

MATERNAL AND FETAL REPRESENTATIONS, DIMENSIONS OF
PERSONALITY, AND PRENATAL ATTACHMENT IN WOMEN HOSPITALIZED
WITH HIGH RISK PREGNANCY

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DEDICATION

To mothers and babies everywhere, including mine,
and to David.

MATERNAL AND FETAL REPRESENTATIONS, DIMENSIONS OF PERSONALITY,
AND PRENATAL ATTACHMENT IN WOMEN HOSPITALIZED
WITH HIGH RISK PREGNANCY

by

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The present study investigated the effects of self-criticism, dependency, object representation, and risk upon maternal antenatal attachment in women hospitalized during pregnancy with high risk of maternal or fetal demise. Ninety-one women completed the Depressive Experiences Questionnaire (Blatt, D’Affliti, and Quinlan, 1976), the Object Relations Inventory (Blatt et al., 1992), the Maternal Antenatal Attachment Scale (Condon, 1973), the Edinburgh Postpartum Depression Scale (Cox, Holden, and Sagovsky, 1987) and the Center for Epidemiological Studies Depression Scale (Unauthored, 1999) within the first three days of hospital admission. No relationship was indicated between maternal representations and antenatal fetal attachment, nor was there a correlation between maternal representation and fetal representation. Self-critical mothers significantly scored lower in the measure of antenatal attachment quality and endorsed a higher number of depressive symptoms. Mothers hospitalized because of maternal risk were not significantly different in their reports of attachment than were mothers hospitalized because of fetal risk, and no significant differences were found across severity of risk factors as evaluated by the Hobel Risk Assessment. Consistent with previous research, depressive symptomatology was associated with a lower quality of maternal antenatal attachment overall. Results suggest that maternal narratives may not be significantly linked with reported antenatal attachment and depressive symptoms have a stronger association with reductions of antenatal attachment than dependent or self-critical tendencies.

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LIST OF DEFINITIONS

Antenatal—period of gestation also referred to as “prenatal” and “antepartum.”

Antepartum—period of gestation, also referred to as “antenatal” and “prenatal.”

Antepartum depression—in this discussion, refers to the onset of a major depressive episode or minor depression during pregnancy.

External validity—the extent to which a study’s conclusions can be applied to populations and settings outside those of the study itself.

Incidence—the percentage of the population with an illness episode that begins within a given period of time (e.g., during pregnancy or within the first 3 months following delivery).

Internal Working Model (IWM)—dynamic mental representations or “templates” constructed by infants of their interpersonal world that shape expectations, responses, and interpretations of interpersonal behavior

Major depressive disorder—a type of mood disorder characterized by one or more major depressive episodes. The Diagnostic and Statistical Manual, version IV, Text Revision, (DSM-IV-TR) defines a major depressive episode as a period of at least 2 weeks during which an individual experiences daily disturbance in mood (intense feelings of sadness), or loss of interest in activities that have been pleasurable in the past, and at least four of eight symptoms: (1) hypersomnia or hyposomnia, (2) changes in appetite or loss/gain of weight, (3) psychomotor agitation or retardation, (4) loss of energy (fatigue), (5) feelings of worthlessness or excessive guilt, (6) problems with concentration, (7) loss of interest in sex, and (8) recurrent suicidal thoughts or suicidal attempt. These symptoms must be present most of the day and nearly every day during the 2-week episode, must cause clinically significant distress or impairment in functioning, and must not be the result of the direct physiologic effects of a substance or a general medical condition. Major depressive disorder is not diagnosed if symptoms are attributable to an acute grief reaction; however, it is diagnosed after an acute grief reaction if the syndrome persists for two months or longer. It is not diagnosed if there is a history of manic, hypomanic, mixed episodes, or schizophrenia.

Minor depressive disorder—a subthreshold diagnosis with a number of definitions (also referred to as minor depression). This term usually describes one or more episodes of depression lasting two weeks or longer but with fewer symptoms than required for major depressive disorder diagnosis.

Multigravida--a pregnant woman who has carried a previous fetus to viability, regardless of outcome.

Multipara—a woman who has carried more than one fetus to viability, regardless of whether the offspring were born alive. Multiparity is the condition of having carried one or more fetuses to viability, and multiparous describes a woman who has borne more than one child.

Object Representation—A psychoanalytic term referring to the internal mental representational aspects of a significant other person, incorporating both realistic and fantasied characteristics of the relationship.

Perinatal—during pregnancy (also referred to as prenatal) and 12 months following delivery.

Period Prevalence—the percentage of the population with depression over a specific period of time (e.g., during pregnancy or from delivery to the end of the first six weeks, the first three months, or the first year, etc.).

Postnatal—period of time following birth referring to the infant

Postpartum—period of time following birth referring to the mother lasting from parturition to 12 months after delivery.

Postpartum depression—the DSM-IV-TR defines this as a specific type of major depressive disorder that has an onset of a major depressive episode within 4 weeks after delivery. In this discussion, the term will be expanded to include minor depression.

Point Prevalence—the percentage of the population with depression at a given point in time

Prenatal—the period of pregnancy from conception to parturition.

Primagravida—A woman during her first pregnancy.

Primipara—A woman who has been delivered of one infant of at least 20 weeks gestation regardless of its viability, and primiparous describes a woman in the period of time surrounding her first pregnancy.

Puerperium—the 6-week period following delivery.

Reliability—the extent to which a test, inventory, or scale is consistent in its evaluation of the same individuals

Screening instrument—a measure or test utilized to identify an individual with respect to likelihood of having a specific disorder. A screen itself does not provide a diagnosis, however, when positive, indicates that further investigation is necessary to confirm (or disconfirm) the presence of the disorder.

Sensitivity—the ability of a measure or test to correctly identify those with a syndrome, calculated as the percentage of true positive values compared to false negative values.

Specificity—the ability of a measure or test to correctly identify those who do not have a syndrome, calculated as the percentage of true negative values compared to false positive values.

Validity—the extent to which a test, inventory, or scale measures what it is supposed to measure.

CHAPTER ONE

Introduction

HISTORY OF ATTACHMENT THEORY

John Bowlby, a young volunteer at a school for maladjusted children, was moved by his experiences with two young boys—one isolated and distant, the other anxious and clinging (Ainsworth, 1968). Since neither child had a stable mother figure, he wondered if early family relationships had profound effects upon the personality development of children. His curiosity and desire to explore this idea, coupled with his rigorous scientific training at the University of Cambridge, led to a reevaluation of career goals and the decision to become a child psychiatrist (Bretherton, 1992; Senn, 1977). Subsequent work led to his formulation of the basic tenets of what is known today as “attachment theory,” a synthesis of elements from ethology, cybernetics, information processing, developmental psychology, and psychoanalysis. Bowlby’s original work focused on the infant’s biological need for a secure early attachment to the mother and the mother’s response, a major conclusion being that a maturing child’s mental health fundamentally required that “the infant and young child should experience a warm, intimate, and continuous relationship with his mother (or permanent mother substitute) in which both find satisfaction and enjoyment” (Fonagy, 2001a; Bowlby, 1951; Bowlby, 1969).

Bowlby conceptualized the attachment system as an evolutionary set of behaviors related to those of exploration, fear, affection, and caregiving. Regulation of this system, Bowlby reasoned, was solely biological; he posited that the infant’s primary goal was to maintain a certain degree of physical proximity to the mother for survival. Bowlby later

added to his stance that attachment would include psychological goals on the part of the developing child and mother, but his insistence that attachment was an independent behavioral system and not related to unconscious drives was a solid wedge between his theory and the psychoanalytic theories of his training. Even though this assumption separated him from the analytic community, key researchers such as Mary Ainsworth, James Robertson, Rudolph Schaffer, and Christopher Heinicke aligned with him to flesh out the theory of attachment that is understood today.

Ainsworth, in particular, believed that the infant's contribution to the attachment process was more than biological and included his or her own internal appraisal of the mother's behaviors (Ainsworth, Blehar, Waters, & Wall, 1978). The "Strange Situation," a 20-minute laboratory test developed by Ainsworth, was the first attempt to scientifically capture the activation of attachment system behaviors between mother and child (Ainsworth et al., 1978). One-year-old children were exposed to two brief separations from their mothers; the responses of both mother and baby were recorded and became the basis for a categorical system of attachment that is still in use today. Most of the children in this study responded to their mothers' absence with some distress but, at her return, were rather quickly comforted and returned to their play. These babies were thought to be "securely attached." About 25 percent of the babies responded to mother's return with indifference, a category named "insecure—avoidant." Another 15 percent sought proximity to their mothers but displayed little or no relief from their distress when reunited. This style was also regarded as insecure, but called "anxious resistant." The discovery that physical separation alone could not account fully for infant response took attachment research to a new level.

Ainsworth and Bowlby persevered in their investigation of the idea that cognitive mechanisms underpinned the behavioral components of the attachment system. Bowlby coined the term “internal working model” to describe a process of mental representation that the preverbal infant developed of his primary caregiver. In his historical work, *Attachment and Loss: Volume I, Attachment*, Bowlby described a child’s “internal world” in this way:

Starting, we may suppose, towards the end of his first year, and probably especially actively during his second and third when he acquires the powerful and extraordinary gift of language, a child is busy constructing working models of how the physical world may be expected to behave, how his mother and other significant persons may be expected to behave, how he himself may be expected to behave, and how each interacts with all the others. Within the framework of these working models he evaluates his situation and makes his plans. And within the framework of the working models of his mother and himself he evaluates special aspects of his situation and makes his attachment plans (1969; pg. 354).

Using this concept, Ainsworth’s infants must have had distinct internal representations of their mothers and of what separation from her meant. What went unmentioned in Ainsworth’s original study was her ability to anticipate each infant’s attachment style based on observations of maternal behavior. Her years of home observations in Uganda had caused her to suspect a predictive link might exist between maternal responsiveness and security of infant attachment (Ainsworth & Marvin, 1995). Ainsworth and colleagues subsequently introduced the concept of “sensitivity” to describe the type of caregiving she found that correlated with secure attachment on the part of the infant (Ainsworth, Bell, & Stayton, 1974). Mothers who exhibited sensitive caregiving behavior were those able to (a) attune to infant’s signals with attentiveness, (b) appropriately interpret the signals, (c) respond appropriately to the signals, and (d) react promptly, in a time period that did not provoke excessive frustration for the child. Highlighting that central to the internal working model was the expected availability and response of the attachment figure injected an importance

into the actions of the maternal part of the dyad that the previous systemic view of attachment behaviors had not (Sroufe & Waters, 1977; Bowlby, 1973). Bowlby continued to refine his approach, further hypothesizing that a child's internal working model of self takes a complementary position to the representation the infant has of his caregiver. In the most primary form of this collaboration, the child evolves a representation of how acceptable or unacceptable he is by how he feels his caregiver views him. More complex forms of this transaction appear all through life in self-other relationships (Fonagy, 2001b).

Those who followed Bowlby and his fellow pioneers of theory moved beyond infancy and began exploring attachment through the internal worlds of young children (Main, Kaplan, & Cassidy, 1985), adolescents (Kobak & Sceery, 1988), and adults (George, Kaplan, & Main, 1985). The Adult Attachment Inventory (AAI), developed by George et al., consists of a series of open-ended probing questions designed to elicit as many details as possible about the individual's childhood attachment experiences and personal evaluations of the effects those early events have on current life functioning (George et al., 1985). This enabled researchers to compare adult and child attachment within the same theoretical framework and categorization strategy. The next wave of research divided adult attachment into two distinct perspectives: parenting and romantic relationships (Bartholomew & Shaver, 1998; Hazan & Shaver, 1987; Bartholomew & Horowitz, 1991). Moving from the behavioral level to the representational level allowed the exploration of how early attachment experiences were remembered by adults as well as how these memories might act as templates for interpersonal relationships (Main et al., 1985). This has broadened the application of attachment theory to all stages of life, including an empathic understanding of

the emotional significance of death and dying (Kubler-Ross, 1969). In each vein of research, behavioral, emotional, and cognitive markers have been identified to enable the measurement of attachment and, since Ainsworth's first measure, numerous objective and projective instruments have been developed for examining childhood, adolescent, and adult attachment.

THE CONCEPTUALIZATION OF PRENATAL ATTACHMENT

It is only fitting that theoretical analyses of the experience of pregnancy largely began with women theorists. Deutch, Bibring, and Benedek explained prenatal attachment in psychodynamic terms as a process in which a pregnant woman's libidinal energy was cathected into the fetus (Deutch, 1945; Bibring, 1959; Bibring, Dwyer, Huntington, & Valenstein, 1961; Benedek, 1959; Benedek, 1958). They hypothesized that the fetus becomes more human to the woman as pregnancy progresses, and eventually the fetus becomes loved both as an extension of self and as an independent object. While this was fascinating material, one of the first empirical suggestions that there was some prenatal connection between mother and fetus came from Kennell and Klaus' observations of the intense grief exhibited by mothers of infants who died during birth (Kennell, Slyter, & Klaus, 1970). This team found maternal grief uninfluenced by whether or not the mothers had any physical contact with the babies after delivery. Additional work by Klaus and others drew attention to the deleterious effects of early separation between mother and neonate and introduced ways of enhancing early postnatal attachment (Klaus et al., 1972). These new ideas launched scientific inquiry by a few key individuals, bringing about the formulation of the construct of prenatal attachment within both medical and psychological communities.

Rubin, a nurse specializing in maternity care doing doctoral work at the University of Chicago, led the way as she explored women's attainment of the maternal role, concluding that the immediate bond between postpartum mother and neonate was a consequence of prenatal processes (Rubin, 1967; Rubin, 1975). Rubin identified four specific tasks the women she observed navigated before childbirth: (1) Seeking safe passage for self and baby, (2) ensuring that the baby is accepted by significant others, (c) binding-in to the fetus, and (4) giving of herself. These tasks formed a framework for early investigation of the psychological experience of pregnancy.

Meanwhile, a perinatal epidemiologist in Australia interviewed 30 primagravidas (first pregnancies) at various time points throughout the three trimesters of pregnancy and found they were able to conceptualize their babies in an increasingly human way over the passage of time (Lumley, 1972). The introduction of ultrasound during pregnancy inspired her to examine the impact on maternal bonding of a visual image of the fetus (Lumley, 1980). Lumley's findings suggested this early view of the fetus enhanced a mother's ability to differentiate it as a "little person." Her next project was one of the first empirical longitudinal studies of prenatal attachment. Through the use of simple tape-recorded interviews at 5 time points before and after childbirth, she attempted to capture first-time parents' attitudes of their fetus. She conceptualized attachment as being an "established relationship with the fetus in imagination," a point at which mothers thought of their babies as a "real person" (Lumley, 1982). Lumley reported this phenomenon in 30% of her subjects in the first trimester, 63% in the second trimester and, by 36 weeks gestation, in 92%. She

interpreted delayed attachment as being related to unpleasant symptoms of pregnancy and lack of interest or support on the part of husbands.

Leifer, a psychologist at the Illinois Institute of Technology, was the author of a monograph reporting findings from a study of 19 primigravidas on the psychological changes observed during the course of gestation (Leifer, 1977). She concluded that, while pregnancy was a time of emotional upheaval and rapid role change, it was also a time of developmental maturation. Leifer introduced the element of personality into the psychological state of pregnancy, concluding the degree of personality integration achieved during the first months of pregnancy could predict psychological growth throughout the rest of pregnancy and into early motherhood.

While early formations of prenatal attachment came from the psychoanalytic approach, the study of the concept was carried on in earnest by nurses, often in the process of graduate work. Mecca Cranley, for example, wrote the first literature review of the subject as her dissertation, proposing a multidimensional model composed of six aspects of maternal-fetal attachment she had identified from her research: Differentiation of Self from Fetus, Interaction with the Fetus, Attributing Characteristics to the Fetus, Giving of Self, Role Taking, and Nesting (Cranley, 1979). Cranley is also credited with the first formal definition of the construct of maternal-fetal attachment (MFA): “The extent to which women engage in behaviors that represent an affiliation and interaction with their unborn child” (Cranley, 1981).

Muller, a researcher who utilized Cranley’s construct of maternal fetal attachment, ultimately found this strategy of conceptualizing the phenomenon focused on behaviors to

the exclusion of the thoughts and fantasies which also revealed the growing affiliation between mother and fetus (Muller, 1993). In her dissertation work, she redefined prenatal attachment as “the unique relationship that develops between a woman and her unborn fetus. These feelings are not dependent on the feelings the woman has about herself as a pregnant person or her perception of herself as a mother” (Muller, 1990). An Australian researcher, John Condon, also found Cranley’s work insufficient in the description of MFA. He went back to adult attachment theory and proposed Bretherton’s broad view of attachment as an “emotional tie” or “psychological bond” to a specific object was not only applicable to MFA but added coherence to the construct (Condon, 1993; Bretherton, 1985). Condon suggested that antenatal attachment contained the core experience of love, and could be described as a developing relationship in which the mother seeks “to know, to be with, to avoid separation or loss, to protect, and to identify and gratify the needs of her fetus.” He later formally defined prenatal attachment as simply “the emotional tie or bond which normally develops between the pregnant parent and her unborn child” (Condon & Corkindale, 1997). Now there were three definitions to the developing construct of prenatal attachment that did not have much in common.

The most recent conceptualization of prenatal attachment has attempted to combine these behavioral, cognitive, and emotional approaches with this working definition: “Prenatal attachment is an abstract concept, representing the affiliative relationship between a parent and fetus, which is potentially present before pregnancy, is related to cognitive and emotional abilities to conceptualize another human being, and develops within an ecological system”

(Doan & Zimmerman, 2003). However, no consistent use of any of these four definitions of the construct has been noted in recent research.

THE MEASURE OF PRENATAL ATTACHMENT

Cranley developed the first antenatal attachment scale, the Maternal Fetal Attachment Scale (MFAS), using the six aspects she had conceptualized in her dissertation work (Differentiation of Self from Fetus, Interaction with the Fetus, Attributing Characteristics to the Fetus, Giving of Self, Role Taking, and Nesting; Cranley, 1981; Cranley, 1979). She asked clinicians and childbirth educators to identify statements made by their patients that implied MFA; the resulting 37 items were then administered to 71 pregnant women between 35 and 40 weeks gestation. Due to a lack of statistical reliability, she eliminated the Nesting aspect after this pilot of the scale. The resulting 24-item instrument yielded five subscales and one global measure of maternal-fetal attachment. Having an instrument pushed MFA research ahead quickly; most previous studies had been qualitative with small samples. The MFAS gave the field a quantitative measure appropriate for cross-sectional studies of larger samples (Grace, 1989) and, 25 years after its development, continues to be the instrument used most frequently by nurse researchers in prenatal studies (Beck, 1999b).

Muller's personal research utilizing the MFAS and her subsequent 1992 literature review found no consistent results; in fact, findings were often either inconclusive or contradictory (Muller & Ferketich, 1992; Muller, 1992). She began to entertain doubt that Cranley's five subscales truly captured prenatal attachment, and even wondered if MFA could be viewed in such a multidimensional fashion (Muller & Ferketich, 1993). Another

research team also questioned the theoretical base of the MFAS, as well as its reliability and validity (Mercer, Ferketich, May, DeJoseph, & Sollid, 1988). The Mercer team made data from a study on antepartum stress available to Muller, and she conducted a secondary analysis of the interviews with those participants (Mercer, Ferketich, DeJoseph, May, & Sollid, 1988). Her findings indicated only three of Cranley's subscales corresponded with the categories generated by the interview data, and two (Giving of Self and Interaction with the Fetus) did not correspond at all (Muller et al., 1992; Beck, 1999a). As Muller suspected, Cranley's items were not capturing certain emotional elements Muller documented from the open-ended interviews of women in the Mercer et al. study (1988). Mercer participants often made statements about their unborn babies using words like "hope," "wish," and "imagine;" they seemed to be expressing feelings rather than just engaging in behaviors. This analysis led to the development of a new scale, the Prenatal Attachment Inventory (PAI; Muller, 1990). The 29 items of this instrument were designed to measure affectionate attachment or the personal relationship that develops during pregnancy between mother and fetus. The construction reflected Muller's disagreement with a multidimensional view of MFA and contained no subscales, providing only a global score. Muller's intent was for this scale to emphasize affiliation, exclude behavioral measures, and stand as an adjunct to Cranley's MFAS, with the goal of increasing agreement across studies (Muller, 1993). Muller also conceptualized a new model of attachment in pregnancy, postulating that an expectant mother's early experiences with her primary caregiver led to the development of internal representations, which then influenced subsequent attachments to family, partner, and

friends. Ultimately this process enabled a woman to adapt to pregnancy and attach to her fetus.

Muller's claim that the MFA construct was unidimensional and her assertion that the PAI yielded only one global measure was challenged some years later by a research team with a sample of 171 Swedish women in their third trimester of pregnancy (Siddiqui, Hagglof, & Eisemann, 1999). Their analysis revealed an underlying dimensional structure with five identifiable factors representing recurrent themes that accounted for 53.9% of the variance: Affection, differentiation of self from fetus, interaction, sharing pleasure, and fantasy. The team proposed that Muller's measure actually supported a multidimensional construct of MFA, pointing out several possible explanations for the disagreement. Their most convincing argument was that Muller's work had been conducted on women at various points in their pregnancy, anywhere between 14 and 40 weeks of gestation, while the Siddiqui et al. team administered the PAI during the third trimester only (between the 36th and 40th week of gestation). Since literature was abundant with recent findings strongly indicating that MFA increased through the course of the pregnancy (Cranley, 1981; Grace, 1989; Lerum & LoBiondo-Wood, 1989), Muller's data was confounded by this variation (Siddiqui et al., 1999).

The newest instrument on the MFA scene was developed in Australia by John Condon (Condon, 1993; Condon & Corkindale, 1998). Condon believed that the existing instruments inadequately differentiated the attitude toward the fetus from the attitude toward the state of pregnancy and motherhood. He included 19 items in his Maternal Antenatal Attachment Scale (MAAS), focusing exclusively on thoughts and feelings about the baby

and ignoring attitudes about the physical state of pregnancy or the maternal role. Two factors, “quality” and “intensity,” were generated. “Quality” described the affective experiences the mother reported, such as closeness/distance, tenderness/irritation, positive/negative, joyful/unpleasant anticipation, and a vivid/vague internalized representation of the fetus as a real person. “Intensity” referred to the amount of time she spent thinking about, talking to, dreaming about, or tactilely interacting with the fetus. Condon mapped these two factors as perpendicular continuums, forming four quadrants of attachment style.

One other scale, the Prenatal Maternal Attachment Scale, is mentioned in the literature, however, only one published study in addition to the initial methodological study has reported its use (Fowles, 1996; LoBiondo-Wood & Vito-O'Rourke, 1990). 29 items are designed to be administered at any time during pregnancy, and 10 additional items are completed only after quickening is experienced.

Of these described instruments, Cranley’s MFAS and Condon’s MAAS are the two most commonly used measures (Laxton-Kane & Slade, 2002). While it is beyond the scope of this discussion, it also must be noted that both Cranley and Condon have constructed paternal adaptations of their measures, hypothesizing that there may be a complementary paternal-fetal attachment process (Weaver & Cranley, 1983; Condon, 2005). No doubt these multiple approaches to capturing the attachment process have stimulated the increased attention and empirical research devoted to MFA, with particular curiosity concerning relationships between the nature of such attachment and the mother’s early parenting experiences, her cognitive capacity to develop an internal working model of her fetus, her

own adult attachment style, her level of social support, and links to perinatal depression, anxiety, and postnatal attachment (Cannella, 2005).

CRITICISM OF THE MFA CONSTRUCT

Bowlby's original theory was built on the premise of reciprocal elements in the attachment system. Since prenatal attachment can only be investigated through one part (mother) of this system, some feel that attachment cannot be measured antenatally with any validity. In addition, the concept of prenatal attachment requires a view of the motivation of security counter to the original theory of the attachment system. Infant and adult attachment in the Bowlbian sense had the goal of security seeking; attachment behaviors were triggered by distress and fear of separation from the attachment figure. In maternal antenatal attachment the mother provides (or may feel responsible for providing) security for the fetus. It has been proposed that prenatal attachment is more appropriately viewed as an "emotional bond" that bears similarities to attachment but is not the same as traditional infant and adult attachment (Pollock & Percy, 1999). Along this line of thinking, it has been suggested that prenatal attachment inventories are no more than attitude measures that may be confounded by social desirability and adjustment (Waters, 2005).

That pre- and post-birth attachments may require different conceptual frameworks is inarguable; nevertheless, their interrelationship is visible in the consistent attention the Bowlbian contingent gives to the mother's own cognitive representations of caregiving and by viewing the feelings and behaviors related to this internal working model as critical to her contribution as an attachment figure for her infant. The possibility there is a convergence

between MFA and mother-infant attachment is illustrated by the association found between measures of prenatal attachment and the following: Postnatal attachment style categorization (Muller, 1996b), parental behavior before and after birth (Condon et al., 1997; Pollock & Percy, 1999), maternal feelings for the neonate after delivery (Leifer, 1977), feeding behavior and maternal sensitivity to an infant's cues, (Fuller, 1990), and postnatal maternal involvement with the infant (Siddiqui, Hagglof, & Eisemann, 2000). This author suggests that, in the absence of the infant's contribution to the matrix (appearance, temperament, etc.), measuring prenatal attachment may provide an avenue for a purer investigation of factors that are solely maternal, such as the mother's own personality, attachment style, and mental representations of her own early caregiving experiences.

In addition, the issue of reciprocity may be less important if the expectant mother assigns reciprocity to the fetus in terms of movement and activity. A literature review of prenatal attachment found that quickening, or discernable fetal movement, was consistently found to be positively correlated with attachment as measured by questionnaires (Muller, 1992). In one randomized controlled observational study of a sample of 213 women with uncomplicated pregnancies, fetal movement counting resulted in a statistically significant increase in total attachment scores on the Cranley scale of maternal-fetal attachment (Mikhail et al., 1991). Zeanah et al. reported that mothers with higher levels of prenatal attachment perceived more movement from their fetus' than those with lower attachment (Zeanah, Carr, & Wolk, 1990). Additionally, an exploratory study of 26 couples proposed four levels of parental awareness during the third trimester of pregnancy, one of which was "awareness of infant interactive ability" (Stainton, 1990). Some participants described their infants as

actively participating in communication with them by moving toward abdominal stroking, extending a limb, or increasing/decreasing activity when certain voices were present.

Lastly, fetal perceptions in utero are largely unknown. Some theorists have hypothesized that intrauterine experience appears to leave “dim residues” that influence later preference for open versus closed spaces (Balint, 1959), sleeping positions, and sensory sensitivities (Piontelli, 1987; Piontelli, 1988). Neonatal research has found that newborns can recognize their mother on the basis of visual cues alone (Bushnell, Sai, & Mullin, 1989), by voice (Fifer, 2002), and by odor (Porter, Winberg, & Varendi, 2005). In one older trial, neonates could produce either the mother’s voice or the voice of another female by sucking on a nonnutritive nipple in different ways (DeCasper & Fifer, 1980). It is not inconceivable that, beyond our measurement ability, some intrauterine fetal phenomenon complementary to MFA takes place. Therefore, without disregarding the issues raised concerning the validity of prenatal attachment measures, the literature available supports their use in further research (Beck, 1999c).

THE RELEVANCE OF PRENATAL ATTACHMENT

Bowlby and colleagues illustrated how critical responsive and sensitive caregiving is for the psychological health of humans from infancy through development, and the contributions of the others described in this discussion have strongly suggested mothers develop caregiving capacity through a variety of prenatal processes. As a result, from a clinical standpoint, the concept of antenatal attachment has facilitated an understanding of the pregnancy period, as well as an understanding of the emotional cost of the loss of a fetus

(Laxton-Kane et al., 2002; Stainton, 1990a; Boyce & Condon, 2000; Condon, 1986; Frost & Condon, 1996). However, refinements of the theoretical construct tested via hypotheses in correlational, comparative, and longitudinal designs are sorely needed (Cannella, 2005). Along with increased empirical knowledge comes responsibility to investigate ways to identify mothers at risk for poor attachment and interventions that can adequately prepare women for motherhood. Women unsure of their attachment may respond to appropriate interventions, and women unaware of or unconcerned about their attachment to their fetus may benefit from education and motivation (Shieh, Kravitz, & Wang, 2001). While some interventions promoting prenatal attachment have been introduced, there is much more to be learned about the concept of attachment, what facilitates its growth, and what prevents or stifles it (Carter-Jessop, 1981; Carson & Virden, 1984; Mikhail et al., 1991; Cranley, 1992).

Studies of the use of MFA to predict postnatal mother-infant attachment are inconclusive in light of inconsistent research and the few available longitudinal studies. Modest correlations have been found between an unpublished measure of attachment and maternal feelings of attachment 24 hours after delivery (Reading, Cox, Sledmere, & Campbell, 1984), prenatal psychological functioning and postnatal attachment (Leifer, 1980), MFAS scores and postnatal maternal interaction (Fuller, 1990), Prenatal Attachment Inventory (PAI) scores and the Maternal Attachment Inventory (an attitude-based postnatal measure) (Muller, 1996a), PAI scores and postnatal maternal involvement (Siddiqui & Hagglof, 2000), MFA and maternal competence (Mercer & Ferketich, 1994), and MFA and mutuality in family relationships and infant mood (White, Wilson, Elander, & Persson, 1999). These longitudinal studies describing contributors to secure attachment are clinically

significant, but also demonstrate how much more work needs to be done in order for a complete understanding of the impact of MFA quality on the next generation.

A generational quality to attachment is suggested by a benchmark study conducted in Great Britain with a sample of 100 primagravidas (Fonagy, Steele, & Steele, 1991). On the basis of AAI classifications given to expectant parents during the last trimester of pregnancy, the research team was able to predict the Strange Situation category of infant attachment to parent when the child was 1 year of age. The correlation between parents and babies styles in the “secure” and “insecure” categories was robust ($r = 0.75$). This suggests that a parent’s state of mind in regard to attachment has an enormous effect upon the quality of attachment of their child (this is not to suggest that significant life events during the first year of life do not have an effect). These findings stimulated many replication studies with the same link between secure mothers and secure babies, and insecure mothers and insecure babies (Levine, Tuber, Slade, & Ward, 1991; Mikulincer & Florian, 1999; Priel & Besser, 2000b). The implication that we might be able to target families at risk for insecure attachment provides a new venue for developing interventions to break vicious cycles and foster healthier attachment.

Attachment theory has also provided another way of conceptualizing the vulnerability to or etiology of psychopathology. By the publication of his second volume in the *Attachment and Loss* series, Bowlby was hypothesizing links between insecure attachment and particular psychopathologies, such as phobias (Bowlby, 1973). Later prospective studies by a plethora of researchers have connected insecure attachment with conduct disorders, parental depression, parental schizophrenia, borderline personality disorder, adolescent

suicidal acting-out, and vulnerability to psychopathology in childhood (Brisch, 2002). As research on attachment disorders continues, new importance is ascribed to early identification and intervention. Inge Bretherton aptly applies one of Freud's statements:

So long as we trace the development from its final outcome backwards, the chain of events appears continuous, and we feel we have gained an insight which is completely satisfactory or even exhaustive. But if we proceed in the reverse way, if we start from the premises inferred from the analysis and try to follow these up to the final results, then we no longer get the impression of an inevitable sequence of events which could not have otherwise been determined (Bretherton, 1992; Freud, 1955).

It is an estimable goal to have enough knowledge about the role of MFA to "proceed in the reverse way," and endeavor to make the "inevitable sequence of events" in incomplete mother-child attachment not so inevitable.

Poor attachment has not surprisingly been associated with the painful topic of fetal and child abuse. A study in England with a sample of 40 women referred by Social Services departments suggested that "negative preoccupied" antenatal attachment (as measured by the Maternal Antenatal Attachment Scale) was predictive of an increased likelihood of symptoms of anxiety, mood disturbance, and depression, self-reported irritation with the fetus, and even fetal abuse (Pollock & Percy, 1999). Other researchers have looked at the association between insecure attachment in mothers and the incidence of child abuse and found positive correlations (Moncher, 1996). Contrastingly, strong MFA has been associated with positive health practices during pregnancy, such as abstinence from tobacco, alcohol, and illegal drugs, obtaining prenatal care, healthy diet and sleep habits, adequate exercise, use of seat belts, and learning about pregnancy, childbirth, and infant care (Lindgren, 2001; Lindgren, 2003).

Quality of attachment has also been associated with the perinatal mental health of the mother. Weak attachment and negative maternal attitude have been associated with postpartum anxiety (Blumberg, 1980; Gaffney, 1989) and depression (Condon et al., 1997; Lindgren, 2001). On the other hand, strong attachment was found to be a moderator of the vulnerability to postpartum depression in one sample of women in Israel (Priel & Besser, 1999). Personality vulnerability factors to depression were measured, and highly self-critical women reported less depression when strongly attached to the fetus during pregnancy. However, as reported in one integrative review, associations between attachment and psychosocial variables have been disappointing (Cannella, 2005). Methods used across studies have been inconsistent, psychometric properties of all instruments have not been consistently valid and reliable, and the relationships investigated were exploratory rather than theoretical. It was concluded that correlational studies utilizing theory-driven variables are necessary for more significant findings.

An important factor for consideration is the large gap in existing research with diverse populations. Psychometric data of current prenatal attachment measures has largely been established using samples of low-risk, middle-class, American, Caucasian pregnant women (Shieh et al., 2001). An increasing number of samples of women with high-risk pregnancies (defined in this work as “fetal anomaly and/or the presence of a chronic disease or pregnancy-induced disease threatening maternal or fetal health and carrying an increased chance of mortality for either mother or fetus”) are being included in research, but only a few published studies have included risk serious enough to require hospitalization (Penticuff, 1982). The reliability and validity of the existing tools for high-risk women is unknown, as

are the consequences of risk on parental adaptation and patterns of attachment. In addition to the health/mortality concerns, high risk pregnancies include the significant possibility of fetal anomaly and/or extreme prematurity. Extreme prematurity has been associated with a higher incidence of insecure attachment; ongoing longitudinal work is examining this further, taking into consideration the neurobiological risk factors (Brisch, 2002).

Finally, the children of societies everywhere deserve mothers (and fathers) prepared for the awesome challenge of loving and training new humans. Five decades of research has emphasized that caregiver response is the central element in how a child understands self and others. John Bowlby expressed this most cogently:

Just as children are absolutely dependent on their parents for sustenance, so in all but the most primitive communities, are parents, especially their mothers, dependent on a greater society for economic provision. If a community values its children it must cherish their parents (Bowlby, 1951).

PURPOSE OF THE STUDY

In line with the recommendations of the works cited, this research will undertake a theory-driven approach to the study of attachment in a sample of women hospitalized with high-risk pregnancies. The purpose of this study is to investigate the influence of an expectant mother's personality style, her maternal object representations, and her ability to develop an internal representation of her fetus upon the quality and intensity of maternal fetal attachment. The exploration of the power of object representation and personality to predict prenatal attachment in the context of hospitalization during high-risk pregnancy would have relevance in both intervention and standard of care for such mothers. Since this is a highly

specialized sample of individuals, it is expected that other variables may have predictive value. Prior depressive episodes, current levels of depression, type and severity of maternal-fetal risk, as well as gestational age of the fetus at the onset of complications will be taken into account.

The construct of MFA discussed in this work will be identified as suggested by Doan and Zimmerman: “Prenatal attachment is an abstract concept, representing the affiliative relationship between a parent and fetus, which is potentially present before pregnancy, is related to cognitive and emotional abilities to conceptualize another human being, and develops within an ecological system” (2003). Working on the assumption that MFA exists, instruments developed from the psychodynamic approach will be employed to examine the cognitive and emotional abilities of an expectant mother to conceptualize her own mother as well as her fetus. Additionally, in view of the proposition that emotional factors preexisting pregnancy are important potential determinants of prenatal attachment (Doan et al., 2003; Mikulincer et al., 1999), the contribution of personality variables will be examined (Blatt, Shahar, & Zuroff, 2001; Priel et al., 1999). The “ecological system” in this work will consist of the situation of hospitalization due to high maternal or fetal risk, defined earlier as an increased probability of fetal anomaly, compromises of maternal or fetal health, or maternal or fetal demise. The literature review has been conducted consistent with these factors of interest.

CHAPTER TWO

Review of the Literature

Since Cranley's creation of a measure for her theoretical construct of maternal-fetal attachment (MFA), there have been approximately 50 published studies incorporating some measure of antenatal attachment in the research. The psychosocial variables examined have included social support, interpersonal relationships, self-esteem/self-concept/sense of mastery/efficacy, anxiety, depression, stress, and coping styles. Demographic characteristics such as parity, age, level of education, and ethnicity have been incorporated into hypotheses or analyzed post hoc. Biological variables such as previous substance abuse, maternal health history, previous perinatal deaths, and maternal/fetal health outcomes have also been correlated to attachment, and some studies have divided their sample by the presence or absence of maternal-fetal risk. A few studies have concentrated on women with some level of this risk, and even fewer have focused exclusively on women with risk severe enough to require hospitalization. To date, there have been no examinations of the possible relationships between personality style, object representations, severity of risk, and attachment within a hospitalized population. However, there are bodies of research that contribute significantly to our understanding of these factors in other contexts and with other populations.

SEARCH METHODS

Relevant MFA studies published from 1981 (publication date of the Maternal Fetal Attachment Scale) through 2005 were located through the use of various databases, including Medline, Psychological Information, and Cumulative Index to Nursing and Allied Health Literature. An ancestry approach (tracking research cited in studies reviewed) was also employed to ensure the review of any articles missed in the database search. Dissertations were excluded, as were articles written in languages other than English. The keywords used were prenatal attachment, antenatal attachment, MFA, maternal-fetal attachment, internal working model, object representation, mental representation, prenatal object relations, personality, and high risk pregnancy. Abstracts of all articles supplied in the database searches were reviewed to identify studies relevant to this review. Studies that incorporated measures and discussions central to prenatal attachment, object representation, and personality characteristics were all considered relevant. While this study is confined to women who are hospitalized, studies that included non-hospitalized women were included in light of the paucity of research with the hospitalized population. The studies reviewed are categorized by their contribution to the understanding of the relationship of attachment to object representation, personality, and risk.

INTERNAL WORKING MODELS AND OBJECT REPRESENTATION

Background

Bowlby's premise of internal working models is reminiscent of the concept of object representation proposed by Melanie Klein, from the very psychoanalytic approach that

Bowlby questioned. However, his concept of the “internal working model” has been attributed to the psychologist and philosopher Kenneth Craik and his 1943 work, *The Nature of Explanation* (Bretherton, 1992). Craik proposed that the human mind built “mental models” of reality that were utilized to anticipate events and produce action. This internal representational paradigm fit well with Bowlby’s belief that some cognitive mechanism was at work with the biological system of attachment, for notice his connection in *Attachment and Loss Volume I: Attachment*:

“If an individual is to draw up a plan to achieve a set-goal not only must he have some sort of working model of his environment, but he must have also some working knowledge of his own behavioural skills and potentialities... Henceforward the two working models each individual must have are referred to respectively as his environmental model and his organismic model... The environmental and organismic models described here as necessary parts of a sophisticated biological control system are, of course, none other than the ‘internal worlds’ of traditional psychoanalytic theory seen in a new perspective” (p.82).

The “new perspective” in this case had several facets. First, Bowlby held that these models were based on real experience. Psychopathology resulted because a model “might become totally out-of-date, or because it is only half revised and therefore remains half out-of-date, or else because it is full of inconsistencies and confusions” but not because of unconscious drives that generated fantasies that became internal representations (Bowlby, 1969). Second, Bowlby pulled from the work of Spitz and Piaget to support his proposal that infants before the age of nine months were not aware of the human characteristics of the “object;” in fact, an infant could not even perceive of the “object” as having any permanence. He favored Spitz’ term, “pre-object relation,” as well as Spitz’ idea that a smiling infant was responding to a “visual gestalt signal,” not relating to a human. This fit in nicely with Bowlby’s thesis that the five responses which made up attachment behavior—sucking, clinging, following, crying, and smiling—were behavior patterns specific to man in much the same way that each

species in the animal world was endowed with its own peculiar repertoires of behavior.

Third, Bowlby also differentiated his term “instinctual response” from the usage of the term “instinct” in psychoanalytic terms. Whereas psychoanalytic instinct referred to a motivational drive, Bowlby’s term referred to an “observable pattern of behavior” that served the evolutionary purpose of survival (Bowlby, 1986). Bowlby believed that during maturation these early behavior patterns would move between various states of latency and activity, being used in “fresh combinations.” Even the infantile behaviors like crying and clinging would re-emerge in situations of danger, illness, or helplessness. Stress and uncertainty could compromise adult-acquired defenses and infantile internal working models would serve as defaults to guide behavior.

On the other hand, Melanie Klein’s conceptualization of “internal objects” (“object” referring to a significant person in an emotional relationship) came from the psychoanalytic view that Bowlby believed needed a “new perspective.” Klein extended Freud’s role of fantasy as a specific mental process provoked by frustration to that of an elaborate collection of unconscious images and knowledge that are the core of all mental processes. Klein theorized that the child’s mental life is filled with fantasy as he establishes a complex set of internalized object representations based on his experiences with primary caregivers. These fantasies and anxieties concerning the internal objects become the underlying basis for an individual’s behavior, emotions, and sense of self. Like Freud, she fueled these fantasies with hypothesized libidinal drives and oedipal conflicts; unlike Freud, the drives are essentially psychological forces always directed toward objects. Kleinian internal objects are largely fabrications of the child’s unconscious drives and wishes inspired by the child’s

experience with real others (Greenberg & Mitchell, 1983). This drive model was integral to the discussions of the psychological processes in pregnancy conducted by the earliest psychoanalysts (Deutch, 1945; Benedek, 1959; Bibring, 1959).

Another contrast between attachment theory and object relations theory is how research for each of these models was conducted. In the psychoanalytic world, investigations of object representation were usually based on clinical case studies. Since quantitative research was not an appropriate venue for exploring abstract conceptualizations of drive theories, most writings were of clinical experiences with patients, often quite ill individuals. Attachment theory, on the other hand, essentially came from work and study with normal children and adults. The influence of ethological and biological research on these theorists propelled them into empirical based research methods that had far greater generalizability than the case-study driven work of the psychoanalysts.

Integration of Theory

For decades differences like these between attachment theorists and psychoanalytical object-relational theorists prevented them from engaging in collaborative dialogue. In recent years, there has been movement toward an integration of ideas made possible by several changes. Peter Fonagy outlines these as: 1) A trend in attachment theory to move focus from infant behavior and external determinants to greater interest in internal representations in both infant and parent; 2) growing importance for observational and empirical research in the psychoanalytic community, due to an awareness of the shortage of models that are both scientifically acceptable and relevant to clinicians; 3) an openness between theoreticians to integrated approaches and new ideas; and 4) the realization on the part of attachment

theorists that without growth through the integration of other approaches the attachment model would remain stunted in terms of providing value to clinical work, enriching research, and developing new theory (Fonagy, 2001a). Integrating Bowlby's internal working model with object representation is such an example of this new landscape.

Today's understanding of internal working models is an amalgam of the contributions of Bowlby, Ainsworth, Bretherton, Mulholland, Crittenden, Main, and Sroufe (Fonagy, 2001a). Fonagy depicts their composite description of the internal working model as an evolution of four basic components: 1) Expectations based on transactions with and interactive attributes of the primary caregiver created in the first year, 2) event representations generated by general and specific memories of attachment-related experiences, 3) autobiographical memories by which specific events are connected and contribute to an ongoing personal narrative, and 4) the resulting inferential understanding of the psychological characteristics of others and self (p. 14). Moving past the strict interpretations of an internal working model as an imprint of historical relational interchanges and an object representation as an elaborate concoction of libidinal-driven fantasy allows a fresh paradigm: Mental representations and internal working models can be described as reflections of reality-based early experiences with caregivers that are colored by internal perceptions and transformations (Priel & Besser, 2001). Not ignoring the gap between attachment and object relational theories, it has been proposed that these two concepts overlap in a fashion that allows the quality of mothers' mental representations to predict the mother-infant attachment (Levine et al., 1991). This reconciliation of approaches

has inspired new forays in research with clinical relevance, particularly in the discussion of MFA.

MFA and Object Representation

Attachment

Bowlby himself believed that the transition of a woman to motherhood mobilized the same “forces” that had in early infancy and childhood attached her to her own mother (1986). Some years later, Rubin restated this in her early discussion of the tasks required to fully attain the maternal role, reporting “Mother was a major prototype and was the most significant contributor of subject’s set of anticipations in becoming a mother” (Rubin, 1967). If the participant’s mother was deceased, she was either interjected into the interviews in the form of memory, or augmented by an aunt, mother-in-law, grandmother, or a person of the mother’s generation who may have had a maternal relationship with the subject. Rubin likened this to the “binding-in” task with the fetus, stating that her subjects seemed to also be “binding-in” again with the mother or mother substitute. In cases where the expectant mother was separated from her mother by distance, Rubin found that often there was an actual or “wished-for” trip that seemed almost like a “pilgrimage.”

While not specifically looking at MFA, the Fonagy, Steele, and Steele (1991) research appears to be the first that empirically explored the association between adult and infant attachment style in a prospective manner beginning in pregnancy. In this longitudinal study, the Adult Attachment Interview (AAI) was administered to 100 primagravidas in their last trimester of pregnancy. At 12 months postpartum, the mothers and infants were assessed in the Strange Situation exercise. An impressive 75% of mothers categorized as secure had

securely attached children; 73% of mothers classified in one of the insecure descriptions had insecurely attached children. A second finding relevant to the discussion of object representation in internal working models is that the quality of those relationships could be measured by the expectant mother's ability to articulate a complex representation of the expectant mother's relationships with her parents. These women were able to:

“fluently convey a global representation (whether favorable or unfavorable) of what her relationship to each parent was like during her childhood...she demonstrates an understanding of her own personal development that includes an awareness of the multiple motives (conscious and perhaps unconscious) that guided her parents' behavior toward her...there are no significantly distorting mental processes at work (pg. 901).

These robust findings were not totally unexpected; Mary Main, one of the developers of the AAI, had herself wondered if adult attachment interviews might have something to say about the mechanism behind the intergenerational cycle of child abuse (Main & Goldwyn, 1984). In a study of 30 normal, non-abusive women whose children had 4 years earlier participated in an Ainsworth Strange Situation study, Main found that a mother's experience of her own mother as rejecting was related to her rejection of her own infant. In addition, these women also revealed systematic cognitive distortions, such as idealization of the rejecting parent, difficulty in remembering childhood, and incoherency in discussing their attachment to their mother. Main found one exception: Women who could coherently describe their rejection by their mothers, expressing resentment and anger, did not exhibit the same avoidant behavior toward their own infants. Evidently, the differences in attachment patterns in these children and women were also related to important cognitive differences, as illustrated by the degree of cohesion and consistency the adults were able to utilize in their narratives (Main et al., 1985).

Integrating Main's findings, Fonagy's team hypothesized that internal working models become activated by certain expectations or events, influencing attachment-related cognitions and behaviors that may be best thought of as "attachment states" (Fonagy et al., 1991). These are distinct from the internal working model which, along with personality traits, predisposes individuals to feelings and behaviors. Their recommendation was that models of attachment could be informed by the examination of representational processes that influence attachment-related emotions, thoughts, and behaviors.

The AAI and the Strange Situation have been paired in research repeatedly since the Main and Fonagy studies, with findings suggesting that attachment classifications are stable even across three generations (Zeanah et al., 1993; Benoit & Parker, 1994). Meanwhile, interest in MFA began increasing in the field of study devoted to child and adolescent mental health. A pair of child psychiatrists introduced the Working Model of the Child Interview (WMCI), a measure designed to evoke mothers' internal representations of their infants. Modeled after the AAI, this one-hour structured interview categorically scored a caregiver's perceptions and subjective experience of their child. Qualitative, content, and affective features of the narrative result in the assignment of one of three classifications: Balanced, disengaged, or distorted. "Balanced" responses convey relatively rich details about the infant, including both positive and negative characteristics of the infant or the mother-infant relationship. "Disengaged" narratives are cool, distant, or indifferent descriptions that implied the infant's experience was either unrecognized or disregarded; descriptions are unelaborated, giving the sense that the caregiver does not truly know the child. "Distorted" representations are internally inconsistent, confusing, unrealistic, and divulge a lack of

insight concerning the impact of parenting upon the infant. In two independent investigations with samples of mothers and their 12-month-old infants, they found that the mothers' WMCI classifications were significantly correlated to their infants' attachment classifications according to the Strange Situation. Narratives classified as "balanced" were associated with secure infants, "disengaged" with insecure-avoidant babies, and "distorted" with insecure-resistant children. Benoit et al. replicated the study with 96 expectant mothers in the third trimester of pregnancy (Benoit, Parker, & Zeanah, 1997). When the WMCI was repeated one year later concurrent with the Strange Situation, not only were WMCI classifications significantly stable over time for the mothers, but the pregnancy WMCI results predicted infant Strange Situation classifications in 74% of the cases. Concordance between 12-month WMCI and Strange Situation classification was 73%. The authors felt that this association could have major implications for early identification of high-risk parent-infant relationships.

Only two other research teams to date have published empirical studies of the relationship between MFA and object representations. Levine et al., working with a sample of 42 pregnant adolescents, hypothesized that object representation during pregnancy could be a predictor of infant attachment style (1991). The AAI was administered before childbirth and the Strange Situation was conducted when the 42 infants were 15-months-old. The quality of object representation was measured by the application of the Krohn Object Representation Scale for Dreams to the responses of the AAI. The Krohn measure is an 8-point scale that assesses hierarchical levels of an individual's maturity of object-representation and capacity for interpersonal relatedness (Krohn & Mayman, 1974).

Originally developed for use with dream analysis, it has been used in a similar way with the responses of a Rorschach administration; however, there is no information as to its reliability and validity in the application of it to the AAI. While the method has been questioned (Priel et al., 2001), this research team did find mothers' attachment style and object representations highly correlated, and also found that both were significantly correlated with infant's attachment style as categorized at 15 months of age. However, the extent to which these findings are generalizable is questionable in light of the fifteen-year mean age of this population. Even considering individual variation in the development of mental representations, this process is usually viewed as unfolding gradually through maturation to adulthood and subject to disruption by developmental demands that are age-inappropriate (Blatt, 1974).

Overlapping Models

What exactly has been measured in this body of research? Since the AAI has formed the basis for these analyses, is the discussion so far one of internal working models or of object representation? While the two concepts are related, they are not identical, and as such, may not have the same contribution to MFA. Internal working models might be described as templates of relationships (Main et al., 1985). In contrast, object representations reflect the internal transformations of early relationship patterns, thereby guiding the use of and affecting the organization of those templates (Fonagy et al., 1991). The AAI was designed to elucidate early patterns of reality-based attachment relationships and the participant is asked to reflect on what those mean to him or her currently. The WCMI was constructed on the same theoretical base; their correspondence is perhaps not surprising. The findings of

these analyses may certainly be revealing what sort of template an individual is describing, but an understanding of what links internal working models with antenatal or maternal-infant attachment continues to be elusive for these researchers. Some theorists, following Main's concept of maternal sensitivity, have assumed that maternal responsivity/sensitivity mediates maternal attachment and infant security (van Ijzendoorn, 1995). This assumption has not been proven, however, and other attachment theorists point to analyses of discordant mother-infant dyads and counter that sensitivity is more accurately thought of as a moderator that can block an attachment state of mind, as when a mother with an insecure attachment style is found to have a secure infant (Atkinson et al., 2005). Therefore, if the interest is in what activates a template or internal working model perhaps another form of measurement is needed.

With this in mind, Priel and Besser of Ben-Gurion University in Israel formulated and tested their hypothesis that a pregnant woman's antenatal attachment and internal working models would be mediated by the expectant mother's internal representation of her own mother on a sample of 120 first-time mothers in the third trimester of a low-risk pregnancy (2001). Their strategy was to utilize operationalizations of internal working models and object representations that corresponded to Bartholomew & Horowitz' conceptualization of adult attachment and Blatt and colleagues' means of identifying object representations, instead of the traditional Ainsworth/Main constructs of adult attachment and internal working models (Bartholomew et al., 1991; Blatt, Chevron, Quinlan, Schaffer, & Wein, 1992a). The Bartholomew and Horowitz conceptual development was an outgrowth of Hazan and Shaver's application of George and Main's attachment categories of the AAI to the romantic

attachment that develops between adults (Hazan et al., 1987; George et al., 1985). As a result of noticing a difference in the motivations behind avoidance when exhibited by dismissive behavior (George and Main's category) as opposed to fearful behavior (Hazan and Shaver's category), Bartholomew & Horowitz hypothesized a classification of adult attachment that is defined by the positivity of the internal working models of self and other. Four dimensions of positivity/negativity of self/other could explain four models of attachment: secure (positive self/positive other), preoccupied (negative self/positive other), dismissing (positive self/negative other), and fearful (negative self/negative other). The measure that resulted from this exploration, the Relationship Questionnaire (RQ), contained four paragraphs, each describing a particular attachment pattern. Participants were first asked to identify which is most descriptive of self, and secondly to indicate on a 5-point scale the extent to which each of the four paragraphs are like self. Object representation in the Priel and Besser study was evaluated using the Object Relations Inventory (ORI), an open-ended description of mother that is analyzed across six dimensions: Benevolence, punitiveness, ambition, ambivalence, complexity, and conceptual level (Blatt et al., 1992a). These measures were then compared with MFA as measured by the Condon measure of MFA quality and intensity (MFAS; Condon, 1993). Several findings of interest emerged in this work: (1) Participants classified as "secure" on the adult attachment measure had maternal representations that were more benevolent and ambitious and less punitive and ambivalent than the representations of the three "insecure" groups (preoccupied, fearful, and dismissing). The secure group's representations were also significantly more complex and displayed a higher conceptual level, a skill that statistically declined from the secure group to

the insecure-fearful and from the fearful to the insecure-preoccupied. (Conceptual development on the ORI is established by assessing the range of ways in which the “other” is experienced as described in the narrative. Five conceptual levels, Sensorimotor Preoperational, Concrete-Perceptual, External Iconic, Internal Iconic, and Conceptual Development are used as anchor points in the scoring.) The insecure-dismissive group generated the least conceptually developed maternal representations (all differences significant at $p < .001$). Significant effects were also found between the four attachment groups and the quality and intensity of MFA, with preoccupied participants scoring significantly lower on both dimensions. They concluded this work supported the hypothesis that internal working models and object representation coexist, particularly since maternal representation was found to “fully mediate the association between internal working models and antenatal ties to their babies.”

Using a different measurement for maternal parental representations, Priel and Besser in another study investigated adult attachment styles, early relationships, antenatal attachment, and perceptions of infant temperament in first-time mothers (2000). In a longitudinal study of 115 mothers of healthy babies that began in pregnancy, the team found that mothers who experienced their own mothers as supportive and non-intrusive were not only secure, but reported higher MFA and perceived their 4-month-old infants as having an “easier” temperament than those women with less positive maternal experiences. In this study, the adult attachment category was derived from Bartholomew and Horowitz’ system and antenatal attachment was measured with Condon’s MAAS. Maternal relationships were analyzed using the Parental Bonding Instrument, a 25-item self-report measure of

participants' memories of parental behaviors and attitudes (Parker, Tulping, & Brown, 1979). Once more, they seemed to identify an association between mothers' representations of their own caregivers, mothers' romantic attachment style, and antenatal attachment.

Priel and Besser's travel to their conclusions may have taken a different avenue than the Fonagy group, but they are nevertheless concordant. Fonagy et al. recognized that attachment states might be activated by an overall organization of mental structures, not purely by quality of early attachment experience (1991). Perhaps Priel and Besser have introduced a rationale for the 25% discordant mother-infant dyads in the Fonagy study.

Missing from the knowledge at this point is what a mother's object representation of her fetus would be. Recall that earlier research described expectant mothers as able to describe their fetus in human terms and as separate from self in an increasingly coherent way as pregnancy progressed (Lumley, 1982; Stainton, 1990). The WCMI is a valuable tool for insight into parental attitudes of their child, but perhaps more descriptive of the "baby template" than of a developing mental representation of their fetus. It is the goal of this research to investigate object representation in the fashion of Priel and Besser. In addition to examining mental representations an expectant woman expresses of her mother, an ORI analysis of the expectant mother's conceptualization of her unborn child will also be introduced.

THE CONTRIBUTION OF PERSONALITY

Although the earliest explorations into the experience of pregnancy promoted it as a psychological process (Benedek, 1958; Bibring et al., 1961; Rubin, 1975; Rubin, 1967;

Leifer, 1977), and pregnancy is undoubtedly one of the most important periods of a woman's adult life, the contribution of personality to MFA has not been widely explored. It has been suggested that the associations among personality, stress, and the development of close relationships should be considered in future discussions of attachment (Mikulincer et al., 1999). While infant temperament has been explored (Lorenzen, Wilson, & White, 2004), other than examining the relationship of self-esteem with MFA (Curry, 1987; Cranley, 1981; Gaffney, 1989; Kemp & Page, 1987; Koniak-Griffin, 1988), relatively few studies have incorporated personality measures in the analyses, and one research team has produced most of the literature available (Pollock & Percy, 1999; Besser & Priel, 2003a; Besser & Priel, 2003b; Reading et al., 1984; Priel et al., 1999; Priel & Besser, 2000a). Two of these studies do not contribute much value to this discussion because of the limited information supplied and the measures used. When Pollock and Percy investigated hypotheses regarding variables that might be related to self-reported risk of harming one's fetus in their study of pregnant women referred by Social Services for psychological evaluation (1999), they employed the Millon Clinical Multiaxial Inventory-2 (MCMI-2). This self-report measure of personality was designed to examine dimensions of personality disorder, which facilitated their investigation of the relationship of borderline personality dimensions and adult attachment (Millon, 1987). Not only are the results questionable in terms of generalizability to a non-forensic population, the MCMI-2 was developed to measure psychopathology, not dimensions of normal personality. Reading et al. reported administering the Eysenk personality measure but do not report findings (1984).

Attachment and Personality in Adult Research

Attachment has been connected to personality style in normal adult populations (Zuroff & Fitzpatrick, 1995; Morrison, Urquiza, & Goodlin-Jones, 1998), and extensively explored in relation to psychopathology (Brisch, 2002; Fonagy, 2001b; Blatt, Auerbach, & Levy, 1997). Quality of attachment has also been associated with perinatal depression (Mercer et al., 1988; Condon et al., 1997), and individuals with certain personality characteristics have been observed to be associated with or vulnerable to perinatal depression (Besser et al., 2003a; Besser et al., 2003b; Steinberg & Bellavance, 1999; Besser et al., 2003a; Priel et al., 1999; Priel et al., 2000a).

Undoubtedly, cavalierly associating attachment with general personality factors or associating it with personality dimensions to the exclusion of other important components of relationship functioning would be counterproductive (Griffin & Bartholomew, 1994). However, the growing integration of internal working models and object representation and their association to attachment theory, developmental psychology, social psychology, and cognitive science has had a major impact on personality assessment (Blatt, Auerbach, & Lindgren, 1997). Recognition of the centrality of these mental templates and structures to personality organization and the difficulty of direct measurement has awakened new interest in the use of projective devices, such as the Rorschach, the Thematic Apperception Test, and the Krohn Object Representation Scale for Dreams, particularly in the search for new ways of understanding intractable psychopathology.

Summarizing personality research or even developing any singular approach to personality is not possible in this discussion, but one particular understanding blends with the

experience of pregnancy in an almost seamless manner. Theorists have stated that the evolution of the capacity for mutuality, or for reciprocal, satisfying, intimate relationships with others, accompanied by a positive, realistic, and differentiated sense of self, is central to the human formation of individual personality (Feldman & Blatt, 1996). This interactive, reciprocal nature (or tension) of the dynamic processes of individuation and relatedness has often been conceptualized. These have been referred to as: Surrender and autonomy (Angyal, 1941), moving toward, against, or away from others (Horney, 1945), connectedness (ocnophilic) and self-sufficiency (philobatic) tendencies (Balint, 1959), communion and agency (Bakan, 1966), intimacy and autonomy (Shor & Sanville, 1978), sociotropy and autonomy (Beck, 1983; Beck, Epstein, Harrison, & Emery, 1983) and introjective (self-critical) and anaclitic (dependent) (Blatt et al., 2001). Correspondingly, the transition to parenthood for both parents but more specifically the mother, has been painted by many as a unique, developmental period in which issues of individuation or self-definition, and mutuality or relatedness are paramount (Diamond, Blatt, Stayner, & Kaslow, 1995; Doan et al., 2003; Leifer, 1977; Rubin, 1967; White et al., 1999). Therefore, looking at dimensions of personality that explicate the transition of motherhood in relation to individuation or mutuality seems most relevant to the relationship between personality and MFA.

Dependency and Self-Criticism

Based upon a history of work with depressed individuals, Blatt and colleagues proposed a theoretical model of personality development that took into consideration the state of development of an individual's concepts of self and other (Blatt et al., 1997; Blatt et al., 2001; Blatt, D'Affliti, & Quinlan, 1976). Personality in this model develops along two

basic trajectories: 1) a line of relatedness to others that incorporates the capacity to form mature, mutually satisfying relationships, and 2) a line of self-definition that involves developing an integrated, realistic, positive and differentiated identity. These two dimensions, termed “anaclitic” and “introjective” respectively, develop throughout life, each dependent upon the other for growth. In psychologically healthy individuals, these two dimensions are balanced, interactive, and mutually facilitating; an overemphasis of one and/or the defensive avoidance of the other results in various degrees of psychological discomfort or disorder. An exaggerated need for and dependence upon others can result in psychopathologies such as anaclitic (empty or loss-based) depression, dependent personality disorder, and borderline personality disorder. In contrast, an overemphasis on autonomy and self-worth can contribute to disorders such as obsessive-compulsive personality disorder, paranoia, narcissism, and introjective (guilt or failure-based) depression. This two-dimensional model has been particularly useful in diagnosing and treating depression (Blatt, 1974; Blatt et al., 1976; Blatt & Zuroff, 1992b) and is interestingly similar to Bowlby’s descriptions of depressed individuals who were either anxiously attached or compulsively self-reliant (Bowlby, 1980).

Based upon a review of clinical literature, Blatt, D’Afflitti, and Quinlan constructed a measure containing 66 statements that were not direct symptomatic expressions of depression but reflected experiences frequently reported by depressed individuals (1976). The items in the Depressive Experiences Questionnaire (DEQ) encompassed issues such as negative or distorted sense of self or others, dependency, helplessness, egocentricity, fear of loss, ambivalence, self-blame, guilt, loss of autonomy, and disruptions in family relationships.

Participants rated these items on a 7-point scale indicating agreement or disagreement with the experience. Statistical analyses of the measure revealed three factors, dependency, self-criticism, and efficacy (sense of confidence about one's resources and capacities). A considerable body of research in the last thirty years has demonstrated its reliability and validity in a number of populations, including perinatal women (Besser et al., 2003a; Besser et al., 2003b; Blatt et al., 1976; Blatt, 2004; Blatt, Zohar, Quinlan, & Zuroff, 1995; Blatt, Schaffer, Bers, & Quinlan, 1992; Blatt et al., 1992a; Bacchiochi, Bagby, Cristi, & Watson, 2003; Bagby, Parker, Joffe, & Buis, 1994; Zuroff, Quinlan, & Blatt, 1990; Priel et al., 1999; Priel et al., 2000a).

With the aid of the DEQ, research has found parallels between adult attachment styles (secure, anxious, dismissive, fearful) and Blatt's dimensions of personality (Zuroff et al., 1995). Dependent (anaclitic) individuals suffer deep longings to be loved and protected, but lack confidence that those needs will be met, fearing abandonment in their interpersonal relationships (Blatt et al., 1992b). Self-critical (introjective) individuals are preoccupied with constant self-scrutiny, fear being disapproved and criticized, and expect to lose the approval and acceptance of significant others. When applied to attachment theory, Zuroff and Fitzpatrick found that both anaclitic and introjective individuals exhibited insecure attachment styles (1994). Dependent individuals were preoccupied with losing emotional support from others, and introjective individuals structured relationships to remain at a distance, perhaps protecting themselves from being hurt but becoming vulnerable to depression as a result of dissatisfying relationships that lacked intimacy. Imbalances in these personality styles have also been associated with various problems in social-personal

adjustment, including early parent-child relationships (Koestner, Zuroff, & Powers, 1991; McCranie & Bass, 1984).

Relevant to this topic are three studies focused upon samples of pregnant women (Besser et al., 2003b; Priel et al., 1999; Priel et al., 2000a). A prospective study of 73 primagravidas in the third trimester of pregnancy tested the hypothesis that dependency and self-criticism could be vulnerability factors to postpartum depressive symptoms. In addition to finding that self-criticism measured in pregnancy was significantly predictive of postpartum depressive symptomatology at eight weeks postpartum, results also indicated that those introjective participants who were strongly attached to the fetus during pregnancy (as measured by the Condon instrument) had a lower risk for depression. Dependency was not associated with depressive symptoms in this study. Priel and Besser suggested that, based on these findings, implementation of more open and ideographic approaches to the measurement of personality might allow a more sophisticated evaluation of antenatal attachment. This might also allow a way to understand the confusion concerning the insecurely attached mothers with secure infants from the earlier cited findings (Fonagy et al., 1991; Main et al., 1984).

Another study with a sample of 120 primagravidas explored potential relationships between personality tendencies, frequency of depressive symptoms, and perceptions of social support (Priel et al., 2000a). Results revealed depressive symptoms in both highly anaclitic and highly introjective women seemed to be mediated by a distinct attitude toward and style of negotiating social support. Self-criticism was found to reduce the perception of available support while dependency seemed to increase this perception. The conclusion was that

personality tendencies do have an effect on perceptions of social support and, indirectly, an influence on depressive symptoms. This same team then underwent a third look at the impact of anaclitic and introjective personality tendencies in relation to coping styles in pregnant women (Besser et al., 2003b). With a sample of 146 women in their first pregnancies, coping style also emerged as a moderator to trait vulnerability to depression.

The body of research contributed by Priel and Besser encourages further evaluation of plausible differences between MFA processes among dependent and self-critical mothers. Development of transactional models would allow focus to shift from simplistic direct relationships to mutual effects of mental representation, personality variables, and the demands of the pregnancy experience upon MFA. The variety of measures available today also enables research teams to quantitatively measure abstract constructs such as object representation.

THE IMPACT OF RISK

Over a million pregnant women a year are identified as being at high-risk for maternal or fetal complications, approximately 700,000 of which are treated with bed rest (Lumley, 2003). When the threat to maternal or fetal health is emergent, hospitalization is required for intensive monitoring, with the aim of prolonging the pregnancy until the balance of risk for maternal and fetal safety weighs the uterine environment unsafe to continue. Two types of high-risk pregnant women have been described: Those with chronic illnesses that predispose them to risk during pregnancy, and those who are faced with an unanticipated complication that arises in what has been a normal pregnancy (Heaman, 1998). Maternal

risks include the hypertension spectrum (chronic hypertension/preeclampsia/eclampsia), gestational diabetes (or pre-existing diabetes), severe anemia, and cardio-pulmonary disease (Hobel, Hyvarinen, Okada, & Oh, 1973). Separate fetal risks include fetal anomaly, premature rupture of membranes, placenta previa, placental abruption, and premature birth.

Preterm birth, defined by the World Health Organization as any birth occurring between 20 and 37 weeks of gestation, is the major clinical problem most associated with fetal demise and childhood disability (Lumley, 2003). Although only 6-10% births are considered preterm, those births account for more than 60% of all perinatal deaths and nearly 50% of long-term neurological disability (Logghe & Walker, 2004; Wood, Marlow, Costeloe, Gibson, & Wilkinson, 2000). While advances in neonatal care have increased the survival rate of premature births, there are marked differences in the probability of survival according to gestational age, with births from 20 to 27 weeks at the most severe risk for demise or disability (Lumley, 2003). Rates for neonatal survival before 24 weeks of gestation are extremely low; at 34 weeks, the survival rate is similar to that of full-term gestation. Risk factors for preterm birth include previous preterm births, multiple births, maternal age greater than 35 or less than 15, maternal weight greater than 200 or less than 100 pounds, history of abortion (spontaneous and/or elected), and poor maternal health practices, such as smoking and substance abuse.

Obstetric Risk and Perinatal Mental Health

What past research has strongly suggested is that high-risk pregnancy alone, without required hospitalization, is associated with increased rates of depression and anxiety (Kurki, Hiilesmaa, Raitasalo, Mattila, & Ylikorkala, 2000). Studies focusing on hospitalized women

have identified higher levels of anxiety and depression, lower self-esteem, less positive expectations for their experience of childbirth, and less optimal family functioning than found in non-hospitalized women (Heaman, 1992; Maloni, Park, Anthony, & Musil, 2005; Maloni & Park, 2005; Maloni, Kane, Suen, & Wang, 2002; Maloni & Kasper, 1991; Mercer & Ferketich, 1988; Heaman, Beaton, Gupton, & Sloan, 1992; White & Ritchie, 1984; Leichtentritt, Blumenthal, Elyassi, & Rotmensch, 2005; Mercer et al., 1994), and negative affect during pregnancy has been associated with adverse obstetric and neonatal outcomes (Kurki et al., 2000). Maloni et al. found that dysphoria (a composite of anxiety, depression, and hostility) was highest upon hospital admission and was significantly greater for those with the highest Hobel Risk Assessment scores (2002). Another finding was that gestational age at birth was significantly correlated with postpartum dysphoria. Priel and Besser also found increased levels of postpartum depression in a selected group of high-risk pregnant women whose pregnancies ended well (Besser, Priel, & Wiznitzer, 2002), lending to the hypothesis that these women may have postponed maternal bonding, which is considered a protective factor against the vulnerability to depression (Priel et al., 1999). Gupton et al. points out the quandary that exists with the multiple findings available: Stress and anxiety are associated with increased risk of preterm birth and low birth weight, psychosocial factors such as depression, anxiety, and low self-esteem have been shown to be associated with higher incidences of poor health practices, and women experiencing a high-risk pregnancy have higher levels of stress and anxiety, but how these factors are all related is basically unknown (Gupton, Heaman, & Cheung, 2001). The preponderance of evidence suggests that women with complicated pregnancies suffer from symptoms of anxiety and depression as

they experience threats to self and fetus and feel a loss of control. Little is known about how long these symptoms last, whether they continue into the postpartum period, and how or if they affect the attachment process.

Issues Specific to High-Risk Pregnancies

The first discussion of the psychological implications in high-risk pregnancy was published in 1982 by Joy Penticuff, who provided the definition of high-risk commonly used today. Using the theory of development during pregnancy proposed by Rubin and others, she outlined five important issues high-risk couples face in their adaptation to pregnancy and parenthood. Penticuff's first point is that in uncomplicated pregnancy, ambivalence regarding the changing roles and addition of a child to the family is usually resolved by the end of the first trimester. However, this resolution of ambivalence can be compromised when negative physical signs indicate danger to the fetus. When parents are informed that there is possibility that the baby may not survive or may be born with disability, the ambivalence toward the pregnancy is intensified. The contrasting feelings change—instead of resolving the transitional issues of becoming a mother, the feelings become a mixture of intense desire for a healthy baby and the fear that the baby will not live or will be damaged.

Secondly, with the possibility of a fetus that may never live, or may live but be disabled, parents may find it hard to allow the natural growth of attachment to the baby. Fear of disappointment and loss may thwart the normal trajectory of increasing MFA. For hospitalized women, this danger is salient with the omnipresent fetal monitor, daily physician visits, physical symptoms, periodic hospital tests, and separation from home and family.

Signs of an uncomplicated pregnancy (e.g. weight gain, appearance of the pregnancy to others, unrestricted activity level) contribute to the sense of adequacy an expectant mother develops through the gestational period. In high-risk pregnancy, there may be negative signs instead, such as poor weight gain, bleeding, contractions, and prescribed bed rest that threaten her sense that she will be able to achieve successful pregnancy and childbirth. Feelings of threat, isolation, and a loss of control may thwart the development of maternal adequacy and spill over into a continuing sense of inadequacy when the baby is born. Penticuff believed women with high-risk were especially vulnerable to feelings of self-blame and failure.

The fourth issue targeted the impairment of traditional nesting behaviors. In normal pregnancy, the last trimester is typically spent acquiring the necessities for infant care, selecting and preparing the layette, and decorating the nursery. Friends and family plan baby showers, and the atmosphere is one of excitement and joy. When complications occur, all these activities are suddenly curtailed (or may never take place), the prevailing atmosphere becomes one of anxiety, and friends and family members are not sure what to do or say.

Finally, the very expectations of labor and delivery change. While there is always some element of anxiety in approaching the birth experience, certain positive expectations are in place. Couples participate in birthing classes, tour labor and delivery facilities, imagine what seeing their baby for the first time will be like, and mothers consider breast-feeding. Complications change all these expectations—labor and delivery are uncertain. There may be no time for classes and tours, no choice to breastfeed an extremely premature

neonate, and couples must prepare themselves for the possibility of an emergency delivery and the risk their child will not survive.

In summary, high-risk pregnancy sends an expectant mother into a state of “limbo,” a place of uncertainty accompanied by an overwhelming sense of vulnerability, with a realization of the loss of control and the need to surrender autonomy. “Others” take on new significance, from the medical professionals who bring the good and the bad news, to the husbands, friends, and families who bring food and stories of the outside world; dependency is somewhat forced upon a high-risk mother. Since Bowlby held that the attachment system was found to be most strongly activated under conditions of distress such as fatigue, illness, or fear, this environment seems ideal for an investigation of attachment (Bowlby, 1973).

Previous Research with Hospitalized Populations

Only three studies of MFA have been conducted using samples that included hospitalized women. The earliest publication reported findings on a prospective, descriptive, correlational study of 75 women hospitalized with complications in their third trimester of pregnancy (Curry, 1987). Curry wondered if social support and self-concept could be intervening variables between maternal behavior and maternal history of stress. She also wanted to take the opportunity to summarize the feelings these hospitalized women had regarding their pregnancies and babies. Although she was unable to support her hypothesis concerning intervening variables, there were several findings pertinent to this discussion. There was a significant positive correlation between Cranley’s MFAS scale and the self-concept measure Curry employed, indicating that women with high measures of self-concept also reported high MFA. Curry hypothesized this supported a profile of women with poor

self-concept, perhaps as a result of inadequate mothering, who then were vulnerable to negative effects from a high-risk pregnancy. This hypothesis was later supported by Priel and Besser's study of the association between introjective women and postpartum depression in uncomplicated pregnancy (1999). Secondly, women who reported better relationships with their mothers also scored higher in the MFAS, supporting both attachment and object relations theories of the developments during pregnancy. However, without specific measures of mental representation that conclusion could not be made. Curry believed that future research using grounded theory and qualitative methods would continue to broaden the understanding of women's feelings in high-risk pregnancy, enable identification of women vulnerable to negative psychological effects from the risk, and develop interventions aimed at improving self-concept in these women.

The other two research teams investigating MFA in hospitalized women were led by Mercer, an early spokeswoman for nurses concerned with expectant mothers at risk (Mercer, 1977; Mercer, 1983). The first study of expectant couples included 153 high-risk hospitalized women (75 mates) and 218 low-risk women (147 mates) in the third trimester of pregnancy (Mercer et al., 1988). Mercer expected to find no effects upon maternal or paternal attachment (measured by Cranley's MFAS and PFAS) of the variables social support, self-esteem, sense of mastery, general health, marital relationship, family functioning, life experiences, anxiety, depression, early relationships with parental figures, or readiness for pregnancy. All measures used were self-report questionnaires, and the ability of some to relatively capture the variable of interest is unclear. For example, in evaluating early relationships with parental figures, Mercer et al. used a single question with a 5-point

Likert-type scale. It is doubtful that this would have the same predictive power of a more comprehensive tool. While their statistical analyses did not find significance, there were interesting trends that are informative. 25% of high-risk women conveyed worry, anxiety, and concern compared to 8% of low-risk subjects; 11% of high-risk women reported loving or talking to their fetus compared with 18% of low-risk subjects; only 23% of high-risk women expressed being curious about and anticipating birth, in contrast to 48% of the low-risk subject. The study also suffered from a 41% refusal rate of the high-risk women at the facility from which the sample was drawn, among which 70% were not Caucasian. In addition, the authors themselves considered that the measures utilized may not be accurately capturing the parameters of the MFA construct.

Six years later, Mercer led another team comparing 121 high-risk women and 182 low-risk women at 5 time points: Antenatal (hospitalization for the high-risk group), postpartal hospitalization, 1, 4, and 8 months postpartum. The hypotheses this time were that high-risk women would report lower maternal role competence than low-risk women, and that there would be a significant relationship between maternal competence and maternal attachment from postpartal to 8 months postpartum. Hypothesis one was rejected, as no significant differences were found in the maternal role competence of either group over time. However, self-esteem and mastery were consistent predictors of maternal competence for both groups. Fetal attachment was a consistent predictor of competence only in the high-risk group, suggesting to the authors that perhaps these women had been sensitized to the value they placed on safely delivering their babies. Depression also explained more variance in the reported maternal competence of the high-risk group at 1 month postpartum, and continued

to have an effect on scores through the last time point. State anxiety was a major predictor to maternal competence for both groups, but only at the postpartal time point. Although fewer measures were used with this study, the ones used were identical to those in the previous study, making it difficult to determine if the findings were consistent because they are meaningful or because the measures were the same as those previously used.

CONCLUSION OF REVIEW

A study of the MFA construct in a sample of hospitalized women would add value to the body of research that is available and perhaps begin addressing previously unanswered questions. Viewing the high-risk population as an avenue to better understand the process of attachment has merit from both attachment and object relational theoretical approaches, for this group of individuals is in the exact climate Bowlby believed activated attachment emotions, cognitions, and behaviors. Gaining an understanding of how mental representations may motivate those reactions could refine our understanding of MFA, help identify those with compromised attachment systems, and inspire interventions aimed at causal mechanisms instead of symptoms. And an understanding of personality tendencies may help tie the mechanisms of attachment and object representation together in a manner that exposes or explains associations as well as individual differences.

RATIONALE FOR THIS RESEARCH

Findings in the literature have been inconsistent regarding the implications of risk on maternal-fetal attachment (MFA), and there is a paucity of research investigating the impact of hospitalization on the development of this attachment. Reviews of extant published

studies have consistently pointed out the necessity for additional correlational research to be conducted with this population for two specific scientific reasons: Existing MFA measures have not been validated outside the population of low-risk pregnant women, and there is a need for increased knowledge regarding the construct of prenatal attachment and the contributions of object representation and personality. This study would provide an investigation of both.

Indirect benefit of this work could be realized as well. If women at risk for weak attachment can be identified before childbirth, then future longitudinal study of interventions would be justifiable and important. Successful development of interventions would require a more refined understanding of MFA across populations (Cranley, 1992). Since strong MFA has been linked with positive health practices during pregnancy, enhancing attachment has the potential of reducing perinatal risk and improving the health of perinatal women and their infants. Although findings are inconsistent, there is some suggestion that strong MFA is a protective factor against postpartum depression; prenatal interventions with women at risk for this tragic illness are important for mothers and babies. Current work in Germany is suggesting that prenatal interventions do improve the sensitivity of mothers at risk for poor caregiving (Brisch, 2002) and past research in the U.S. has proposed simple interventions nurses can employ with women to enhance attachment (Carter-Jessop, 1981). Sound, theory-driven studies are a necessary foundation for any of this work.

AIMS OF THE STUDY

The primary goals of this dissertation research are: 1) To investigate to what extent maternal and fetal representations influence an expectant mother's ability to form attachment with her fetus in the uncertainty of maternal and/or fetal risk factors significant enough to require hospitalization, and 2) to explore the association between personality, object representation, and MFA.

Secondarily, interrelationships between object representation, personality, type of risk, severity of risk, gestational age of fetus at time of onset of complications, and depression will be analyzed.

HYPOTHESES

Primary Hypotheses

Hypothesis One

It is hypothesized that, in a hospitalized sample of high-risk pregnant women, those participants expressing complex, highly integrated conceptual levels of representation of their own mothers (as evaluated by the Conceptual Level scale of the Object Relations Inventory) will report both a higher quality and greater intensity of attachment (as measured by the Maternal Antenatal Attachment Scale) to their unborn babies than those whose maternal representations are less highly developed.

Hypothesis Two

It is also expected that those individuals who are able to articulate more complex representations of their mothers will also be able to do so of their babies (as evaluated by the Conceptual Level scale of the Object Relations Inventory).

Hypothesis Three

Dependency (as identified on the Depressive Experiences Questionnaire) is expected to be more highly associated with anxious/ambivalent prenatal attachment (as categorized from the Maternal Antenatal Attachment Scale) while self-criticism (as identified on the Depressive Experiences Questionnaire) is expected to be more highly associated with a positive quality of attachment but low preoccupation (as categorized from the Maternal Antenatal Attachment Scale).

Hypothesis Four

In addition, it is predicted that women with a self-critical personality style will convey object representations of a higher conceptual level (as evaluated by the Object Relations Inventory) and report a higher quality of attachment than women with a dependent style.

Secondary Hypotheses

Hypothesis Five

Since some risks are to mother and others to fetus within high risk pregnancy, the relationship between maternal representation/fetal representation (as evaluated by the Object Relations Inventory) and attachment (as measured by the Maternal Antenatal Attachment Scale) is suspected to be influenced by the type of risk described to the participant by her

physician. Risk in this study will be categorized as primarily maternal or primarily fetal. Severity of risk will also be taken into account, stratifying risk as low, medium, and high, based on the physician's diagnosis and the Hobel Risk Assessment score. Specifically, it is expected that fetal risk will be associated with a higher global score of the Maternal Antenatal Attachment Scale than maternal risk.

Hypothesis Six

It is also expected that the intensity subscale scores of this measure will be higher in patients with identified fetal risk.

Hypothesis Seven

It is also expected that gestational age of the fetus at time of onset of complications will be positively correlated with the global attachment score.

CHAPTER THREE

METHODOLOGY

PARTICIPANTS

Participants were a sample of women with maternal and/or fetal risk severe enough to require admission to the antenatal unit of Baylor University Medical Center. The antepartum unit often receives patients who are admitted for less than 24 hours, making complete data collection on all new admits unfeasible. In order to minimize missing data, participation in the study was limited to women admitted to the antenatal unit of Baylor University Medical Center with the expectation of a hospitalization longer than 72 hours. Women who were actively psychotic, suicidal, or homicidal were excluded from the research, as were any with cognitive impairment.

METHODS AND PROCEDURES

The study coordinator reviewed the antenatal unit's daily log of admissions and discharges from the floor. Information from the charge nurse regarding the proposed length of stay determined if new admissions were solicited for the study. Patients expected to remain in the unit for at least 72 hours were approached in their hospital rooms and the project was introduced as a study of women's experiences during hospitalization for complications of pregnancy. After obtaining consent (Appendix A), a member of the research team obtained demographic information, explained the self-report measures, and left

the packet with the patient for completion, arranging to return for it at a designated time. The investigator also reviewed medical records to obtain relevant medical information including gestational age and factors of mother/baby risk. To ensure confidentiality, each mother was assigned a participant number and all study materials bore only that identifying number. The consent forms were kept locked in a separate file from the measures.

MEASURES

The Center for Epidemiological Studies—Depression Scale (CES-D) was developed as a screening instrument to detect depression in nonclinical populations. Because the items tap few physiological symptoms (appetite, sleep, energy level, fatigue), it is well suited for the prenatal population, in view of those symptoms being commonly associated with pregnancy and less specific for depression (Unauthored, 1999; Beeghly et al., 2002; Besser et al., 2002; Marcus, Flynn, Blow, & Barry, 2003). The 20 items cover the previous 7 days and are rated on a 4-point scale. A total score is derived from summing the ratings; the score of 16 has been used as the standard cutoff point to determine distress in community samples as well as with an obstetric population. Good internal consistency has been reported (Cronbach's alpha = .88-.91) in studies with perinatal women (Beeghly et al., 2002). A threshold score of 16 or more in this study dictated the administration of The Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I) to review symptoms and establish or rule out the diagnosis of depression.

The Depressive Experiences Questionnaire (DEQ) was specifically developed for assessing dependency and self-criticism, and accomplishes this by assessing a broad range of feelings about the self and others without overlapping with the actual clinical symptoms of

depression (Blatt et al., 1976). This self-report questionnaire is comprised of 66 items inquiring about the nature of an individual's experience of depression, and requires approximately 15 minutes for administration. Participants identify the extent to which each item is true on a 7-point scale ranging from (1) "strongly disagree" to (7) "strongly agree." Negative scores indicate low involvement on that particular factor. Subscales of the factors are also rated and yield scaled scores. Three primary factors, Dependency (interpersonal), Self-Criticism (self-definitional), and Efficacy are analyzed. Dependency elicits concerns about abandonment, separation, loss, and feeling unloved. Self-Criticism reflects worries of failure, guilt, self-definition, and unreasonably high expectations. Efficacy concerns pride, self-confidence, self-satisfaction, and strength. Since efficacy has not been found to be a risk factor for attachment or depression, the Efficacy scores will not be used in this study. The mean for each factor is 0, and the standard deviation is +1/-1. Psychometric properties of the scales are reportedly satisfactory; internal consistencies are high (Cronbach alphas > .75) and test-retest reliabilities at 12 months are similarly high ($r = .79$) (Zuroff, Igreja, & Mongrain, 1990). High convergent, construct, and discriminant validity has also been reported (Blatt et al., 1992b). Women were designated "dependent" (anaclitic) or "self-critical" (introjective), if their score deviated from the sample mean by one standard deviation.

The Edinburgh Depression Scale (EPDS) is a 10-item, multiple-choice self-report scale developed specifically for the screening and assessment of perinatal depression. The most common tool reported in previous studies (Gaynes et al., 2005), it covers the common symptoms of depression but excludes somatic symptoms such as fatigue and changes in

appetite, which occur naturally in pregnancy and would not discriminate depressed women from non-depressed women. It takes less than five minutes to complete and has been widely used in research and clinical practice. The split-half reliability of the EPDS has been reported to be .88 and the standardized α coefficient 0.87 (Cox & Holden, 2003b). Scores on this scale range from 0-30; higher scores indicate more depressive symptoms. A threshold score of 11 or higher in this study dictated the administration of The Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I) to review symptoms and establish or rule out the diagnosis of depression.

The Maternal Antenatal Attachment Scale (MAAS) is a self-report questionnaire designed to capture the developing attachment of mother to fetus (Condon et al., 1997; Condon, 1993). Nineteen items, requiring less than 10 minutes for completion, yield data clustered in two factors: “Quality” assesses positive emotions and thoughts regarding closeness, tenderness, the desire to know and see the baby, as well as vivid internal representations of the baby; “Intensity” measures the mothers’ preoccupation about the baby, including the amount of time spent thinking about and talking to it. Prenatal attachment as measured in this instrument has been found to fall in four quadrants, each depicting an attachment style: strong/healthy, positive affective/low preoccupation, uninvolved/ambivalent, and anxious, ambivalent, or affectless preoccupation. Responses are identified on a 5-point Likert-type scale, with higher values indicating greater antenatal attachment. In item analysis, the 19 items were reported to have an internal consistency of $\alpha = .818$.

The Object Relations Inventory is a method developed by Blatt and colleagues for assessment of basic dimensions of object representations (Blatt et al., 1992a). The participant is asked to write a description of mother and fetus. The scoring procedure includes 12 qualitative dimensions and scores of ambivalence, complexity and conceptual level. The 12 dimensions are Likert-style ratings of perceived personal qualities of the parent or subject of reference: affectionate, ambitious, malevolent-benevolent, cold-warm, degree of constructive involvement, intellectual, judgmental, negative-positive ideal, nurturant, punitive, successful, and weak-strong. The 7-point scales are anchored at 1 = “Little” and 7 = “Very.” A score of 9 indicates that the quality is not mentioned in the narrative and cannot be evaluated. These 12 items produce 3 factors—Benevolent, Punitive, and Ambitious. Ambivalence, the degree to which opposite or inconsistent feelings are expressed, is rated by the coder on a 5-point scale anchored at 1 = “none,” 3 = “moderate,” and 5 = “large.” Complexity refers to verbal fluency and is rated on a 7-point scale according to the length of the description. The final score, Conceptual Level, is a five-level evaluation based on the developmental concepts of Piaget, Werner, and others. Level One, Sensorimotor Preoperational, is a personal, subjectively focused description that identifies the individual primarily in terms of his/her satisfying or disappointing the subject. The second level, Concrete-Perceptual, refers to narratives that describe the person literally, concretely, according to external characteristics or physical properties. External Iconic, Level Three, focuses on the person as a separate entity, describing activities and attributes that are uniquely the person’s and not related to the subject’s gratification or frustration. Internal Iconic, the fourth level, is coded when the description that conveys the internal state of the

person in such a way that the reader can empathize with the person's experience of reality, as the subject has done in the narrative. Conceptual Representation is the highest level and is judged on the basis of a cohesive integration of a wide range of levels on which the person is understood and experienced. These five levels are represented on the scale on 9 points, one for each level and one between levels to reflect narratives that may include elements from both levels. In the assessment of maternal representations, this open-ended instrument has been found to be reliable (Bornstein, Galley, & Leone, 1986; Fishler, Sperling, & Carr, 1990) and it has been utilized in a recent study of expectant mothers (Priel et al., 2001). The inclusion of the description of the fetus was novel, as there have been no published studies in which the instrument was used for this purpose. Coding was done by two raters, and interrater reliability was monitored throughout the course of data gathering.

Pregnancy risk was assessed with a revision of the Hobel Risk Assessment, an instrument assigning prescribed scores to 126 medical and obstetric risk factors of mother and neonate (Hobel et al., 1973; Hobel, Youkeles, & Forsythe, 1979). From the original instrument, 36 factors are intrapartum (during delivery) and 35 factors are neonatal (assessed after the birth of the infant); these factors will not be evaluated in this study. All original items have weighted scores based on their association with mortality, and previous studies have fixed the score of >10 as indicative of high risk. Four additional items were added that, while not included in the original instrument, account for a large percentage of antenatal hospital admissions. These are premature rupture of the membrane, primary dysfunctional labor, placenta previa, and abruption placentae. The Principal Investigator of the study, John Rosnes, M.D., assigned weighted scores to these four items. Dr. Rosnes also categorized the

nature of each Hobel item as primarily maternal or primarily fetal. While the chief interest was in maternal versus fetal risk, an additional curiosity was the possible relationship between level of risk and attachment. An analysis of risk was conducted stratifying risk into 3 categories: 1-4 = "Low risk," 5-10 = "Medium risk," and >10 = "High risk."

CHAPTER FOUR

RESULTS

DEMOGRAPHIC INFORMATION

Unlike most previous studies utilizing largely Caucasian, middle-class, married women, this project enjoyed a richly diverse sample. Table 1 provides the demographic information for the sample. The sample consisted of 91 women, ranging in age from 17 to 44 years, with a mean age of 27.01 ($SD = 6.44$). Fifty-four percent ($N = 49$) were Caucasian, 33% were African American ($N = 30$), 11% were Hispanic ($N = 10$), and 2% were Asian ($N = 2$). Forty-nine percent of the participants were married ($N = 49$), 32% were single ($N = 29$), 10% were living with a partner ($N = 9$), and 3% were separated from their husbands ($N = 3$). The average number of children at home was 1.02, with a range of 0 to 6 children ($SD = 1.45$). Eleven per cent of the sample did not complete high school ($N = 10$), however 25% completed high school or had completed a General Educational Development test ($N = 23$), 33% received some college education ($N = 30$), and 26% had obtained an undergraduate or graduate college degree ($N = 24$). Thirty percent had an annual household income below \$26,000 ($N = 27$), 16.5% reported income of \$26,000--\$40,000 annually ($N = 15$), 16.5% reported \$41,000--\$65,000 ($N = 15$), and 29% reported earnings of more than \$65,000 a year ($N = 26$). Government funds (Medicaid) covered 43% ($N = 15$), 48% were covered by a private insurance plan ($N = 44$), and 3.3% had no coverage at the time of their admission to Baylor ($N = 3$).

Pregnancy Characteristics

Although almost one-third of the sample was experiencing a first pregnancy ($N = 29$), 24% had been pregnant before ($N = 22$), and 44 % ($N = 39$) had history of at least two previous pregnancies (Table 2). Four percent ($N = 4$) had suffered delivering a stillborn baby, 27% had history of miscarriage ($N = 24$), and 37% had history of obstetric complications ($N = 34$). Almost half of the patients were in their third trimester at onset of obstetric complications ($N = 42$), but 11% ($N = 10$) were in their first trimester and 37% in their second ($N = 34$).

Psychiatric Characteristics

As Table 3 reveals, slightly more than three-quarters of the participants denied any history of psychiatric disturbance, hospitalization, psychotropic treatment, or counseling ($N = 69$), but 7% reported a history of depression ($N = 6$), 7% reported a history of anxiety disorder ($N = 6$), 3% had been treated for both depression and anxiety ($N = 3$), and one participant suffered from bipolar disorder. However, when screened for depression, 36% ($N = 33$), endorsed depressive symptoms on the Center for Epidemiologic Studies- Depression scale (CES-D; score exceeded the threshold of 16 for possible mood disorder) and 42% ($N = 38$), endorsed depressive symptoms on the Edinburgh Postpartum Depression Scale (EPDS). Although 35 Structured Clinical Interviews were administered, only three patients met the criteria for Major Depressive Disorder (six met criteria for one of the anxiety disorders). Seventy-seven percent ($N = 70$), of the participants denied a familial history of psychiatric disturbance, but 18% ($N = 16$), reported family history of mood, anxiety, or substance-use disorders.

Nature of Obstetric Risk

There was significant variance in the severity of risk across participants in the sample (Table 4). The mean revised Hobel Assessment score was 18.35 ($SD = 9.62$), with a range of 5 to 45 points. Twenty-five percent of the patients fell between 10 and 15 points of severity. Classifying risk as “maternal” or “fetal” was not problematic; however, 42% ($N = 38$) of the sample met criteria for both types of risk. This would occur, for example, when a participant would carry the diagnosis of toxemia (severe gestational hypertension) and would also have a history of a stillbirth and/or a premature delivery. In nine of these instances (21%), the dual risk was due to a multiple pregnancy.

OVERVIEW OF STATISTICAL ANALYSES

Primary Hypotheses

Hypothesis One

Participants who expressed an integrated understanding of their mother’s characteristics, qualities, and aspirations in the Object Relations Inventory (ORI) narrative were expected to also report a higher quality and greater intensity of attachment, as evaluated by two factors of the Maternal Antenatal Attachment Scale (MAAS). The ORI narratives are scored on six dimensions: Benevolence, Punitiveness, Ambition, Length, Ambivalence, and Conceptual Level. The subject’s responses on the MAAS yield a global score of attachment as well as scores on two orthogonal factors: Quality, describing positive affect regarding the fetus, and Intensity, reflecting the amount of time the expectant mother reports being preoccupied with thoughts about the fetus. A one-way multivariate analysis of variance

(MANOVA) was conducted to determine the effect of the six dimensions of the ORI upon the MAAS global score of attachment. The scores were separated into two levels, above and below the mean ($M = 81.5$, Table 4), in the first analysis. No significant differences were found among the dimensions for attachment, Wilks' $\Lambda = .899$, $F(6, 32) = .601$, $p = .728$. The multivariate η^2 based on Wilks' Λ was nonsignificant, .101. Table 5 contains the means and the standard deviations on the dependent variables for the six groups. A second MANOVA was conducted, dividing the Global score into three groups: Lowest through $-.99$ sd below the mean, -1 sd through 1 sd , and 1.01 sd through the highest score. This further stratification was also nonsignificant, Wilks' $\Lambda = .620$, $F(12, 62) = 1.393$, $p = .193$, $\eta^2 = .212$ (Table 6).

A one-way analysis of variance was conducted to evaluate the relationship between Conceptual Level of the mother narrative and the Quality of attachment score from the MAAS. The 95% confidence intervals for the multiple comparisons, as well as the means and standard deviations for the four Conceptual Levels, are reported in Table 7. The independent variable, Conceptual Level of the narrative, included four levels: "Sensorimotor-Preoperational," "Concrete," "External Iconic," and "Internal Iconic" (no narratives contained the necessary elements for the highest level, "Conceptual Level"). The dependent variable was the Quality of Attachment score from the MAAS. The ANOVA was nonsignificant, $F(3, 79) = .434$, $p = .729$. Figure 1 displays the distribution of the sample. The analysis was repeated using the attachment Intensity score from the MAAS as the dependent variable, with similar results: $F(3, 77) = 1.35$, $p = .265$ (Table 8; Figure 2). A significant issue in the interpretation of the preceding analyses is the uneven distribution of

the sample across the Conceptual Level dimension of the ORI (Table 9). In view of this limitation, several other analytical strategies were employed.

Correlation coefficients were computed among the Quality of Attachment factor, the Intensity of Attachment factor, and only the Conceptual Level of the mother narrative (Table 10). Since the Conceptual Level score is ordinal, Spearman's rho was computed for this comparison. The results of the correlational analysis were nonsignificant (.02 for Quality and -.210 for Intensity). See Figures 3 through 5 for distributions of Conceptual Level across the MAAS Quality, Intensity, and Global scores.

In the following analysis, the ORI scores for Conceptual Level were collapsed into two groups: Participants with narratives in the Sensorimotor-Preoperational and Concrete levels were combined and those with narratives in the External and Internal Iconic level were combined. A two-way contingency table analysis was conducted to assess whether there were differences in the Quality of Attachment factor between the two levels of narratives (Table 11). The Quality scores were divided above and below the mean and, once more, test results were nonsignificant: Pearson $\chi^2 (1, N = 83) = .855, p = .465$. A second analysis was undertaken, forming three groups of attachment scores: "Low," lowest through -.6, "Average," -.5 through .5, and "High," .6 through the highest score (Table 12). (Since there were no scores greater than +1 standard deviation from the mean it was necessary to choose .5 as the point for analysis.) The test statistic changed slightly: Pearson $\chi^2 (2, N = 83) = .111, p = .946$ and, once again, the problem of unbalanced distribution across the groups of attachment calls for caution in interpretation.

These two analyses were repeated exploring the relationship between MAAS Intensity of Attachment scores and Conceptual Level of the mother narrative. The first two-way contingency table analyzed two levels of object representation Conceptual Level, Preoperational/Concrete and External/Internal Iconic, and two levels of Intensity, above and below the mean. Table 13 displays the nonsignificant results: Pearson $\chi^2 (1, N = 81) = .173, p = .727$. The second analysis repeated the stratification of Conceptual Level and also stratified Intensity into three levels: “Low” (lowest through -.6), “Average” (-.5 through .5), and “High” (.6 through the highest score). These nonsignificant findings appear in Table 14: Pearson $\chi^2 (1, N = 81) = 2.04, p = .361$. In light of these findings, no further analyses were performed. The results suggest that the participants’ mental representations of their mothers were not related to the quality or intensity of antenatal attachment as evaluated by the MAAS.

Hypothesis Two

Originally, it was also proposed that these same analytic procedures would be carried out with participants’ narratives about their fetuses. However, in scoring the narratives it became apparent that the twelve characteristics from which the Benevolent, Punitive, and Ambitious dimensions are derived were not appropriate for a narrative about an unborn baby. Three dimensions, Ambivalence, Length, and Conceptual Level, were retained for analysis, and a MANOVA was conducted with these dimensions and the MAAS Global Attachment score (once again divided into an “Above the Mean” group and a “Below the Mean” group). A significant difference between the groups was found, Wilks’ $\Lambda = .843, F(3, 81) = 5.031, p = .003, \eta^2 = .157$. Means and standard deviations are contained in Table 15. Analyses of

variances (ANOVA) on each dimension were conducted as follow-up test to the MANOVA. The ANOVA on the Ambivalence dimension was significant, $F(1, 83) = 11.12, p = .001, \eta^2 = .118$, while the ANOVAs on the Length, $F(1,83) = .026, p = .873$, and Conceptual Level, $F(1, 83) = .003, p = .958$, were nonsignificant. When subjected to the same second analyses with the Global Attachment score categorized in three levels, the significance remained; Wilks' $\Lambda = .769, F(6, 160) = 3.735, p = .002, \eta^2 = .123$ (Table 16). In the follow-up ANOVAs on each dimension, the statistic on Ambivalence increased in significance, $F(2, 82) = 8.52, p = .000, \eta^2 = .172$. Baby narrative Conceptual Level and Length remained nonsignificant. These findings suggest that mothers who express ambivalent feelings about their babies have slightly lower Global scores of antenatal attachment.

It was hypothesized that women who could articulate more complex representations of their mothers would also be able to do so of their babies, as evaluated by the Conceptual Level dimension of the ORI. Taking into consideration the ordinal quality of the measures, a Spearman's rho analysis was performed and no significant association between the Conceptual Levels of the two narratives was suggested, $r = .068, p = .55$. Figure 6 illustrates the distributions of Conceptual Levels of the two narratives. Two other dimensions of the two narratives, Ambivalence and Length, were also compared. The results of the correlational analyses presented in Table 17 show that 8 out of the 15 correlations were statistically significant, ranging from $r = .27$ to $r = .72$. All significant correlations were related to Ambivalence or Length, one of which was associated with Conceptual Level. The findings seem to suggest that women who express ambivalence toward their mothers also express it of their babies, and these narratives tend to be more fluent than those in which no

ambivalence is scored. The length of the baby narrative was positively associated with the Conceptual Level of the baby narrative, perhaps not surprising in that higher Conceptual Levels would require greater articulation.

Two bi-level variables were created by collapsing the Conceptual Levels of mother and baby narratives into two categories, Preoperational/Concrete and External/Internal Iconic. A two-way contingency table analysis was conducted to evaluate whether there were associations between these broader categories of representation. The results of the test were nonsignificant, Pearson $\chi^2(1, N = 82) = .206, p = .695$ (Table 18). Although the two narratives may resemble one another in terms of Ambivalence and Length, the findings do not support any association on the dimension of Conceptual Level.

Hypothesis Three

According to Condon's model of antenatal attachment, expectant parents resided in one of four quadrants of attachment style, estimated by the scores on the Quality and Intensity factors (Condon, 1993). The final stated expectations of the primary hypotheses were that dependent tendencies would be more highly associated with an anxious, ambivalent style of prenatal attachment as conceptualized in the fourth quadrant of the MAAS Attachment Style paradigm. Self-critical tendencies, as identified by scores above the mean on the Depressive Experiences Questionnaire (DEQ) were expected to be more highly associated with a high quality of attachment but an avoidant style (second quadrant). Blatt's original scoring method of the DEQ (raw scores are transformed into z scores, weighted according to the factor they are most highly correlated, and summed) was employed for these analyses (Blatt et al., 1976). Means and standard deviations of the DEQ

are located in Table 4. First, a Pearson's product-moment correlation was performed between the DEQ z scores for dependency and self-criticism and the MAAS Global, Quality, and Intensity of Attachment scores (Table 19). The self-critical scale of the DEQ was negatively correlated with the MAAS Quality of Attachment factor ($N = 91$; $r = -.366$, $p \leq .000$), but analysis revealed no significant association between the self-critical scale and the MAAS Intensity of Attachment factor. Dependency was not found to correlate with either the quality or intensity of attachment.

In the next analyses, participants were identified by one of Condon's quadrants according to their scores on the Quality and Intensity factors of the MAAS. Following Condon's theoretical framework, four categories were established: Quadrant One, high Quality and high Intensity (strong, secure) ; Quadrant Two, high Quality and low Intensity (avoidant); Quadrant Three, low Quality and low Intensity (withdrawn); and Quadrant Four, low Quality and High Intensity (anxious, ambivalent). Quality and Intensity were rated "high" when above the mean of the sample and "low" when below the mean. Figure 7 portrays the distribution of the sample according to Condon's formulation. In order to identify highly dependent or highly self-critical individuals from the DEQ scores, it had been proposed that the sample be divided into individuals within and outside of two standard deviations of the mean. After the data were collected, it became apparent that this strategy was not the best way to analyze the data because of the homogeneity of the scores. Therefore, differences of greater or less than one standard deviation on the DEQ scores established three categories of the Self-critical style ($M = -.93$, $SD = 1.01$) and Dependent style ($M = -.53$, $SD = .90$). (Categories were "Low" < -1 standard deviation from the mean,

“Average” > -1 but < 1 standard deviation from the mean, and “High” > 1 standard deviation from the mean. A contingency table analysis was then conducted to investigate whether pregnant women who are more self-critical reported a higher quality of attachment but a lower intensity (Quadrant Two). A Pearson χ^2 analysis was nonsignificant, (6, $N = 91$) = 5.714, $p = .456$. However, the sample size was not large enough to afford a valid interpretation (Table 20). Therefore, the Self-Criticism factor was condensed to two levels, below and above the mean ($M = -.93$). The sample still lacked power, however the Pearson χ^2 was significant, (3, $N = 91$) = 8.93, $p = .03$, $\eta^2 = .21$ (Table 21). Nevertheless, a look at the sample reveals that those individuals who are more self-critical are less likely to reside in the Avoidant quadrant than in the other three. It is unlikely, even with greater power, the hypothesis would be supported.

The same approach was attempted with Dependency scores. In this sample, so few participants scored in the average range of DEQ Dependency that the resulting Pearson chi-square analysis cannot be interpreted (Table 22). The second analysis, identifying subjects as above or below the mean on the Dependency factor, improved the distribution of the sample, but those who endorse dependent statements do not appear to have a clear preference for any of Condon’s four quadrants (Table 23). Although the analyses are somewhat underpowered, these findings suggest that women who are more self-critical report a lower quality of attachment and trend toward the third (withdrawn) and fourth (anxious ambivalent) quadrant attachment styles in Condon’s model. There appear to be no significant differences in the level of attachment intensity such women report. On the other hand, the attachment scores of women who are more dependent do not fit clearly into any of the Condon quadrants.

Hypothesis Four

It was further expected that women with a self-critical personality style would convey object representations of a higher Conceptual Level and report a higher quality of attachment than women with a dependent style. Once again, the distribution of the sample across the categories did not allow for a valid analysis of four Conceptual Levels of the narrative by self-criticism or dependency in three categories, Low, Average, and High (Tables 24 and 25). Even when stratifying the narrative Conceptual Level into two levels (Preoperational/Concrete and External/Internal Iconic) and the DEQ Dependency and Self-Critical factors above and below the mean (Tables 26 and 27; Figures 8 and 9), the sample does not distribute as expected, and is not significant. For the Self-Critical model, the Pearson $\chi^2 (1, N = 83) = 1.51, p = .272$; for the Dependent model, the Pearson $\chi^2 (1, N = 83) = 1.32, p = .284$. However, the data trend toward a refutation of the original hypothesis.

Secondary Hypotheses

Hypothesis Five

The secondary hypotheses are to be viewed as exploratory. Firstly, it was hypothesized that fetal representation and attachment might be influenced by the type of risk (maternal, fetal, or combined) described to the patient by her obstetrician. A one-way analysis of covariance (ANCOVA) was conducted. The independent variable, Conceptual Level of the ORI, included two levels: Preoperational/Concrete and External/Internal Iconic. The dependent variable was the MAAS Global attachment score and the covariate was risk. The ANCOVA was non significant, $F (1, 82) = .05, MSE = 2.49, p = .823$. Holding risk

constant, there was no relationship between Conceptual Level of the baby narrative and the Global attachment score.

Secondly, it was expected that those mothers identified as being hospitalized for significant risk of fetal demise would report higher antenatal attachment, as indicated by the global score of the MAAS, than mothers hospitalized because of significant maternal risk factors. The risk factors of the revised Hobel scale as identified primarily “fetal” or “maternal” are listed in Tables 28 and 29. A one-way analysis of variance was conducted to evaluate the relationship between type of risk and attachment. The independent variable, type of risk, included three levels: fetal, maternal, and both fetal and maternal. The dependent variable was the change in the Global score of the MAAS. The ANOVA was nonsignificant, $F(2, 90) = .436, p = .648$. The means and standard deviations for the three types of risk are reported in Table 30 and portrayed in Figure 11. Since the third group incorporates fetal risk, the three groups were combined into two groups, maternal and fetal/combined maternal-fetal. Another one-way analysis of variance was conducted and was also nonsignificant, $F(1, 90) = .04, p = .841$. The means and standard deviations for the two groups are reported in Table 31. These results suggest that the type of obstetric risk has little association with mental representation or reported attachment.

Hypothesis Six

It was expected that mothers with identified fetal risk would report a greater intensity of antenatal attachment. First, a one-way analysis of variance was performed with the MAAS Intensity score as the dependent variable and type of risk the independent variable (means, standard deviations, and pairwise comparisons appear in Table 32). The ANOVA

was nonsignificant, $F(2, 86) = 1.239, p = .295$. A two-way contingency table analysis was then conducted with three levels of risk, maternal, fetal, and fetal-maternal, and two levels of Intensity, above and below the mean ($N = 89, M = 30.71, SD = 4.88$). Fetal risk and intensity of attachment were nonsignificantly related, Pearson $\chi^2(2, 89) = 1.36, p = .506$ (Table 33). The MAAS Quality factor and Global score were also analyzed in this manner, with no significant findings (Table 33). The analyses were repeated collapsing risk into two categories, maternal and fetal/combined maternal-fetal. The results remained nonsignificant, Pearson $\chi^2(1, 89) = .048, p = 1.00$ (Table 34). A Pearson's product-moment correlation was performed for risk severity (represented as the sum of Hobel weighted risk items) and the three MAAS scores (Quality, Intensity, and Global). Table 35 reports the values. A one-way analysis of variance was also executed placing the MAAS Intensity score as the dependent variable and the level of risk as the independent variable (means, standard deviations, and pairwise comparisons appear in Table 36). The statistic, $F(2, 86) = 1.25, p = .293$, was nonsignificant. From these analyses, there does not appear to be a significant relationship between type of risk or level of risk severity and intensity of attachment as measured by the MAAS.

Hypothesis Seven

It was hypothesized that older gestational age of the fetus (calculated in weeks) at the time of admission to the antenatal unit would be positively correlated with the Global attachment score of the MAAS. A Pearson's product-moment correlation was employed to assess this relationship and was also nonsignificant, so this hypothesis is disproved. Table 37 reports the correlations and probabilities.

Depression and Attachment

As reviewed earlier, depression and antenatal attachment have been linked by numerous previously published studies. The data from this population support those findings. Both screening measures, the Edinburgh Postpartum Depression Scale (EPDS) and the Center for Epidemiologic Studies-Depression scale (CES-D) were negatively correlated with the Quality of Attachment factor from the MAAS (Table 36). The screening measures do not have a significant correlation with the Intensity factor, and only the EPDS is significantly correlated with the Global score.

In order to examine this association more closely, a univariate analysis of variance was conducted with the EPDS score as the dependent variable and attachment style as the independent variable. The F ratio was significant, 8.693 (3, 87), $p = .000$, and the relationship strong, as assessed by η^2 , with the Quality of Attachment score accounting for 23% of the variance of the dependent variable. Post-hoc tests were performed to evaluate pairwise differences among the means (Table 40). There was a significant difference in the means between the groups that reside in the High Quality quadrants of Condon's attachment style framework. Those participants who were above the mean on the Quality factor reported fewer depressive symptoms than those who were below the mean and in the two Low Quality quadrants of the model. A second analysis confirmed the findings, Pearson χ^2 (3, 91) = 21.339, $p = .000$. This relationship was stronger than that reported in the ANOVA ($\eta^2 = .39$).

Exploratory Analyses

DEQ: As some have been concerned with the use of factor-derived scale scores in the original scoring system of the DEQ, several analyses were run on the variables of interest utilizing other scoring procedures of the instrument (Bagby et al., 1994; Rude & Burham, 1995; Santor, Zuroff, & Fielding, 1997a; Blatt et al., 1995). Bagby et al. proposed a shortened scale in which items with excellent fit to the two-factor model (Dependency and Self-Criticism) were isolated (1994). Blatt and colleagues identified two “facets” of the Dependency factor that suggested two different levels of interpersonal functioning: “Dependence,” derived from items that endorsed feelings of helplessness, broad apprehensions about rejection or fears of separation and loss not related to a specific individual, and “Relatedness,” the product of items that consider feelings about the loss or loneliness that might occur as the result of disruption in a relationship with a particular significant person (1995). Rude and Burnham theorized that dependency was not entirely pathological, and that the Dependency scale of the DEQ could be divided into the subscales “Connectedness” and “Neediness” (1995). Connectedness referred to healthy valuing of relationships and neediness applied to the pathological anxiety concerning rejection and loss. Santor et al. introduced a shortened instrument that utilizes the preferred unit-weighted composite scoring system yet preserves the orthogonality of the factors found in the original scoring system (1997).

First, Pearson’s product-moment intercorrelations were computed for the sample across all four scoring systems. Table 42 reports the means and standard deviations for the sample and Table 43 reports the intercorrelations. As would be expected, the scoring

systems are highly correlated; out of 28 correlations, 14 exceed $r = .60$, and only 5 are nonsignificant. Note both the original scoring and the McGill scoring of the Self-Criticism factor are not associated significantly with Rude & Burnham's "Connectedness" aspect of Dependency but are moderately associated with the "Neediness," the less healthy aspect of interpersonal functioning.

Second, Pearson product-moment correlations between MAAS attachment scores and the three revised scoring system were conducted (Tables 44-46). The Self-Critical factor, as scored in the McGill system, is negatively related with Quality ($r = -.339, p < .01$). Blatt's revised subscale of Dependency, Relatedness, is negatively associated with Quality ($r = -.241, p < .05$) and Rude & Burnham's subscale, Neediness, is also negatively associated with Quality ($r = -.242, p < .05$).

Finally, a series of regression analyses were then conducted to compare to what extent each scoring method of dependency and self-criticism scores could predict the MAAS Global Attachment score. The predictors were the eight scores (original, McGill, Blatt revised, and Rude and Burnham revised), and the criterion variable was the overall measure of attachment provided by the MAAS. Out of four analyses, no linear combination of dependency and self-criticism scores proved to be significantly related to the attachment index. Table 47 contains reports the results.

Gestational age: Other investigators, as cited in the literature review, have found relationships between attachment and gestational age, particularly after quickening. No such relationship was found in this population in a Pearson product-moment correlation of

gestational age (weeks) and MAAS Global Attachment score ($r = .135, p = .203$), Quality of Attachment ($r = .08, p = .45$), or Intensity of Attachment ($r = .157, p = .142$).

Object Relations Inventory: The use of the Object Relations Inventory in assessing the maternal-fetal relationship is as yet unpublished. To explore a possible relationship between the baby narrative and gestational age, a Spearman's rho correlation was conducted and no significant associations were found (Table 48). Multivariate analyses of variance were also conducted on the Length, Ambivalence, and Conceptual Level dimensions of the mother and baby narratives across ethnicity, with nonsignificant results: Wilks' $\Lambda = .77, F(18, 204) = 1.09, p = .368$. Pearson's product-moment correlations were performed between age and the above dimensions. All correlations were nonsignificant with the exception of ambivalence in the mother narrative, $r = .230, p < .05$. Within this sample, younger women revealed more ambivalent feelings in the narratives about their mothers than did older participants.

Another analysis explored the possibility of a relationship between the baby narrative and having other children. A Pearson's product-moment correlation was conducted between "number of children at home" and the Conceptual Level of the ORI. There was no significance: $r = -.054, p = .627$.

Maternal Antenatal Attachment Scale: Table 39 reports an interesting positive correlation between age and Quality of attachment ($r = .29, p < .01$). This finding suggests that older women report a higher quality of attachment than do their younger colleagues. A second exploration investigated parity, however a two-way contingency table found no

significant difference in Global attachment scores of multiparous women and primagravidas,

Pearson $\chi^2 (1, 88) = 2.69, p = .10$.

CHAPTER FIVE

Conclusions and Recommendations

The purpose of the present investigation was to delineate the convergence of personality, object representation, and antenatal attachment in the context of significant maternal or fetal risk. Previous research in general populations has associated depression with the personality tendencies of dependency and self-criticism, and also with lower levels of development in object representation. As these relationships have been investigated in women during the perinatal period, findings have suggested that not only are there relationships between personality, object representation, and depression, but depression often impinges upon the natural process of maternal attachment to baby (Priel et al., 2001). Depression and attachment seem to have a reciprocal relationship, for other research has suggested that strong antenatal attachment acts as a protective factor against postpartum depression (Priel et al., 1999). Most prior research has focused on uncomplicated pregnancies in a Caucasian, middle-class, married population, however studies that have included women with elevated obstetric risk have suggested that such risk may be both a moderate predictor of postpartum depression and a risk factor for healthy antenatal attachment. This study attempted to assess the variables of personality, object representation, and maternal/fetal risk with the expectation they would have heuristic value in predicting antenatal attachment and clinical value in identifying those women at risk for postpartum

depression. The knowledge of significant risk in the hospital environment was expected to interact with these other factors by increasing the level of attachment to the fetus that hospitalized women report.

CHARACTERISTICS OF THE SAMPLE

Demographic Qualities

In addition to their hospitalization, the 91 women who participated in this research were quite different from the sample groups of previous studies. Almost half of the participants were not Caucasian, however the percentage of Caucasian patients who participated in the research is congruent with the general population of the Dallas area (53.8% versus 59.1%). The sample percentage of Hispanic patients is slightly smaller (11% versus 35.6%) and the number of African American patients is slightly higher (33% versus 20.3%) than the Dallas demographic (2004 Dallas Community Census). Previous research done in this country has been done with samples that were predominantly Caucasian: Studies utilizing high risk samples like those of Gupton (77.9%) and Maloni (94%) have to this date underrepresented other ethnicities (Gupton et al., 2001; Maloni, Brezinski-Tomasi, & Johnson, 2001).

Participants' average age was 27 years, with a range of 17 to 44. This sample was slightly younger than other research with high risk populations (Gupton reported a mean age of 29.27 and Maloni reported 31.2) as well as with samples of women with uncomplicated pregnancy (Zimmerman and Doan reported 30.06 and Lindgren reported 29.5) (Zimmerman & Doan, 2003; Lindgren, 2001).

Socioeconomic status was balanced: 24% reported less than \$25, 000 in household income, 35% reported between \$26,000 and \$65,000, and 29% exceeded \$66,000 annually. In comparison to Gupton's sample, this group is somewhat wealthier (Maloni did not report income). Educational attainment was also well represented. Eleven percent of the sample did not finish high school, but 25% graduated or received a GED, 33% had some college, and 26% had an undergraduate/graduate degree. Ninety-four percent of Maloni's sample had some college (Gupton did not report education), but this is not representative of the Dallas demographic. According to the 2004 Dallas Community Survey, 76% of Dallas County residents 25 years and older are High school graduates and 28% have a Bachelor's degree or higher. The 91 women included in this research represent the area population fairly well.

According to Cornell University New Service, out-of-wedlock births accounted for one-third of all U. S. births in 2003, exactly the same ratio of unmarried participants in this study (Lang, 2005). Sixty-five percent were married or were cohabiting. This also distinguishes the sample from previous psychosocial studies, as most of the participants in other samples have been married (Gupton, 85.6%; Maloni, 92.1%).

Pregnancy-Related Qualities

Another distinctive quality of this sample is the range of new mothers to primiparous mothers. Thirty-two percent of the sample was experiencing a first pregnancy, 24.4% were experiencing their second, 22% their third, and 21.6% had a range of four to seven previous pregnancies. Fifty-three percent of Gupton's participants were pregnant for the first time, and Lindgren reported her sample as being 41% primiparous. Maloni, in her discussion of the impact of bed rest upon the families of her participants, reported that 45 of the 89 women

had other children. In this sample, 54.9% of the women had at least one child at home (33% had two children, and 15% had from three to six children in the household).

Psychiatric Qualities

Although psychiatric illness was not a specific interest in this study, it is of interest to compare the prevalence rates of depression and anxiety published in the Diagnostic and Statistical Manual of Mental Disorders with the rates found in this sample of women (2000). Almost seven percent of the sample had history of being diagnosed with depression (point prevalence in community samples is 5-9%), and the same number reported receiving a diagnosis of one of the anxiety disorders (one-year prevalence rate in community samples is 5%). Three percent reported a dual diagnosis (community rates are around 10%), and one participant had previously been diagnosed with bipolar disorder (lifetime prevalence approximately 0.5%). Almost 42% of the women scored at or over the threshold (score of 11) of the Edinburgh Postpartum Depression Scale (EPDS), and 44% scored at or over the threshold (score of 16) on the Center for Epidemiologic Studies-Depression scale (CES-D) provoking the administration of the Structured Clinical Interview for Diagnosis of Axis-I Disorders (SCID). Yet of these administrations, although two participants fully met the criteria for a dual diagnosis of Major Depressive Disorder and Generalized Anxiety Disorder, none met the criteria for a diagnosis of depression alone. Although it is beyond the scope of this discussion, this is a common finding due to the difficulty of choosing a threshold score on depression screening instruments with the acceptable balance of specificity and sensitivity (Austin & Lumley, 2003; Cox & Holden, 2003a). In Austin and Lumley's review article of antenatal screening research, four out of sixteen published studies reported similarly high

percentages of subjects exceeding the threshold. One possible explanation for the discrepancy between positive screenings for depression and negative diagnoses in this sample pertains to the DSM-IV criteria for Major Depressive Disorder. The EPDS instructs the subject to answer the questions based on how she has felt over the last seven days, however the DSM-IV criteria require that the depressive symptoms have been in place for most of the day over the previous two-week period. The participants in this study completed the questionnaire within the first 72 hours of hospitalization; the clinical interviews were usually administered at a later point, dependant upon patient and research investigator availability. Often patients would report that they had been upset initially upon hospitalization but were “feeling better now that things have settled down.”

Varieties of Obstetric Risk

The Hobel Risk Assessment system includes 51 antenatal maternal and fetal risk factors (Tables 28 and 29). Its design was to enable an assessment of prematurity probability (Hobel et al., 1973). However, the original instrument did not include in the prenatal inventory four conditions that often present in hospital admission for obstetric risk: Premature rupture of the membranes, preterm labor, placenta previa, and placental abruption. In this study, these four common diagnoses were included in the risk assessment, and weighted for severity by the Principal Investigator of the study, obstetrician John Rosnes. Three studies provide interesting comparisons of common risks (Table 49). Perhaps Gupton’s study is the most similar in context, for it included 105 women hospitalized for more than 48 hours. Maloni’s study sample consisted of 89 women prescribed antepartum bed rest in the hospital or at home, and participants in Besser’s study were not hospitalized.

However, there are significant differences across these three samples, testifying to the difficulty of comparing this sample with others in the population.

DISCUSSION OF FINDINGS

Maternal Object Representation and Maternal Antenatal Attachment

A previous investigation found significant associations between antenatal attachment and object representation (Priel et al., 2001), but the data from this sample does not support a relationship between the two constructs. Multiple statistical analyses, both parametric and nonparametric, were employed manipulating the sample in several configurations and all failed to reach significance. Contrary to the hypotheses, it is intriguing that the MANOVA procedures examining the Maternal Antenatal Attachment Scale (MAAS) scores of Quality, Intensity, and Global attachment across the Conceptual Levels of the narratives consistently associated lower attachment scores to the participants rated the highest in developmental level on the Object Relations Inventory (ORI) narratives. This nonsignificant trend is an example of the hazard of sampling error, for only eight subjects fell in the lower two levels of development (Sensorimotor/preoperational and Concrete) in the mother narrative as opposed to 75 found in the two higher levels of development (External and Internal Iconic). Although the sample reached the stated minimum of 90 subjects, the power was insufficient for confidently detecting differences in some analyses, particularly those involving the six dimensions of the ORI. Nevertheless, this study was an effective pilot in terms of exploring trends or signals.

Priel and Besser employed both the ORI and the MAAS in a study of 120 Israeli women with uncomplicated pregnancies and a mean age of 25.21 ($SD = 3.50$; Priel et al., 2001). Table 50 displays a comparison of the ORI and MAAS means and standard deviations from their sample with those of this work. The statistics of the two samples overlap in each score with the exception of “Punitive.” In regard to the attachment measure, the Quality score means are within one point of one another, while the Baylor sample Intensity means exceed those of the Israeli sample by three points. Priel and Besser were able to report significant correlations between each ORI dimension and Quality of attachment, as well as a significant correlation between Conceptual Level and Intensity of attachment. Table 51 compares the correlations of the two samples. A primary difference between the two samples is the presence of obstetric risk in the Baylor subjects, but the differences in findings are more likely a product of discrepant sample sizes (the Israeli study included 120 participants, 45% more than the Baylor sample).

In the absence of relationships between the ORI dimensions and the MAAS scales, there are some interesting relationships within the ORI. One rather strong association found in the mother narrative is that between the characteristics of Ambivalence and Length ($r = .40, p = .000$). The scoring manual of the ORI directs Ambivalence to be evaluated by the degree to which the subject relates opposing feelings about the “other,” or expressing confused, mixed feelings. Length is evaluated by counting the lines in the narrative. In taking a look at the specific narratives with high ambivalence scores, it clearly takes more fluency for the subject to express the confusion. One narrative demonstrates this vividly:

My mother just turned 44 years old this month. She is also the mother of ten children, but if it weren't for abortion and miscarriages (sic) she would probably

have 25 kids. She had me at the age of 16 and I was raised by my grandmother. My mother has never really had a job for a long time but she is very educated. She has attained several different degrees and not once put one to use. I sometimes believe that she has multiple personalities but she does have a good heart and you just have to know her to love her.

Ambivalence is also strongly negatively related to Benevolence ($r = -.41, p = .000$) and has an even stronger positive correlation with the Punitive descriptive ($r = .66, p = .000$), further explaining the nature of confusing feelings about the other.

Object Representation of Mother and Baby

One adventure of this study has been the exploration of the ORI narrative of the fetus. The assumption was that women who had the capability of expressing complex highly developed narratives about their mother would be able to do the same about their unborn child. This was to be evaluated by a comparison of the Conceptual Levels of the two narratives. This proved to be difficult in data collection, for few narratives about babies could meet the criteria for the higher conceptual levels. Describing the fetus in preoperational symbiotic language, concrete literal terms, or by fetal movement and activity was dominant. Attributing thoughts, feelings, values, or understanding the baby on a wide range of levels was less often noted. (See Table 9 for the frequencies of Conceptual Levels in both narratives.) There was no significant association between this characteristic of the two narratives. However, there were associations in the other dimensions of the scale. The Conceptual Level of the baby narrative was associated with the length of the mother narrative. Additionally, the length of the baby narrative was positively correlated with length of the mother narrative ($r = .720, p = .000$), and ambivalence in both narratives. As pointed out in the previous section, some scoring requires the subject to write more about the person,

so these relationships of length may be more functional than psychologically revealing. The ORI has been validated in a number of populations and has no reports of level of education biasing the narratives, but an analysis of this sample was performed for confirmation. A two-way contingency table analysis failed to find significant differences in either the baby or mother narratives according to educational level.

Another consideration is whether the baby narrative is actually capturing the mother's internal representation of her baby or her ability to imagine her baby. This would not be contradictory to the theoretical stance that object representations differ from internal working models in the respect that they introduce wish and fantasy into the mental representation of the relationship. The fantasies of pregnant women have been alluded to in other antenatal research; in fact, the absence of antenatal fantasy has been considered dysfunctional (Cohen, 1979; Grace, 1989; Cranley, 1981; Leifer, 1977). In one investigation, 184 pregnant women were asked, "Please write a few sentences about what you expect your baby to be like" (Sorenson & Schuelke, 1999). The responses were analyzed by a series of iterations that ultimately identified ten major themes: Appearance, psychological traits, gender, behavior, normalization, deification, role relations, impact on parents, spiritual, and ambiguity. Findings indicated that fantasies tended to develop across gestational age and differed between multiparas and primigravidas, with multiparous women seeming to be significantly influenced by their older child. In investigation of this sample, however, no differences in Conceptual Level of the ORI were found between women who had children at home and first-time mothers.

Dependency, Self-Criticism, and Antenatal Attachment

In studies of romantic attachment in adult samples, dependency has been associated with an anxious-ambivalent style and self-criticism with a fearful, avoidant style (Besser et al., 2003a) (Zuroff et al., 1995). Similar findings resulted from research conducted with a sample of women in uncomplicated pregnancy (Priel et al., 1999). Therefore, it was expected that dependency in this sample would be related to Condon's anxious ambivalent antenatal attachment style (low quality, high intensity) and that self-criticism would be associated to the avoidant antenatal attachment style (high quality, low intensity; Condon, 1993). A larger sample may have produced significance; however, the trend suggests that the hypothesis would be disproved even in a larger sample. Those scoring over the mean of the sample for dependency were fairly equally distributed throughout the four attachment styles. Out of 39 individuals who scored above the mean for self-criticism, only three resided in the Avoidant quadrant, whereas the other 36 participants were fairly evenly distributed across the remaining three antenatal attachment styles.

A question that appears in this analysis is the suitability of the MAAS for this type of exploration. First, it is possible that the Quality and Intensity scales of the MAAS are not sufficiently orthogonal to produce the four theorized styles. Second, some of Condon's predictions regarding the scale are not confirmed in the sample. For example, he proposed that multiparous women may be overrepresented in the second quadrant, Avoidant, due to a lack of time in "attachment mode." Analyses in this study found no differences between multiparous and nulliparous women.

Self-Criticism, Dependency, and Object Representation

It was predicted that women with a self-critical style would convey maternal object representations of a higher conceptual level and report a higher quality of antenatal attachment than women with a dependent style. Only eight subjects responded with narratives in the lower two conceptual levels opposed to 75 who were rated in the higher two conceptual levels. Although the differences were not significant, it is noteworthy that dependent and self-critical styles in the two-way contingency tables (Tables 26 and 27) are exactly opposite in their placement. Those who are less self-critical tend to provide narratives of higher conceptual levels, whereas those who are more dependent express maternal representations of a higher level.

Also, the self-critical type failed to report a higher quality of attachment than the dependent type. Self-criticism was, in fact, significantly negatively associated with Quality of attachment ($r = -.37, p < .000$). This result is interesting in relation to Priel and Besser's finding that highly self-critical subjects' risk for depression was lowered if they became strongly attached to the fetus during pregnancy. If self-criticism is associated with a lower quality of antenatal attachment, but attachment can reduce vulnerability to postpartum depression, an interesting paradox exists.

Risk and Attachment

Previous research has been equivocal concerning the impact of risk on maternal fetal attachment. Findings from this sample are not ambiguous—they are simply negative. A number of statistical analyses investigating both type of risk (maternal, fetal, or combined) and level of risk (low, medium, and high, calculated by the mean of the Hobel Risk

Assessment scores of the sample) failed to find any significant relationships between risk, attachment, and object representation in this sample. Ruling out measurement error, it is possible that the level or type of risk is not strong enough to affect differences in antenatal attachment in the women in this sample (Cannella, 2005).

Depression

Both screening measures, the CES-D and the EPDS, were significantly correlated with the Quality scale of the MAAS. However, only the EPDS was significantly associated with the Global score, and neither instrument was associated with the Intensity scale. It would be interesting in future research to investigate any potential associations between the Intensity of Attachment factor and screening instruments designed for the spectrum of anxiety disorders. Both screening instruments were significantly correlated with the Dependency and Self-Criticism scales of the DEQ. However, neither instrument was associated with the severity of risk.

Exploring the attachment styles of mothers who scored above and below the threshold for possible depression on the EPDS depression instrument exposed an interesting and significant relationship between depressive symptomatology and attachment quality. Table 41 portrays mothers over the threshold score of 11 as residing in the third (withdrawn) and fourth (anxious ambivalent) quadrants of Condon's model. This is consistent with previous research referring to the tendency for depressed mothers to be withdrawn from their infants, at great cost to the child (Dawson, Klinger, Panagiotides, Hill, & Spieker, 1992; Murray, 1992).

Alternate Scoring Methods for the DEQ

As mentioned in the results, psychometricians have concerns regarding the standard scoring system utilized for the DEQ (Santor et al., 1997a; Bagby et al., 1994). In addition, a growing movement within the domain of feminist psychology has questioned the assumption of dependency as a maladaptive style of interpersonal relatedness (Rude et al., 1995). Several theorists, Blatt and the fellow authors of the DEQ included, have suggested that the Dependency scale might actually be composed of two subscales, a “healthy” one and an “unhealthy” one. This has led to revisions of the scoring system and new subscales of “Relatedness” and “Dependency” (Blatt et al., 1995; Bacchiochi et al., 2003) and “Connectedness and Neediness” (Rude et al., 1995). Advocates of this stance believe this distinction between the psychologically adaptive maintenance of close, reciprocal relationships and the pathological fearful, helpless, and clinging approach to others may explain why often those who score highly in Dependency are less vulnerable to depression (McBride, Zuroff, Bacchiochi, & Bagby, 2006; Besser, Flett, & Davis, 2003; Zuroff et al., 1995). As seen in Table 43, the samples’ DEQ scores were calculated by each method and then compared for associations. Of note are the positive correlations between the two Self-Criticism scores and Rude and Burnham’s Neediness subscale, and the lack of association between the Self-Criticism scores and the Connectedness subscale. The difference, while still significant, is not so striking when comparing Blatt’s subscales, Dependency and Relatedness, with the standard scales. This generates the question of what is being measured, personality tendencies or a vulnerability to depression that transcends self-criticism or dependency?

When testing the other scoring methods for associations with attachment, there are significant findings. The McGill scoring system produces the same negative correlation between Self-Criticism and Quality of attachment ($r = -.339, p < .001$), as the standard scale ($r = -.336, p < .000$), and correlations between Dependency, Intensity of attachment, and Global attachment are all nonsignificant. Blatt et al's subscale Relatedness (the healthy, mature form of dependency) has a significant negative association with the Quality of Attachment factor ($r = -.24, p = .02$). Adding to the confusion, Rude and Burnham's Neediness (the unhealthy, pathological type of dependency), has the exact same significant negative association with Quality of attachment ($r = -.24, p = .02$). It is difficult to understand why both the healthy and unhealthy forms of dependency would be negatively correlated with attachment quality. This might be instrument error, or some piece of the Dependency construct might be relating in an underlying fashion to the attachment measure.

When all eight scores are subjected to a linear regression with the Global attachment score, all fail to reach significance. The standard scoring system and the McGill scoring system are slightly more powerful than the subscales of the Dependency factor, no doubt because of the inclusion of the Self-Criticism factor. Although it is possible that a larger sample size would drive some of these analyses into significance, it appears that the relationship of self-critical and dependent tendencies with attachment is far less important than the relationship between depression and attachment. The Self-Critical and Dependent factors of the DEQ may be more valuable in identifying risk factors for postpartum depression than in identifying risk factors for low or poor quality attachment.

Gestational Age and Attachment

Since previous research has suggested that attachment grows with gestational age, it was surprising that gestational age was not associated with the level of attachment reported by the participants. A common observation across studies has been that fetal movement is a trigger for increased antenatal attachment, and all subjects in this sample had experienced quickening (Mikhail et al., 1991; Reading et al., 1984). This may have rendered the analyses useless. However, one narrative underscores the individual nature of antenatal bonding:

“...I must say that he wasn’t planned. Me and his father were not trying to get pregnant, but it happened so quickly my eyes didn’t have time to blink. I didn’t bond with him until I was almost 5 months pregnant. At this time, that’s when the secret about me being pregnant was finally out of the bag to my family and everybody I hid it from...”

Another confounding issue with this research is that all participants had received at least one sonogram, many of them three-dimensional, and had pictures of the fetus at bedside. The impact upon antenatal attachment of viewing the fetus through sonogram has been under investigation although findings have been inconclusive (Reading et al., 1984; Righetti, Dell’Avanzo, Grigio, & Nicolini, 2005).

Exploring Fetal Object Representation

In addition to testing the hypotheses, a few other questions were asked. Joy Penticuff highlighted the developmental resolution of ambivalence toward a new member of the family that occurs over the course of pregnancy (Penticuff, 1982). It was supposed that this ambivalence was intensified in mothers with higher obstetric risks. However, in all the analyses of risk, no significant association was found between the Ambivalence dimension of the ORI and risk. There was a significant association between Ambivalence in the mother

narrative and Ambivalence in the baby narrative, suggesting that these conflicting feelings may be more a characteristic of the mother rather than of a particular mental representation. In addition, Ambivalence was negatively correlated with the Global attachment score, implying that this characteristic has implications for antenatal attachment.

Other analyses tested for relationships between the ORI dimensions, ethnicity and age, with no significant differences found in the narratives. The ability to convey complex information about mother or baby does not seem to be related to factors outside the process of mental representation.

A final curiosity about the fetal narrative had to do with the theories behind internal working models and mental representations. If these are activated during infancy and are primarily associated with caregiver relationships (and later to romantic attachment figures), perhaps there is a distinctly different model or representation a mother constructs of her child. This model and representation may be focused on caregiving, instead of care “receiving.” If so, multiparous women might have a certain facility with the mental representation of their baby that nulliparous women, with no previous model or representation of a baby, do not possess. This was not borne out statistically and, although the sample size was adequate for the chi-square analysis, there were no significant differences in the Conceptual Level of the fetal narratives according to parity.

Maternal Antenatal Attachment Scale

The positive correlation between age and the Quality of attachment factor was moderately strong ($r = .292, p = .005$). It appears that older mothers may have more positive thoughts about their babies than younger ones, although there is no difference in their level of preoccupation with the fetus. It has also been stated that multiparous women spend less time in “attachment mode” because of caregiving responsibilities for other children. However, this was unsupported in the sample, as there were no differences in attachment scores between first-time mothers and those with children at home.

THEORETICAL IMPLICATIONS

While this study did not find the proposed relationships between personality characteristics, mental representation, and attachment, the limitations of the sample size warn against premature conclusions. This work did, however, contribute to the ongoing dialogue regarding the construct of antenatal attachment and its associations. In addition, it provided a valuable, diverse sample of hospitalized women who enabled research to ask old questions in a new context.

CLINICAL IMPLICATIONS

Even though the construct of antenatal attachment remains elusive, this research also adds value to the growing investigation into the insidious link between depression and attachment. Whether depressed mothers suffer from impaired attachment or a mother’s inability to attach to a baby contributes to a vulnerability to depression remains to be seen.

These findings support all those before that point to the necessity of identifying, targeting, and intervening where possible to enhance maternal-fetal attachment and treat perinatal depression.

The idea that self-critical tendencies are a detractor of attachment as well as a strong contributor to depressive symptomatology is not new, but this research has broadened its application to the population of women with high-risk pregnancy. In fact, self-criticism may be a salient contributor in this population in view of the tendency for women with high-risk to look inward for a causal relationship between something they did or did not do and the complications. The findings in this research, consistent with those of the Priel and Besser team in Israel, suggest that pregnant women who are self-critical are vulnerable to depressive feelings and may benefit from interventions that expose these tendencies. In addition, since self-criticism also impacts antenatal attachment, interventions that enhance attachment to the fetus may be indicated.

Although cognitive-behavioral and interpersonal approaches with postpartum depression have been empirically studied (Dennis, 2004), only one reference was found that suggests treating childbearing depression from an attachment theory framework (Whiffen & Johnson, 2006). This case example illustrated how Emotionally Focused Marital Therapy, a manualized psychotherapy based upon attachment theory, could be employed in treating postpartum depression. Social support has been found to be protective against perinatal depression (Priel et al., 2000a), so targeting depression from a “couples” standpoint would be ideal for enhancing attachment and encouraging partner support. This could be even more critical in women with obstetric risks. Hospitalization separates them from their partners,

increases the partner burden in terms of household, family, and financial responsibilities, and sets in place a fertile environment for partner blame and discord. Progressive hospitals have added group therapy to antepartum unit care for psychosocial support with equivocal results (Dennis, 2004). Perhaps focusing on the marital dyad would be more effective in the prevention of perinatal depression. Interventions that highlight emotional expression and foster understanding of each spouse's needs and childbearing fears could be operationalized in group sessions, similar to childbirth classes, or in the hospital room privately.

LIMITATIONS AND FUTURE DIRECTIONS

The study shared two common limitations to research of this sort. Self-report measures are often the only practical way to approach cross-sectional research. In the battery of measures for this study, other than the ORI, the questionnaires were all forced choice Likert-type instruments. Future research might include other forms of data gathering, such as structured interviews or family reports. In addition, although the instruments utilized in this study are considered to be reliable and valid, more research is needed to assess the extent to which they genuinely evaluate these particular constructs of personality, mental representation, and attachment.

A possible limitation for this work specifically has to do with the method of administration of the ORI. Because this investigation was a small piece of a larger study including a number of measures, it was decided to include the ORI in the questionnaire packet. Although study personnel conscientiously explained to the participants to “take five minutes and write a description of your mother and the baby you are carrying,” the packets

were left for completion and in some cases the narratives were either skipped (five of the 91 subjects did not complete either the mother or the baby narrative and an additional three did not complete the mother narrative) or so short that some of the descriptive qualities were by necessity scored as “missing.” Future studies of this sort might consider conducting the ORI in more of an interview fashion. Initial remarks could be recorded and probing questions asked if additional information is needed.

Rating the fetal narratives according to the standard scoring system was not possible, as explained earlier, because the descriptives were inappropriate in application to a fetus (Affectionate, Ambitious, Malevolent/Benevolent, Cold-Warm, Constructive Involvement, Intellectual, Judgmental, Negative/Positive Ideal, Nurturant, Punitive, Successful, and Strength). However, the narratives did often contain the themes Condon posits are found in human attachment: the desire to know, the desire to be with, the desire to protect, and the desire to prevent loss or separation. They also reflected the themes found in the earlier cited research on antenatal fantasies: Appearance, psychological traits, gender, behavior, normalization, deification, role relations, impact on parents, spiritual, and ambiguity (Sorenson & Schuelke, 1999). An intriguing future exploration might involve the use of the ORI with a specialized rating system for the fetus utilizing these previously noted themes.

Diverse samples are both desirable and problematic. Participants in this sample covered a broad range of age, previous pregnancy experiences, cultural backgrounds, educational levels, and socioeconomic factors. Some were from the Dallas Metroplex, a sprawling urban environment, and others had spent their lives in small rural communities

well outside city life. They represent the diversity of the state of Texas fairly, however the experience of obstetric risk is distinct from individual to individual.

The women who agreed to participate knew they were taking part in research investigating emotions during hospitalization, so the sample may have been biased by this knowledge. Even though all subjects were approached within 72 hours of hospitalization, not all completed the instruments in a timely manner. Some completed quickly, others may have taken several days. In addition, due to HIPAA regulations, it was not possible to gather data about those who declined to participate in the research. An observation from other work has been that those who do not participate may not do so because they are depressed. This possibility may impair the generalizability of the findings.

Since risk was not found to have significance in these findings, a number of avenues of investigation would be elucidating. One calls for evaluating the woman's perspective of the risk, in terms of both severity and the necessity of behavioral alterations. A second approach would entail an examination of the coping resources and social support systems of women who are hospitalized. These variables may moderate the additional stress of obstetric risk and hospitalization. Hospitalization itself plays the part of a social support system—a valuable look at this variable might include a population of women with complications who are prescribed bed-rest at home. Thirdly, there has been some suggestion that depression may be related to specific obstetric risks, such as preeclampsia (Kurki et al., 2000). A larger sample size would permit an investigation of the impact of specific risk factors upon attachment and depression.

Since no causal inferences can be made from studies like this one, longitudinal research on women from this population would be of great value. There are many unanswered questions concerning perinatal mental health and mother child relationships that can only be addressed by research covering longer time periods.

Continuing the investigation into the association between attachment and depression is vital. As observed in this research, attachment has a stronger relationship with depressive symptoms than many other elements in the context of complicated pregnancy. In light of the difficult decision in prenatal screening for depression of whether to increase sensitivity and lose specificity, resulting in large numbers of false positive screenings, or decrease sensitivity and gain specificity, risking missing depression entirely, perhaps attachment measures such as the MAAS and personality measures such as the DEQ could supplement traditional instruments, increasing sensitivity *and* specificity in the screening process. Obstetricians, pediatricians, nurses, and social workers are in a place of advantage for intervention with hospitalized pregnant women identified as being at risk for depression. Multidisciplinary teams that include psychologists and psychotherapists would afford intervention at the earliest point possible, before the baby is born.

CONCLUSION

Women who are hospitalized with high-risk pregnancy are admitted with a host of individual needs and concerns. Some are trying desperately to hang on to a longed-for pregnancy, some are anxious about how their family will fare in day-to-day life without them, and others are content to stay in the care of professionals during an uncertain time.

They have idiosyncratic histories. Some women in this study had experienced successful, uncomplicated pregnancies previously, while others had buried stillborns. Because Baylor Hospital draws a diverse geographical population, women from rural farming communities were in rooms next to women who had never been outside the city of Dallas. And in the way of society, some patients had visitors every day and a room full of flowers while others slept all day in darkened rooms. What they all had in common was one (or both) of two questions: “Will my baby make it to viability? Will my baby be born OK?”

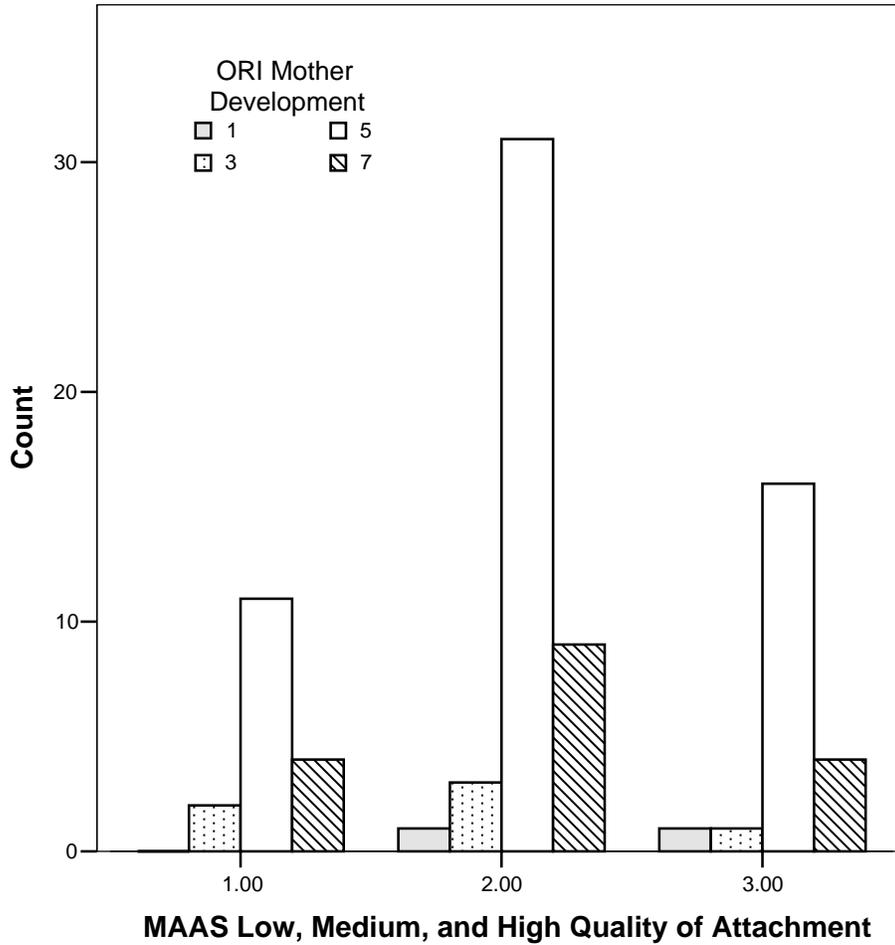
One goal of this research was to take a closer look at perinatal depression by way of attachment. These findings agreed with other studies that have consistently pointed to the relationship between attachment and depression. Also apparent from this work is just how well antenatal attachment eludes theorists and clinicians alike. It was thought that exploring this concept in the context of risk and uncertainty would contribute to the shared understanding of what psychodynamic forces contribute to this primordial phenomenon of mother-baby love. Attachment was slippery even in this perfect Bowlbian environment. What did emerge clear and strong was that women report strong attachment to their fetuses regardless of what gestational age they are, regardless of what type of mother they had themselves, and regardless of the risk carrying this baby poses to their own life. Women who are sad are not as sure of this attachment, but it is there, nonetheless. Women who are self-critical may be afraid they cannot live up to the demands of mothering, but they are attached too. These mothers just need a little help.

The continued exploration of antenatal attachment is a worthy venture, but the next step is to take what is known and make application to intervention. The findings of this study

add in a small way to the growing body of knowledge that will help develop interventions specific to impaired maternal attachment and perinatal mood disorders.

Figure 1

Levels of Mother Narrative Conceptual Level Across Low, Medium, and High Quality of Attachment Scores



Note: ORI = Object Relations Inventory

1 = Preoperational

3 = Concrete

5 = External Iconic

7 = Internal Iconic

MAAS = Maternal Antenatal Attachment Scale

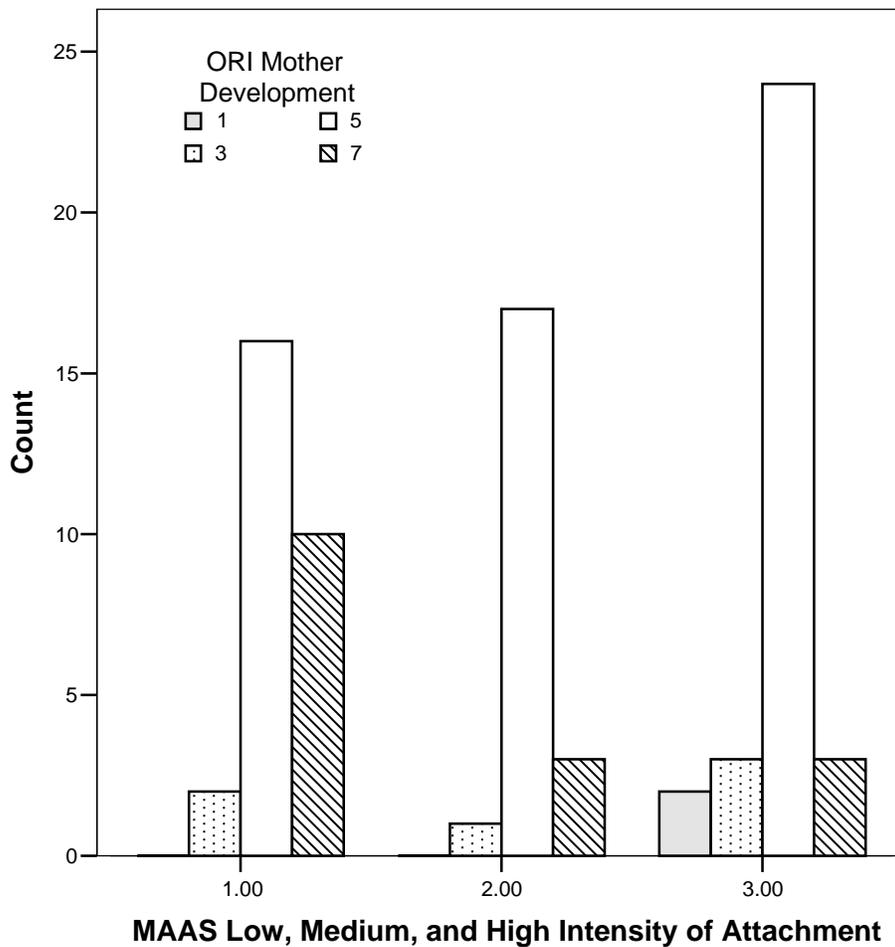
Low = Lowest score through $-.6 SD$

Medium = $-.5 - .5 SD$

High = $.5$ through highest score

Figure 2

Levels of Mother Narrative Conceptual Level Across Low, Medium, and High Intensity of Attachment Scores



Note: ORI = Object Relations Inventory

1 = Preoperational

3 = Concrete

5 = External Iconic

7 = Internal Iconic

MAAS = Maternal Antenatal Attachment Scale

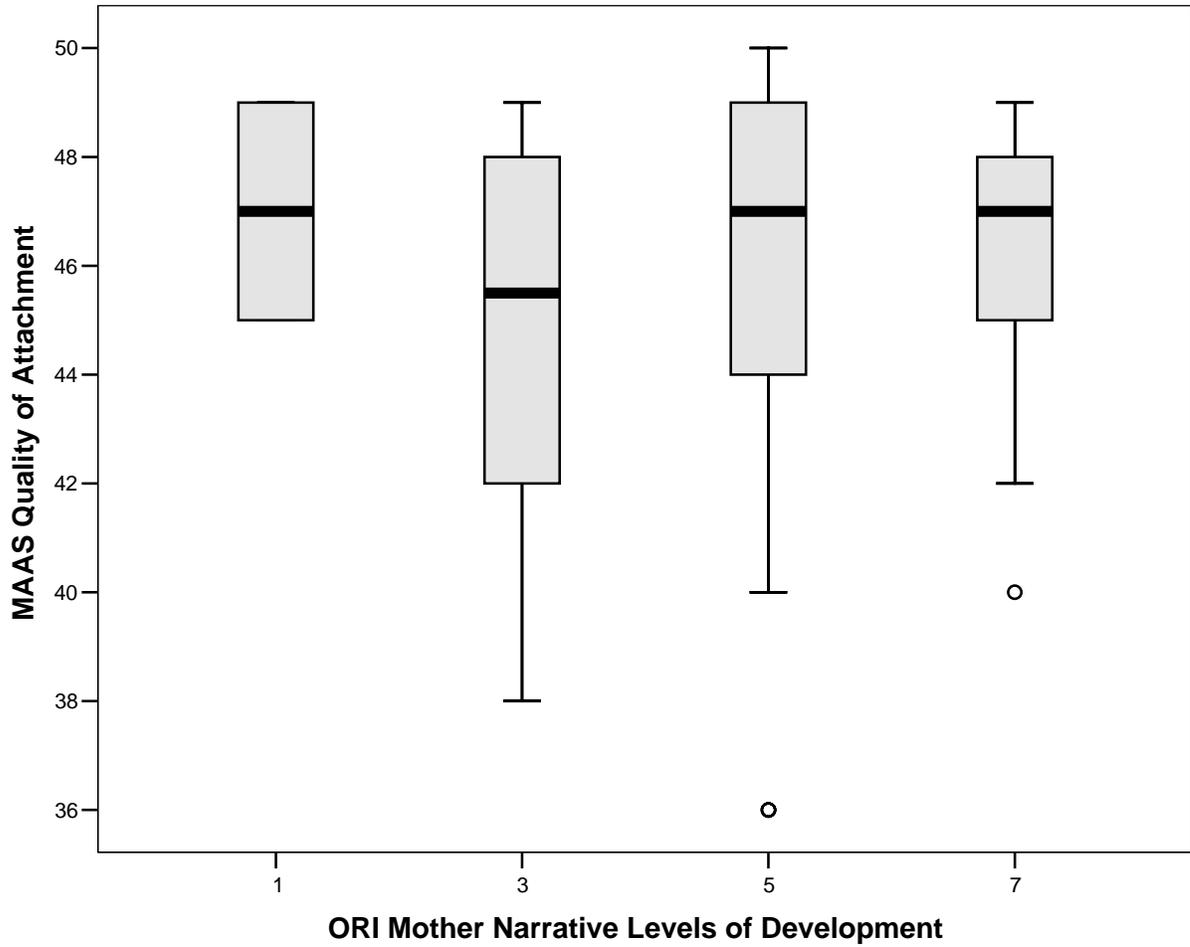
Low = Lowest score through $-.6 SD$

Medium = $-.5 - .5 SD$

High = $.5$ through highest score

Figure 3

Quality of Attachment and Mother Narrative Conceptual Level



Note: MAAS = Maternal Antenatal Attachment Scale

ORI = Object Relations Inventory

1 = Preoperational

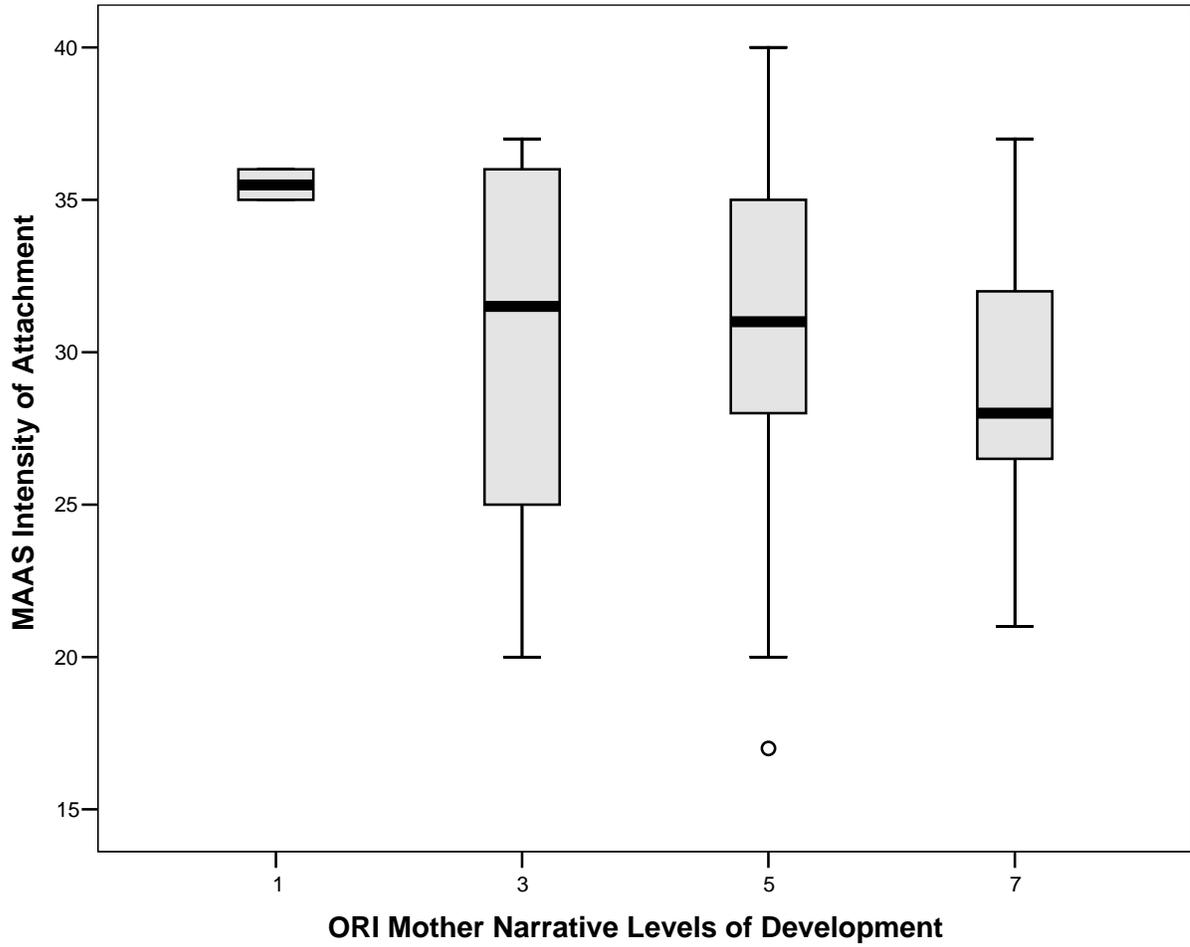
3 = Concrete

5 = External Iconic

7 = Internal Iconic

Figure 4

Intensity of Attachment and Mother Narrative Conceptual Level



Note: MAAS = Maternal Antenatal Attachment Scale

ORI = Object Relations Inventory

1 = Preoperational

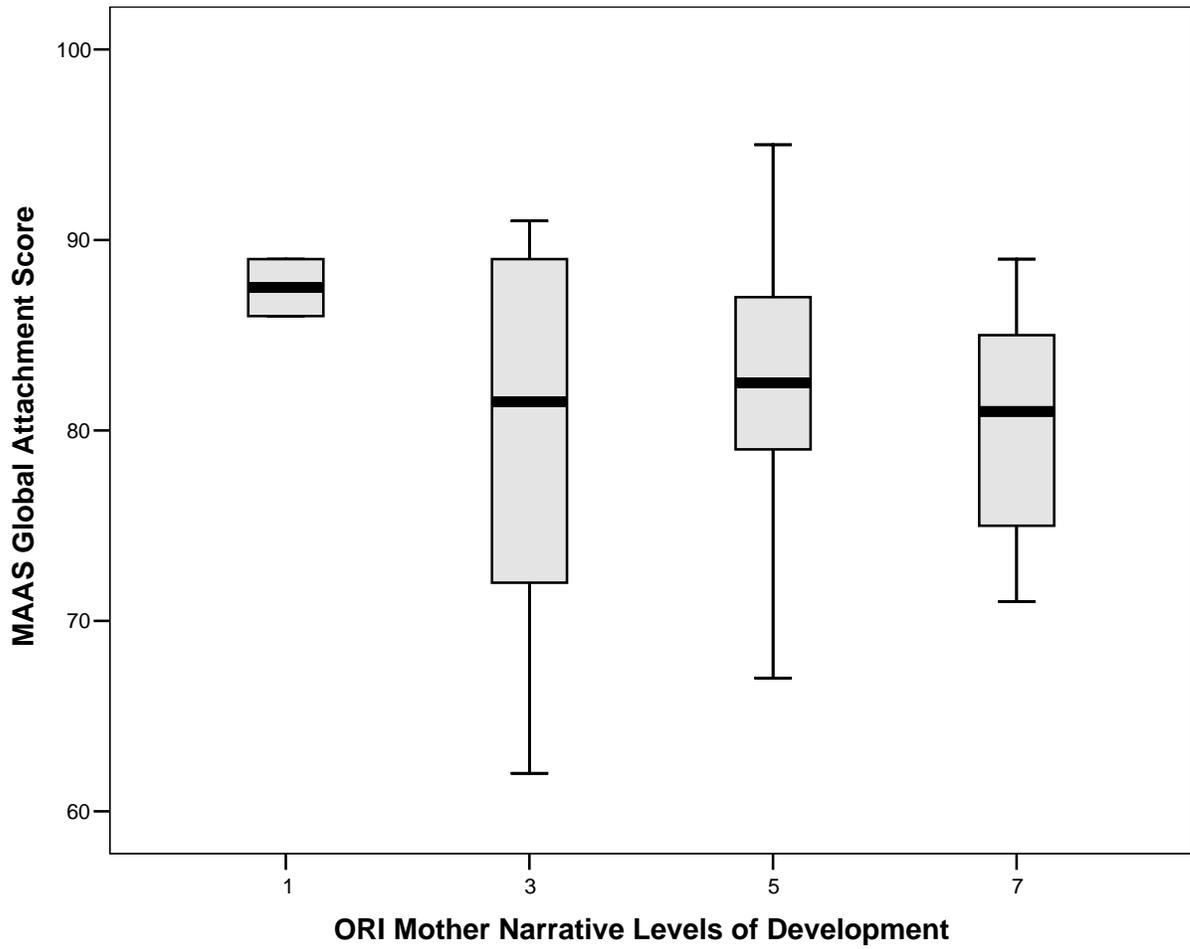
3 = Concrete

5 = External Iconic

7 = Internal Iconic

Figure 5

Global Attachment and Mother Narrative Conceptual Level



Note: MAAS = Maternal Antenatal Attachment Scale

ORI = Object Relations Inventory

1 = Preoperational

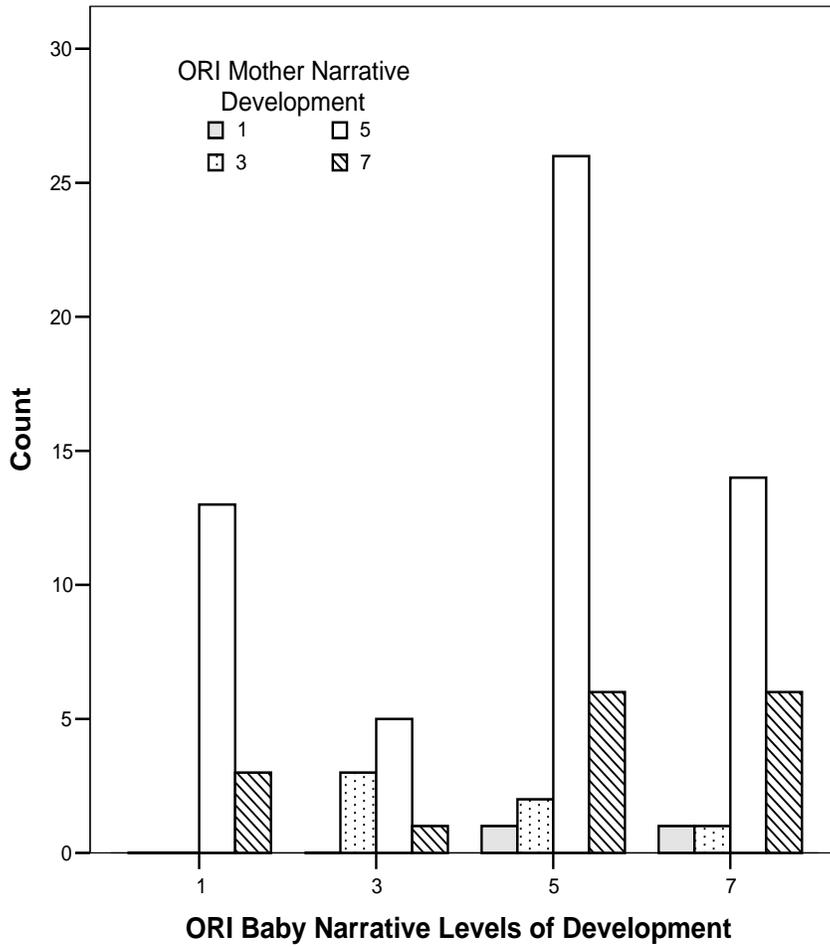
3 = Concrete

5 = External Iconic

7 = Internal Iconic

Figure 6

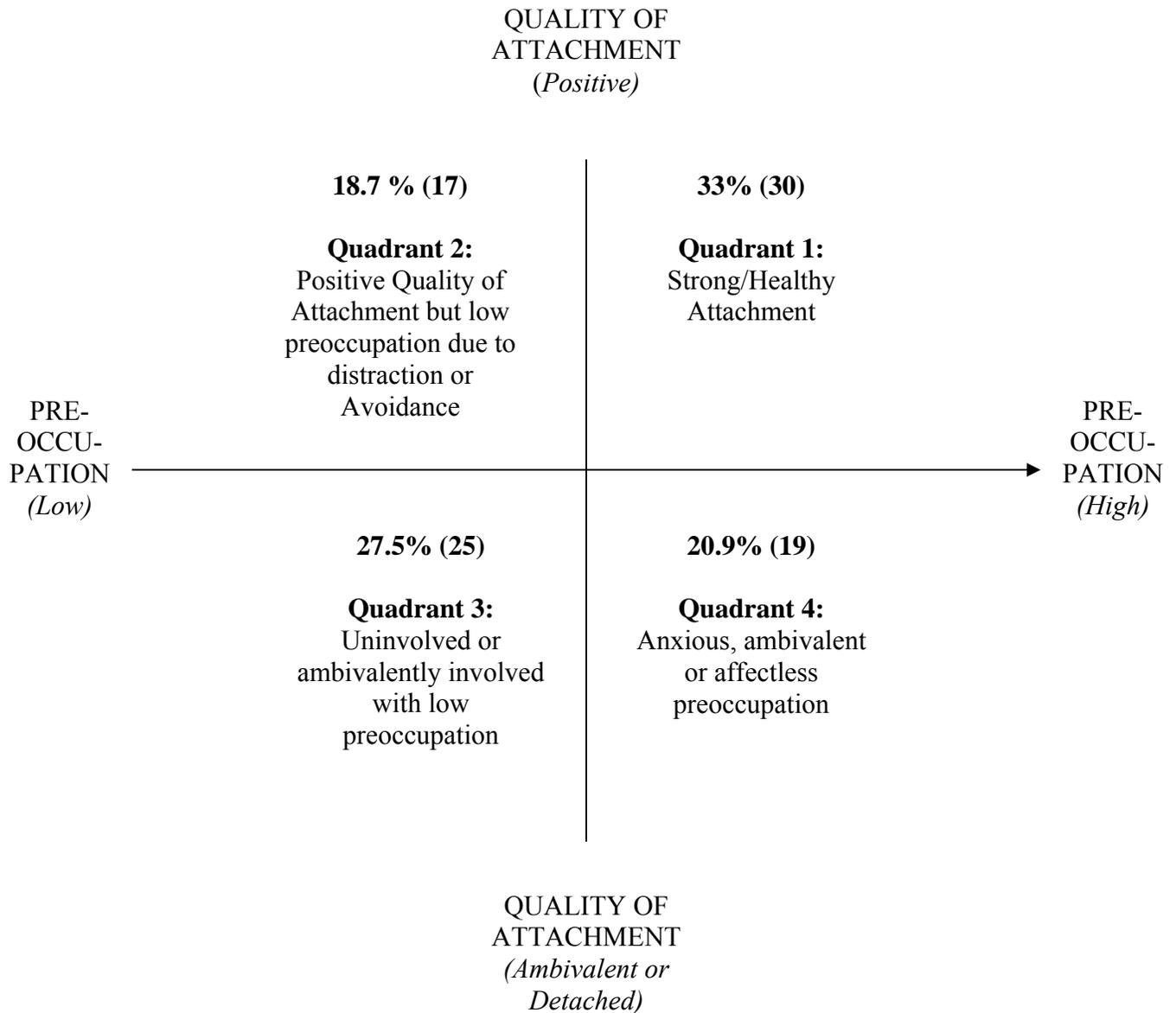
Distribution of Levels of ORI Narrative Conceptual Level



Note: ORI = Object Relations Inventory
1 = Preoperational
3 = Concrete
5 = External Iconic
7 = Internal Iconic

Figure 7

Attachment Style Based on Below and Above Means of MAAS Quality and Intensity Factors

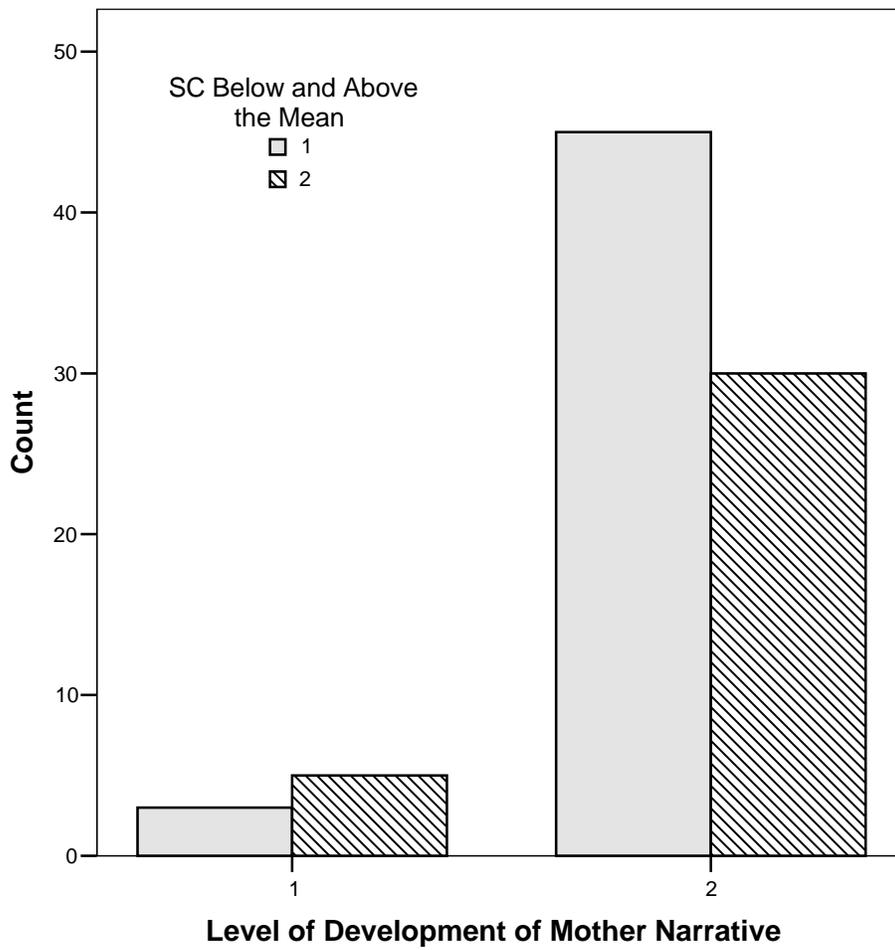


Note: N = 91

Condon, J.T. (1993). The assessment of antenatal emotional attachment: Development of a questionnaire instrument. *British Journal of Medical Psychology*, 66, pp. 167-183.

Figure 8

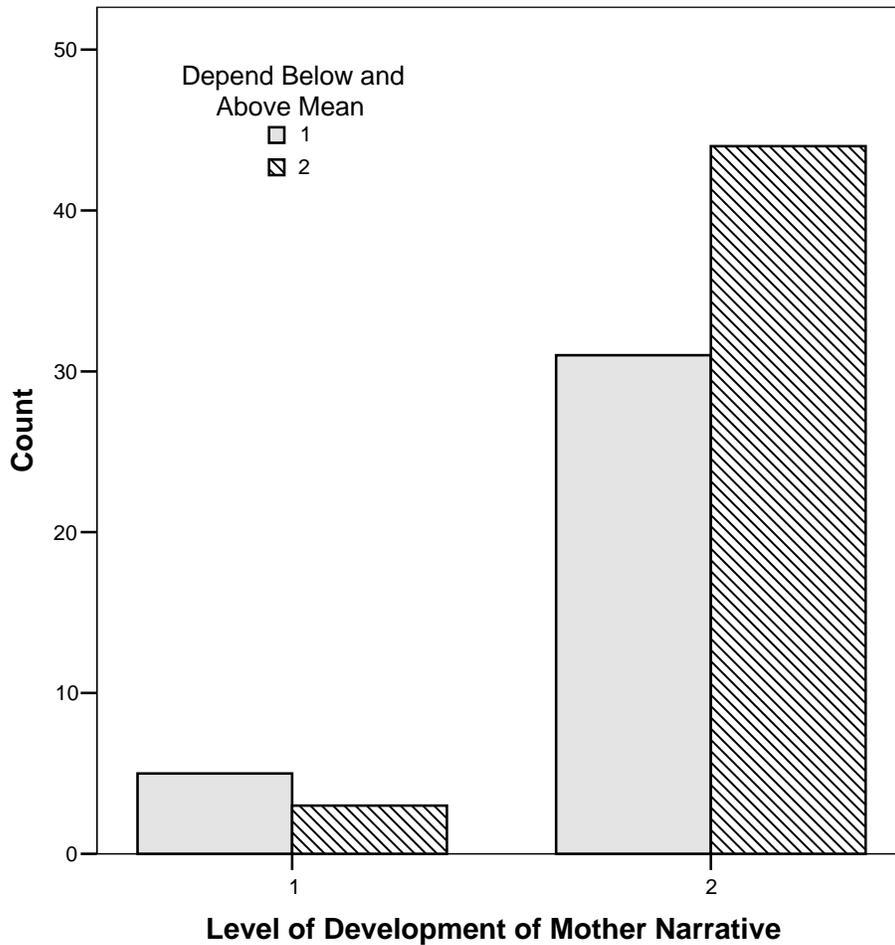
Distributions of ORI Conceptual Levels of Mother Narrative Across DEQ Self-Criticism Scores



Note: DEQ = Depressive Experiences Questionnaire
ORI = Object Relations Inventory
1 = Preoperational/Concrete
2 = External/Internal Iconic

Figure 9

*Distributions of ORI Conceptual Levels of Mother Narrative Across DEQ
Dependency Scores*

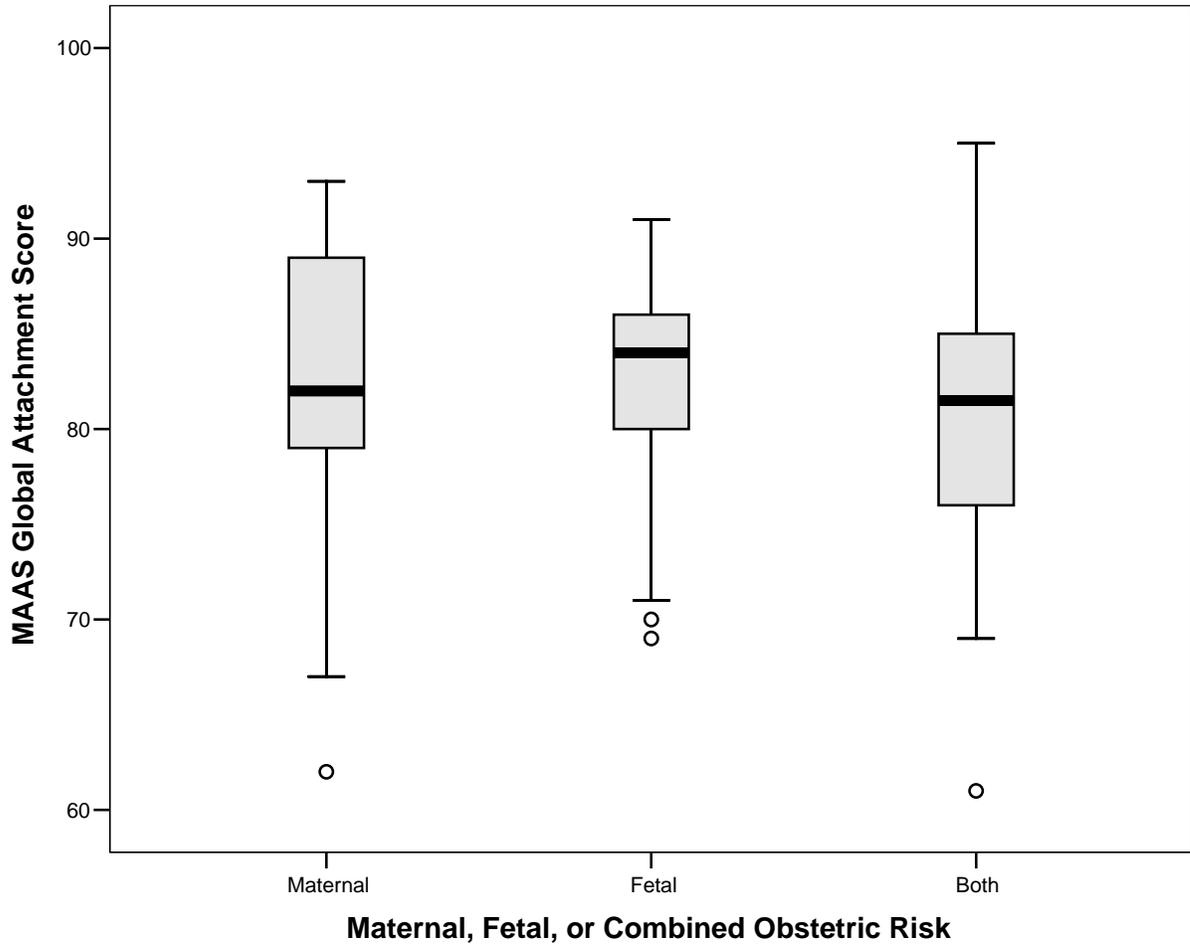


Note: DEQ = Depressive Experiences Questionnaire

ORI = Object Relations Inventory
1 = Preoperational/Concrete
2 = External/Internal Iconic

Figure 10

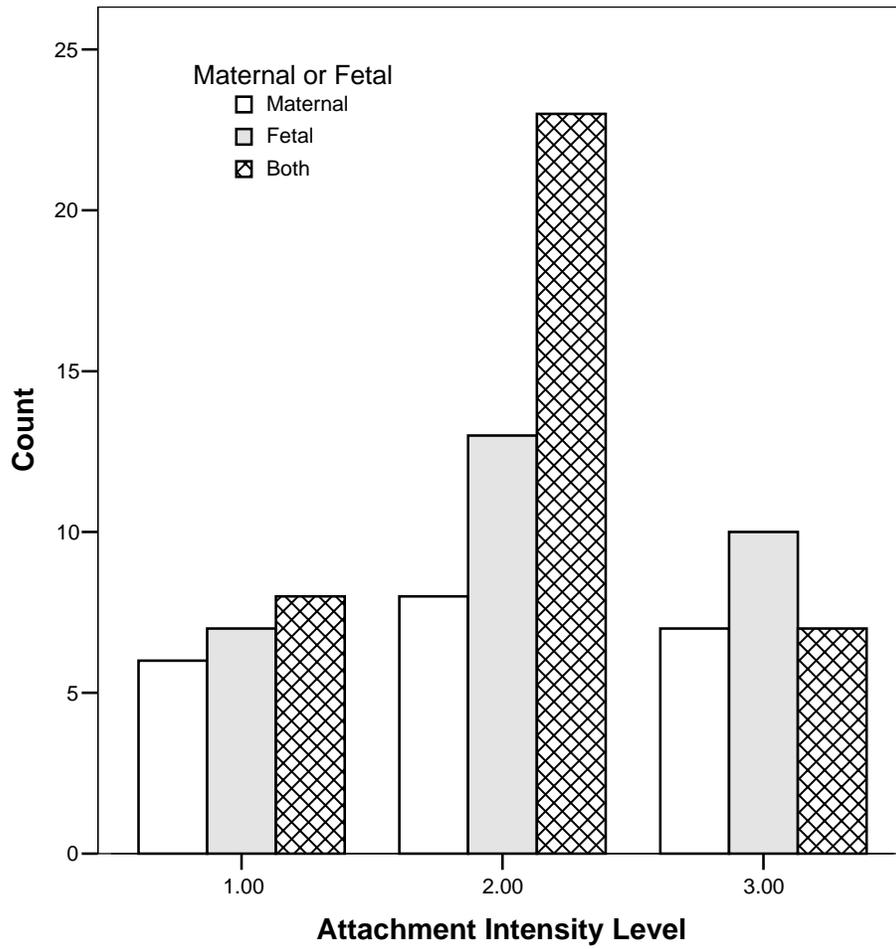
Type of Risk and MAAS Global Attachment Scores



Note: MAAS = Maternal Antenatal Attachment Scale

Figure 11

Type of Risk and MAAS Intensity of Attachment



Note: MAAS = Maternal Antenatal Attachment Scale

Table 1
Demographic Characteristics of Total Sample (n=90)

Variable	<i>N</i>	<i>M</i>	<i>SD</i>	Range
Age (years)	91	27.01	6.44	17-44
Children (natural children in household)	87	1.02	1.45	0-6

Comparison of Sample Population with Dallas County Ethnicity Proportions

Variable	<i>N</i>	%	Dallas County %
Ethnicity			
African American	30	33.0	20.3
Hispanic	10	11.0	35.6
Caucasian	49	53.8	49.4
Asian	2	2.2	4.3

(Demographic Table continues)

Demographic Table (continued)

Variable	N	%
Marital Status		
Single	29	31.9
Married	49	53.8
Cohabiting	9	9.9
Separated	3	3.3
Undetermined	1	1.1
Education		
9-12 Years	10	11.0
HS or GED	23	25.3
Some College	30	33.0
College Degree	24	26.4
Undetermined	4	4.4
Annual Household Income		
Under \$12,000	5	5.6
\$12,000-25,000	22	24.2
\$26,000-40,000	15	16.5
\$41,000-65,000	15	16.5
Over \$65,000	26	28.6
Undetermined	8	8.8

(Table continues)

(Demographic Table continued)

Variable	<i>N</i>	<i>%</i>
Biological Children at Home		
None	41	45.1
One	30	33.0
Two	6	6.6
Three	4	4.4
Four	3	3.3
Five	1	1.1
Six	3	3.3
Undetermined	3	3.4

Note: *N* = 91

Table 2

Pregnancy Characteristics of Sample

Variable	<i>N</i>	%
Total Prior Pregnancies		
0	29	31.9
1	22	24.2
2	20	22.0
3	10	11.0
4 or more	9	9.8
Undetermined	1	1.1
Previous Stillborn or Neonatal Demise	4	4.5
Previous Miscarriage	24	27.3
Previous Pregnancy Termination	8	9.1
Onset of Complications		
First Trimester	10	11.0
Second Trimester	34	37.4
Third Trimester	42	46.2
Complications with Previous Pregnancies	34	37.4

Table 3

Psychiatric Characteristics of Sample

Variable	<i>N</i>	%
Previous Psychiatric History		
Depression	6	6.6
Anxiety	6	6.6
Comorbid Depression and Anxiety	3	3.3
Bipolar Disorder	1	1.1
Undetermined	6	6.6
Positive Screening for Depression at Admission		
CES-D (score \geq 16)	33	36.3
EPDS (score \geq 11)	38	41.8
Positive Diagnosis on SCID		
Mood Disorder	0	0
Anxiety Disorder	5	5.5
Comorbid Mood and Anxiety Disorders	2	2.2
Family History of Psychiatric Illness	16	17.6

Note: EPDS = Edinburgh Postpartum Depression Scale
 CES-D = Center for Epidemiological Studies-Depression
 SCID = Structured Clinical Interview for the Diagnosis of DSM-IV Axis One Disorders

Table 4

Means and Standard Deviations of Measures

Measure	<i>N</i>	<i>M</i>	<i>SD</i>	Range
Depressive Symptoms (Screening Measures)				
EPDS (Depression suggested at ≥ 11)	91	9.46	5.54	0-22
CES-D (Depression suggested at ≥ 16)	75	15.88	10.37	0-37
Personality(DEQ)				
Dependent Characteristics	91	-.53	.90	-2.60-1.21
Self-Critical Characteristics	91	-.93	1.01	-2.92-2.25
Antenatal Attachment (MAAS)				
Global Attachment Score	91	81.49	7.13	61-95
Quality of Attachment Factor	91	46.01	3.48	33-50
Intensity of Attachment Factor	89	30.71	4.88	17-40
Object Representation of Mother (ORI)				
Benevolent Qualities	81	4.11	1.54	.63-7.88
Punitive Nature	81	1.49	1.42	.33-6.33
Ambitious Characteristics	39	3.53	1.69	.50-7.00
Ambivalent Feelings about Mother	83	1.83	1.3	1-5
Length of Narrative	83	2.41	1.54	1-7
Conceptual Level of Narrative	83	5.17	1.22	1-7

(Table continues)

Means and Standard Deviations of Measures (continued)

Measure	<i>N</i>	<i>M</i>	<i>SD</i>	Range
Object Representation of Fetus (ORI)				
Length of Narrative	85	2.2	1.64	1-7
Ambivalent Feelings about Baby	85	1.42	1.03	1-5
Conceptual Level of Narrative	85	4.46	2.15	1-7
Severity of Risk				
Hobel Risk Assessment, Revised	91	18.35	9.62	5-45

Note: EPDS = Edinburgh Postpartum Depression Scale
CES-D = Center for Epidemiological Studies-Depression
DEQ = Depressive Experiences Questionnaire
MAAS = Maternal Antenatal Attachment Scale
ORI = Object Relations Inventory

Table 5

Means and Standard Deviations on Dimensions of the Object Relations Inventory Mother Narrative for Global Attachment Above and Below the Mean

	Mother Narrative											
	Benevolent		Punitive		Ambitious		Length		Ambivalence		Conceptual Level	
MAAS Global Attachment Score (<i>M</i> = 81.5)	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Below the Mean	4.38	2.11	1.81	1.65	3.43	1.70	2.79	1.85	2.43	1.79	5.57	1.22
Above the Mean	4.27	1.20	1.72	1.61	3.58	1.72	2.28	1.28	1.88	1.24	5.08	.91

Note: *N* = 83
 MAAS = Maternal Antenatal Attachment Scale

Table 6

Means and Standard Deviations on Dimensions of the Object Relations Inventory Mother Narrative for Global Attachment by Standard Deviation

	Mother Narrative											
	Benevolent		Punitive		Ambitious		Length		Ambivalence		Conceptual Level	
MAAS Global Attachment Score (<i>M</i> = 81.5)	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Low (Lowest through $-.99$ <i>SD</i> (<i>SD</i> = 7.12))	3.93	2.26	1.05	.99	4.07	1.88	2.00	1.41	2.29	1.89	5.29	1.38
Average -1 <i>SD</i> through 1 <i>SD</i>	4.34	1.50	2.08	1.77	3.44	1.73	2.80	1.61	2.20	1.47	5.48	.872
High 1.1 <i>SD</i> through Highest	4.57	1.03	1.28	1.23	3.29	1.47	1.71	.76	1.43	.787	4.43	.98

Note: *N* = 83
 MAAS = Maternal Antenatal Attachment Scale

Table 7

*95% Confidence Intervals of Pairwise Differences in Mean Changes of Attachment Quality (MAAS) by Conceptual Level of ORI
Mother Narrative*

	<i>M</i>	<i>SD</i>	Pre- operational	Concrete	External Iconic
Pre-operational	47.00	2.83			
Concrete	44.67	4.08	-41.93 to 37.26		
External Iconic	46.16	3.37	-46.41 to 44.72	-4.76 to 7.73	
Internal Iconic	46.18	2.74	-45.46 to 43.82	-4.91 to 7.93	-2.21 to 2.26

Note: *N* = 83
 MAAS = Maternal Antenatal Attachment Scale
 ORI = Object Relations Inventory

Table 8

*95% Confidence Intervals of Pairwise Differences in Mean Changes of Attachment Intensity (MAAS) by Conceptual Level of ORI
Mother Narrative*

	<i>M</i>	<i>SD</i>	Pre- operational	Concrete	External Iconic
Pre-operational	30.67	4.91			
Concrete	30.17	6.74	-5.33 to 2.80		
External Iconic	31.32	4.97	-4.46 to .82	.87 to 2.83	
Internal Iconic	29.06	4.11	-6.44 to 1.14	-1.10 to 2.94	-1.97 to 1.22

Note: *N* = 81
 MAAS = Maternal Antenatal Attachment Scale
 ORI = Object Relations Inventory

Table 9

Frequency Distribution of Conceptual Levels of Mother and Baby Narratives (ORI)

	Mother Narrative			Baby Narrative		
	<i>N</i>	Percent	Cumulative Percent	<i>N</i>	Percent	Cumulative Percent
Sensorimotor	2	2.4	2.4	18	21.2	21.2
Concrete	6	7.2	9.6	9	10.6	31.8
External Iconic	58	69.9	79.5	36	42.4	74.1
Internal Iconic	17	20.5	100.0	22	25.9	100.0
Total	83	100.0		85	100.0	

Note: *ORI* = Object Relations Inventory

Table 10

Spearman's rho Correlations for Conceptual Level and Attachment

	ORI Conceptual Conceptual Level Mother	MAAS Quality	MAAS Intensity
Conceptual Level of Mother	X	.023 N = 83	-.210 N = 81
Quality of Attachment Factor	X	X	.379** N = 89
Intensity of Attachment Factor	X	X	X

Note: MAAS = Maternal Antenatal Attachment Scale

ORI = Object Relations Inventory

** $p < .01$

Table 11

Two-Way Contingency Table of Levels of Object Representation of Mother and Quality of Attachment Above and Below the Mean

	ORI Object Representation		Pearson $\chi^2 = .855$, $p = .465$
	Sensorimotor Concrete	External Internal Iconic	
MAAS Quality of Attachment Factor ($M = 46.01$)	% (N)	% (N)	
Below the Mean	6.0 (5)	41.0 (34)	
Above the Mean	3.6 (3)	49.4 (41)	

Note: $N = 83$
 MAAS = Maternal Antenatal Attachment Scale
 ORI = Object Relations Inventory

Table 12

Two-Way Contingency Table of Levels of Object Representation of Mother and Quality of Attachment by Standard Deviation

	ORI Object Representation		Pearson $\chi^2 = 2.732$, $p = .255$
	Sensorimotor Concrete	External Internal Iconic	
	% (N)	% (N)	
MAAS Quality of Attachment Factor ($M = 46.01$)			
Low (.6 <i>SD</i> Below the Mean)	2.4 (2)	18.1 (15)	
Average (.5 <i>SD</i> Below the Mean to .5 <i>SD</i>) Above the Mean	4.8 (4)	48.2 (40)	
High (.6 <i>SD</i> Above the Mean)	2.4 (2)	24.1 (20)	

Note: $N = 83$

MAAS = Maternal Antenatal Attachment Scale

ORI = Object Relations Inventory

Table 13

Two-Way Contingency Table of Levels of Object Representation of Mother and Intensity of Attachment Above and Below the Mean

	ORI Object Representation		Pearson $\chi^2 = .173$, $p = .727$
	Sensorimotor Concrete	External Internal Iconic	
	% (N)	% (N)	
MAAS Intensity of Attachment Factor ($M = 30.71$)			
Below the Mean	3.7 (3)	40.7 (33)	
Above the Mean	6.2 (5)	49.4 (40)	

Note: $N = 81$
 MAAS = Maternal Antenatal Attachment Scale
 ORI = Object Relations Inventory

Table 14

Two-Way Contingency Table of Levels of Object Representation of Mother and Intensity of Attachment by Standard Deviation

	ORI Object Representation		Pearson $\chi^2 = 2.04$, $p = .361$
	Sensorimotor Concrete	External Internal Iconic	
	% (N)	% (N)	
MAAS Intensity of Attachment Factor ($M = 30.71$)			
Low (.6 <i>SD</i> Below the Mean)	2.5 (2)	32.1 (26)	
Average (.5 <i>SD</i> Below the Mean to .5 <i>SD</i>)	1.2 (1)	24.7 (20)	
High (.6 <i>SD</i> Above the Mean)	6.2 (8)	33.3 (27)	

Note: $N = 81$

MAAS = Maternal Antenatal Attachment Scale

ORI = Object Relations Inventory

Table 15

Means and Standard Deviations on Dimensions of the Object Relations Inventory for Global Attachment Above and Below the Mean

	Baby Narrative					
	Length		Ambivalence		Conceptual Level	
MAAS Global Attachment Score (<i>M</i> = 81.5)	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Below the Mean	2.17	1.73	1.83	1.42	4.44	2.12
Above the Mean	2.22	1.59	1.12	.39	4.47	2.19

Note: *N* = 83
 MAAS = Maternal Antenatal Attachment Scale

Table 16

Means and Standard Deviations on Dimensions of the ORI for Global Attachment by Standard Deviation

	Baby Narrative					
	Length		Ambivalence		Conceptual Level	
MAAS Global Attachment Score	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
(<i>M</i> = 81.5)						
Low (.6 <i>SD</i> Below the Mean)	2.05	1.76	2.14	1.67	4.18	2.11
Average (.5 <i>SD</i> Below the Mean to .5 <i>SD</i>)	2.22	1.62	1.22	.540	4.50	2.16
High (.6 <i>SD</i> Above the Mean)	2.30	1.61	1.11	.424	4.63	2.22

Note: *N* = 83

MAAS = Maternal Antenatal Attachment Scale

Table 17

Spearman's rho Correlations for Object Representations of Mother and Baby Narratives

ORI Dimensions	Mother Ambivalence	Mother Length	Mother Conceptual Level	Baby Ambivalence	Baby Length	Baby Conceptual Level
Ambivalent Feelings about Mother	X	.403*** N = 82	.102 N = 82	.458*** N = 81	.401** N = 81	.065 N = 81
Length of Narrative about Mother	X	X	.171 N = 83	.184 N = 82	.720*** N = 82	.270** N = 82
Conceptual Level of Mother	X	X	X	.310** N = 82	.307** N = 83	.068 N = 82
Ambivalent Feelings about Baby	X	X	X	X	.355** N = 85	-.170 N = 85
Length of Narrative about Baby	X	X	X	X	X	.127 N = 82
Conceptual Level of Baby	X	X	X	X	X	X

Note: ORI = Object Relations Inventory
 * $p < .05$; ** $p < .01$; *** $p \leq .001$

Table 18

Two-Way Contingency Table of ORI Conceptual Level of Mother Narrative by Baby

Narrative

		Baby Narrative		
Mother Narrative		Sensorimotor Concrete	External/ Internal Iconic	
		% (<i>N</i>)	% (<i>N</i>)	Pearson $\chi^2 (1, 82) = .206$ $p = .70$
	Sensorimotor/ Concrete	3.7 (3)	26.8 (22)	
	External/Internal Iconic	6.1 (5)	63.4 (52)	

Note: *N* = 83

ORI = Object Relations Inventory

Table 19

Pearson Product- Moment Correlations of Dependency, Self-Criticism, and Maternal Antenatal Attachment

	DEQ Dependent	DEQ Self-Critical	MAAS Quality	MAAS Intensity	MAAS Global
Personality(DEQ)					
Dependent Characteristics	X	.015 <i>n</i> = 91	-.021 <i>n</i> = 91	.0777 <i>n</i> = 89	.037 <i>n</i> = 91
Self-Critical Characteristics	X	X	-.366*** <i>n</i> = 91	-.025 <i>n</i> = 89	-.198 <i>n</i> = 91
Antenatal Attachment (MAAS)					
Quality of Attachment Factor	X	X	X	.410*** <i>n</i> = 89	.777*** <i>n</i> = 91
Intensity of Attachment Factor	X	X	X	X	.887*** <i>n</i> = 89
Global Attachment Score	X	X	X	X	X

Note: MAAS = Maternal Antenatal Attachment Scale
 DEQ = Depressive Experiences Questionnaire

Table 20

Two-Way Contingency Table of Self-Criticism (Low, Average, and High) and Antenatal Attachment Style

Antenatal Attachment Style (MAAS)	DEQ Self-Critical Factor			Pearson $\chi^2(6, 91) = 5.714,$ $p = .456$
	Low < -1 SD	Average > -1 to < 1 SD	High > 1 SD	
	<i>N</i>	<i>N</i>	<i>N</i>	
1) High Quality, High Intensity (Strong, secure)	6.6 (6)	22.0 (20)	4.4 (4)	
2) High Quality, Low Intensity (Anxious Avoidant)	4.4 (4)	13.2 (12)	1.1 (1)	
3) Low Quality, Low Intensity (Withdrawn)	3.3 (3)	17.6 (16)	6.6 (6)	
4) Low Quality, High Intensity (Anxious Ambivalent)	1.1 (1)	14.3 (13)	5.5 (5)	

Note: $N = 91$

MAAS = Maternal Antenatal Attachment Scale

DEQ = Depressive Experiences Questionnaire, Self-Criticism Factor, $M = -.925$, $SD = 1.01$

Table 21

Two-Way Contingency Table of Self-Criticism (Above the Mean and Below the Mean) and Antenatal Attachment Style

Antenatal Attachment Style (MAAS)	DEQ Self-Critical Factor		Pearson χ^2 (3, 91) = 8.932, $p = .03$
	Below the Mean	Above the Mean	
	<i>N</i>	<i>N</i>	
1) High Quality, High Intensity (Strong, secure)	20.9 (19)	12.1 (11)	
2) High Quality, Low Intensity (Anxious Avoidant)	15.4 (14)	3.3 (3)	
3) Low Quality, Low Intensity (Withdrawn)	13.2 (12)	14.3 (13)	
4) Low Quality, High Intensity (Anxious Ambivalent)	7.7 (7)	13.2 (12)	

Note: $N = 91$

MAAS = Maternal Antenatal Attachment Scale

DEQ = Depressive Experiences Questionnaire, Self-Criticism Factor, $M = -.925$, $SD = 1.01$

Table 22

Two-Way Contingency Table of Dependency (Low, Average, and High) and Antenatal Attachment Style

	DEQ Dependent Factor			Pearson $\chi^2(6, 91) = 10.412,$ $p = .108$
	Low < -1 <i>SD</i>	Average > -1 to < 1 <i>SD</i>	High > 1 <i>SD</i>	
Antenatal Attachment Style (MAAS)	<i>N</i>	<i>N</i>	<i>N</i>	
1) High Quality, High Intensity (Strong, secure)	19.8 (18)	1.1 (1)	12.1 (11)	
2) High Quality, Low Intensity (Anxious Avoidant)	8.8 (8)	2.2 (2)	7.7 (7)	
3) Low Quality, Low Intensity (Withdrawn)	16.5 (15)	0	11.0 (10)	
4) Low Quality, High Intensity (Anxious Ambivalent)	6.6 (6)	0	14.3 (13)	

Note: $N = 91$

MAAS = Maternal Antenatal Attachment Scale

DEQ = Depressive Experiences Questionnaire, Dependency Factor, $M = -.53$, $SD = .90$

Table 23

Two-Way Contingency Table of Dependency (Above the Mean and Below the Mean) and Antenatal Attachment Style

Antenatal Attachment Style (MAAS)	DEQ Dependent Factor		Pearson χ^2 (3, 91) = 4.55, $p = .207$
	Below the Mean	Above the Mean	
	<i>N</i>	<i>N</i>	
1) High Quality, High Intensity (Strong, secure)	17.6 (16)	15.4 (14)	
2) High Quality, Low Intensity (Anxious Avoidant)	8.8 (8)	9.9 (9)	
3) Low Quality, Low Intensity (Withdrawn)	15.4 (14)	12.1 (11)	
4) Low Quality, High Intensity (Anxious Ambivalent)	5.5 (5)	15.4 (14)	

Note: $N = 91$

MAAS = Maternal Antenatal Attachment Scale

DEQ = Depressive Experiences Questionnaire, Dependency Factor, $M = -.53$, $SD = .90$

Table 24

Two-Way Contingency Table of Self-Criticism (Low, Average, and High) and Conceptual Level of Mother Narrative

	DEQ Self-Critical Factor			
	Low < -1 <i>SD</i>	Average > -1 to < 1 <i>SD</i>	High > 1 <i>SD</i>	
ORI Mother Narrative Conceptual Level	% (<i>N</i>)	% (<i>N</i>)	% (<i>N</i>)	Pearson χ^2 (6, 83) = 4.763, $p = .575$
Sensorimotor	1.2 (1)	1.2 (1)	0	
Concrete	1.2 (1)	4.8 (4)	1.2 (1)	
External Iconic	9.6 (8)	50.6 (42)	9.6 (8)	
Internal Iconic	3.6 (3)	10.8 (9)	6.0 (5)	

Note: $N = 83$

ORI = Object Relations Inventory

DEQ = Depressive Experiences Questionnaire, Self-Criticism Factor, $M = -.925$, $SD = 1.01$

Table 25

Two-Way Contingency Table of Dependency (Low, Average, and High) and Conceptual Level of Mother Narrative

	DEQ Dependent Factor			
	Low < -1 SD	Average > -1 to < 1 SD	High > 1 SD	
ORI Mother Narrative Conceptual Level	<i>N</i>	<i>N</i>	<i>N</i>	Pearson $\chi^2(6, 83) = 7.47$, $p = .28$
Sensorimotor	1.2 (1)	0	1.2 (1)	
Concrete	6.0 (5)	0	1.2 (1)	
External Iconic	33.7 (28)	1.2 (1)	34.9 (29)	
Internal Iconic	7.2 (6)	2.4 (2)	10.8 (9)	

Note: $N = 83$

ORI = Object Relations Inventory

DEQ = Depressive Experiences Questionnaire, Dependency Factor, $M = -.53$, $SD = .90$

Table 26

Two-Way Contingency Table of Object Representation and Self-Critical Characteristics (Below the Mean and Above the Mean)

	DEQ Self-Critical Factor		
	Below the Mean	Above the Mean	
ORI Mother Narrative Conceptual Level	% (<i>N</i>)	% (<i>N</i>)	Pearson $\chi^2 (1, 83) = 1.50, p = .272$
Sensorimotor/ Concrete	3.6 (3)	6.0 (5)	
External/Internal Iconic	54.2 (45)	36.1 (30)	

Note: *N* = 83

ORI = Object Relations Inventory

DEQ = Depressive Experiences Questionnaire, Self-Criticism Factor, *M* = -.925, *SD* = 1.01

Table 27

Two-Way Contingency Table of Object Representation and Dependent Characteristics (Below the Mean and Above the Mean)

	DEQ Dependent Factor		
	Below the Mean	Above the Mean	
ORI Mother Narrative Conceptual Level	% (N)	% (N)	Pearson χ^2 (1, 83) = 1.32, p = .284
Sensorimotor/ Concrete	6.0 (5)	3.6 (3)	
External/Internal Iconic	37.3 (31)	53.0 (44)	

Note: $N = 83$

ORI = Object Relations Inventory

DEQ = Depressive Experiences Questionnaire, Dependency Factor, $M = -.53$, $SD = .90$

Table 28

Hobel Risk Assessment Factors Identified as Fetal

Previous fetal exchange transfusion
for Rh

Previous premature infant

Previous neonatal death

Fetal anomalies

Incompetent cervix

Polyhydramnios

Multiple pregnancy

Viral disease

Rh sensitization only

Vaginal spotting

Alcohol (moderate)

Premature rupture of membrane
(PROM)*

Primary dysfunctional labor (PTL)*

* Items added as revision of scale

Table 29

Hobel Risk Assessment Factors Identified as Maternal

Moderate to severe toxemia

Chronic Hypertension

Moderate to severe renal disease

Severe heart disease, Class II-IV

History of eclampsia

History of pyelitis

Class I heart disease

Mild toxemia

Acute pyelonephritis

History of cystitis

Acute cystitis

History of toxemia

Diabetes \geq Class A-II

Previous endocrine ablation

Thyroid disease

Prediabetes (A-I)

Family history of diabetes

Previous stillbirth

(Table continues)

(Maternal Risk Items continued)

Post-term > 42 weeks

Previous cesarean section

Habitual abortion

Infant > 10 pounds

Multiparity > 5

Epilepsy

Uterine malformation

Abnormal fetal position

Small pelvis

Abnormal cervical cytology

Sickle cell disease

Age ≥ 35 or ≤ 15

Positive serology

Severe anemia (< 9 Gm. Hgb)

Excessive use of drugs

History of TB or PPD ≥ 10 mm.

Weight < 100 or > 200 pounds

Pulmonary disease

Flu syndrome (severe)

(Table continues)

(Maternal Risk Items continued)

Mild anemia (9-10.9 Gm. Hgb)

Smoking \geq 1 pack/day

Emotional problem

Placenta previa*

Abruptio placentae*

* Items added for revision of scale

Table 30

Means and Standard Deviations of MAAS Global Antenatal Attachment Scores Across Three Types of Risk

	<i>M</i>	<i>SD</i>
Fetal Risk	82.45	6.22
Maternal Risk	81.23	8.635
Fetal and Maternal Risk	80.67	6.97

Note: $N = 91$

MAAS = Maternal Antenatal Attachment Score

Table 31

Means and Standard Deviations of MAAS Global Antenatal Attachment Scores Across Two Types of Risk

	<i>M</i>	<i>SD</i>
Maternal Risk	81.23	8.635
Fetal and Fetal/Maternal Risk	81.58	6.64

Note: *N* = 91

MAAS = Maternal Antenatal Attachment Score

Table 32

95% Confidence Intervals of Pairwise Differences in Mean Changes of MAAS Attachment

Intensity by Type of Risk

	<i>M</i>	<i>SD</i>	Maternal	Fetal
Maternal	30.52	5.45		
Fetal	31.23	5.26	-3.12 to 4.54	
Combined	30.39	4.31	-3.59 to 3.33	-3.76 to 2.08

Note: $N = 89$

MAAS = Maternal Antenatal Attachment Scale

Table 33

Two-Way Contingency Table of Three Risk Types and Antenatal Attachment (MAAS)

	Maternal Risk	Fetal Risk	Fetal/Maternal Risk	
	% (N)	% (N)	% (N)	
Quality of Attachment Factor				Pearson $\chi^2(1, 91) = .39,$ $p = .823$
<i>N</i> = 91				
Above the mean score (46)	11.0 (10)	29.7 (27)	5.5 (5)	
Below the mean score (46)	14.3 (13)	35.2 (32)	4.4 (4)	
Intensity of Attachment Factor				Pearson $\chi^2(1, 89) = 1.36,$ $p = .506$
<i>N</i> = 89				
Above the mean score (31)	9.0 (8)	31.5 (28)	4.5 (4)	
Below the mean score (31)	16.9 (15)	32.6 (29)	5.6 (5)	
Global Attachment Score				Pearson $\chi^2(1, 89) = 2.245,$ $p = .325$
<i>N</i> = 89				
Above the mean score (81)	7.7 (7)	29.7 (27)	5.5 (5)	
Below the mean score (81)	17.6 (16)	35.2 (32)	4.4 (4)	

Note: MAAS = Maternal Antenatal Attachment Scale

Risk factors of revised Hobel assessment were categorized by the maternal-fetal medicine specialist, John Rosnes, M.D.

Table 34

Two-Way Contingency Table of Two Risk Types and Maternal Antenatal Attachment

	Maternal Risk	Fetal/Combined Risk	
	% (<i>n</i>)	% (<i>n</i>)	
Antenatal Attachment (MAAS)			
Quality of Attachment Factor <i>N</i> = 91			Pearson χ^2 (1, 91) = 2.39, <i>p</i> = .121
Above the mean score (46)	16.5 (15)	37.4 (34)	
Below the mean score (46)	7.7 (7)	38.5 (35)	
Intensity of Attachment Factor <i>N</i> = 89			Pearson χ^2 (1, 89) = .048, <i>p</i> = .826
Above the mean score (31)	13.5 (12)	34.8 (31)	
Below the mean score (31)	10.1 (9)	34.8 (31)	
Global Attachment Score <i>N</i> = 89			Pearson χ^2 (1, 89) = .045, <i>p</i> = .832
Above the mean score (81)	14.3 (13)	42.9 (39)	
Below the mean score (81)	9.9 (9)	33.0 (30)	

Note: MAAS = Maternal Antenatal Attachment Scale
Risk factors of revised Hobel assessment were categorized by the maternal-fetal medicine specialist, John Rosnes, M.D.

Table 35

Pearson Product-Moment Correlations for Severity of Risk and Maternal Antenatal Attachment

	Hobel Risk Score, Revised (Risk Severity)
MAAS Quality of Attachment Factor	<i>r</i> = -.175 <i>p</i> = .098
MAAS Intensity of Attachment Factor	<i>r</i> = -.101 <i>p</i> = .347
MAAS Global Attachment Score	<i>r</i> = -.146 <i>p</i> = .167

Note: N = 89

MAAS = Maternal Antenatal Attachment Scale

Table 36

95% Confidence Intervals of Pairwise Differences in Mean Changes of MAAS Attachment

Intensity by Level of Risk

	<i>M</i>	<i>SD</i>	Low	Medium
Low	31.91	4.93		
Medium	30.11	4.83	-4.81 to 1.20	
High	31.44	4.95	-5.84 to 4.90	-3.62 to 6.29

Note: *N* = 89

MAAS = Maternal Antenatal Attachment Scale

Table 37

Pearson Product-Moment Correlations for Gestational Age and Antenatal Attachment

Antenatal Attachment (MAAS)	Gestational Age of Fetus (at Hospital Admission)
Quality of Attachment Factor	$r = .080$ $p = .45$
Intensity of Attachment Factor	$r = .157$ $p = .142$
Global Attachment Score	$r = .135$ $p = .203$

Note: N = 91

Gestational age of fetus in weeks as recorded at hospital admission

MAAS = Maternal Antenatal Attachment Scale

Table 38

Pearson Product-Moment Correlations for Depressive Symptoms, Attachment, and Risk

Domain and Measure	Dependent <i>n</i> = 91	Self-Critical <i>n</i> = 91	EPDS <i>n</i> = 91	CES-D <i>n</i> = 75	MAAS Quality <i>n</i> = 91	MAAS Intensity <i>n</i> = 89	MAAS Global <i>n</i> = 91	Hobel Risk <i>n</i> = 91
Personality (DEQ)								
Dependent Characteristics	X	.015	.391***	.349***	-.021	.077	.037	-.125
Self-Critical Characteristics	X	X	.432***	.387***	-.366***	-.025	-.198	.121
Depressive Symptoms								
EPDS	X	X	X	.812***	-.451***	-.035	-.247*	.172
CES-D	X	X	X	X	-.348**	.110	-.095	.054
Attachment (MAAS)								
Quality of Attachment Factor	X	X	X	X	X	.410***	.777***	-.138
Intensity of Attachment Factor	X	X	X	X	X	X	.887***	-.051
Global Attachment Score	X	X	X	X	X	X	X	-.090
Risk								
Hobel Risk Assessment, Revised	X	X	X	X	X	X	X	X

Note: DEQ = Depressive Experiences Questionnaire; EPDS = Edinburgh Postpartum Depression Scale;
 CES-D = Center for Epidemiology Studies-Depression; MAAS = Maternal Antenatal Attachment Scale
 * $p < .05$; ** $p < .01$; *** $p \leq .001$

Table 39

Correlations Between Major Demographic Variables, Depressive Symptoms (EPDS), and Antenatal Attachment (MAAS)

	Age	Prior Preg	Gest Age	Children	EPDS	Risk	Quality	Intensity
Age	X	.293**	-.137	.152	-.108	.292**	.292**	-.016
Prior pregnancies	X	X	.075	.701***	.148	.431***	.028	.009
Gestational age at interview (Weeks)	X	X	X	.112	-.115	-.119	.080	.157
Children at home	X	X	X	X	.089	.218*	-.036	-.143
Depressive symptoms (EPDS)	X	X	X	X	X	.172	-.451**	-.035
Severity of Risk (Hobel)	X	X	X	X	X	X	-.138	-.051
Quality of Attachment Factor (MAAS)	X	X	X	X	X	X	X	.410***
Intensity of Attachment Factor (MAAS)	X	X	X	X	X	X	X	X

Note: MAAS = Maternal Antenatal Attachment Scale
 EPDS = Edinburgh Postpartum Depression Scale
 * $p < .05$; ** $p < .01$; *** $p < .001$

Table 40

95% Confidence Intervals of Pairwise Differences in Means of EPDS (Depressive Symptoms)

Depressive Symptoms	<i>M</i>	<i>SD</i>	High Quality High Intensity (Strong Secure)	High Quality Low Intensity (Avoidant)	Low Quality Low Intensity (Withdrawn)
1) High Quality, High Intensity (Strong, secure)	7.13	5.41			
2) High Quality, Low Intensity (Anxious Avoidant)	6.53	4.53		-4.74 to 3.53	
3) Low Quality, Low Intensity (Withdrawn)	12.40	4.14	1.74 to 8.80*	1.98 to 9.76*	
4) Low Quality, High Intensity (Anxious Ambivalent)	11.89	5.47	.31 to 9.21*	.63 to 10.10*	-4.72 to 3.71

Note: EPDS = Edinburgh Postpartum Depression Scale

MAAS = Maternal Antenatal Attachment Scale

An asterisk indicates that the 95% confidence interval does not contain zero, and therefore the difference in means is significant at the .95 significance using Dunnett's C procedure.

Table 41

Chi-Square Comparison of EPDS Depressive Symptomatology and MAAS Antenatal Attachment

Style

	EPDS Below Threshold	EPDS Above Threshold	
Antenatal Attachment Style	% (N)	% (N)	
1) High Quality, High Intensity (Strong, secure)	26.4 (24)	6.6 (6)	$\chi^2 = 21.339, p = .000$
2) High Quality, Low Intensity (Anxious Avoidant)	15.4 (14)	3.3 (3)	
3) Low Quality, Low Intensity (Withdrawn)	7.7 (7)	19.8 (18)	
4) Low Quality, High Intensity (Anxious Ambivalent)	8.8 (8)	12.1 (11)	

Note: EPDS = Edinburgh Postpartum Depression Scale (Threshold for screening ≥ 11)
MAAS = Maternal Antenatal Attachment Scale

Table 42

Sample Means and Standard Deviations of Standard and Three Alternate Versions of Scoring of the Depressive Experiences Questionnaire

	<i>M</i>	<i>SD</i>
Standard Dependency	-.53	.90
Standard Self-Criticism	-.93	1.01
Blatt Revised Dependency	37.31	9.36
Blatt Relatedness	36.43	7.95
McGill Dependency	130.37	18.14
McGill Self-Criticism	101.25	19.41
Rude & Burnham Neediness	-.31	.817
Rude & Burnham Connectedness	-.58	.941

Note: $N = 91$

(Blatt et al., 1995; Santor, Zuroff, Mongrain, & Fielding, 1997b; Rude et al., 1995)

Table 43

Sample Intercorrelations of Four Scoring Methods of the Depressive Experiences Questionnaire

	Standard		Blatt Revision		McGill Revision		Rude & Burnham Revision	
	Depend	SelfC	Depend	Relate	Depend	SelfC	Need	Connect
Standard Dependency	X	.015	.800***	.838***	.974***	-.028	.701***	.825***
Standard Self-Criticism	X	X	.361**	.258*	-.002	.976***	.440***	.193
Blatt Revised Dependency	X	X	X	.658***	.824***	.333**	.870***	.593***
Blatt Relatedness	X	X	X	X	.793***	.228*	.625***	.829***
McGill Dependency	X	X	X	X	X	-.052	.740***	.750***
McGill Self-Criticism	X	X	X	X	X	X	.387***	.156
Rude & Burnham Neediness	X	X	X	X	X	X	X	.377***
Rude & Burnham Connectedness	X	X	X	X	X	X	X	X

Note: $N = 91$; * $p < .05$; ** $p < .01$; *** $p \leq .000$

Table 44

Pearson Product-Moment Correlations of DEQ Dependency, DEQ Self-Criticism, and MAAS Antenatal Attachment Using the McGill Scoring Method

	McGill Dependent	McGill Self-Critical	MAAS Quality	MAAS Intensity	MAAS Global
Personality(DEQ)					
Dependent Characteristics	X	-.052 N = 91	-.060 N = 91	.057 N = 89	.004 N = 91
Self-Critical Characteristics	X	X	-.339** N = 91	-.049 N = 89	-.201 N = 91

Note: N = 91

MAAS = Maternal Antenatal Attachment Scale

McGill = Revised Scoring of the Depressive Experiences Questionnaire (Santor et al., 1997b)

** $p < .01$; *** $p \leq .000$

Table 45

Pearson Product- Moment Correlations of DEQ Dependency and Relatedness with MAAS Antenatal Attachment

	Blatt Dependency	Blatt Relatedness	MAAS Quality	MAAS Intensity	MAAS Global
Personality(DEQ)					
Dependence (Immature)	X	.658*	-.194	.019	-.085
Relatedness (Mature)	X	X	-.241*	-.003	-.132

Note: $N = 91$

DEQ = Depressive Experiences Questionnaire

Revised Scoring Method (Blatt et al., 1995)

MAAS = Maternal Antenatal Attachment Scale

* $p < .05$; *** $p \leq .000$

Table 46

Pearson Product Moment Correlations of MAAS Antenatal Attachment and Rude & Burnham's Needy and Connectedness DEQ Scoring Method

	Rude & Burnham Neediness	Rude & Burnham Connectedness	MAAS Quality	MAAS Intensity	MAAS Global
Personality(DEQ)					
Neediness (Unhealthy)	X	.377***	-.242*	.036	-.095
Connectedness (Healthy)	X	X	-.048	.041	-.004

Note: $N = 91$

DEQ = Depressive Experiences Questionnaire
Revised Scoring Method (Rude & Burnham, 1995)

* = $p < .05$; *** $p \leq .000$

Table 47

Linear Regression Analyses of Dependency and Self-Criticism Scores Predicting MAAS Global Attachment Score

	95% CI	<i>F</i> (2, 88)	<i>p</i>	<i>R</i> ²	Adj. <i>R</i> ²
Standard Scoring					
Dependency	-1.32 to 1.96	1.87	.16	.04	.019
Self-Criticism	-2.86 to .064				
McGill Scoring					
Dependency	-.08 to .08	1.86	.16	.04	.019
Self-Criticism	-.15 to .002				
Blatt Subscales					
Dependency	-.37 to .13	.78	.46	.02	-.005
Relatedness	-.21 to .22				
Rude & Burnham					
Neediness	-2.94 to 1.03	.457	.63	.01	-.01
Connected	-1.44 to 2.01				

Note: *N* = 89

Table 48

Spearman's rho Correlation of ORI Baby Narrative and Gestational Age (Weeks)

ORI Baby Narrative			
	Conceptual Level	Length	Ambivalence
Conceptual Level	X	X	X
Length	.127	X	X
Ambivalence	-.170	.355**	X
Gestational Age (Weeks)	-.114	.060	-.038

Note: $N = 85$

ORI = Object Relations Inventory

** = $p = .001$

Table 49

Comparison of Most Common Risk Factors

	Baylor Sample		Maloni Sample		Besser Sample		Gupton Sample*	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Preterm Labor	40	43.95	41	46.06	X	X	X	20
Placenta Previa	3	3.29	7	7.86	X	X	X	20
Incompetent Cervix	29	31.87	6	6.74	X	X	X	X
Cervical Abnormality	2	2.19	5	5.61	X	X	X	X
Pregnancy-Induced Hypertension	18	19.78	3	3.3	X	X	X	18
Premature Rupture of Membranes	16	17.58	2	2.2	X	X	X	17
Other	X	X	X	28.23	X	X	X	25
Diabetes	5	5.49	X	X	146	100%	X	X
Total	91	**	89	100	146	100%	105	100

Note: *Gupton did not include exact *N* per condition
 ** Percentages exceed 100% in view of dual or multiple diagnoses
 (Maloni et al., 2001; Besser et al., 2002; Gupton et al., 2001)

Table 50

Comparison of the ORI and MAAS Means and Standard Deviations from Two Samples

	Baylor Sample		Israeli Sample	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Object Representations (Mother)				
Benevolent	4.11	1.54	4.62	1.20
Punitive	1.49	1.42	3.97	1.07
Ambitious	3.53	1.69	3.90	1.18
Ambivalent	1.83	1.30	2.61	1.32
Conceptual Level	5.17	1.22	5.34	2.08
Antenatal Attachment				
Quality	46.01	3.48	45.21	4.24
Intensity	30.71	4.88	27.72	4.96

Note: Baylor Sample: Object Relations Inventory (ORI) $N = 83$
 Maternal Antenatal Attachment Scale (MAAS) $N = 91$
 Israeli Sample: $N = 120$ (Priel et al., 2001)

Table 51

Comparisons of Correlations for ORI Mother Narrative and Maternal Antenatal Attachment in Two Samples

	Baylor Sample <i>N</i> = 83		Israeli Sample <i>N</i> = 120	
	Quality	Intensity	Quality	Intensity
Object Representations (Mother)				
Benevolent	.174	.045	.33***	.07
Punitive	-.020	-.154	-.23***	-.16
Ambitious	-.218	.043	.39***	.12
Ambivalent	-.130	-.168	-.29**	-.11
Conceptual Level	.040	-.176	.42***	.19*

Note: ** $p < .01$; *** $p < .001$
Israeli Sample (Priel et al., 2001)

APPENDIX A
Baylor Internal Review Board Approval

APPENDIX B
Letter of Consent

APPENDIX C
MEASURES

CENTER FOR EPIDEMIOLOGIC STUDIES—DEPRESSION SCALE (CES-D)

Below is a list of some ways you may have felt or behaved. Please indicate how often you have felt this way during the last week by checking the appropriate space.

During the past week:	<i>Rarely</i> or none of the time (less than 1 day)	<i>Some</i> or a <i>little</i> of the time (1- 2 days)	<i>Occasionally</i> or a Moderate amount of Time (3-4 days)	<i>Most</i> or all of the Time (5-7 days)
1. I was bothered by things that usually don't bother me.	0	1	2	3
2. I did not feel like eating; my appetite was poor.	0	1	2	3
3. I felt that I could not shake off the blues even with help from my family or friends.	0	1	2	3
4. I felt I was just as good as other people.	0	1	2	3
5. I had trouble keeping my mind on what I was doing.	0	1	2	3
6. I felt depressed.	0	1	2	3
7. I felt that everything I did was an effort.	0	1	2	3
8. I felt hopeful about the future.	0	1	2	3
9. I thought my life had been a failure.	0	1	2	3
10. I felt fearful.	0	1	2	3
11. My sleep was restless.	0	1	2	3
12. I was happy.	0	1	2	3
13. I talked less than usual.	0	1	2	3
14. I felt lonely.	0	1	2	3
15. People were unfriendly.	0	1	2	3
16. I enjoyed life.	0	1	2	3
17. I had crying spells.	0	1	2	3
18. I felt sad.	0	1	2	3
19. I felt that people disliked me.	0	1	2	3
20. I could not get going.	0	1	2	3

DEPRESSIVE EXPERIENCES QUESTIONNAIRE (DEQ)

Listed below are a number of statements concerning personal characteristics and traits. Read each item and decide whether you agree or disagree and to what extent. If you strongly agree, circle 7; if you strongly disagree, circle 1; The midpoint, if you are neutral or undecided, is 4.

	Strongly Disagree							Strongly Agree
1. I set my personal goals and standards as high as possible.	1	2	3	4	5	6	7	
2. Without support from others who are close to me, I would be helpless.	1	2	3	4	5	6	7	
3. I tend to be satisfied with my current plans and goals, rather than striving for higher goals.	1	2	3	4	5	6	7	
4. Sometimes I feel very big, and other times I feel very small.	1	2	3	4	5	6	7	
5. When I am closely involved with someone, I never feel jealous.	1	2	3	4	5	6	7	
6. I urgently need things that only other people can provide.	1	2	3	4	5	6	7	
7. I often find that I don't live up to my own standards or ideals.	1	2	3	4	5	6	7	
8. I feel I am always making full use of my potential abilities.	1	2	3	4	5	6	7	
9. The lack of permanence in human relationships doesn't bother me.	1	2	3	4	5	6	7	
10. If I fail to live up to expectations, I feel unworthy.	1	2	3	4	5	6	7	
11. Many times I feel helpless.	1	2	3	4	5	6	7	
12. I seldom worry about being criticized for things I have said or done.	1	2	3	4	5	6	7	
13. There is a considerable difference between how I am now and how I would like to be.	1	2	3	4	5	6	7	
14. I enjoy sharp competition with others.	1	2	3	4	5	6	7	
15. I feel I have many responsibilities that I must meet.	1	2	3	4	5	6	7	
16. There are times when I feel "empty" inside.	1	2	3	4	5	6	7	
17. I tend not to be satisfied with what I have.	1	2	3	4	5	6	7	

18. I don't care whether or not I live up to what other people expect of me.	1	2	3	4	5	6	7
19. I become frightened when I feel alone.	1	2	3	4	5	6	7
20. I would feel like I'd be losing an important part of myself if I lost a very close friend.	1	2	3	4	5	6	7
21. People will accept me no matter how many mistakes I have made.	1	2	3	4	5	6	7
22. I have difficulty breaking off a relationship that is making me unhappy.	1	2	3	4	5	6	7
23. I often think about the danger of losing someone who is close to me.	1	2	3	4	5	6	7
24. Other people have high expectations of me.	1	2	3	4	5	6	7
25. When I am with others, I tend to devalue or "undersell" myself.	1	2	3	4	5	6	7
26. I am not very concerned with how other people respond to me.	1	2	3	4	5	6	7
27. No matter how close a relationship between two people is, there is always a large amount of uncertainty and conflict.	1	2	3	4	5	6	7
28. I am very sensitive to others for signs of rejection.	1	2	3	4	5	6	7
29. It's important for my family that I succeed.	1	2	3	4	5	6	7
30. Often, I feel I have disappointed others.	1	2	3	4	5	6	7
31. If someone makes me angry, I let him (her) know how I feel.	1	2	3	4	5	6	7
32. I constantly try, and very often go out of my way, to please or help people I am close to.	1	2	3	4	5	6	7
33. I have many inner resources (abilities, strengths).	1	2	3	4	5	6	7
34. I find it very difficult to say "No" to the requests of friends.	1	2	3	4	5	6	7
35. I never really feel secure in a close relationship.	1	2	3	4	5	6	7
36. The way I feel about myself frequently varies: there are times when I feel extremely good about myself and other times when I see only the bad in me and feel like a total failure	1	2	3	4	5	6	7

37. Often, I feel threatened by change.	1	2	3	4	5	6	7
38. Even if the person who is closest to me were to leave, I could still "go it alone."	1	2	3	4	5	6	7
39. One must continually work to gain love from another person: that is, love has to be earned.	1	2	3	4	5	6	7
40. I am very sensitive to the effects my words or actions have on the feelings of other people.	1	2	3	4	5	6	7
41. I often blame myself for things I have done or said to someone.	1	2	3	4	5	6	7
42. I am a very independent person.	1	2	3	4	5	6	7
43. I often feel guilty.	1	2	3	4	5	6	7
44. I think of myself as a very complex person, one who has "many sides."	1	2	3	4	5	6	7
45. I worry a lot about offending or hurting someone who is close to me.	1	2	3	4	5	6	7
46. Anger frightens me.	1	2	3	4	5	6	7
47. It is not "who you are," but "what you have accomplished" that counts.	1	2	3	4	5	6	7
48. I feel good about myself whether I succeed or fail.	1	2	3	4	5	6	7
49. I can easily put my own feelings and problems aside, and devote my complete attention to the feelings and problems of someone else.	1	2	3	4	5	6	7
50. If someone I cared about became angry with me, I would feel threatened that he (she) might leave me.	1	2	3	4	5	6	7
51. I feel comfortable when I am given important responsibilities.	1	2	3	4	5	6	7
52. After a fight with a friend, I must make amends as soon as possible.	1	2	3	4	5	6	7
53. I have a difficult time accepting weaknesses in myself.	1	2	3	4	5	6	7
54. It is more important that I enjoy my work than it is for me to have my work approved.	1	2	3	4	5	6	7

55. After an argument, I feel very lonely.	1	2	3	4	5	6	7
56. In my relationships with others, I am very concerned about what they can give to me.	1	2	3	4	5	6	7
57. I rarely think about my family.	1	2	3	4	5	6	7
58. Very frequently, my feelings toward someone close to me vary: there are times when I feel completely angry and other times when I feel all-loving towards that person.	1	2	3	4	5	6	7
59. What I do and say has a very strong impact on those around me.	1	2	3	4	5	6	7
60. I sometimes feel that I am "special."	1	2	3	4	5	6	7
61. I grew up in an extremely close family.	1	2	3	4	5	6	7
62. I am very satisfied with myself and my accomplishments.	1	2	3	4	5	6	7
63. I want many things from someone I am close to.	1	2	3	4	5	6	7
64. I tend to be very critical of myself.	1	2	3	4	5	6	7
65. Being alone doesn't bother me at all.	1	2	3	4	5	6	7
66. I very frequently compare myself to standards or goals.	1	2	3	4	5	6	7

EDINBURGH POSTPARTUM DEPRESSION SCALE (EPDS)

Please circle the answer that best describes how you have felt over the past 7 days.

In the past 7 days:

1. I have been able to laugh and see the funny side of things -
 - 0 As much as I always could
 - 1 Not quite so much now
 - 2 Definitely not so much now
 - 3 Not at all

2. I have looked forward with enjoyment to things -
 - 0 As much as I ever did
 - 1 Rather less than I used to
 - 2 Definitely less than I used to
 - 3 Hardly at all

3. I have blamed myself unnecessarily when things went wrong -
 - 0 No, not at all
 - 1 Hardly ever
 - 2 Yes, sometimes
 - 3 Yes, very often

4. I have been anxious or worried for no good reason -
 - 3 Yes, quite a lot
 - 2 Yes, sometimes
 - 1 No, not much
 - 0 No, not at all

5. I have felt scared or panicky for no very good reason -
 - 3 Yes, quite a lot
 - 2 Yes, sometimes
 - 1 No, not much
 - 0 No, not at all

6. Things have been getting on top of me -
- 3 Yes, most of the time I haven't been able to cope at all
 - 2 Yes, sometimes I haven't been coping as well as usual
 - 1 No, most of the time I have coped quite well
 - 0 No, I have been coping as well as ever
7. I have been so unhappy that I have had difficulty sleeping -
- 3 Yes, most of the time
 - 2 Yes, sometimes
 - 1 Not very often
 - 0 No, not at all
8. I have felt sad or miserable -
- 3 Yes, most of the time
 - 2 Yes, quite often
 - 1 Not very often
 - 0 No, not at all
9. I have been so unhappy that I have been crying -
- 3 Yes, most of the time
 - 2 Yes, quite often
 - 1 Only occasionally
 - 0 No, never
10. The thought of harming myself has occurred to me -
- 3 Yes, quite often
 - 2 Sometimes
 - 1 Hardly ever
 - 0 Never

MATERNAL ANTENATAL ATTACHMENT SCALE (MAAS)

These questions are about your thoughts and feelings about the developing baby. Please tick one box only in answer to each question.

1) Over the past two weeks I have thought about, or been preoccupied with the baby inside me:

- Almost all the time
- Very frequently
- Frequently
- Occasionally
- Not at all

2) Over the past two weeks when I have spoken about, or thought about the baby inside me I got emotional feelings which were:

- Very weak or non-existent
- Fairly weak
- In between strong and weak
- Fairly strong
- Very strong

3) Over the past two weeks my feelings about the baby inside me have been:

- Very positive
- Mainly positive
- Mixed positive and negative
- Mainly negative
- Very negative

4) Over the past two weeks I have had the desire to read about or get information about the developing baby. This desire is:

- Very weak or non-existent
- Fairly weak
- Neither strong nor weak
- Moderately strong
- Very strong

5) Over the past two weeks I have been trying to picture in my mind what the developing baby actually looks like in my womb:

- Almost all the time
- Very frequently
- Frequently
- Occasionally
- Not at all

6) Over the past two weeks I think of the developing baby mostly as:

- A real little person with special characteristics
- A baby like any other baby
- A human being
- A living thing
- A thing not yet really alive

7) Over the past two weeks I have felt that the baby inside me is dependent on me for its well-being:

- Totally
- A great deal
- Moderately
- Slightly
- Not at all

8) Over the past two weeks I have found myself talking to my baby when I am alone:

- Not at all
- Occasionally
- Frequently
- Very frequently
- Almost all the time I am alone

9) Over the past two weeks when I think about (or talk to) my baby inside me, my thoughts:

- Are always tender and loving
- Are mostly tender and loving
- Are a mixture of both tenderness and irritation
- Contain a fair bit of irritation
- Contain a lot of irritation

10) The picture in my mind of what the baby at this stage actually looks like inside the womb is:

- Very clear
- Fairly clear
- Fairly vague
- Very vague
- I have no idea at all

11) Over the past two weeks when I think about the baby inside me I get feelings which are:

- Very sad
- Moderately sad
- A mixture of happiness and sadness
- Moderately happy
- Very happy

12) Some pregnant women sometimes get so irritated by the baby inside them that they feel like they want to hurt it or punish it:

- I couldn't imagine I would ever feel like this
- I could imagine I might sometimes feel like this, but I never actually have
- I have felt like this once or twice myself
- I have occasionally felt like this myself
- I have often felt like this myself

13) Over the past two weeks I have felt:

- Very emotionally distant from my baby
- Moderately emotionally distant from my baby
- Not particularly emotionally close to my baby
- Moderately close emotionally to my baby
- Very close emotionally to my baby

14) Over the past two weeks I have taken care with what I eat to make sure the baby gets a good diet:

- Not at all
- Once or twice when I ate
- Occasionally when I ate
- Quite often when I ate
- Every time I ate

15) When I first see my baby after the birth I expect I will feel:

- Intense affection
- Mostly affection
- Dislike about one or two aspects of the baby
- Dislike about quite a few aspects of the baby
- Mostly dislike

16) When my baby is born I would like to hold the baby:

- Immediately
- After it has been wrapped in a blanket
- After it has been washed
- After a few hours for things to settle down
- The next day

17) Over the past two weeks I have had dreams about the pregnancy or baby:

- Not at all
- Occasionally
- Frequently
- Very frequently
- Almost every night

18) Over the past two weeks I have found myself feeling, or rubbing with my hand, the outside of my stomach where the baby is:

- A lot of times each day
- At least once per day
- Occasionally
- Once only
- Not at all

19) If the pregnancy was lost at this time (due to miscarriage or other accidental event) without any pain or injury to myself, I expect I would feel:

Very pleased

Moderately pleased

Neutral (i.e. neither sad nor pleased, or mixed feelings)

Moderately sad

Very sad

Chart Review

Participant number

Obstetrician of record _____

Birthdate _____

Ethnicity	Af Am	Asian	Caucasian	Latino	Other	
Marital Status	Single	Married	Separated	Divorced	Widowed	Cohabiting
Total Pregnancies (Prior)	<input type="text"/>					
Full Term (Prior)	<input type="text"/>					
Premature (Prior)	<input type="text"/>					
Abortions induced	<input type="text"/>					
Abortions spontaneous	<input type="text"/>					
Ectopics	<input type="text"/>					
Multiple births (Prior)	<input type="text"/>					
Living	<input type="text"/>					
Stillborn	<input type="text"/>					

List any interventions that have been initiated or ordered by the doctor:

HOBEL RISK ASSESSMENT--PRENATAL

	yes	no
Moderate to severe toxemia	10	0
Chronic Hypertension	10	0
Moderate to severe renal disease	10	0
Severe heart disease, Class II-IV	10	0
History of eclampsia	5	0
History of pyelitis	5	0
Class I heart disease	5	0
Mild toxemia	5	0
Acute pyelonephritis	5	0
History of cystitis	1	0
Acute cystitis	1	0
History of toxemia	1	0
Diabetes ≥ Class A-II	10	0
Previous endocrine ablation	10	0
Thyroid disease	5	0
Prediabetes (A-I)	5	0
Family history of diabetes	1	0

Previous fetal exchange transfusion for Rh	10	0
Previous stillbirth	10	0
Post-term > 42 weeks	10	0
Previous premature infant	10	0
Previous neonatal death	10	0
Previous cesarean section	5	0
Habitual abortion	5	0
Infant > 10 pounds	5	0
Multiparity > 5	5	0
Epilepsy	5	0
Fetal anomalies	1	0
Uterine malformation	10	0
Incompetent cervix	10	0
Abnormal fetal position	10	0
Polyhydramnios or oligohydramnios	10	0
Small pelvis	5	0
Abnormal cervical cytology	10	0
Multiple pregnancy	10	0
Sickle cell disease	10	0
Age ≥ 35 or ≤ 15	5	0
Viral disease	5	0
Rh sensitization only	5	0
Positive serology	5	0
Severe anemia (< 9 Gm. Hgb)	5	0
Excessive use of drugs	5	0
History of TB or PPD ≥ 10 mm.	5	0
Weight < 100 or > 200 pounds	5	0
Pulmonary disease	5	0
Flu syndrome (severe)	5	0
Vaginal spotting	5	0
Mild anemia (9-10.9 Gm. Hgb)	1	0
Smoking ≥ 1 pack/day	1	0
Alcohol (moderate)	1	0
Emotional problem	1	0
Premature rupture of membrane (PROM)	5	0
Primary dysfunctional labor (PTL)	5	0
Placenta previa	10	0
Abruptio placentae	10	0

OBJECT RELATIONS INVENTORY (ORI)

DESCRIBE YOUR MOTHER.

OBJECT RELATIONS INVENTORY (ORI)

DESCRIBE THE BABY YOU ARE CARRYING.

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VITAE

Anna Rachel Brandon was born in Cleveland, Ohio, to Ronald and Barbara Coleman. She completed High School in Brownwood, Texas in 1973. She married and relocated to California where her daughters, Rachel and Sarah, were born. She returned to Texas in 1981, living in San Antonio, where her son, David, was born. In 1991, she relocated her textile sales agency to the Dallas International Apparel Mart. She began attending Mountain View College part-time, completing an Associate of Arts degree in Business in 1999. She was accepted to Southern Methodist University and, in 2001, she graduated Summa cum laude with dual degrees in Business Administration and Psychology. In August 2002, she entered the Graduate School of Biomedical Sciences at the University of Texas Health Science Center at Dallas.

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