



## Theoretical Approaches to Maternal–Infant Interaction: Which Approach Best Discriminates Between Mothers With and Without Postpartum Depression?



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### ABSTRACT

**Objective:** The purpose of this study was to determine which of the four common approaches to coding maternal–infant interaction best discriminates between mothers with and without postpartum depression.

**Methods:** After extensive training, four research assistants coded 83 three minute videotapes of maternal infant interaction at 12 month postpartum visits. Four theoretical approaches to coding (Maternal Behavior Q-Sort, the Dyadic Mini Code, Ainsworth Maternal Sensitivity Scale, and the Child–Caregiver Mutual Regulation Scale) were used. Twelve month data were chosen to allow the maximum possible exposure of the infant to maternal depression during the first postpartum year. The videotapes were created in a laboratory with standard procedures. Inter-rater reliabilities for each coding method ranged from .7 to .9. The coders were blind to depression status of the mother.

**Results:** Twenty-seven of the women had major depressive disorder during the 12 month postpartum period. Receiver operating characteristics analysis indicated that none of the four methods of analyzing maternal infant interaction discriminated between mothers with and without major depressive disorder.

**Conclusion:** Limitations of the study include the cross-sectional design and the low number of women with major depressive disorder. Further analysis should include data from videotapes at earlier postpartum time periods, and alternative coding approaches should be considered. Nurses should continue to examine culturally appropriate ways in which new mothers can be supported in how to best nurture their babies.

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Early social interactions with consistent caregivers are important for children's emotional development (Ainsworth & Bell, 1970; Ainsworth, Blehar, Waters, & Wall, 1978; Blehar, Lieberman, & Ainsworth, 1977; Bowlby, 1969, 1970). Ainsworth et al. and Bowlby introduced the modern concept of attachment and the importance of early mother–infant interactions to the development of attachment behaviors and socio-emotional functioning of infants. An extensive

literature documented the long reaching effects of early physical and social environments on socio-emotional development, cognitive functioning, school readiness, academic success, behavior, and health (Bornstein, Hendricks, Haynes, & Painter, 2007; Clark, Woodward, Horwood, & Moor, 2008; Cooper, Masi, & Vick, 2009; Davis, Harris, & Burns, 2009; Landry, Garner, Swank, & Baldwin, 1996; Landry, Miller-Loncar, Smith, & Swank, 2002; Robinson, Burns, & Davis, 2009; Salonen, Lepola, & Vauras, 2007; Zajicek-Farber, 2011).

Theoretical approaches to maternal infant interaction vary slightly in the specific aspect of the interaction that is emphasized. However, Ainsworth's Attachment Theory serves as the foundational theory in the field and postulates that the quality of the first attachment relationship is fundamental to social and emotional development of the infant and has a critical influence on the infant throughout life (Ainsworth et al., 1978). Data are commonly collected by observational approaches and analysis of videotapes of maternal infant interaction (Horowitz, Logsdon, & Anderson, 2005).

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At the forefront of theoretical approaches to examining the maternal infant relationship is maternal sensitivity (Davis & Logsdon, 2011). Ainsworth et al. (1978) described five types of behaviors that exemplified maternal sensitivity with infants: responsiveness to infant cries or distress; reactions to infant's presence upon reunion after separation; affectionate bodily contact; synchrony in behaviors during face to face interactions; and synchrony during feeding. Sensitive mothers respond promptly and appropriately to infant signals (Tamis-LeMonda & Baumwell, 2011).

In contrast, Tronick and colleagues at Harvard Medical School base their work upon the Mutual Regulation Model or "the capacity of each of the interactants, child and adult, to express their motivated intentions, to appreciate the intentions of the partner, and to scaffold their partner's actions so that their partner can achieve their goal" (Tronick & Weinberg, 1997, p. 56). Thus, the role of the infant as partner in maternal infant interactions differentiates synchronous approaches from maternal sensitivity.

### MATERNAL DEPRESSION AND MATERNAL INFANT RELATIONSHIP

In a nationally representative sample of the civilian population of the United States ( $N = 8916$ ), part of the National Epidemiologic Survey of Alcohol and Related Conditions, maternal depression was found to be a major public health problem in the United States impacting 10% of new mothers and their families (Ertel, Rich-Edwards, & Koenen, 2011). International studies have demonstrated that salient features of maternal depression can impair the maternal infant relationship (Edhborg, Nasreen, & Kabir, 2011; Moehler, Brunner, Wiebel, Reck, & Resch, 2006) and adversely impact a child's cognitive development, social skills, and behavior (Grace, Evindar, & Stewart, 2003; Tronick & Reck, 2009; Wu, Selig, Roberts, & Steele, 2011). In a classic meta-analysis of 19 studies, Beck (1995) demonstrated a moderate to large effect of postpartum depression on maternal infant interaction during the first postpartum year.

### IMPACT OF DEPRESSION TREATMENT

Fortunately, postpartum depression symptoms and overall functioning improve with treatment (Gjerdingen, 2003) as does the satisfaction with the maternal role (Logsdon, Wisner, Sit, Luther, & Wisniewski, 2011). However, the literature describing the impact of depression treatment on the maternal infant relationship and on the child is mixed. A systematic review of 8 clinical trials demonstrated the effectiveness of interventions directed towards improving the maternal infant relationship in depressed mothers (Poobalan et al., 2007). However, improvement in maternal depression may not prevent child psychopathology (Gunlicks & Weissman, 2008). Interventions that do not specifically focus on maternal infant interaction have variable effects on the maternal infant relationship. For example, in a clinical trial, Forman et al. (2007) investigated the impact of psychotherapy on parenting and child outcomes in women with postpartum depression. Participants included depressed women randomly assigned to psychotherapy ( $n = 60$ ), a waitlist ( $n = 60$ ), and a non-depressed comparison group ( $n = 56$ ). At 6 months the depressed mothers were less responsive to their infants, experienced more parenting stress, and viewed their infants more negatively than did non-depressed mothers. Although treatment improved parenting stress, depressed mothers still rated their children lower in attachment security, higher in behavior problems, and more negatively in temperament than did nondepressed mothers.

Researchers investigating the impact of depression treatment on maternal infant interaction have used a variety of theoretical approaches in analysis of observational data of maternal infant interaction. Some coding methods focus only on maternal sensitivity, and other coding methods include the child's behavior in the scoring. As no "gold standard" exists, our research team investigated which approach

might be a better measure of the impact of depression on the maternal infant relationship.

### PURPOSE

The purpose of this study was to simultaneously determine which of four commonly used theoretical perspectives to coding maternal infant interactions best discriminates between mothers with and without postpartum depression. Since Mercer (1985) has established that mothers should function competently and comfortably in the maternal role by 12 months postpartum, videotapes of maternal infant interaction at 12 months postpartum were used for data analysis.

### MATERIAL AND METHODS

#### *Study Design and Setting*

This observational study focused on examination of maternal infant interaction at 12 months postpartum in women with and without depression. The study was a supplemental study to an National Institute of Mental Health funded observational study which included women with major depressive disorder (treated or untreated with medication) and nondepressed controls, followed during pregnancy and postpartum (Wisner et al., 2009).

#### *Procedures*

Four research assistants separately coded three minute videotapes of maternal infant interaction which were recorded at 12 month postpartum. Each research assistant had expertise and extensive training in one of four common theoretical approaches to coding (Ainsworth Maternal Sensitivity Scale, the Dyadic Mini Code, Maternal Behavior Q-Sort, and the Child-Caregiver Mutual Regulation Scale), and our research team had previously conducted pilot studies of the procedures (e.g., Logsdon, 2008). Inter-rater reliabilities for each coding method ranged from .7 to .9; researchers who were experienced in each coding method provided training to individual research assistants and served as the partner for reliability ratings. The research assistants were masked to depression and treatment status of mothers. Noldus Behavioral Coding software was used for data entry and analysis.

The videotapes were created in an observation room with standard procedures developed by Tronick, Als, Adamson, et al. (1978). That is, mothers and infants were seated facing each other with the infant placed in a table top infant seat so that eye to eye contact was facilitated. Two video cameras recorded the faces of both the mother and the baby and the baby's entire body. The room had no windows or decorative items. The mother was told to play with her baby as she would normally, but no toys or food were allowed.

#### *Instruments*

Two of the coding approaches are focused upon determining maternal sensitivity. Ainsworth Maternal Sensitivity Scales are based on maternal behaviors as indicators of the mother's ability to perceive and interpret her baby's signals, and to respond to these signals in a prompt and appropriate manner. The scales are founded upon four fundamental components of maternal sensitivity, including the mother's awareness of baby's signals, an accurate perception of the signals, a prompt response to them, and an appropriate response to them. The scale consists of descriptive levels of maternal sensitivity including highly sensitive (9), sensitive (7), inconsistently sensitive (5), insensitive (3), and highly insensitive (1). After observing a maternal-infant interaction, an observer codes a numerical rating for overall maternal sensitivity, based on the 9 point scale. The rating should be anywhere from 1 (highly insensitive) to 9 (highly sensitive). At the conclusion of the assessment, a composite score of maternal sensitivity is created (Ainsworth, 1969).

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