would negatively impact mother-infant attachment at 1 year. In general, the results from this study supported most of the hypotheses, and thus, provided support for Stern's theory as well as prior findings in the attachment literature. Results will be discussed in more detail next, followed by a discussion of this study's strengths and limitations, future directions for research, and clinical implications of the results.

Representational Processes

Structural equation modeling results revealed a significant relationship between mothers' representations of attachment, based on recollections of the relationships with their own mothers, and mothers' representations of their infants during pregnancy. Mothers who reported more negative, insecure attachment experiences characterized by, for example, more rejection, greater feelings of anger, less love, and trouble remembering

events from childhood (believed to be a defensive process involved in insecure attachment) had more insecure representations of their infants during pregnancy. These insecure representations were characterized by not only less sensitive and accepting attitudes towards the infant, but more impoverished, rigid, and incoherent narratives. These results are consistent with previous empirical and clinical papers, which have suggested a strong relationship between mothers' own attachment experiences during childhood and mothers' attachment representations of their own infants (Ammaniti, 1991; George & Solomon, 1996; Fraiberg et al., 1975; Slade & Cohen, 1996). However, this is the first study to demonstrate this relationship prenatally and empirically, rather than through case studies or with postnatal samples.

At this time, it is still somewhat unclear *how* mothers' attachment experiences influence their representations of their infants, and specifically attachment-related representations, but some researchers have speculated about the nature of this relationship. In one of the earliest papers, Fraiberg et al. (1975) suggested that mothers who have not had their own attachment needs met are unable to be empathically attuned to their infants because their own needs interfere with their ability to do so. In other words, mothers with insecure attachment experiences may not be able to decrease their own subjectivity for the purpose of being acutely in tune with the infant or may not be able to make psychological room for the infant, which Stern (1995) proposes are important transformations that ideally occur during pregnancy. As a result, they may be unable to think about and discuss their infants in a non-distorted, coherent, and flexible way. Similarly, Fonagy et al. (1991, 1993) have proposed that mothers who have not had attachment needs met do not develop the ability to understand the mental states of self

105

and others (lacking 'reflective self-function'), which leads to greater difficulty anticipating their infant's needs, ultimately leading to less sensitive caregiving. Furthermore, Fonagy et al. stated that mothers who are more defensive in their thinking about attachment (e.g., display idealization or repression) are less able to understand or be in tune with their infant's mental world. Clearly, there is much to be learned and these are all interesting hypotheses to examine in future research.

Surprisingly, model results did not reveal a significant relationship between mothers' representations of attachment and mothers' representations of themselves as mothers during pregnancy. At first glance, this appears to suggest that the way in which mothers see themselves as caregivers during pregnancy is not influenced by mothers' experiences of being cared for during childhood, which is contrary to Stern's (1995) theory and to prior literature (Ammaniti, 1991; Ammaniti et al. 1992; Fava Vizziello et al., 1993; Slade & Cohen, 1996). However, this is not believed to be the case.

First, bivariate correlations (see Appendix R) in this study indicated that many of the observed variables which measure maternal representations of attachment were, in fact, significantly related to prenatal representations of the self as mother. That is, more positive, secure experiences during childhood were related to more secure representations of the self, characterized by a confident and realistic view of the self as a caregiver. In addition, model results indicated that there was a very strong, significant relationship between representations of the infant and representations of the self as a mother, as hypothesized. In fact, this relationship was almost perfect, with more secure representations of the infant related to more secure or balanced representations of the self. Thus, because the two representational constructs (infant and self) were so highly related

106

and shared so much variance, only one significant pathway from maternal representations of attachment to representations of the infant emerged. That is, the SEM analyses parceled out the shared variance and suggested that this was the best model fit for the data.

There is also an important theoretical explanation for these results that should be considered. Because there was a near perfect relationship between representations of the infant and representations of the self as mother, it is possible that these sets of representations are not distinct, as hypothesized, but rather are part of one integrated "caregiving" representational system as suggested by George and Solomon (1989, 1996). These researchers suggest, as others have (e.g., Bowlby, 1973; Bretherton & Munholland, 1999; Slade & Cohen, 1996), that representations of the self and other are related and develop from working models of early attachment experiences. However, they seem to take this one step further and imply that *in the context of an attachment relationship and from the parental perspective* these representations are integrated into one representational system. Thus, representations of the self as a caregiver are integrally related to representations of the infant and these should not be considered distinct sets of representations. In other words, the internal working model of caregiving includes all information related to the role as attachment figure, including both information about the self and information about the child-to-be-cared-for. Interestingly, George and Solomon are the only researchers to discuss the idea of an integrated caregiving representation in such detail, and their published papers have only described this process in parents of early school-age children. The results from the present study suggest that an integrated caregiving representational system may begin much earlier during pregnancy.

As hypothesized, results also revealed that prenatal representations of the infant were significantly related to infant attachment security 1 year postpartum. More secure or balanced maternal representations during pregnancy, characterized by richness, coherence and sensitivity for example, were related to greater infant attachment security, while less secure representations were related to less infant security. These results are consistent with several other studies, which have demonstrated a significant relationship between representations of the child from the parental perspective and child attachment security (Bretherton et al., 1989; George & Solomon, 1989, 1996). More importantly, however, these results provide powerful evidence that representations of the infant *before the infant is even born* may significantly impact infant attachment security one year later. Only one previous study has examined this relationship prospectively (Benoit et al., 1997) and this was in a low-risk, middle-class sample, while the present study included more high-risk participants. These findings have important clinical implications for working with at-risk pregnant women, which will be discussed in more detail below.

Because representations of the self during pregnancy and postnatal self-efficacy were examined for the caregiving role specifically, it was hypothesized that these would be significantly related. Results confirmed this hypothesis; more secure or balanced representations of the self were related to greater reported feelings of postnatal self-efficacy. However, unexpectedly, postnatal self-efficacy was not significantly related to infant attachment security. There are several possible explanations for this finding. One explanation is that self-reported feelings of efficacy are not actually related to infant attachment, as measured through the well-known Strange Situation procedure. Prior studies that have demonstrated a clear relationship between self-efficacy and

"attachment" have measured both constructs through maternal self-report (Mercer &

Ferketick, 1990, 1994; Williams et al., 1987), and thus, may have only actually

demonstrated a relationship between self-reported efficacy and self-reported beliefs about

the mother-child relationship. That is, the findings from these studies may have been

spurious due to the complete reliance on maternal self-report and/or may have been

misinterpreted.

Another possibility is that there is in fact a significant relationship between

mothers' feelings of self-efficacy in the caregiving role and infant attachment security,

but that mothers were unable to accurately self-report about themselves in this domain.

Studies that have examined the impact of mothers' representations of themselves as

mothers, as coded by trained researchers, on mother-infant attachment (as measured

through laboratory procedures like the Strange Situation) have found significant

relationships (Ammaniti, 1991; George & Solomon, 1996). One study that examined the

relationship between self-reported efficacy and mother-infant attachment in the Strange

Situation reported that self-efficacy ratings did not differ among mothers of secure and

avoidant children (Spieker & Booth, 1988), and the authors reasoned that mothers of

avoidant children were defensively reporting high levels of self-efficacy, which is

consistent with defensive processes observed in mothers of avoidant infants. Support for

this explanation from the current study comes from the observation that maternal self-

efficacy scores were highly skewed towards the positive end, which would not be

theoretically expected from such a high-risk sample unless there was defensive reporting.

The studies conducted by Donovan and colleagues (1989, 1990) also provide

support for this explanation. They found that some mothers displayed high illusions of

control, or unrealistically positive views of themselves as caregivers, which appeared to mask feelings of inadequacy. Furthermore, mothers with high illusions of control were more likely to have insecurely attached children in the Strange Situation. Again, these results suggest that mothers may not be able to accurately self-report on caregiving efficacy. Although results from the present study did show a significant relationship between prenatal representations of the self (coded by researchers) and postnatal self-efficacy, self-efficacy scores may not have been 'accurate' enough to predict infant attachment security. It is possible that had researchers coded representations of the self as a mother from a clinical interview postnatally (like the WMCI), representations would have been significantly related to infant security in the expected direction. This may be a more valid way of measuring maternal self-efficacy than self-report questionnaires.

One final possibility mentioned here is that there were problems in the measurement model that may have prevented a true significant relationship from emerging between these constructs. Both constructs, postnatal self-efficacy and infant attachment, only had one indicator each. This creates possible identification problems and there is less variance to be explained for each construct, making it harder to detect relationships. As already mentioned, the observed variable for maternal self-efficacy also did not have adequate variance.

In sum, modeling results indicated that mothers' representations of their own attachment, of their infants, and of themselves as mothers were related to each other and to infant attachment security in theoretically-important ways. Perhaps the most important pathways in this part of the model were between maternal representations of attachment, representations of the infant, and infant attachment security at 1 year. These results

demonstrated that attachment representations may be transmitted from mother to child, as prior research has suggested. That is, more secure representations of attachment from childhood predict more secure representations of the infant during pregnancy, which in turn predict more secure infant attachment after birth. It is also likely that representations of the self as a mother are involved in this pathway, as part of a broader caregiving representation. These findings extend the results from previous studies by showing some continuity of attachment over time, beginning in pregnancy, in a more diverse and high-risk sample.

Social Support and Mother-Infant Attachment

According to Stern (1995), social support from females is particularly helpful to women as they transition to motherhood, e.g., by providing advice and emotional support. Therefore, social support was expected to indirectly impact mother-infant attachment through its effects on self-efficacy. As hypothesized, prenatal support from other women was significantly related to postnatal support from women. That is, the quality of participants' social support remained relatively stable over time. In addition, the perceived quality of support was significantly related to self-efficacy, with better support related to greater feelings of self-reported efficacy. These findings are consistent with previous studies showing a significant relationship between social support and maternal self-efficacy (Cutrona & Troutman, 1986; Shea & Tronick, 1988; Teti et al., 1996). It also supports Crittenden's (1985) conclusion that *quality* of support may be more important than *quantity* of support, since the measure in this study was average satisfaction rather than simply the number of supporters in participants' networks. These findings suggest that social support can enhance feelings of efficacy by, for example,

111

increasing parenting skills and knowledge, providing confirmation or assurances of parenting capabilities, or providing opportunities to model others.

Support from women specifically, many of whom have likely been mothers, may be especially helpful because of the increased credibility granted to them because of their own experiences with caregiving. Thus, advice or support from women may be given more 'weight' than support from men, at least in the context of pregnancy and parenthood. Indeed, this was the first study to show empirically that support from women had a significant impact on maternal feelings of self-efficacy, as Stern (1995) has suggested theoretically.

As mentioned previously, however, maternal self-efficacy was unrelated to infant attachment security, and thus, it appears that social support did not have an indirect impact on infant attachment, as was hypothesized in the current study. There are several possible explanations for this finding. It may be that social support does in fact have an indirect effect on infant attachment through self-efficacy, as has been shown by a few other researchers (Donovan & Leavitt, 1989; Isabella, 1994), but this indirect relationship did not emerge because of the problems described above with the self-efficacy construct and the pathway between self-efficacy and infant attachment in the current study. It may also be that social support has an indirect impact on mother-infant attachment, but through its effects on some other variable such as maternal behaviors or parenting, e.g., sensitivity, which were not examined in this study.

It also seems possible that social support might have a direct impact on infant attachment security, as others have found (Crnic et al., 1986; Crockenberg, 1981). However, when all other variables were taken into account, the data in the current study

did not support this notion (although emotional and caregiving support were weakly related correlationally to infant attachment security, see Appendix R). Rather, the results from this study suggest that if social support has an impact on mother-infant attachment, it is probably more indirect than direct. This conclusion is supported by a few other studies that have reported no direct relationship between social support and attachment (Belsky & Isabella, 1988; Zeanah et al., 1993).

In sum, the results from this study generally do not clarify the already-mixed findings in the literature about the relationship between social support and mother-infant attachment, although the results do support the idea that social support positively affects women's self-efficacy in the maternal role. It will be important for future studies to continue to examine the role that support may or may not have in contributing to child attachment security, including different dimensions of support such as type and source of support.

The Impact of Risk Factors

It was hypothesized that maternal risk factors (e.g., domestic violence, depression, poverty) would directly predict mother-infant attachment. Although risk factors were related to infant attachment security correlationally (see Appendix R), with more risk related to greater insecurity, risk was more strongly related to prenatal representations of the infant when all variables were considered simultaneously. Therefore, SEM results revealed a significant pathway from risk status to prenatal representations of the infant rather than from risk status to mother-infant attachment at 1 year. Women who experienced more risk factors such as domestic violence, depression, and demographic risks had more insecure representations of their infants during pregnancy, characterized

113

by less sensitivity, acceptance, and less open, rich, and coherent narratives. Representations were in turn related to mother-infant attachment.

This finding (risk related to representations) was not originally hypothesized, however, the results make theoretical sense. Although prior studies have shown a direct relationship between risk factors and mother-infant attachment in the Strange Situation (Martins & Gaffan, 2000; Spieker & Booth, 1988; Zeanah et al. 1999), similar to the correlational results in this study, it has generally been assumed that there is some intervening step in this process. That is, maternal exposure to risk itself does not 'automatically' create less securely attached children. Rather, risk such as maternal depression or poverty may, for example, lead to less sensitive or more rejecting behaviors (Gelfand & Teti, 1990; Halpern, 1993; Norton, 1990), which are then related to the development of less secure attachment. The findings from this study support the notion that risk is more *indirectly* related to mother-infant attachment through its effects on the mother's functioning and way of thinking about her child (Thompson, 2000). This indirect relationship between risk and child functioning via maternal functioning has already been shown in other areas of the literature examining different child outcomes, e.g., anxiety, peer relationships, or school functioning (e.g., Holden & Ritchie, 1991; Levendosky & Graham-Bermann, 2001). Thus, it appears this indirect relationship may be true for risk and infant attachment as well.

These results are also consistent with one recent study showing a relationship between maternal risk and maternal representations of the child and of the self as a mother (Pajulo, Savonlahti, Sourander, Piha, & Helenius, 2001). In this study, results revealed that maternal risks such as substance use, depression, and demographic risks,

were significantly related to the content of maternal representations of self and child during pregnancy. In this study, participants were categorized into a high- or low-risk group based on the presence or absence of a risk factor and comparisons were made on responses to a self-report questionnaire. Findings indicated that women in the high-risk group rated their infant and themselves as mothers much more negatively than the low-risk group. Unfortunately, this study did not examine the relationship between prenatal representations and infant attachment after birth and was limited by the sole use of self-report data. In contrast, the results of the current study extend and improve upon those findings by Pajulo et al. by showing that maternal risks affect not only the *content* of prenatal representations, but also the *way* in which mothers talk about their infants, the latter of which may be particularly important for determining the overall quality of attachment.

Exploratory Analyses

Exploratory analyses were conducted to examine the concordance between mothers' and infants' attachment classifications over time using the WMCI and SS classifications. This was believed to be another way of examining the continuity or discontinuity of attachment over time between mother and infant. When disorganized infants were omitted from analyses and when three groups were used, results revealed a concordance or match rate of 49% between WMCI and SS classifications, which was non-significant. When two groups were used (Insecure and Secure), the concordance rate increased to 60%. This two by two analysis was significant; however, the kappa was still very low (.19). Overall, these results indicate a significant amount of *discontinuity* between mothers' attachment representations of the infant and mother-infant attachment

115

at 1 year, especially discontinuity of insecure attachment classifications. Thus, although modeling results revealed a strong, significant relationship between these variables when operationalized as dimensional constructs, categorical analyses revealed a substantial amount of discontinuity as well. Although the lower rates of concordance may be partly due to measurement error (imperfect inter-rater reliability), it is more likely that there is a theoretical explanation for these findings.

In fact, theoretical and empirical discussions of attachment *dis*continuity have been rapidly increasing within the last several years, and these seem to be particularly relevant to the current study. Investigators have examined the stability or instability of attachment in three different ways: within the same groups of infants over time, within the same groups of individuals from infancy to adulthood, and within caregiver-child dyads. In all three areas, researchers have generally found several consistent results: 1) there is less continuity among the insecure forms of attachment, 2) there is less continuity in high-risk samples compared to low-risk samples, and 3) changes in family circumstances, and especially those that have broad effects on multiple family members, are most likely to alter attachment security or insecurity (see Thompson, 2000 for a review). Each of these areas in the literature will be discussed in more detail next.

Egeland and Farber (1984) were among the first to examine attachment stability in young children over time. They found that 60% of their high-risk infant sample had stable classifications from 12 to 18 months of age, with more stability in the secure group (74%) than in the insecure groups (45% for Avoidant and 37% for Ambivalent). Correlates of infant change away from security (moving from secure to insecure groups) were less maternal education, more maternal aggression and suspiciousness, more life

stress, and single parenthood. Correlates of change towards security (moving from insecure groups to secure group) were greater maternal effectiveness and responsiveness, better understanding of the infant, and more advanced infant development. Similarly, Frodi, Grolnick, and Bridges (1985) found an overall stability rate of 66% in infant attachment classification from 12 to 20 months, but this was predominately due to stability of security (77%) rather than insecurity (33% for Avoidant and 20% for Ambivalent groups).

More recently, Vondra et al. (1999) reported a 50% stability rate from 12 to 18 months in their low-income sample with 68% stable Secure, 25% stable Avoidant, 33% stable Ambivalent, and 46% stable Disorganized. Correlates of stable security or move toward security were relatively low risk experiences, low scores on aggressive/suspicious personality, low stressful events, and high relationship satisfaction. Correlates of stable insecurity or move toward insecurity were maternal anxiety and depression, infant difficult temperament, low relationship satisfaction, stressful life events, and self-reported anger. In a follow-up study, Vondra et al. (2001) reported an overall increase in insecurity at 24 months compared to 12 and 18 month classifications. Although the overall percentage of stability was similar at 24 months as it was at 18 months (45% and 50%, respectively), there was less stability *within* the Avoidant and Ambivalent insecure groups from 12/18 months to 24 months: 89% stable Secure, 61% stable Avoidant, 32% stable Ambivalent, and 100% stable Disorganized (n = 2 in the latter group). Thus, overall, these and other studies examining infant attachment stability (e.g., Barnett et al., 1999) have generally found less stability of insecure groups and less stability in high-risk samples.

117

Several recent studies have also examined the stability of attachment over many years from early childhood to adulthood. For example, Waters et al. (2000) followed a middle-class sample from infancy to early adulthood and found that 64% of the sample had the same classification at both time points. Individuals who experienced negative life events such as parental loss, abuse, or life-threatening illness to a family member were significantly more likely to change attachment classifications over time, especially to change from secure to insecure rather than from one form of insecurity to another. The authors concluded that the relatively high degree of stability in this sample may have been due to the low-risk nature of the sample. Similarly, Hamilton (2000) reported a 63% stability rate from infancy to adolescence. However, this study found that negative life events were significantly associated with the maintenance of insecure attachment over time. Finally, Weinfield, Sroufe, and Egeland (2000) reported a 39% stability rate from infancy to early adulthood in their low-income, high-risk sample. These researchers found that stressful life events were unrelated to stability or change, but that child maltreatment was related to stability of insecurity and maternal depression was related to movement toward insecurity from security. Overall, these three studies suggest that, although there may be continuity in attachment, there can also be change in attachment over time and discontinuity is often related to changes in the home environment.

Finally, there have been a number of studies examining the transmission or stability of attachment from caregiver to child, many of which have been described in detail in the current paper's literature review. Several studies have shown, for example, more discontinuity among the insecure attachment classifications when comparing mothers' representations of attachment on the AAI and infant attachment in the SS

(Benoit & Parker, 1994); this may be particularly true for the preoccupied-ambivalent groups (Fonagy et al., 1991; Pederson et al., 1998; Zeanah et al., 1993). Other studies examining the relationship between mothers' representations of the infant and infant attachment security, similar to the present study, have also found less stability among insecure attachment groups (Benoit et al., 1997; Zeanah et al., 1994).

Overall, the results from the present study's exploratory analyses are consistent with other findings, which show less stability in insecure types of attachment and in high-risk samples. That is, the results from this study found less stability between WMCI and SS categories for the two insecure attachment groups compared to the secure group, as well as lower overall concordance rates (49% using three groups and 60% using two groups) compared to previous studies with low-risk samples. Findings related to the discontinuity of attachment classifications do not necessarily contradict earlier SEM results. First, when categorical attachment data are used, there is a potential for some masking of continuity compared to when continuous data are used (Weinfield et al., 2000). This may be because there are differences in felt security within the broad classifications and/or because of the greater likelihood of classification error for individuals that do not fit neatly into a group, e.g., individuals that are on the border between two groups.

Alternatively, the findings related to discontinuity actually provide a more complete picture of attachment theory. Attachment theory predicts relative stability over time; however, it also posits that internal working models, and development in general, remain open to revision in the context of new life experiences (Waters et al., 2000). That is, attachment theory predicts both stability *and* change. More recent work in this area,

119

described earlier, has shown that change is more likely to occur in individuals who live in less stable, more chaotic environments and/or who experience more profound life changes. Results from the present study are based on a high-risk sample of individuals, who likely experience less stable living conditions, *and* this study examined stability before and after a major life event, the birth of a child. Thus, it is not surprising that there was significant discontinuity in attachment classifications.

Summary of Results

In sum, results based on SEM analyses generally supported Stern's (1995) theory about the psychological processes related to the transition to motherhood. One of the most striking results from model testing was the continuity of attachment between mothers' representations of their own attachment to mothers' representations of the infant during pregnancy to infant attachment at 1 year, when attachment was operationalized as a dimensional construct. Thus, mothers appeared to think about their infants in ways that were similar to the way they thought about being cared for during childhood, which in turn, was related to the quality of attachment they formed with their infants after birth. In addition, the results supported the notion that there may be an integrated caregiving representational system that women develop during pregnancy, which includes representations of both the infant and the self as a caregiver. Social support from females also predicted maternal self-efficacy, as expected, but self-efficacy was not significantly related to infant attachment. It is believed that this lack of finding was due to particular measurement and statistical reasons, rather than to faulty theory. Thus, it cannot be concluded that social support and maternal self-efficacy do not impact infant attachment.

Interestingly, the data suggested that maternal risk factors impact mother-infant attachment indirectly through their impact on maternal representations of the child, rather than directly. Thus, maternal representations appear to be an important mechanism through which psychosocial risk exerts its effects. Exploratory analyses revealed substantial discontinuity of attachment when attachment was assessed categorically. This is not surprising in light of the high-risk nature of the sample and what has recently been reported in the literature about discontinuity in high-risk and insecure groups. In addition, model results and exploratory results provided evidence that attachment is both relatively stable over time *and* is capable of being revised in light of life events and circumstances.

There are a number of strengths in the current study that support previous findings and expand the current state of the attachment literature. First, this study used a prospective design, assessing maternal representations and other variables before the infant was even born. This type of design adds more confidence to the conclusion that prenatal risk factors and prenatal representations contribute to infant attachment security, rather than vice versa. In addition, this study is one of the few studies to examine the impact of both intrapsychic and environmental factors in relation to mother-infant attachment, making this more comprehensive than most attachment studies. Similarly, this study examined these processes within a high-risk sample, which has been done much less frequently than studies with low-risk, middle class families. It is important to show that much of Stern's (1995) theory, as well as basic ideas from attachment theory, hold true in this population as well as in higher functioning populations.

There are also several methodological strengths. Although several variables were measured through maternal self-report, several other constructs were assessed using clinical interviews and observational methods that were coded by trained, reliable coders. This minimizes the possibility of spurious findings, especially those findings that involve variables that are not based on self-report. More importantly, these methods for assessing attachment are believed to provide more rich and valid data because they allow for measurement of unconscious or automatic processes (Crowell et al., 1999), which are believed to be intimately involved in attachment-related representations. In other words, one does not have to be concerned that the participant is self-reporting inaccurately about their attachment-related thoughts and feelings. Finally, the use of structural equation modeling provides several advantages for data analysis and interpretation. It is generally a more stringent method of testing relationships between variables because it estimates parameters after taking into account all other relationships and shared variance. In addition, measurement error can be estimated and therefore removed so that resulting relationships between constructs are error free. It also allows for the testing of a complex model (including possible modifications) by providing overall fit indices and evaluating relationships simultaneously, rather than requiring a series of analyses to test bivariate relationships.

However, this study was not without limitations, and it is important to consider these limitations when drawing conclusions about the results. First, the use of self-report questionnaires to assess some of the constructs in the study poses some risk for inaccurate and biased reporting. This has already been discussed for the self-report used to measure maternal self-efficacy, which was highly skewed toward positive responses. This

particular measure may have been problematic because each item begins with the statement "How good are you at...." followed by some description of caregiving. It seems that this wording may be especially prone to social desirability. Although the self-report used to assess maternal representations of attachment experiences from childhood (PAAQ) predicted other constructs in the expected direction, some attachment researchers would argue that self-report questionnaires are unable to accurately assess attachment representations. Although it is true that the PAAQ does not yield some of the process-oriented constructs related to defensiveness (e.g., coherence in the narrative) and to overall attachment classifications, the results suggest that this instrument may be valid for assessing overall attachment security, possibly through some of the subscales such as 'No Memory'.

Another disadvantage of using self-report questionnaires with the same informant is the possibility of spurious or inflated findings, for example, between maternal social support and maternal self-efficacy. Fortunately, most pathways in the model included constructs that were measured using two different methods, e.g., self-report, interview codes, and observation codes. Another limitation that was more statistical in nature was the fact that three constructs had only one indicator, which is generally not advised when conducting structural model testing. Single indicator constructs present possible identification problems and may make it more difficult to detect relationships because there is less variance to work with for these constructs. Finally, although the high-risk nature of the current sample was generally a strength of the study (since most previous studies have only included low-risk, middle-class families), it also limits the generalizability of findings. Thus, the results from this particular study may only be

123

representative of women that are generally more at-risk (e.g., low-income, single parents, history of domestic violence) than of women who are generally not at-risk.

Directions for Future Research

There are a number of ways that future research can expand our current understanding of the processes related to the formation of mother-infant attachment, including the influence of both intrapsychic and environmental variables. First, it seems that more research needs to be done in diverse and higher-risk groups of mothers and infants. Some researchers are studying attachment in high-risk groups such as low-income and maltreatment samples (e.g., Barnett et al., 1999; Egeland & Sroufe, 1984; Spieker & Booth, 1988; Vondra et al., 1999; Weinfield et al., 2000); however, the majority of attachment research is done with low-risk, middle-class, Caucasian samples. It also seems important for future studies to replicate the findings here in order to further validate (or invalidate) Stern's (1995) theory about the transition to motherhood and the role of female social support in facilitating this transition. This is the first model to test his theory and others should continue to test his theory with different populations.

A very important, more specific direction for future research is the further examination of processes related to the stability and instability of attachment, both within the same individual and across generations from parent to child. Most attachment research has focused on validating and emphasizing the notion of continuity over time, but more work needs to be done to investigate cases of discontinuity and factors related to discontinuity. As others have begun to point out more clearly, Bowlby (1973, 1980) not only indicated that attachment is somewhat continuous and resistant to change, but that it is also dynamic and open to revision. Thus, there needs to be further examination

124

of factors such as stressful life events, changes in the family environment, changes in caregiver behaviors, etc... to determine how significant life experiences may alter attachment representations. In addition, it will be important to determine what experiences are important for what types of people and at what developmental stages. Thompson (2000) recently suggested that life events which affect relational patterns and developmental periods during which there are significant representational advances may be particularly important areas to investigate. Clearly, this work has just begun and will have pivotal implications for clinical work.

Another important direction for future research is the investigation of intermediate factors that might further elucidate the link between maternal representations and infant attachment, e.g., between the AAI or WMCI and the Strange Situation. The results from this study suggested that there is a strong relationship between maternal representations during pregnancy and infant attachment security after birth, when measured as dimensional constructs, but it is still unclear how these representations are "transmitted" to the infant. Although the majority of prior research in this area has focused on maternal sensitivity and responsiveness (through overt, observable behaviors) as the mediating variable, research has shown that sensitivity explains only a relatively small amount of the relationship between mothers' representations and infant attachment (DeWolff & van Ijzendoorn, 1997; Pederson et al., 1998; van Ijzendoorn, 1995). Thus, other observable variables, which may reflect important aspects of the caregiver as a secure base, need to be investigated.

Finally, there are several methodological considerations for future attachment research. First, it has been suggested by several attachment researchers (Cicchetti, 2001;

Weinfield et al., 2000) that both dimensional and categorical measures of attachment be used in future research. Each way of operationalizing attachment may be useful and may be complementary to the other. This idea is supported by the current findings, which revealed an interesting picture of attachment processes when both kinds of data were used. There has been some debate over whether and how to convert the Strange Situation codes into a continuous variable. One method is the conversion system developed by Bretherton and colleagues (1989, 1990) used in the present study, which appears to be a viable option. An additional method that should be considered for future research is the empirically derived system described by Richters, Waters, and Vaughn (1988), which uses the subscale scores that are coded and used to make overall classifications. This method was shown by the authors to be a reliable and valid means of assessing attachment security along a continuum. Last, but not least, it is important for future research to use longitudinal, prospective designs to examine the complex processes involved in the development and evolution of attachment over time.

Clinical Implications

Finally, the results from the present study not only extend our conceptual and theoretical understanding of the processes related to the development of mother-infant attachment, they also provide important information that is directly relevant to clinical work with at-risk pregnant and parenting women. A number of researchers and clinicians have already developed treatments for work with parents and infants (e.g., Lieberman & Pawl, 1993; McDonough, 1993; Stern, 1995); however, results from studies such as this one can help guide and support the direction of these treatments.

First, the results of this study suggested that maternal risk factors such as poverty and domestic violence have an indirect impact on infant attachment through its effects on maternal representations of the infant. Maternal social support may also have an indirect impact on infant attachment, although this was less clear. Still, it seems important for clinical interventions to consider and attend to environmental factors that could be impinging on a mother's ability to psychologically prepare for motherhood and her ability to think about her infant and herself as a mother in a non-defensive, sensitive, and accepting manner. Thus, clinicians may need to evaluate the mother's family, community, and social systems in order to help the mother correct or alter those factors that may be interfering with the caregiving process, even as this process begins during pregnancy.

The most striking finding in this study that is directly relevant to clinical work is the strong, direct relationship between prenatal representations of the infant and infant attachment at 1 year. These findings suggest that early interventions with at-risk pregnant women can be critical in preventing the transmission of insecure attachment from mother to child. Furthermore, these results indicate that clinical work must address mothers' representational processes including representations of their own attachment and representations of their infant and themselves as caregivers. Fortunately, many of the existing parent-infant psychotherapy programs do focus on altering mothers' representations as a way to improve mother-infant relationships (Lieberman & Pawl, 1993; Stern, 1995); however, these programs are generally geared towards working with mothers after the birth of the baby. It is important for research studies like this one to

127

show empirical support for these types of programs, as well as the importance of beginning this work during pregnancy.

Programs do, however, differ in how they approach altering mothers' representations. Stern (1995) summarizes a number of programs which all use different "ports of entry" to alter parental representations, but states that all share the common goal of changing these representations. Working with the assumption that mothers' representations influence behaviors towards the infant which in turn influence infant behaviors and infant representations (and vice versa), he states that clinicians can focus on any of these elements as a way of entering into and altering the mothers' representations. For example, some programs use infant behaviors as a starting point, while others use maternal behaviors, etc...Subsequent to altering representations, it is believed that mothers will interact with their infants in a more positive, sensitive, and responsive manner, which eventually leads to more secure infant attachment. Based on the current study, it seems that intervening through the mothers' representations would be the natural starting point when working with pregnant women since parent behaviors could not yet be observed. Finally, in addition to exploring mothers' representations directly, an equally important part of this clinical work includes providing the mother with a "corrective attachment experience," whereby the therapist serves as an attachment figure who is internalized and integrated into existing representations. Through both exploration and experience, the mother is able to alter representations of self and other, enabling her to be a more secure attachment figure to her own infant.

Conclusions

In sum, this study expands our current understanding of the processes related to the formation of mother-infant attachment, beginning in pregnancy and extending into the first year of life. This study provides empirical support for the significance of both individual, intrapsychic factors *and* environmental factors in predicting infant attachment, which demonstrates the importance of studying mother-infant attachment from an ecological perspective, particularly in diverse, high-risk samples. The results from this study suggest that maternal representations during pregnancy and maternal risk factors may be especially important predictors of infant attachment security, while the role of maternal social support is less clear. Interestingly, the results from this study also demonstrate that there is both continuity *and* discontinuity of attachment over time, which provides empirical support for both aspects of attachment theory.

In addition to the theoretical implications, the results from this study have clear clinical implications; results suggest that it is critical to preventively intervene with women at risk for attachment disturbances *during pregnancy*, by targeting both intrapsychic (e.g., representations) and environmental factors. Finally, future research in this area can expand our understanding of the complex processes involved in the evolution of attachment over time by: 1) operationalizing attachment both dimensionally and categorically, 2) examining the stability and instability of attachment within and across individuals, and 3) examining possible mechanisms at multiple system levels, e.g., individual and community, that account for this (in)stability. In so doing, future research will also help deepen and broaden our understanding of more general adaptive and maladaptive developmental processes throughout the life span.

APPENDICES

<u>ARE YOU PREGNANT?</u>

<u>YOU MAY BE ELIGIBLE TO PARTICIPATE IN A STUDY ABOUT MOTHER-INFANT RELATIONSHIPS</u>

!! $50.00 !!

We are looking for pregnant women to participate in a research study at Michigan State University. You will be asked about experiences and feelings during pregnancy, perceptions of your infants, and recent life events.

- Interview can be done at MSU or at your home.
- You will be paid **$50.00** in cash.
- All information is kept <u>completely confidential.</u>

!! $50.00 !!

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If you are interested or would like more information, please call **432-1447** and ask for
Dr. Anne Bogat's <u>Mother-Infant Study</u>

MOTHER-INFANT STUDY 432-1447	MOTHER-INFANT STUDY 432-1447	MOTHER-INFANT STUDY 432-1447	MOTHER-INFANT STUDY 432-1447	MOTHER-INFANT STUDY 432-1447	MOTHER-INFANT STUDY 432-1447

HAVE YOU BEEN HURT BY SOMEONE YOU LOVE?

ARE YOU PREGNANT AND HAVE YOU BEEN PUSHED OR GRABBED OR HIT OR SLAPPED OR KICKED (OR WORSE) BY A PARTNER OR BOYFRIEND DURING YOUR PREGNANCY?

We need women to take part in an interview about their lives and their pregnancies.

- Interview can be done at MSU or at your home.
- You will be paid **$50.00** in cash.
- All information is kept completely confidential.

!! $50.00 !!

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If you are interested or would like more information, please call **432-1447** and ask for

Dr. Anne Bogat's Mother-Infant Study

MOTHER-INFANT STUDY 432-1447	MOTHER-INFANT STUDY 432-1447	MOTHER-INFANT STUDY 432-1447	MOTHER-INFANT STUDY 432-1447	MOTHER-INFANT STUDY 432-1447	MOTHER-INFANT STUDY 432-1447

MOTHER-INFANT STUDY
CONSENT FORM

This study is part of a survey of women in Michigan, some of whom may be experiencing domestic violence. We hope to learn about the strengths that you bring to your situation, your feelings and perceptions of your baby during pregnancy, and your relationships with others, including family members, partners, and friends. We hope to use this information to help plan better programs for families experiencing domestic violence.

If you decide to take part in the survey, you will be asked questions about how you have been feeling recently, events that have happened to you, your feelings about pregnancy and your baby, the people in your life who provide support to you, and your memories of your childhood. This will take a total of 2-3 hours.

All information will be kept strictly confidential. Your name will be removed from all questionnaires and an identification number will be put on them instead. All questionnaires will be kept in locked file cabinets in a locked office. Your identity will not be revealed in any reports written about this study. We will summarize information from all study participants and will not report information about individuals. The only exception is in the case of ongoing child abuse. If you indicate that child abuse is occurring in your household, we are required to make a report to Protective Services.

You have the right to withdraw from this study at any point during the interview with no penalty or negative consequences. Your decision about whether to participate or not will not affect your relationship with any agencies or Michigan State University. If you have any questions, please ask us. If you have questions later, you can contact Dr. Anne Bogat or Dr. Alytia Levendosky at (517) 432-1447.

We are also interested in recontacting you about 2 months after the birth of your baby by telephone and then we would like to meet with you and your baby at 12 months after the birth of your baby. So at the end of the interview today, we will ask you for information that will help us keep in contact with you. Your participation at this time does not obligate you to participate in the second telephone appointment, or the third interview. You will be paid $50 for the first interview, mailed a baby gift after the telephone interview, and $75 and a baby gift for the third interview, if you wish to participate.
****

I have read and understood the above statements. I understand that my participation in this study is completely voluntary and that I can withdraw from this study at any time without penalty or negative consequences.

Signature of Participant:_____   Date: _____

Witness: _____   Date: _____

Anne Bogat, Ph.D.   Alytia Levendosky, Ph.D.
Michigan State University   Michigan State University
Department of Psychology   Department of Psychology
123 Snyder Hall   121 Snyder Hall
East Lansing, MI 48824-1117   East Lansing, MI 48824-1117

APPENDIX C
Time 2 Verbal Assent Form

Before I begin asking you questions, I need to get your verbal consent to participate in this interview. I will read a few paragraphs and ask you whether you understand and agree with what I have said.

If you decide to take part in the telephone interview today, you will be asked questions about your health during and after your pregnancy, your labor and delivery, and your baby's health and personality. You will be sent a gift for your baby after the interview as a token of our thanks for participating.

All information that you provide will be kept strictly confidential. Your name will not be put on any questionnaires; they will only have an identification number on them. All questionnaires will be kept in locked file cabinets in a locked office. Your identity will not be revealed in any reports written about this study. We will summarize information from all study participants and will not report information about individuals. The only exception is if you indicate that child abuse is occurring in your household; then we are required to notify Protective Services.

You have the right to withdraw from this study at any point during the interview with no penalty or negative consequences. Your decision about whether to participate or not will not affect your relationship with any agencies or with Michigan State University. If you have any questions, please ask us. If you have questions later on, you can contact Dr. Anne Bogat or Dr. Alytia Levendosky at (517) 432-1447.

In addition, we would also like to contact you when your baby is 11-12 months old. Your participation today does not obligate you to participate in the third interview.

Do I have your permission to continue with the interview? (Circle one)   YES   NO

Date:

Dear _____:

       Thank you again for participating in the Mother-Infant Study at Michigan State University. We really appreciate your willingness to help us learn about the unique and important experiences of mothers and infants in our community. With the knowledge that we gain from this study, we will be able to develop new and better programs for families like yours. Therefore, your participation in our study will directly benefit many other women and children!

       We are writing this letter to update our records so that we will be able to reach you about 1 year after the birth of your baby, at which time we would like to meet with you and your child. You will be paid $75.00 and given a gift for your child at that interview. Please take a moment to fill out the <u>Subject Information Sheet</u> and send it back to us in the enclosed self-addressed, stamped envelope. If you prefer, you may also call us at 432-1447 or 432-7726 to give us your updated information. Please send back the information sheet or call us even if you still have the same address and phone number. As usual, all information will be kept strictly confidential. Thank you again for your help on this important project.

Sincerely,

Mother-Infant Study Staff Member

Subject Information Sheet

Name: _____

Address: _____
(Street Number and Street Name)

_____
(City, State and Zip Code)

Telephone Number: _____

Alternate Telephone Number: _____

Cell Phone Number: _____

Pager or Beeper Number: _____

E-mail: _____

Other Contact Information:

Thank You!!!!

_____
For Office Use Only
Date Received:
90 day follow-up: 1st or 2nd
Other Notes:

APPENDIX E
Time 3 Consent Form

MOTHER-INFANT STUDY
CONSENT FORM-T3

Thank you for participating in the first two interviews for this study. This study is part of a survey of women in Michigan, some of whom may be experiencing domestic violence. We hope to learn about the strengths that you bring to your situation, your feelings, your perceptions of your baby, and your relationships with others, including family members, partners, and friends. We hope to use this information to help plan better programs for families experiencing domestic violence.

If you decide to take part in the survey today, you will be asked questions about how you have been feeling recently, events that have happened to you in the last year, and your feelings about your baby and the people in your life who provide support for you. You will also be asked to participate in some play with your baby that will be videotaped. Your baby will also play with some toys and games with an interviewer for about an hour. The total interview will take about 3-4 hours. You will be paid $75 for your participation and you will also receive a toy for your baby.

All information that you give us will be kept strictly confidential among the project staff. Your name or your baby's will not be on any questionnaires and videotapes; an identification number will be put on them instead. All questionnaires and videotapes will be kept in locked file cabinets in a locked office. Your identity will not be revealed in any reports written about this study. We will summarize information from all study participants and will not report information about yourself or any individuals. Your privacy will be protected to the maximum extent allowable by law. The only exception to full confidentiality is in the case of ongoing child abuse or neglect. If you indicate that child abuse or neglect is occurring in your household, we are required to make a report to Child Protective Services. We would inform you if we thought we needed to make such a report.

You have the right to refuse to answer any questions or to withdraw from this study at any point during the interview with no penalty or negative consequences. Your decision about whether to participate or not will not affect your relationship with any agencies or Michigan State University. If you have any questions, please ask us. If you have any questions about the study later, you can contact Dr. Anne Bogat or Dr. Alytia Levendosky at (517) 432-1447. If you have questions about your rights as a participant in this research study you may contact Dr. David Wright at 355-2180.

We may be interested in recontacting you 2 years after the birth of your baby. At the end of the interview today, we will ask you to update the contact information that we have for you. Your participation today does not obligate you to participate in any future interviews.

I have read this form and agree to participate.

Signature of Participant: _____   Date: _____

Witness: _____   Date: _____

Anne Bogat, Ph.D.   Alytia Levendosky, Ph.D.
Michigan State University   Michigan State University
Department of Psychology   Department of Psychology
East Lansing, MI 48824   East Lansing, MI 48824

137

Perceptions of Adult Attachment Questionnaire

PAAQ

The majority of the following statements refer to your early childhood relationship with your mother (when you were approximately 3 to 8 years old). If someone else was the principal person responsible for your care in childhood, please respond to the questions which refer to "mother" with that person in mind.

A few of the questions have two parts. For example "when I caused trouble as a child I knew my mother would forgive me." Some people might feel like they never caused trouble as a child; however, they consider their mothers very forgiving. How then do you answer? Only answer **AGREE** or **STRONGLY AGREE** if you agree with both parts of the statement. If you agree with only one part of the statement answer **NEUTRAL**. If you disagree with both parts of the statement answer **DISAGREE** or **STRONGLY DISAGREE**.

> **1= STRONGLY DISAGREE**
> **2 = DISAGREE**
> **3 = NEUTRAL (NEITHER DISAGREE NOR AGREE)**
> **4 = AGREE**
> **5 = STRONGLY AGREE**

_____1.   In childhood I felt like I was really treasured by my mother.

_____2.   In childhood I sometimes felt like my mother was really lonely when I was not with her.

_____3.   My mother was not very affectionate.

_____4.   When I was a young child and little things went wrong, I did not feel sure I could count on my mother to take care of me.

_____5.   As a child I couldn't stand being separated from my mother.

_____6.   My mother can make me feel really good, but when she is not nice to me she can really tear me apart.

_____7.   In my family of origin we don't make a show of expressing our feelings. We prefer keeping feelings to ourselves.

_____8.   Neither my mother nor myself are perfect, but somehow we made it through my childhood.

1= STRONGLY DISAGREE
2 = DISAGREE
3 = NEUTRAL (NEITHER DISAGREE NOR AGREE)
4 = AGREE
5 = STRONGLY AGREE

_____9.   I remember, when I was frightened as a child, my mother holding me close.

_____10.   When I was a child, my mother sometimes told me that if I was not good she would stop loving me.

_____11.   My mother is selfishly caught up in herself to the exclusion of everybody else.

_____12.   My family was not particularly intimate, but this has never bothered me.

_____13.   It's hard for me to remember my early relationship with my mother in any detail.

_____14.   In childhood I sometimes felt that my mother and I were so alike that I didn't know where she ended and I began.

_____15.   If anything happened to my mother I wonder if I could survive it.

_____16.   I remember as a child feeling a desire to protect my mother.

_____17.   Even though I went through rough times with my mother during my childhood, somewhere along the line I managed to let go of the majority of those angry, hurt feelings.

_____18.   In childhood I knew I was low on my mother's priority list.

_____19.   My mother was an all-around excellent mother.

_____20.   No one gets under my skin like my mother.

_____21.   As a child I never thought separations from my parents were any big deal.

_____22.   I often felt responsible for my mother's welfare.

_____23.   In childhood my mother sometimes threatened to leave me or to send me away if I wasn't good.

_____24.   To this day my mother has no clue who I am or what I am all about.

1= STRONGLY DISAGREE
2 = DISAGREE
3 = NEUTRAL (NEITHER DISAGREE NOR AGREE)
4 = AGREE
5 = STRONGLY AGREE

_____25. Even with all our past difficulties, I realize my mother did the best for me that she could.

_____26. I have forgotten what most of my early childhood was like.

_____27. I always knew my mother was there for me; no matter what I could depend on her.

_____28. There are times when I feel like shaking my mother and saying "wake up and see me for who I am."

_____29. In childhood I often had the impression that my mother was not listening to me. She often tuned me out.

_____30. During my childhood I sometimes felt like I was my mother's whole life.

_____31. My mother and I are more accepting of each other's differences than we have been in the past.

_____32. When I was young, I often feared something dreadful would happen to my mother or father.

_____33. I remember my mother telling me that I didn't pay enough attention to her or love her enough.

_____34. I often take my mother's opinions about me to heart and lose sight of my own opinions about myself.

_____35. My mother is a real nag.

_____36. My mother and I were so alike we often could finish each other's sentences.

_____37. I think people put too much emphasis on the mother/child relationship.

_____38. I remember very little about my early childhood (ages three to seven).

_____39. The concept of the loving, supporting mother is pure myth.

1= STRONGLY DISAGREE
2 = DISAGREE
3 = NEUTRAL (NEITHER DISAGREE NOR AGREE)
4 = AGREE
5 = STRONGLY AGREE

_____40. My relationship with my mother has gone through major changes over the course of my childhood and adolescence.

_____41. Even as an adult I sometimes feel like I will never dig myself out from under my mother's influence.

_____42. As a child I sometimes got the feeling that without me my mother would have fallen apart.

_____43. I couldn't have asked for a better mother.

_____44. If my mother was not fair to me as a child I realize now it was because she was dealing with her own problems.

_____45. If something really bad happened to me in childhood, I did not feel I could count on my mother to support me.

_____46. When I was a child I sometimes got the feeling that my mother wished I was never born.

_____47. I remember when I was a child feeling scared that one or both of my parents would die unexpectedly.

_____48. My mother can devastate me with her criticisms.

_____49. In childhood my mother often told me she was sacrificing herself for me.

_____50. I don't think my early childhood relationship with my mother has any significant influence on who I am today or my present relationships.

_____51. My mother was always there for me when I needed her.

_____52. When I acted bad as a child my mother would, at times, threaten to send me away.

_____53. I never felt like my mother gave me enough attention.

1= STRONGLY DISAGREE
2 = DISAGREE
3 = NEUTRAL (NEITHER DISAGREE NOR AGREE)
4 = AGREE
5 = STRONGLY AGREE

_____54. For all our past problems, my mother and I can still enjoy a good laugh together.

_____55. During my childhood, my mother would often turn to me and tell me lots of things that upset and bothered me.

_____56. In childhood, I often worried about my mother's state of health.

_____57. I find it difficult to remember my early childhood.

_____58. My mother was a perfect mother.

_____59. My mother's issues are still interfering with my life.

_____60. When I think back to my early childhood experiences, I discover things about myself and my parents that I've never considered before.

Working Model of the Child Interview

WMCI

INTERVIEWER: *PLEASE TURN ON THE TAPE RECORDER AND MICROPHONE. Test the tape recorder by saying "Testing 1, 2, 3" a few times. Rewind and play back the recording to make sure everything is working properly. THEN, TURN ON TAPE RECORDER–PRESS RECORD–AGAIN. WAIT 5 SECONDS. SAY YOUR NAME, DATE, and SUBJECT NUMBER INTO THE RECORDER. BEGIN INTERVIEW.*

1. MAKE SURE TAPE RECORDER IS TURNED ON and THAT "RECORD" IS PRESSED.
2. MAKE SURE MICROPHONE IS TURNED ON.

We are interested in how parents think and feel about their children before they are born. This interview is a way for us to ask you about that. The interview will take us about an hour to complete.

1a. Let's start with your pregnancy. I'm interested in things like whether it was planned or unplanned, how you feel physically and emotionally, and what you are doing during the pregnancy (e.g., working). Let's take these one at a time. *[The idea is to put the participant at ease and to begin to obtain a chronological history of the pregnancy. Additional probes may be necessary to make sure that the individual is given a reasonable opportunity to convey the history of their reactions and feelings about the pregnancy and the baby (which may or may not be the same).]*

Was the pregnancy planned or unplanned?

How much is the baby wanted or not wanted?

When did the pregnancy seem real to you?

How have you felt physically and emotionally throughout your pregnancy? *[Interviewer: Find out the history of these throughout the pregnancy.]*

What are you doing, or have you been doing, during the pregnancy? (e.g., working?) *[Interviewer: Find out the history of these throughout the pregnancy.]*

What have been your impressions about the baby while you're pregnant? What do you sense the baby might be like?

**** MAKE SURE THE TAPERECORDER IS TURNED ON and "RECORD" IS PRESSED.
**** MAKE SURE THE MICROPHONE IS TURNED ON.

1b. How do you think you will react to labor and delivery? What do you think your feelings about labor and delivery will be?

What do you think your first reaction will be when you see the baby?

What will be your reaction if the baby is a boy? If the baby is a girl?

How do you think your family will react to the birth of your baby? *[Interviewer: Be sure to include husband/partner, other siblings.]*

1c. Do you think your baby will have any problems in the first few days after birth?

How long do you think the baby will have to stay in the hospital?

Are you going to breast-feed or bottle-feed? Why? How did you come to that decision?

1d. How do you think the first few weeks at home with the baby will go? *[Interviewer: Explore feelings about feeding, sleeping, crying, etc.]*

1e. How old do you think your baby will be when he/she sits up?

Crawls?

Walks?

Smiles?

Talks?

Do you think your baby will do these things ahead, behind, or at the same time as other babies?

Do you have any sense yet of what your baby's intelligence will be? Why do you think that?

1f. Do you think your baby will have a regular routine? What do you think will happen if you or your baby can't stay in the routine?

1g. Will you need to be separated from your baby after he/she is born? (e.g., work)
    If the participant says YES or NO, the interviewer asks:
    **What do you think this will be like for you? For the baby?

    If the participant says "I HOPE NOT" the interviewer asks:
    **If this did happen, what would this be like for you? For the baby?

Will there be any separations in the first year of your baby's life that will last for more than a day? How will that be for you? For your baby?

2a. What do you think your child's personality will be like when he/she is born?
[Personality--the qualities/traits/features that give someone their identity, that makes someone who they are]

2b. Pick 5 words (adjectives) that describe what your child's personality will be like when he/she is born. *[Interviewer: Write these down on the paper for reference. It is not important that participants come up with exactly 5 adjectives.]*
    1.
    2.
    3.
    4.
    5.

For each one, what makes you say that?

3a. Who do you think your baby will be most like?

What personality traits do you think your child will inherit from you?

What traits will your child inherit from the baby's father?

3b. Do you think there are any characteristics your child will inherit from your side of the family?

From the baby's father's side of the family?

3c. Have you decided on your child's name? How did you decide?(or How *will* you decide?)

Does that name have special meaning in your family or the baby's father's family?

4. In what ways do you think your child will be unique or different from other children?

5. After your baby is born, what behavior in his/her first year of life do you think will be the most difficult for you to handle? Can you give an example?

5a. Why will this be difficult? How often do you think it will occur?

What will you feel like doing when your child behaves like that? How will you feel if your child acts this way? What will you do about the behavior?

5b. Do you think your child will know you don't like that behavior? Why do you think he/she will act like that?

5c. What do you imagine will happen to this behavior as your child grows older? Why do you think so?

6a. How would you describe your relationship with your baby now, while you're pregnant?

6b. Pick five words (adjectives) to describe your relationship. For each word, describe an incident or memory that illustrates what you mean. *[Interviewer: Write these down on the paper for reference. It is not important that participants come up with exactly 5 adjectives.]*

       1.

       2.

       3.

       4.

       5.

7a. What pleases you most about your relationship with your baby while you're pregnant?

What do you wish you could change about it?

7b. How do you feel your relationship with your baby while you're pregnant will affect your baby's personality?

7c. Has your relationship with your baby changed during the pregnancy? In what ways? What is your feeling about the change?

8. When your baby is born, what parent do you think he/she will be closest to? Why?

Do you expect that to change (as the child gets older, for instance)? How do you expect it to change?

9. Do you think your baby will get upset often in his/her first 12 months? What will you do at those times? What do you think your feelings will be at those times?

9a. What about when the baby becomes emotionally upset? What will you do at those times?

What do you think your feelings will be at those times?

9b. What about when your child becomes physically hurt a little bit (e.g., hitting his head against the crib)? What will you do at those times? What do you think your feelings will be at those times?

9c. What about when your child becomes sick (e.g., he/she gets a fever)? What will you do at those times? What do you think your feelings will be at those times?

10. Tell me a favorite story about your pregnancy, perhaps one you've told to family or friends. I'll give you a minute to think about this one. *[Interviewer: If the participant is struggling, you may tell them that this doesn't have to be the favorite story, only a favorite one.]*

What do you like about this story?

11a. Can you think of any experiences you've had during your pregnancy that might have been a setback for your baby? Why do you think so? *[Setback=something that happened that makes things harder for your baby than for other babies.]*

> *If person says YES, then ask:*
> ***Why do you think so?
>
> *If person says NO, go to next question.*

[Interviewer: Indirectly, we're trying to determine whether the parent feels responsible in any way for the setbacks.]

Knowing what you know now, if you started all over again with your pregnancy, what would you do differently?

11b. Are there any experiences your baby might have during the first year of his/her life that might be a setback for him/her? *If person says NO, go to question 12.*
> *If person says YES, then ask:*
> Why do you think so?
>
> Who or what is likely to contribute to these setbacks?
>
> Is there anything you might do to prevent these setbacks?

12. Do you ever worry about your unborn baby? What do you worry about?

13. If your child could be any age right now (unborn, 1 month, 1 year, etc.), what age would you choose? Why?

14. As you look ahead, what will be the most difficult time in your child's development? Why do you think so?

15. What do you expect your child to be like as an adolescent? What makes you feel this way? What do you expect to be good and not so good about this period in your child's life?

16. Think for a moment of your child as an adult. What hopes and fears do you have about that time?

INTERVIEWER:

1. TURN TAPE RECORDER AND MICROPHONE OFF.
2. GIVE PARTICIPANT THE INTERVIEW PACKET.

Maternal Efficacy Questionnaire

MEQ

We want to ask you some questions about <u>yourself and your baby</u>. We are trying to get a general idea of how you usually handle different situations with your baby. We realize that no one is always effective or always ineffective. We all do better in some situations than in others. So we would like to have you think about some situations that all mothers encounter.

1. When your baby is upset, fussy or crying, how good are you at soothing him or her?

1	**2**	**3**	**4**
not good at all	**not good enough**	**good enough**	**very good**

2. How good are you at understanding what your baby wants or need? For example, do you know when your baby needs to be changed or wants to be fed?

1	**2**	**3**	**4**
not good at all	**not good enough**	**good enough**	**very good**

3. How good are you at making your baby understand what you want him/her to do? For example, if you want your baby to eat dinner or play quietly, how good are you at making him or her do that?

1	**2**	**3**	**4**
not good at all	**not good enough**	**good enough**	**very good**

4. How good are you at getting your baby to pay attention to you? For example, when you want your baby to look at you, how good are you at making him or her do it?

1	**2**	**3**	**4**
not good at all	**not good enough**	**good enough**	**very good**

5. How good are you at getting your baby to have fun with you? For example, how good are you at getting your baby to smile and laugh with you?

1	**2**	**3**	**4**
not good at all	**not good enough**	**good enough**	**very good**

6. How good are you at knowing what activities your baby will enjoy? For example, how good are you at knowing what games and toys your baby will like to play with?

1	**2**	**3**	**4**
not good at all	**not good enough**	**good enough**	**very good**

7. How good are you at keeping your baby occupied when you need to do housework? For example, how good are you at finding things for the baby when you need to do the dishes.

1	**2**	**3**	**4**
not good at all	not good enough	good enough	very good

8. How good do you feel you are at feeding, changing, and bathing your baby?

1	**2**	**3**	**4**
not good at all	not good enough	good enough	very good

9. How good are you at getting your baby to show off for visitors? For example, how good are you at making your baby smile or laugh for people who visit?

1	**2**	**3**	**4**
not good at all	not good enough	good enough	very good

10. In general, how good a mother do you feel you are?

1	**2**	**3**	**4**
not good at all	not good enough	good enough	very good

APPENDIX I
The Strange Situation (SS): Laboratory Procedures

Episode 1 (30 seconds): The mother and baby are introduced to the experimental room by experimenter. Mother is shown where to set the baby down and where to sit. The examiner leaves the room as soon as she has completed the instructions.

Episode 2 (3 minutes): The mother and baby are alone in the experimental room. The mother sits in her chair and pretends to read a magazine. The mother has been instructed ahead of time that she should not initiate conversation with the baby, although she can respond to baby's initiation of interaction. If after 2 minutes the baby has not explored the toys, the mother is signaled (through a knock on the wall by the experimenter) to help the baby become interested in the toys.

Episode 3 (3 minutes): A stranger (who has never met the baby before) enters the room and introduces herself to the mother. The stranger immediately sits in her designated chair and remains silent for 1 minute. At the end of 1 minute, the stranger begins a conversation with the mother. At the end of another minute, the stranger is signaled (by experimenter) to initiate interaction with the baby. At the end of 3 minutes total, the mother unobtrusively leaves the room, leaving her purse or handbag behind on her chair.

Episode 4 (3 minutes): As soon as the mother leaves, the stranger reduces interaction with the baby so that the baby can notice that the mother is gone. Stranger returns to her chair. If the baby cries, the stranger will try to distract the baby with toys. If necessary, the stranger will attempt to calm the baby by talking to or picking up him/her. If baby is calmed, the stranger puts him/her down and attempts to engage the baby with the toys.

Episode 5 (3 minutes): The mother approaches the closed door and speaks outside, loudly enough that the baby can hear her. She pauses, opens the door, and pauses again to let the baby respond. Meanwhile, the stranger leaves unobtrusively. After 3 minutes, the mother leaves the room. She pauses at the door and says "bye-bye," closing the door behind her.

Episode 6 (3 minutes): The baby is left alone to explore the room for 3 minutes. If the baby becomes acutely distressed, this episode is terminated, but the remaining time is added onto episode seven.

Episode 7 (3 minutes): The stranger approaches the door and speaks outside, loudly enough that the baby can hear her voice. She pauses, opens the door, and pauses again allowing the baby to respond. If the baby is crying, the stranger will attempt to soothe the baby. When the baby is calm, the stranger will gradually return to her chair.

Episode 8 (3 minutes): The mother opens the door and pauses for a moment, giving the baby a chance to respond. The mother then talks to the baby and picks him/her up. The stranger leaves the room.

APPENDIX J
Social Support Questionnaire

PLEASE READ ALL DIRECTIONS
ON THIS PAGE BEFORE STARTING

Please list each significant person in your life on the right. Consider all the persons who provide personal support for you or who are important to you.

Use only first names or initials, and then indicate the relationship, as in the following example:

Example:

First Name or Initials   Relationship

1. _____   _____
2. _____   _____
3. _____   _____
4. _____   _____
5. _____   _____

Use the following list to help you think of the people important to you, and list as many people as apply in your case.

--spouse or partner
--family members or relatives (specify: mother, father, grandmother, etc.)
--friends
--work or school associates
--neighbors
--health care providers
--counselor or therapist
--minister/priest/rabbi
--other

You do not have to use all 24 spaces. Use as many spaces as you have important persons in your life.

PERSONAL NETWORK

First Name or Initials   Relationship

1. _____   _____
2. _____   _____
3. _____   _____
4. _____   _____
5. _____   _____
6. _____   _____
7. _____   _____
8. _____   _____
9. _____   _____
10. _____   _____
11. _____   _____
12. _____   _____
13. _____   _____
14. _____   _____
15. _____   _____
16. _____   _____
17. _____   _____
18. _____   _____
19. _____   _____
20. _____   _____
21. _____   _____
22. _____   _____
23. _____   _____
24. _____   _____

For each person you listed, please answer the following questions by writing in the number that applies.

0 = not at all
1 = a little
2 = moderately
3 = quite a bit
4 = a great deal

Question 1:

How much does this person make you feel liked or loved?

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
13.
14.
15.
16.
17.
18.
19.
20.
21.
22.
23.
24.

Question 2:

How much does this person make you feel respected or admired?

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
13.
14.
15.
16.
17.
18.
19.
20.
21.
22.
23.
24.

Question 3:

How much can you confide in this person?

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
13.
14.
15.
16.
17.
18.
19.
20.
21.
22.
23.
24.

0 = not at all
1 = a little
2 = moderately
3 = quite a bit
4 = a great deal

Question 4:

How much does this person agree with or support your actions or thoughts?

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
13.
14.
15.
16.
17.
18.
19.
20.
21.
22.
23.
24.

154

Question 5:

If you needed to borrow $10, a ride to the doctor, or some other immediate help, how much could this person usually help?

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
13.
14.
15.
16.
17.
18.
19.
20.
21.
22.
23.
24.

Question 6:

If you were confined to bed for several weeks, how much could this person help you?

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
13.
14.
15.
16.
17.
18.
19.
20.
21.
22.
23.
24.

Question 7:

How much advice and guidance about pregnancy do you get from this person? (e.g., diet, what to expect during delivery)

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
13.
14.
15.
16.
17.
18.
19.
20.
21.
22.
23.
24.

Question 8:

How much practical assistance about pregnancy do you get from this person, (e.g., take you to the doctor)

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
13.
14.
15.
16.
17.
18.
19.
20.
21.
22.
23.
24.

155

0 = not at all
1 = a little
2 = moderately
3 = quite a bit
4 = a great deal

Question 9:

How much emotional support about pregnancy do you get from this person? (e.g., listens to you when you're upset or worried)

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____
21. _____
22. _____
23. _____
24. _____

Question 10:

How much does this person criticize, or seem intrusive, or create conflict, or disappoint you?

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____
21. _____
22. _____
23. _____
24. _____

Question 11:

How long have you known this person?

1 = less than 6 months
2 = 6 to 12 months
3 = 1 to 2 years
4 = 2 to 5 years
5 = more than 5 years

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____
21. _____
22. _____
23. _____
24. _____

Question 12:

How frequently do you usually have contact with this person? (phone calls, visits, or letters)

5 = daily
4 = weekly
3 = monthly
2 = a few times a year
1 = once a year or less

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____
21. _____
22. _____
23. _____
24. _____

156

13. During the past year, have you lost any important relationships due to moving, a job change, divorce or separation, death, or some other reason?

_____ 0. NO *(Interviewer: If NO is checked, interview ends)*

_____ 1. YES

IF YOU LOST IMPORTANT RELATIONSHIPS DURING THIS PAST YEAR:

13a. Please indicate the number of persons from each category who are no longer available to you.

_____ spouse or partner
_____ family members or relatives   Specify: _____
_____ friends
_____ work or school associate
_____ neighbors
_____ health care providers
_____ counselor or therapist
_____ minister/priest/rabbi
_____ other (specify) _____

13b. Overall, how much of your support was provided by these people who are no longer available to you?

_____ 0. None at all
_____ 1. A little
_____ 2. A moderate amount
_____ 3. Quite a bit
_____ 4. A great deal

157

APPENDIX K
Postnatal Pregnancy Support Items

1. How much advice and guidance about parenting do you get from this person (e.g., baby's diet, how to comfort the baby)?

2. How much practical assistance about parenting do you get from this person (e.g., take you to the pediatrician, lend or give you things for the baby, babysit)?

3. How much emotional support about parenting do you get from this person (e.g., listens to you when you are upset or worried)?

APPENDIX L
Demographic Questionnaire

1. Your date of birth: __ / __ / __
                          (mo) (dy) (yr)

2. Your baby's due date: __ / __ / __
                           (mo) (dy) (yr)

3. Have you been pregnant before? (Circle one)
       1 = YES   2 = NO (If NO, go to Question 7)

    If YES, to Question 3:
    4. How many times? _____
    5. Have you had any miscarriages, still births, or abortions? (Circle one)
       1 = YES
       2 = NO
    6. How many biological children do you currently have?

7. How many people, including yourself, live in your household?
    (If participant is living in a shelter, questions 7 & 8 refer to household
    composition before moving into shelter.)

8. Please list these: (Write in specific relationship to mother. Be specific--is the
    person (for ex.) a husband, stepfather, biological child, foster child, or partner's
    child?)

    _____   _____   _____
    _____   _____   _____
    _____   _____   _____

9. Choose the one that best describes your current marital/relationship status (choose
    only one):

       (a) single, never married (see below)
       (b) married   For how long? _____ (in months)
       (c) separated   For how long? _____ (in months)
       (d) divorced   For how long? _____ (in months)
       (e) widowed   For how long? _____ (in months)

       If (a) is circled: Are you currently in a relationship?   YES NO
               If YES, go to Question 10.
               If NO, were you in a relationship that lasted at least
                       6 weeks during your current pregnancy?   YES NO

10. First name of your current partner or the partner you were with for at least 6

weeks during your pregnancy:_____

11.   Are you currently living with your partner/spouse? (Circle one)
           1 = YES
           2 = NO

12.   If yes to Question 11, how long have you been doing so? (Circle one)
           1 = less than 1 year
           2 = 1-3 years
           3 = 4-6 years
           4 = 7-9 years
           5 = 10-12 years
           6 = 13-15 years
           7 = 16 - 18 years
           8 = 19 - 21 years
           9 = 22 - 24 years
           10 = 25 or more years

13.   Prior to your current romantic relationship, specified in Question #10
       (a) were you ever married?   1 = YES   2 = NO
       (b) did you ever live with a partner? 1 = YES   2 = NO
       (c) were you ever separated?   1 = YES   2 = NO
       (d) were you ever divorced?   1 = YES   2 = NO
       (e) were you ever widowed?   1 = YES   2 = NO

14.   What is your current relationship with the father of your baby? (Circle one)
           1 = spouse
           2 = ex-spouse
           3 = partner
           4 = ex-partner
           5 = friend
           6 = acquaintance
           7 = stranger
           8 = other   Please specify: _____

15.   What is your racial or ethnic group? (Circle one)
           1 = Native American
           2 = Asian American/Pacific Islander
           3 = Black, African American
           4 = Latino, Hispanic, Chicano
           5 = Biracial (mixed): Specify_____
           6 = Caucasian, White
           7 = Other: _____

16.   What is the baby's father's racial or ethnic group? (Circle one)
           1 = Native American

2 = Asian American/Pacific Islander
3 = Black, African American
4 = Latino, Hispanic, Chicano
5 = Biracial (mixed): Specify_____
6 = Caucasian, White
7 = Other: _____

17.   What is the highest level of education you have completed? (Circle one)
1 = grades 1, 2, 3, 4, 5, or 6 **(circle specific grade)**
2 = grades 7, 8, 9, 10, 11, 12, GED **(circle specific grade)**
3 = some college   Where? _____
4 = AA degree   Where? _____
5 = BA/BS   Where? _____
6 = some grad school   Where? _____
7 = graduate degree   Where? _____
_____ MA?
_____ Ph.D.?
_____ Law?
_____ MD?
8 = other; Specify (e.g., Beauty School, nursing school)

_____

18. Do you currently work outside the home?   YES   NO
If NO, did you work outside the home during the last year?   YES   NO

19. If YES to either part of Question 18, what is/was your
occupation?_____
*Please be specific. For example, bookkeeper, cashier, computer
programmer.*
*If there were two jobs/occupations, have participant choose the one that
she feels best represents her occupation.*

20. What is the highest level of education your partner/spouse has completed? (Circle
one)
1 = grades 1, 2, 3, 4, 5, or 6 **(circle specific grade)**
2 = grades 7, 8, 9, 10, 11, 12, GED **(circle specific grade)**
3 = some college   Where? _____
4 = AA degree   Where? _____
5 = BA/BS   Where? _____
6 = some grad school   Where? _____
7 = graduate degree   Where? _____
_____ MA?
_____ Ph.D.?
_____ Law?
_____ MD?

161

8 = other; Specify (e.g., Beauty School, nursing school)

_____

21. Does s/he work outside the home? (Circle one)
        1 = YES
        2 = NO

22. If yes to Question 20, what is his/her occupation?

_____

23. What is your total family income per month (estimate)? _____

24. Do you currently receive any public assistance? (Circle one)
        1 = YES
        2 = NO

25. Are you currently residing in a shelter for battered women?
    YES   NO   # days?_____

26. Have you ever stayed in a shelter for battered women before . . .

    (a)   Because of your experience of abuse? YES NO   # days?_____

    (b)   Because of your mother's/guardian's
            experience of abuse?   YES NO   # days?_____

27. Have you ever stayed in a homeless shelter before . . .

    (a)   Because of your experiences?   YES NO   # days?_____

    (b)   Because of your parents'/guardians'

Beck Depression Inventory

BDI

In answering these questions, think about each item carefully and circle the answer out of the group of 4 items that best reflects how you have been feeling **during the past week.**

1. [1]   I do not feel sad.
    [2]   I feel sad.
    [3]   I am sad all the time and I can't snap out of it.
    [4]   I am so sad or unhappy that I can't stand it.

2. [1]   I am not particularly discouraged about the future.
    [2]   I feel discouraged about the future.
    [3]   I feel I have nothing to look forward to.
    [4]   I feel that the future is hopeless and that things cannot improve.

3. [1]   I do not feel like a failure.
    [2]   I feel I have failed more than the average person.
    [3]   As I look back on my life, all I can see is a lot of failures.
    [4]   I feel I am a complete failure as a person.

4. [1]   I get as much satisfaction out of things as I used to.
    [2]   I don't enjoy things the way I used to.
    [3]   I don't get real satisfaction out of anything anymore.
    [4]   I am dissatisfied or bored with everything.

5. [1]   I don't feel particularly guilty.
    [2]   I feel guilty a good part of the time.
    [3]   I feel quite guilty most of the time.
    [4]   I feel guilty all of the time.

6. [1]   I don't feel I am being punished.
    [2]   I feel I may be punished.
    [3]   I expect to be punished.
    [4]   I feel I am being punished.

7. [1]   I don't feel disappointed in myself.
    [2]   I am disappointed in myself.
    [3]   I am disgusted with myself.
    [4]   I hate myself.

8. [1]   I don't feel I am any worse than anybody else.
    [2]   I am critical of myself for all my weaknesses or mistakes.
    [3]   I blame myself all the time for my faults.
    [4]   I blame myself for everything bad that happens.

9. [1] I don't have any thoughts of killing myself.
   [2] I have thoughts of killing myself, but I would not carry them out.
   [3] I would like to kill myself.
   [4] I would kill myself if I had the chance.

10. [1] I don't cry any more than usual.
    [2] I cry more now than I used to.
    [3] I cry all the time now.
    [4] I used to be able to cry, but now I can't cry even though I want to.

11. [1] I am no more irritated by things than I ever am.
    [2] I am slightly more irritated now than usual.
    [3] I am quite annoyed or irritated a good deal of the time.
    [4] I feel irritated all the time now.

12. [1] I have not lost interest in other people.
    [2] I am less interested in other people than I used to be.
    [3] I have lost most of my interest in other people.
    [4] I have lost all of my interest in other people.

13. [1] I make decisions about as well as I ever could.
    [2] I put off making decisions more than I used to.
    [3] I have greater difficulty in making decisions than before.
    [4] I can't make decisions at all anymore.

14. [1] I don't feel that I look any worse than I used to.
    [2] I am worried that I am looking old or unattractive.
    [3] I feel that there are permanent changes in my appearance that make me look unattractive.
    [4] I believe that I look ugly.

15. [1] I can work about as well as before.
    [2] It takes an extra effort to get started at doing something.
    [3] I have to push myself very hard to do anything.
    [4] I can't do any work at all.

16. [1] I can sleep as well as usual.
    [2] I don't sleep as well as I used to.
    [3] I wake up 1-2 hours earlier than usual and find it hard to get back to sleep.
    [4] I wake up several hours earlier than I used to and cannot get back to sleep.

17. [1] I don't get more tired than usual.
    [2] I get tired more easily than I used to.
    [3] I get tired from doing almost everything.
    [4] I am too tired to do anything.

18.   [1]   My appetite is no worse than usual.
        [2]   My appetite is not as good as it used to be.
        [3]   My appetite is much worse now.
        [4]   I have no appetite at all anymore.

19.   [1]   I haven't lost much weight, if any, lately.
        [2]   I have lost more than five pounds.
        [3]   I have lost more than ten pounds.
        [4]   I have lost more than fifteen pounds.

20.   [1]   I am no more worried about my health than usual.
        [2]   I am worried about physical problems such as aches and pains, or upset stomach, or constipation.
        [3]   I am very worried about my physical problems and it's hard to think of much else.
        [4]   I am so worried about my physical problems that I cannot think about anything else.

21.   [1]   I have not noticed any recent change in my interest in sex.
        [2]   I am less interested in sex than I used to be.
        [3]   I am much less interested in sex now.
        [4]   I have lost interest in sex completely.

APPENDIX N
Severity of Violence Against Women Scales

VAW Scales–Pregnancy Interview, Pt. I
*****This questionnaire refers to _____ [NAME, see Page 2, Question 10].*****
You and _____ have probably experienced anger or conflict. Below is a list of behaviors he may have done. Describe how often he has done each behavior at 2 different times (during your current pregnancy and the year before you became pregnant) by choosing a letter from the following scale. *[Interviewer: If participant was not involved in a relationship with _____ during the year before she became pregnant, code E]*

A	BB	C	D	E
never	once	a few times	many times	not applicable

During your current pregnancy:
    The year before you became pregnant:

____ ____Hit, kicked a wall, door, or furniture
____ ____Threw, smashed or broke an object
____ ____Driven dangerously with you in the car
____ ____Threw an object at you
____ ____Shook a finger at you
____ ____Made threatening gestures or faces at you
____ ____Shook a fist at you
____ ____Acted like a bully toward you
____ ____Destroyed something belonging to you
____ ____Threatened to harm or damage things you care about
____ ____Threatened to destroy property
____ ____Threatened someone you care about
____ ____Threatened to hurt you
____ ____Threatened to kill himself
____ ____Threatened you with a club-like object
____ ____Threatened you with a knife or gun
____ ____Threatened to kill you
____ ____Threatened you with a weapon
____ ____Acted like he wanted to kill you
____ ____Held you down, pinning you in place
____ ____Pushed or shoved you
____ ____Shook or roughly handled you

During your current pregnancy:
    The year before you became pregnant:

____ ____Scratched you
____ ____Pulled your hair
____ ____Twisted your arm
____ ____Spanked you
____ ____Bit you
____ ____Slapped you with the palm of hand
____ ____Slapped you with the back of hand
____ ____Slapped you around your face/head
____ ____Kicked you
____ ____Hit you with an object
____ ____Stomped on you
____ ____Choked you
____ ____Punched you
____ ____Burned you with something
____ ____Used a club-like object on you
____ ____Beat you up
____ ____Used a knife or gun on you
____ ____Demanded sex whether you wanted to or not
____ ____Made you have oral sex against your will
____ ____Made you have sexual intercourse against your will
____ ____Physically forced you to have sex
____ ____Made you have anal sex against your will
____ ____Used an object on you in a sexual way
____ ____Grabbed you suddenly or forcefully

Severity of Violence Against Women Scales-Previous Partner

VAW Scales--Pregnancy Interview, Pt. II

How often did your most recent previous partner *(the person before [NAME])* engage in each of these activities with you? *[Interviewer: Relationship with previous partner must have lasted 6 weeks or longer in order to complete questionnaire.]*

Please give the dates of this relationship: _____ / _____ to _____ / _____
(mo)   (yr)   (mo)   (yr)

A	BB	C	D	E
never	**once**	**a few times**	**many times**	**not applicable**

How often did your parnter:

_____ _____ Hit, kicked a wall, door, or furniture
_____ _____ Threw, smashed or broke an object
_____ _____ Driven dangerously with you in the car
_____ _____ Threw an object at you
_____ _____ Shook a finger at you
_____ _____ Made threatening gestures or faces at you
_____ _____ Shook a fist at you
_____ _____ Acted like a bully toward you
_____ _____ Destroyed something belonging to you
_____ _____ Threatened to harm or damage things you care about
_____ _____ Threatened to destroy property
_____ _____ Threatened someone you care about
_____ _____ Threatened to hurt you
_____ _____ Threatened to kill himself
_____ _____ Threatened you with a club-like object
_____ _____ Threatened you with a knife or gun
_____ _____ Threatened to kill you
_____ _____ Threatened you with a weapon
_____ _____ Acted like he wanted to kill you
_____ _____ Held you down, pinning you in place
_____ _____ Pushed or shoved you
_____ _____ Shook or roughly handled you

How often did your partner:

_____ _____ Scratched you
_____ _____ Pulled your hair
_____ _____ Twisted your arm
_____ _____ Spanked you
_____ _____ Bit you
_____ _____ Slapped you with the palm of hand
_____ _____ Slapped you with the back of hand
_____ _____ Slapped you around your face/head
_____ _____ Kicked you
_____ _____ Hit you with an object
_____ _____ Stomped on you
_____ _____ Choked you
_____ _____ Punched you
_____ _____ Burned you with something
_____ _____ Used a club-like object on you
_____ _____ Beat you up
_____ _____ Used a knife or gun on you
_____ _____ Demanded sex whether you wanted to or not
_____ _____ Made you have oral sex against your will
_____ _____ Made you have sexual intercourse against your will
_____ _____ Physically forced you to have sex
_____ _____ Made you have anal sex against your will
_____ _____ Used an object on you in a sexual way
_____ _____ Grabbed you suddenly or forcefully

APPENDIX O
Severity of Violence Against Women Scale-Time 3 Interview

You and your partner have probably experienced anger or conflict. Below is a list of behaviors he may have done. Describe how often he has done each behavior during the last year by choosing a letter from the following scale. *[Interviewer: If participant was not involved in a relationship with a partner during the year code E]*

A	BB	C	D	E
never	**once**	**a few times**	**many times**	**not applicable**

During the last year, how often did your partner:

____ ____Hit or kicked a wall, door or furniture
____ ____Hit, kicked a wall, door, or furniture
____ ____Threw, smashed or broke an object
____ ____Driven dangerously with you in the car
____ ____Threw an object at you
____ ____Shook a finger at you
____ ____Made threatening gestures or faces at you
____ ____Shook a fist at you
____ ____Acted like a bully toward you
____ ____Destroyed something belonging to you
____ ____Threatened to harm or damage things you care about
____ ____Threatened to destroy property
____ ____Threatened someone you care about
____ ____Threatened to hurt you
____ ____Threatened to kill himself
____ ____Threatened you with a club-like object
____ ____Threatened you with a knife or gun
____ ____Threatened to kill you
____ ____Threatened you with a weapon
____ ____Acted like he wanted to kill you
____ ____Held you down, pinning you in place
____ ____Pushed or shoved you
____ ____Shook or roughly handled you

How often did your partner:

____ ____Scratched you
____ ____Pulled your hair
____ ____Twisted your arm
____ ____Spanked you
____ ____Bit you
____ ____Slapped you with the palm of hand
____ ____Slapped you with the back of hand
____ ____Slapped you around your face/head
____ ____Kicked you
____ ____Hit you with an object

____ ____Stomped on you
____ ____Choked you
____ ____Punched you
____ ____Burned you with something
____ ____Used a club-like object on you
____ ____Beat you up
____ ____Used a knife or gun on you
____ ____Demanded sex whether you wanted to or not
____ ____Made you have oral sex against your will
____ ____Made you have sexual intercourse against your will
____ ____Physically forced you to have sex
____ ____Made you have anal sex against your will
____ ____Used an object on you in a sexual way
____ ____Grabbed you suddenly or forcefully

168

APPENDIX P
Parent Behavior Checklist

PBC

This checklist includes statements about how parents raise young children. For each statement, mark the number **1** if the statement ALMOST ALWAYS OR ALWAYS applies to how you raise your child. Mark the number **2** if the statement FREQUENTLY applies. Mark the number **3** if the statement SOMETIMES applies. Mark the number **4** if the statement ALMOST NEVER OR NEVER applies. A sample item is shown below.

Almost Always=1   Frequently=2   Sometimes=3   Almost Never/Never=4

1. I spank my child at least once a week.
2. If my child would hit, kick, bite, or scratch someone, I would spank him/her.
3. If my child hit me in anger, I would hit or spank my child.
4. When my child doesn't do what I tell him/her to do I spank him/her.
5. I tell my child that his/her bad behavior will make God sad.
6. I yell at my child for whining.
7. I tell my child he/she should be ashamed of him/herself for soiled pants (bowel movement).
8. If my child is overactive, I yell at him/her.
9. If my child cries after being put to bed, I spank him/her.
10. To toilet train my child, I make him/her sit on the toilet for over 15 minutes.
11. I spank my child for refusing to eat.
12. I would spank my child in public for bad behavior.
13. I yell at my child for being too noisy at home.
14. I scold my child for soiling in his/her pants.
15. I threaten to tell my spouse/partner about my child's bad behavior.
16. I tell my child that he/she is bad.
17. I scold my child for playing with his/her private parts.
18. I tell my child to behave so that my spouse/partner won't get mad.
19. If my child cries after being put to bed, I yell at him/her.
20. I yell at my child for spilling food.
21. I get so angry with my child I spank him/her on the bottom.
22. I punish my child for wetting the bed.
23. I make my child stay at the table until all of his/her food is gone.
24. I would spank my child for wetting his/her pants.
25. I would slap my child for being sassy or backtalking.
26. I threaten to punish my child but then I don't.
27. I hit my child with an object (such as a spoon or belt).
28. I tell my child God doesn't like children who lie.
29. When my child has a temper tantrum, I spank him/her.
30. I send my child to bed as a punishment.

Physical and Emotional Neglect Scale

Please answer the following items using the scale below.

Never	Almost Never	Sometimes	Frequently	Almost Always	Always
1	2	3	4	5	6

|		
_____	1.	I hug and kiss my child everyday.
_____	2.	I feed my child on a regular schedule.
_____	3.	I have run into the store and left my child in the car for a few minutes.
_____	4.	During the day, I let my child cry for 15 minutes before I pick him/her up.
_____	5.	My child has had diaper rash.
_____	6.	I play games with my child that will help him/her develop new skills.
_____	7.	I put prescription and over-the-counter medicine out of the reach of my child.
_____	8.	I change my child's diaper 4 times a day or more.
_____	9.	I take my child to the doctor for regular checkups.
_____	10.	I talk back and forth with my child every day.
_____	11.	Once my child is asleep for the night, I have left him/her alone so that I could go out.
_____	12.	I give my child lots of encouragement when he/she does something new (such as walking or making a new sound).
_____	13.	It is hard to know when my child is hungry.
_____	14.	I play with my child every day.
_____	15.	I arrange child care when I can't be with my child.
_____	16.	Whatever I do for my child, he/she is never satisfied.
_____	17.	I have left my child at home alone during the daytime so that I could run a quick errand.
_____	18.	I tell my child that I love him/her every day.
_____	19.	I sometimes let my child go a couple of days without washing him/her.
_____	20.	I have trouble making sure my house gets cleaned regularly.
_____	21.	I try to provide time for my child to play with other children.
_____	22.	I put child safety plugs on all the electrical outlets in my house.
_____	23.	If I'm upset with my child, I sometimes don't talk to him/her all day.
_____	24.	I change my child's diaper less than 2 times a day.
_____	25.	It's hard to understand what my child is crying about.
_____	26.	I feed my child within 30 minutes of when s/he is hungry.
_____	27.	There are days when I'm so busy, that I barely see or talk to my child.
	28.	I put household cleaning products and chemicals in cabinets that my child can't get open.
_____	29.	During the day, I let my child cry for 30 minutes or longer before I pick him/her up.
_____	30.	I feed my child at least 3 times a day.

APPENDIX R
Correlation Matrix of Original Model Variables

	1	2	3	4	5	6	7	8	9	10	11	12
1	1.000											
2	-0.863	1.000										
3	0.766	-0.720	1.000									
4	0.400	-0.317	0.359	1.000								
5	0.493	-0.385	0.558	0.154	1.000							
6	0.383	-0.442	0.385	0.421	0.221	1.000						
7	-0.192	0.137	-0.144	-0.270	-0.049	-0.268	1.000					
8	-0.201	0.097	-0.198	-0.209	-0.178	-0.153	0.654	1.000				
9	-0.174	0.064	-0.141	-0.230	-0.135	-0.158	0.664	0.728	1.000			
10	-0.236	0.112	-0.218	-0.269	-0.205	-0.244	0.702	0.782	0.720	1.000		
11	-0.194	0.112	-0.185	-0.275	-0.149	-0.228	0.729	0.752	0.726	0.785	1.000	
12	-0.232	0.114	-0.185	-0.251	-0.187	-0.180	0.667	0.684	0.668	0.686	0.694	1.000
13	-0.259	0.238	-0.206	-0.182	-0.213	-0.172	0.117	0.150	0.178	0.146	0.123	0.155
14	-0.353	0.373	-0.383	-0.303	-0.285	-0.217	0.087	0.076	0.064	0.103	0.112	0.138
15	-0.277	0.298	-0.260	-0.154	-0.184	-0.120	-0.034	-0.077	-0.041	-0.070	-0.031	0.025
16	-0.223	0.247	-0.154	-0.119	-0.116	-0.155	0.012	-0.094	-0.028	-0.090	-0.054	-0.002
17	-0.170	0.216	-0.158	-0.260	-0.135	-0.168	0.137	0.145	0.123	0.139	0.103	0.150
18	-0.124	0.147	-0.015	-0.168	-0.010	-0.049	-0.078	-0.155	-0.130	-0.123	-0.167	-0.077
19	-0.205	0.210	-0.080	-0.265	-0.066	-0.141	0.056	-0.085	-0.110	-0.023	-0.082	0.041
20	0.125	-0.020	0.159	0.158	0.113	0.069	-0.421	-0.421	-0.394	-0.490	-0.459	-0.397
21	0.140	-0.062	0.213	0.134	0.272	0.285	-0.237	-0.300	-0.224	-0.273	-0.277	-0.279
22	0.185	-0.117	0.266	0.093	0.268	0.007	-0.189	-0.360	-0.309	-0.315	-0.363	-0.266
23	0.126	0.013	0.064	0.184	0.138	0.112	-0.197	-0.283	-0.282	-0.325	-0.262	-0.272
24	-0.072	0.020	-0.104	-0.058	-0.039	-0.014	0.089	0.192	0.161	0.207	0.121	0.204

|	13	14	15	16	17	18	19	20	21	22	23	24
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13	1.000											
14	0.242	1.000										
15	0.194	0.560	1.000									
16	0.136	0.496	0.633	1.000								
17	0.299	0.359	0.250	0.182	1.000							
18	0.188	0.255	0.426	0.282	0.540	1.000						
19	0.203	0.346	0.345	0.335	0.576	0.694	1.000					
20	-0.033	0.003	0.025	0.045	0.002	0.161	0.088	1.000				
21	-0.275	-0.212	-0.135	-0.097	-0.264	-0.051	-0.186	0.133	1.000			
22	-0.100	-0.267	-0.178	-0.044	-0.203	-0.031	-0.105	0.412	0.303	1.000		
23	-0.209	-0.140	-0.042	0.024	-0.138	-0.040	-0.068	0.281	0.160	0.269	1.000	
24	0.012	0.144	0.058	0.046	0.144	0.090	0.161	-0.234	-0.182	-0.186	-0.224	1.000

Note: variables are: 1=PAAQ Rejection, 2=PAAQ Love, 3=PAAQ Angry, 4=PAAQ Derogating, 5=PAAQ Vulnerability, 6=PAAQ No Memory, 7=WMCI Richness of Perceptions, 8=WMCI Openness to Change, 9=WMCI Coherence, 10=WMCI Acceptance, 12=WMCI Rep. Of Self, 13=MEQ, 14=T1 Emotional Support, 15=T1 Practical Support, 16=T1 Caregiving Support, 17=T3 Emotional Support, 18=T3 Practical Support, 19=T3 Caregiving Support, 20=Demographic Risk, 21=Maternal Depression, 22=Domestic Violence, 23=Child Abuse/Neglect, 24=Infant Attachment. Standard Deviations are listed in Table 3.
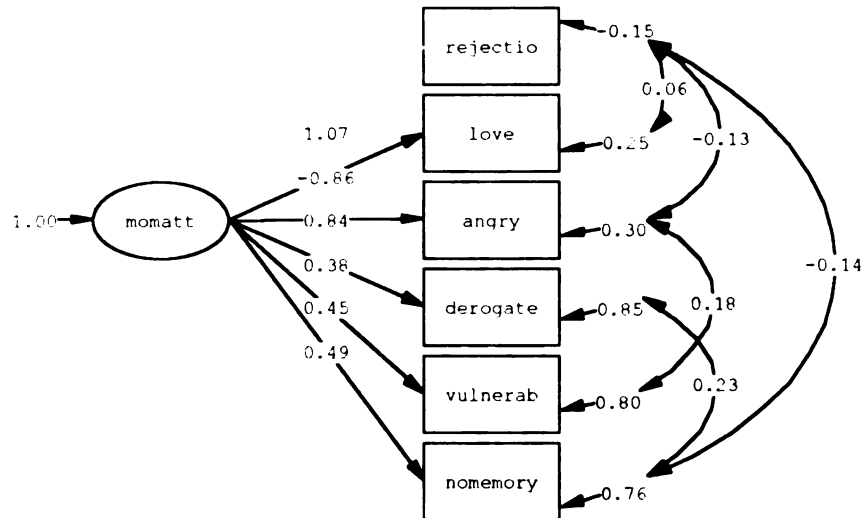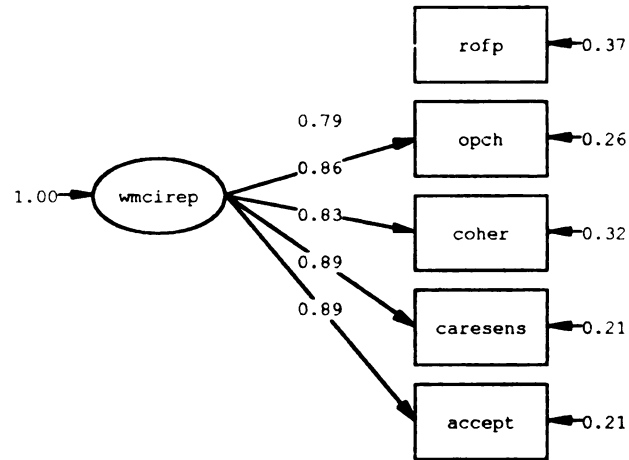
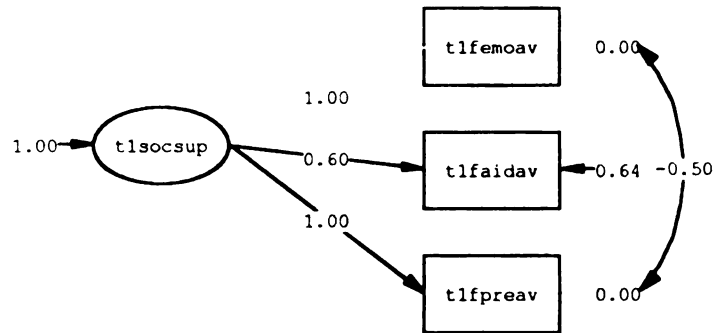Chi-Square=4.25, df=4, P-value=0.37270, RMSEA=0.018
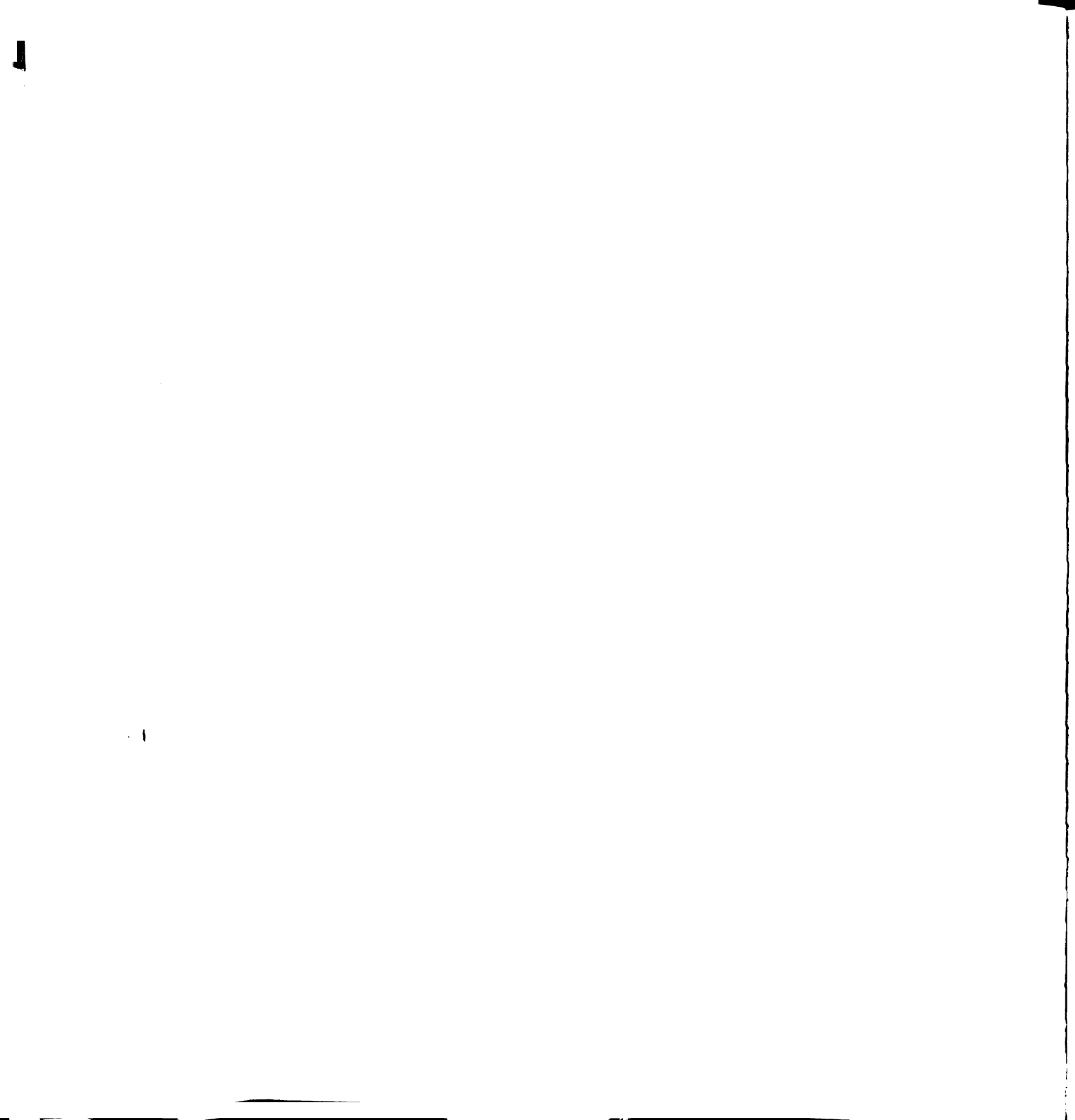
APPENDIX T
WMCI Measurement Model

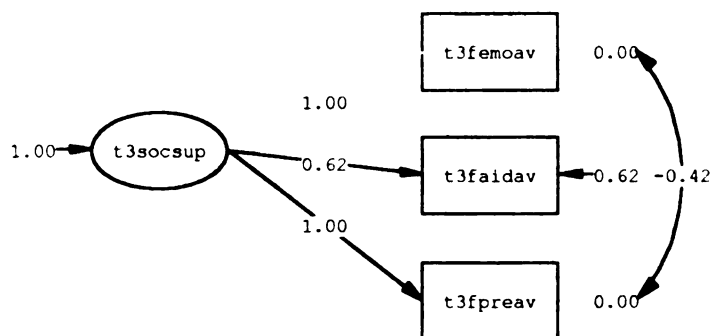Chi-Square=6.64, df=5, P-value=0.24905, RMSEA=0.040

APPENDIX U
Time 1 Social Support Measurement Model

Chi-Square=1.99, df=1, P-value=0.15852, RMSEA=0.069

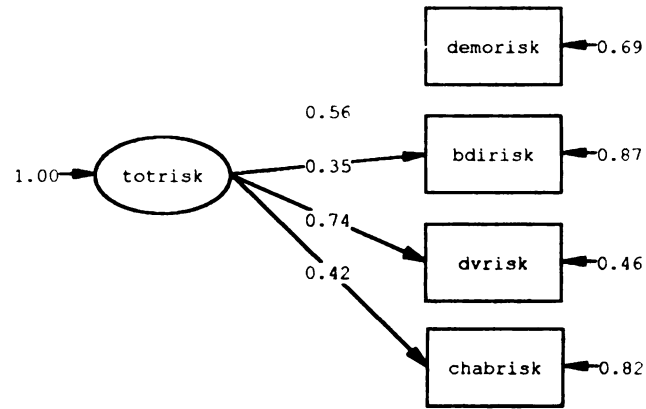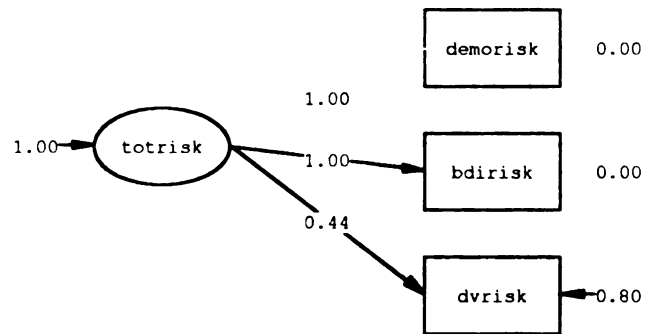Chi-Square=10.72, df=1, P-value=0.00106, RMSEA=0.217

APPENDIX W
Risk Factors Measurement Model

Chi-Square=3.90, df=2, P-value=0.14243, RMSEA=0.068

Revised Risk Factors Measurement Model

Chi-Square=4.68, df=2, P-value=0.09649, RMSEA=0.081

APPENDIX Y
Correlation Matrix of Final Model Variables

	1	2	3	4	5	6	7	8	9	10	11	12
1	1.000											
2	-0.863	1.000										
3	0.766	-0.720	1.000									
4	0.400	-0.317	0.359	1.000								
5	0.493	-0.385	0.558	0.154	1.000							
6	0.383	-0.442	0.385	0.421	0.221	1.000						
7	-0.192	0.137	-0.144	-0.270	-0.049	-0.268	1.000					
8	-0.201	0.097	-0.198	-0.209	-0.178	-0.153	0.654	1.000				
9	-0.174	0.064	-0.141	-0.230	-0.135	-0.158	0.664	0.728	1.000			
10	-0.236	0.112	-0.218	-0.269	-0.205	-0.244	0.702	0.782	0.720	1.000		
11	-0.194	0.112	-0.185	-0.275	-0.149	-0.228	0.729	0.752	0.726	0.785	1.000	
12	-0.232	0.114	-0.185	-0.251	-0.187	-0.180	0.667	0.684	0.668	0.686	0.694	1.000
13	-0.259	0.238	-0.206	-0.182	-0.213	-0.172	0.117	0.150	0.178	0.146	0.123	0.155
14	-0.353	0.373	-0.383	-0.303	-0.285	-0.217	0.087	0.076	0.064	0.103	0.112	0.138
15	-0.277	0.298	-0.260	-0.154	-0.184	-0.120	-0.034	-0.077	-0.041	-0.070	-0.031	0.025
16	-0.223	0.247	-0.154	-0.119	-0.116	-0.155	0.012	-0.094	-0.028	-0.090	-0.054	-0.002
17	-0.170	0.216	-0.158	-0.260	-0.135	-0.168	0.137	0.145	0.123	0.139	0.103	0.150
18	-0.124	0.147	-0.015	-0.168	-0.010	-0.049	-0.078	-0.155	-0.130	-0.123	-0.167	-0.077
19	-0.205	0.210	-0.080	-0.265	-0.066	-0.141	0.056	-0.085	-0.110	-0.023	-0.082	0.041
20	0.125	-0.020	0.159	0.158	0.113	0.069	-0.421	-0.421	-0.394	-0.490	-0.459	-0.397
21	0.267	-0.226	0.332	0.069	0.350	0.189	-0.221	-0.363	-0.269	-0.292	-0.291	-0.243
22	0.224	-0.157	0.284	0.078	0.252	0.032	-0.201	-0.396	-0.321	-0.311	-0.350	-0.264
23	-0.072	0.020	-0.104	-0.058	-0.039	-0.014	0.089	0.192	0.161	0.207	0.121	0.204

	13	14	15	16	17	18	19	20	21	22	23
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13	1.000										
14	0.242	1.000									
15	0.194	0.560	1.000								
16	0.136	0.496	0.633	1.000							
17	0.299	0.359	0.250	0.182	1.000						
18	0.188	0.255	0.426	0.282	0.540	1.000					
19	0.203	0.346	0.345	0.335	0.576	0.694	1.000				
20	-0.033	0.003	0.025	0.045	0.002	0.161	0.088	1.000			
21	-0.224	-0.202	-0.113	-0.134	-0.203	0.003	-0.077	0.094	1.000		
22	-0.069	-0.214	-0.149	-0.001	-0.228	-0.066	-0.101	0.435	0.317	1.000	
23	0.012	0.144	0.058	0.046	0.144	0.090	0.161	-0.234	-0.120	-0.164	1.000

Note: variables are: 1=PAAQ Rejection, 2=PAAQ Love, 3=PAAQ Derogating, 4=PAAQ Angry, 5=PAAQ Vulnerability, 6=PAAQ No Memory, 7=WMCI Richness of Perceptions, 8=WMCI Openness to Change, 9=WMCI Coherence, 10=WMCI Sensitivity, 11=WMCI Acceptance, 12=WMCI Rep. Of Self, 13=MEQ, 14=T1 Emotional Support, 15=T1 Practical Support, 16=T1 Caregiving Support, 17=T3 Emotional Support, 18=T3 Practical Support, 19=T3 Caregiving Support, 20=Demographic Risk, 21=Maternal Depression (Time 1 only), 22=Domestic Violence (Time 1 only), 23=Infant Attachment. Standard Deviations are listed in Table 3 and in the text for new risk variables.

180

APPENDIX Z
Standardized Residual Values for Observed and Latent Variables

Observed Variables:	Residual Value:
1. Rejection	-.02
2. Love	.27
3. Angry	.32
4. Derogating	.85
5. Vulnerability	.80
6. No Memory	.76
7. Richness of Perceptions	.36
8. Openness to Change	.26
9. Coherence	.32
10. Sensitivity	.22
11. Acceptance	.23
12. Representation Of Self	.38
13. Self-Efficacy	.15
14. T1 Emotional Support	.52
15. T1 Practical Support	.33
16. T1 Caregiving Support	.43
17. T3 Emotional Support	.56
18. T3 Practical Support	.37
19. T3 Caregiving Support	.26
20. Demographic Risk	.40
21. Maternal Depression	.84
22. Domestic Violence	.69
23. Infant Attachment Security	.67

Latent Variables:	
1. Maternal Representations of Attachment	1.00
2. Prenatal Representation of Infant	.55
3. Prenatal Representation of Self as Mother	.00
4. Postnatal Self-Efficacy	.88
5. Prenatal Social Support	1.00
6. Postnatal Social Support	.80
7. Risk Factors	1.00
8. Mother-Infant Attachment	1.00

Test of original dissertation model with risk revised for T1
da ni=23 no=207
la
rejectio love angry derogate vulnerab nomemory rofp optoch coher caresens
accept recmse totalmeq t1femoav t1faidav t1fpreav t3femoav t3faidav t3fpreav demorisk
bdirisk dvrisk overconv
ra fi=newfull.dat
mo ny=23 ne=8 te=sy,fi ps=sy,fi be=fi,fu
le
momatt wmci mse meq t1socsup t3socsup risk infatt
fr te 1 1 te 2 2 te 3 3 te 4 4 te 5 5 te 6 6 te 7 7 te 8 8 te 9 9 te 10 10
fr te 11 11 te 14 14 te 15 15 te 16 16 te 17 17 te 18 18
fr te 19 19 te 20 20 te 21 21 te 22 22
fr ps 1 1 ps 2 2 ps 5 5 ps 6 6 ps 7 7
fr ps 3 3 ps 4 4 ps 8 8 te 12 12
va 1 te 23 23 te 13 13
fr ly 1 1 ly 2 1 ly 3 1 ly 4 1 ly 5 1 ly 6 1
fr ly 7 2 ly 8 2 ly 9 2 ly 10 2 ly 11 2
fr ly 12 3
fr ly 13 4
fr ly 14 5 ly 15 5 ly 16 5
fr ly 17 6 ly 18 6 ly 19 6
fr ly 20 7 ly 21 7 ly 22 7
fr ly 23 8
fr be 2 1 be 3 1
fr be 3 2
fr be 4 3
fr be 6 5
fr be 4 6
fr be 8 4
fr be 8 2
fr be 2 7
fr ps 5 1 ps 6 8 ps 2 8
fr te 22 1 te 20 1 te 22 3 te 6 4 te 5 3 te 6 1 te 3 1 te 22 5 te 18 15 te 22 2 te 20 3 te 14 22
fr te 14 17 te 22 21 te 21 6 te 13 21 te 9 19 te 20 21 te 7 22 te 5 7 te 7 23 te 7 19 te 4 14
fr te 3 16 te 5 21 te 3 21
pd
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APPENDIX BB
Goodness of Fit Statistics

Degrees of Freedom = 194
Normal Theory Weighted Least Squares Chi-Square = 242.03 (P = 0.011)
Estimated Non-centrality Parameter (NCP) = 48.03
90 Percent Confidence Interval for NCP = (12.45 ; 91.77)

Minimum Fit Function Value = 1.26
Population Discrepancy Function Value (F0) = 0.23
90 Percent Confidence Interval for F0 = (0.060 ; 0.45)
Root Mean Square Error of Approximation (RMSEA) = 0.035
90 Percent Confidence Interval for RMSEA = (0.018 ; 0.048)
P-Value for Test of Close Fit (RMSEA < 0.05) = 0.97

Expected Cross-Validation Index (ECVI) = 1.97
90 Percent Confidence Interval for ECVI = (1.80 ; 2.18)
ECVI for Saturated Model = 2.68
ECVI for Independence Model = 13.29

Chi-Square for Independence Model with 253 Degrees of Freedom = 2692.25
Independence AIC = 2738.25
Model AIC = 406.03
Saturated AIC = 552.00
Independence CAIC = 2837.90
Model CAIC = 761.31
Saturated CAIC = 1747.83

Normed Fit Index (NFI) = 0.90
Non-Normed Fit Index (NNFI) = 0.96
Parsimony Normed Fit Index (PNFI) = 0.69
Comparative Fit Index (CFI) = 0.97
Incremental Fit Index (IFI) = 0.97
Relative Fit Index (RFI) = 0.87
Critical N (CN) = 193.09
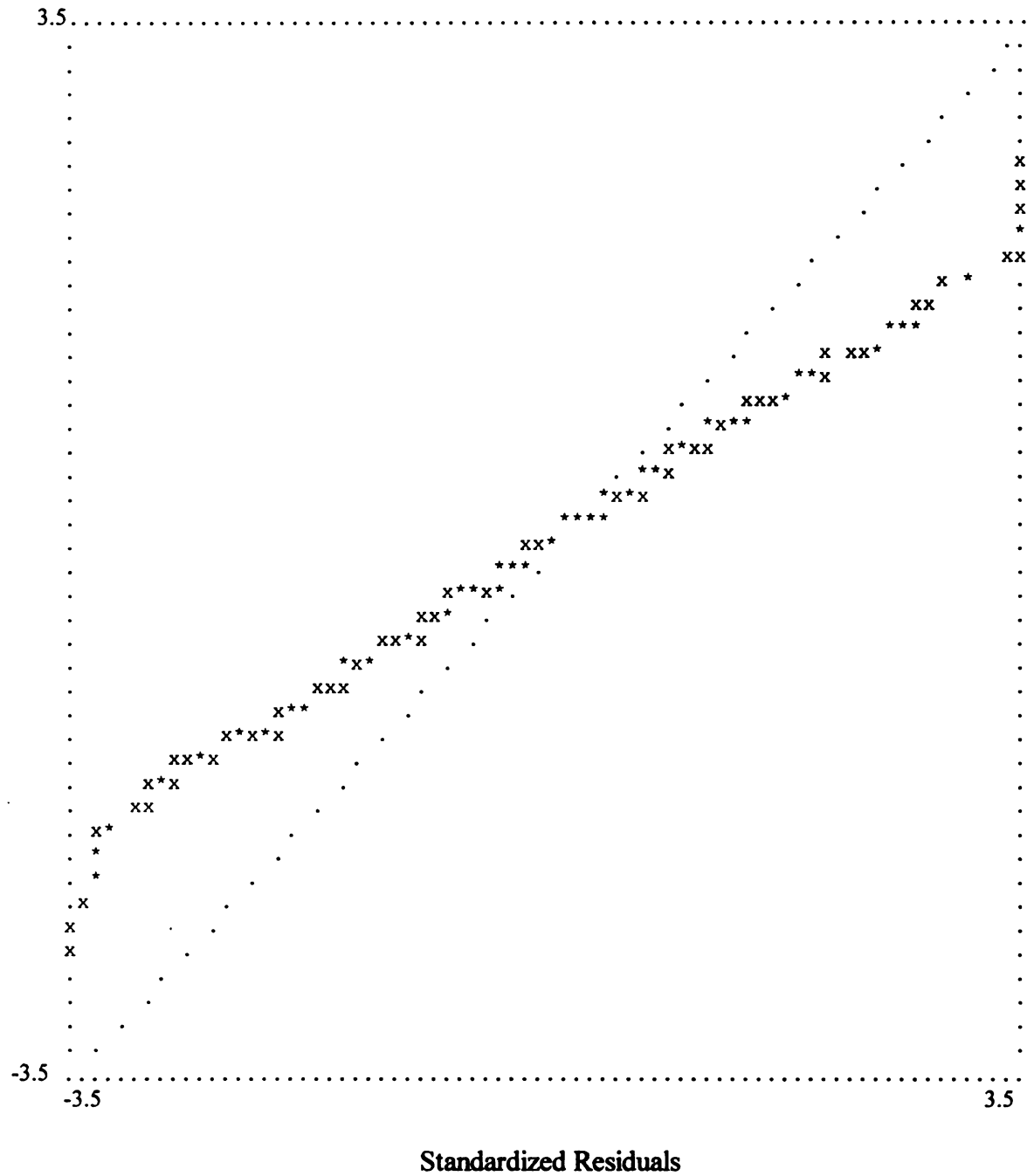

Root Mean Square Residual (RMR) = 0.64
Standardized RMR = 0.090
Goodness of Fit Index (GFI) = 0.91
Adjusted Goodness of Fit Index (AGFI) = 0.87
Parsimony Goodness of Fit Index (PGFI) = 0.64

APPENDIX CC
Q-plot of Standardized Residuals

3.5

-3.5

-3.5   3.5

Standardized Residuals

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187

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195

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