IMPACT OF NEGATIVE INFANT EMOTIONAL

REACTIVITY ON MATERNAL SENSITIVITY

WITH FATHER INVOLVEMENT

AS A MODERATOR

By

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Chapter I

Introduction

Background

      Parents' lives change forever when they have a baby. During the first year after their child's birth parents are trying to understand and adapt to this change. They spend more time with their newborns during this time than any other phase in a child's life (Bornstein, 2002). Infants communicate through emotional expressions and this is the most evident form of infant's response to their parent's behavior (Grolnick & Farkas, 2002). Parents also try to pay more attention to their infant's cues to manage and soothe any kind of distress or difficulty that their infants may feel (Bornstein). Parents and their children develop the most unique relationship of all through these mutual interactions. The parent-child relationship is seen to have a major impact on all aspects of child development, and has been a major focus of research in the field of child development. Especially, the infancy period has been considered by most theorists to be a crucial period for both infants and their parents for developing this life long relationship that grows stronger as years go by (Bornstein). Bowlby (1969) theorized that infancy is a period when children totally depend on their parents for their needs and that this phase is "evolutionarily conditioned" for developing long- term secure attachments with the caregivers (as cited in Bornstein, p. 7). It is necessary for children to develop a healthy relationship with their parents. The major milestones achieved in a

child's life depend on the strength of this relationship that starts developing during infancy (Erickson, Sroufe, & Egeland, 1985; Erickson, Korfmacher, & Egeland, 1992).

Mothers' behavior towards their infant is considered to have an important influence on this relationship and also for it to develop into a secure-attachment bond between the children and their parents. Mother's behavior is often times studied as maternal sensitivity. Maternal sensitivity is measured by looking at mothers' attitude towards the child, quality of interaction between the mother and the infant, and if the mother is able to soothe her infant through positive stimulation (see recent review by Dewolff & van Ijzendoorn, 1997).

Infants also contribute to this relationship that they share with their parents. Recent research has begun to focus on infant temperament and its influence on the family as a whole. Temperament is considered as a child characteristic that influences parental functioning and parenting strategies. Infant's negative expression of emotions, like intense crying and negative mood appear to have the most influence on the developing pattern of mother-infant interaction (Donovan & Leavitt, 1978).

Social support available to the mothers through their friends and families has a positive influence on this relationship (Crockenberg, 1981; Crnic & Greenberg, 1990). Father's involvement is shown to provide both emotional and instrumental support for mothers and their children (Belsky, 1981). Researchers who have examined the influence of stress and support on mother-infant relationships have found that marital relationships, which are one of the closest interpersonal relationships, can provide both stress and important support for mothers and their infants (Belsky & Isabella, 1998; Pianta & Egeland, 1990).

Purpose of the study

The purpose of the current study was both descriptive and exploratory; it examined how the relation between infant's negative temperament and maternal behavior was moderated by the presence of an involved father. The aim of the study was to describe the association among *infant negative emotional reactivity, maternal sensitivity, and father involvement* for this particularly low risk sample. The study was also exploratory in trying to look at how *father involvement* affected the mother-infant dyad.

Conceptualization

In this study, a number of terms were used that require explanation. Brief definitions of these terms follow:

1. *Maternal Sensitivity* is defined in the current study as the mother's ability to respond in a responsive, non-intrusive, and positive way to her infant's cues during mother-infant play session.

2. *Father Involvement* is defined as engagement of father with his child; the amount of time the father is available to the child, and responsibilities that the father takes for the child's day to day care (Lamb, 2004). In the current study the level of father's involvement with his infant is conceptualized as the amount of responsibilities that the father shared with the mother in providing care for his infant.

3. *Infant Negative Emotional Reactivity* will be used to measure difficult temperament in infants in the current study. This construct is defined by the infant's quality of mood, inability to adapt to new situations, and expression of emotions.

Chapter II

Review of Literature

Overview

The review of literature that follows will begin with an introduction to the conceptual model that will be used in this study. The literature review will then examine child temperament, specifically infant negative emotional reactivity, maternal sensitivity, and the aspects of father involvement that were examined in the current study.

Parenting Model

For the purpose of the current study there is a need for a model that not only looks at the individuals involved in the interaction and their personalities but also aspects of the context in which the interactive process is taking place. This study will use an integrated conceptual framework developed by Belsky. This conceptual model was developed (see Figure 1) as a means to integrate family science and child developmental psychology, and in an attempt to understand the influence children had on family dynamics (Belsky, 1984). Belsky's "process model of determinants of parenting" emphasizes three sources of influence on mother's interaction style with her infant (1984). The model examines the different determinants of parenting such as parent's personal characteristics, characteristics of the child, and the social and contextual sources of stress and support (1984). Parent's personal characteristics are further divided into parent's personality and parent's developmental history. This model

looked at how child characteristics related to difficult temperament affect parenting behavior in mothers. The contextual sources of support and stress are further divided into family or marital relationship, social network, and the mother's work environment. The current study will use this conceptual model to derive its hypotheses. Difficult child temperament will be considered along with father's involvement with caregiving activities and how this affects mother's behavior towards the child. The current study will examine the effects of child behavior (infant negative emotional reactivity) on parenting (maternal sensitivity) and also how this link is influenced by the presence of an involved father in the family.

Infant Temperament

Introduction. Vaughn and Bost (1999) in their review of temperament models grouped them into four categories: the behavioral style model, emergent personality model, emotion or psychological model, and a social construction model. They discussed that from the behavioral genetics point of view, temperamental traits have been defined as characteristics that are seen early on in life and have lasting influence on behavior due to their genetic link (Plomin, 1983). They added that Lerner and Lerner (1986) implied that child's temperament is influenced by the social context of the child. According to Vaughn and Bost, a social ecological model suggests considering individual differences in children while studying temperament. This model suggests examining the influence that child's age, gender, and birth order may have on temperamental differences in children.

Temperamental Categories. Nine categories of temperament were recognized by the New York Longitudinal Study (NYLS) (Chess & Thomas, 1982). The nine

categories of temperament are: activity, rhythmicity, approach, adaptability, responsiveness, intensity, mood, distractibility, persistence, and attention span. The nine dimensions of temperament suggested by Thomas and Chess (1977, as cited in Chess & Thomas, 1982) have been grouped into three basic classifications of children: easy children, difficult children, and slow-to-warm-up children. In particular, characteristics associated with difficult temperament are related to later behavior problems (Chess & Thomas, 1987).

Negative Infant Emotional Reactivity. Based on the nine categories of temperament evident in infancy, researchers have tried to define categories that cause most stress and concern for parents. The purpose of the current study is to explore those features of difficult temperament that most affect parenting, especially maternal sensitivity. Researchers who are studying emotions in infancy have focused more on the constructs of emotional reactivity and regulation as these dimensions reflect important aspects of temperament. Mostly research on infant negative emotionality has focused on the intensity and duration of negative reactions to stimuli. Buss and Plomin (1975) measured negative emotionality by looking at temperamental dimensions of fear, anger, and distress in infants. Thomas and Chess (1977, as cited in Chess & Thomas, 1982) used quality of mood and level of intensity in measuring negative emotions. Children, who were withdrawn, adapted slowly, had intense emotional reactions, and displayed frequent negative mood were classified as difficult infants. Rothbart and Derryberry (1981) measured the construct of reactivity by looking at fear and anger. The current study had the limitation of having to use archival data available from a larger longitudinal study called National Institute of Child Health and Human Development

Study of Early Child Care (NICHD-SECC). The larger NICHD-SECC study used mothers' report on a revised version of Early Infancy Temperament Questionnaire to measure temperament. The current study used only the infant negative emotional reactivity dimension to measure infant difficult temperament. The construct of infant negative emotional reactivity for the current study was calculated by combining the dimensions of infant mood, intensity, and adaptability. Adaptability is defined as the ease or difficulty with which the child adjusts to unfamiliar circumstances. Mood is defined as the child's quality of mood, for example if the child is normally happy or unhappy. Intensity is the child's level of response to stimuli whether they are high or low in intensity (Medoff-Cooper, Carey, McDevitt, 1993). Therefore, by combining these three dimensions of temperament the current study created a score for infant negative emotional reactivity (higher score reflecting negative mood, low adaptability, and high intensity).

The NICHD-SECC study used mothers' report to measure infant temperament. Different instruments used to measure infant temperament will be reviewed in the following section. One of the widely used methods to measure children's temperamental characteristics is through mothers' report. Parents are often used as informants of their children's temperament style. Some of the widely used questionnaires mentioned in the review by Crockenberg (1986) are the Infant Temperament Questionnaire (ITQ) developed by Carey (1970); Revised Infant Temperament Questionnaire (RITQ) developed by Carey and McDevitt (1978); Toddler Temperament Scale (TTS) developed by Fullard, McDevitt, and Carey (1984); Infant Behavior Questionnaire developed by Rothbart (1981), and Infant Characteristic

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Questionnaire (ICQ) developed by Bates, Freeland, and Lounsbury (1979). The scale

that does not use mother's report is the Neonatal Behavior Assessment Scale (NBAS)

developed by Brazelton (1973, as cited in Crockenberg). The concern with using

parent's report of infant's temperament is that the report could be biased due to

mother's own personality or expectation of her infant. But even if observation of

infant's behavior is used to study infant temperament it will still not reflect an unbiased

measure of infant temperament because infants are still responding to the stimuli they

receive from their environment (Crockenberg).

Therefore, this study will test for any link between infant negative emotionality

and maternal sensitivity. Hypothesis 1 (HYP. 1), in the current study examined the

relation between infant negative emotional reactivity *(INER)* and maternal sensitivity

(MS) (HYP. 1, see Figure 2 in Appendix B). However, it should be noted that this study

will not determine the direction of this effect but is trying to expand the understanding

of the association between *maternal sensitivity* and *infant negative emotional reactivity*

and examine how this link is affected by a moderating variable.

Studies have shown that fathers and mothers respond differently to their infant's

needs. Fathers respond to differences in child characteristics such as gender, age, and

temperament differently when compared to mothers. The NICHD (ECCRN, 2000)

study found that fathers are more involved when they have a boy child. Fathers may be

sensitive to other characteristics of infants like infant temperament. One study found

that fathers engage less with infants who become more negative whereas mothers

engage more with infants who become more negative (Belsky, Fish, & Isabella, 1991).

Mothers and fathers may respond differently to a difficult infant which in turn can affect

their relationship with their infant. However, the type of paternal behavior and how that affects the particular type of infant behavior may be more important to understand than the general gender differences. The exploratory research question that this study tried to answer is how are father involvement and infant negative emotional reactivity related to each other? Research Question 1 (RQ. 1) examined if there was any relation between infant negative emotional reactivity and father involvement *(FI)*? (RQ. 1, see Figure 3 in Appendix B).

Maternal Sensitivity

Maternal sensitivity is measured by looking at mothers' attitude towards the child, quality of interaction between the mother and the infant, and if the mother is able to soothe her infant through positive and encouraging interactions (see a recent review by Dewolff & van Ijzendoorn, 1997). This current study conceptualized *maternal sensitivity* as the mother's ability to react in a responsive, non-intrusive, and positive way to her infant's cues. As children play an active role in influencing maternal behavior through their personal characteristics, maternal sensitivity was assessed by observing maternal behavior during a 15-minute mother-infant play session (NICHD ECCRN, 1999a, 1999b).

Association between infant temperament and maternal sensitivity. Studies have show that there is a positive as well as a negative relation between infant difficulty and maternal behavior. Crockenberg proposed three possible models to explain these contradictory findings about the relation between infant negative emotionality and pattern of parenting, specifically maternal sensitivity (1986). Crockenberg proposed that either difficult temperament directly influences maternal sensitivity or it doesn't. The

third model that she proposed was that the influence of difficult temperament on maternal sensitivity was significant under specific conditions, especially factors present in the mother's and infant's immediate family context.

Case for Moderation

There are contradicting findings linking infant difficulty and maternal behavior, especially maternal sensitivity. Crockenberg (1986) reviewed some of the studies that have looked at the association between infant difficult temperament and maternal sensitivity using different measures. Crockenberg starts her review by examining all the studies that showed a negative correlation between infant difficulty and maternal sensitivity. According to Crockenberg, a study conducted by Kelly in 1976 using ITQ on four month old difficult infants reported a negative correlation between maternal sensitivity and difficult temperament. Milliones (1978) used a modified version of ITQ to measure difficult temperament in one-year-old infants. He also found a negative correlation between maternal responsiveness and infant difficult temperament. Campbell (1979) also reported that when mothers rated their infants as having difficult temperaments at three months, they interacted with them less and were less responsive to their cries at three and eight months compared to mothers who rated their infants as easy (as cited in Crockenberg). Since that review by Crockenberg, studies like the one done by Mangelsdorf, Gunnar, Kestenbaum, Lang, and Andreas (1990) have found that distressed infants received lower levels of warmth from their mothers. Van den boom and Hoeksma (1994) found that infants and young children with difficult temperament received low level of responsiveness from their mothers.

An equal number of studies have also found the opposite to be true. Crockenberg and Smith (1982) found the opposite to be true when they observed infants identified as irritable using the Newborn Behavior Assessment Scale (NBAS). They found that irritable infants received more stimulation and responses from their parents when compared to easy infants. Sroufe (1985) also found that parents pay more attention to infants who are distressed. Washington, Minde, and Goldberg (1986) found similar results when they observed mothers who had premature infants. Mothers who described their preterm infant as difficult on the RITQ received more positive and responsive parenting from their mothers. In a study conducted on eight month olds, Zahr (1991) reported a positive correlation between difficult temperament and maternal sensitivity. On the other hand, some studies have found no relation between infant difficulty and maternal behavior. For example, a longitudinal study that followed 115 children from 4 months to 15 months did not show any correlation between infant temperament and maternal sensitivity (Hagekull, Bohlin, & Rydell, 1997).

Studies have tried to look at child characteristics other than temperament, like gender, age, and the child's ability to regulate emotions that could moderate this link. There are studies that have tried to explore maternal personal characteristics such as personality, attitude towards temperament, childhood history, and depression to test their role in this relation between temperament and maternal sensitivity. Some studies have explored characteristics in the infant's and mother's immediate social context such as family and friends. One such social context is the immediate family that can have a significant impact on the mother and her infant. In the current study the construct of father involvement will be studied. Father's presence and involvement in care giving

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and its impact on the link between maternal sensitivity and infant temperament will be explored.

Father Involvement

Three components of father involvement as conceptualized by Lamb (2004) are the father's engagement with the child, the amount of time the father is available to the child, and responsibilities that the father takes for the child's caregiving. Pleck and Masciadrelli (2004) reviewed four different methods used to measure father involvement in their children's life. According to them, "time diaries" are the most frequently used method for assessing father involvement (p. 224). In this method fathers are asked to report a time sheet listing all the activities they did during a 24 hours time period. Second is the "time estimate measure" which asks the fathers exactly how much time they spent with their children (p. 226). The third method explained in their review is the "activity frequency measure" (p. 227). This method asks fathers to report how frequently they take part in some specific activities related to their children such as playing with their children, reading with them, etc. The fourth method is the "relative engagement measure." This measures father involvement by asking each father how he shares his responsibilities related to his child with his partner or the child's mother (p. 227). They also inform that the activity frequency and relative engagement methods are used to assess quality of the father's engagement with his child and could be a used for assessing father involvement and how it impacts children.

In the current study the level of father's involvement with his infant is conceptualized as the amount of responsibilities that the father shared with the mother in providing care for his infant. It is measured using fathers self-report, which can raise

questions about the validity of the measure. Internal consistency or reliability among the items that measure this construct is high (.80) but there is no empirical finding supporting the validity of such measures. This is a relative engagement measure (as discussed in the review by Pleck & Masciadrelli, 2004) and is considered as a widely used method with good value for research related to father-child relationship quality (Pleck & Masciadrelli, 2004). In general, studies in the past that have compared fathers' and mothers' report of father involvement (Bonney, Kelley, & Levant, 1999; Coley & Morris, 2002) have found consistency between fathers' report and mothers' report. Even when differences were found, they were very small (Coley & Morris, 2002).

Social support as a moderator. Researchers have looked at constructs of stress and social support and their impact on mother-infant relationships. Social support is one such contextual factor which seems to moderate the link between infant characteristics and maternal behavior. Crockenberg (1981) found that not only does social support in the mother's and infant's immediate social network help mothers be more sensitive but also helps infants by putting them in contact with an alternative adult who is more responsive to their needs. Social support especially from close family and friends can help mothers be more sensitive to her infant's needs (Crnic & Greenberg, 1990). Goldstein, Diener, and Mangelsdorf (1996) looked at mothers' immediate social support network and their ability to respond sensitively to their infants needs. They found a positive correlation between maternal sensitivity and the size of their social network. They also reported that spousal support and the level of satisfaction mothers received from the spousal support during pregnancy positively influenced postpartum moods and, in turn, affected maternal sensitivity. The study also found that mothers with

negative moods showed signs of diminished maternal sensitivity (Goldstein et al., 1996). In another study, mothers received lower support from their network of friends and relatives when they had a premature infant (Feiring, Fox, Jaskir, & Lewis, 1987). After controlling for birth status and infant behavior, support received from relatives, friends, and fathers was seen to have significant influence on maternal sensitivity.

These studies show that close interpersonal relationships in the mothers' immediate family or social network has a positive impact on mother's behavior towards her infant. Referring back to the Belsky's conceptual model (Belsky, 1984, see Figure 1), his model also determined social network and marital relationship as a contextual source of support to the mother. These sources of support were direct as well as indirect determinants of maternal behavior. According to Belsky (1984) support can indirectly affect maternal behavior by providing emotional support during transition to parenthood which can have positive influence on mothers' well-being. It can also have a direct effect on maternal behavior by providing much needed instrumental support by helping with the child care and parenting activities. The current study looked at how father's involvement in providing instrumental support by sharing responsibilities with the mother in caregiving affected maternal sensitivity towards the infant. Hypothesis 2 (HYP 2.) examined the relation between maternal sensitivity and father involvement. It was proposed that maternal sensitivity will increase as father involvement increases (HYP. 2, see Figure 4 in Appendix B).

From the review of literature on factors that affect both infants' and mothers' behavior, it is evident that support available in the immediate social network has a significant impact on the mother-infant relationship. This study therefore looked at one

such contextual factor present in the family context, which could have significant impact on both the infant and the mother. Father involvement can be seen as an important instrumental support for mothers. Therefore, fathers' greater involvement with their negatively reactive infants may serve as a protective factor to buffer against the potentially negative impact of the infants' temperament on mothers' caregiving (see *Figure 5*, the final conceptual model for the study). This study explored the moderating effect of father involvement on the link between infant negative emotional reactivity and maternal sensitivity. Hypothesis 3 (HYP. 3) looked at how father involvement will moderate the relation between infant negative emotional reactivity and maternal sensitivity. It was proposed that, when father involvement is high, mothers will be more sensitive to their difficult infants than when father involvement is low (HYP. 3, see Figure 5 in Appendix B).

Summary

Most of the research on maternal sensitivity has looked at how temperament might mediate the link between maternal behavior and child developmental outcomes. *Father involvement* has also been a subject that has been studied outside the mother-child dyad, by looking at how fathers impact children and their development. Therefore, this study examined how these three variables: infant temperament, maternal sensitivity, and father involvement are associated with each other.

Research Question and Hypotheses

Based upon previous research findings and the parenting model developed by Belsky, the following hypotheses and exploratory research question have been drawn

about how child temperament, maternal sensitivity, and father involvement may affect each other (see Figure 5 in Appendix B).

1. Hypothesis 1: *Infant Negative Emotional Reactivity (INER)* will be significantly negatively related to *Maternal Sensitivity (MS)*. (HYP. 1, see Figure 2 in Appendix B)

2. Research Question 1: Will *Infant Negative Emotional Reactivity* be significantly negatively related to the level of *Father Involvement (FI)*? (RQ. 1, see Figure 3 in Appendix B)

3. Hypothesis 2: Level of *Father Involvement* will be significantly positively related to *Maternal Sensitivity*. (HYP. 2, see Figure 4 in Appendix B)

4. Hypothesis 3: *Father Involvement* will moderate the relation of *Infant Negative Emotional Reactivity* and *Maternal Sensitivity*. Therefore when *Father Involvement* is high, mother will be more sensitive to their difficult infants than when *Father Involvement* is low. (HYP. 3, see Figure 5 in Appendix B)

Note: Hypothesis 3 was tested regardless of the significance of correlation between *FI* and *INER*. Hypotheses 1 and 2 do not have to be significant to test for moderation in Hypothesis 3.

Chapter III

Methodology

Participants

This study used archival data from a longitudinal research study supported by the National Institute of Child Health and Human Development called the NICHD Study of Early Child Care (NICHD-SECC). For testing hypotheses in the current study, infant temperament, maternal sensitivity, and father involvement data were used which were taken from the Phase I (birth to 36 months) part of the larger NICHD-SECC. There were 423 two-parent families who provided demographic, child outcome, mother, and father data for this study.

The participants in the NICHD-SECC study were recruited from 10 sites located in or near Little Rock, AR; Orange County, CA; Lawrence, KS; Boston, MA; Philadelphia, PA; Pittsburgh, PA; Charlottesville, VA; Seattle, WA; Morganton, NC; and Madison, WI (NICHD ECCR, 1997, 1999a, 1999b, 2000, 2006). During the selected 24-hr sampling periods in 1991, 8986 women who were scheduled to give birth during that period were selected. Participants were selected using a conditional random sampling plan. To be eligible for the study, the participants had to meet a set of criteria. The study required infants to be healthy after birth. The study included only English speaking mothers who were 18 or above, and had no past record of drug abuse. The

study also required that the mothers be willing to be contacted at home after their return

from hospital (NICHD ECCRN-1997, 1999a, 1999b, 2006).

Six sites (Arkansas, California, Kansas, Pittsburgh, North Carolina, and

Wisconsin) also were required to collect father data. To collect this data, the study

required the father to be residing with the mother and the infant. In early stages of father

data collection, the study enrolled 585 participants (NICHD ECCRN, 2000). For the

purpose of the current study, the researcher needed father data so only this sub-sample

from the father study was used. After accounting for all the missing data and sorting

data to match data available on the other measures used in the current study, the final

sample for this study consisted of 423 two-parent families.

Procedure

From the time of enrollment these 423 families provided demographic

information on a periodic basis. The demographic information for the participating

families was obtained through telephone interviews, home visits, and by filling several

questionnaires during each data collection phase starting from the time the families

were recruited in the hospitals when their children were born (NICHD ECCRN, 1997,

1999a, 1999b, 2000, 2006).

Child variables that mothers reported at 6 months used in the current study are

child's gender, ethnicity, birth order, and child temperament. At 6 months home visit,

mothers were asked to respond to the Early Infancy Temperament Questionnaire

(EITQ) developed by Medoff-Cooper, et al. (1993, as cited in NICHD ECCRN, 1999a,

1999b). Mothers' report was used to assess infant temperament at 6 months of age.

Mother-child interaction during a semi-structured play session was videotaped when the

children were 6, 15, 24 and 36 months. For the purpose of the current study only data from the 6 months home visit were used. Trained research assistants were used to collect data across all sites. The videotapes were then sent to a different location where trained coders scored both mother and infant behavior during play sessions. A composite score was calculated for maternal sensitivity using data available on mother's play interaction with their infants. This composite score of maternal sensitivity will be used in the current study

During 6 month home visits, fathers completed questionnaires describing their responsibilities for caregiving activities. This questionnaire was called the "My Time Spent as a Parent: Part I" designed by Glysch and Vandell (1992 as cited in NICHD-ECCRN, 2000) for the NICHD- SECC study. It was a self-report of father's assessment of his child care responsibilities for his infant.

Measures

Infant Temperament. At 6 months home visit mothers completed a revised version of the Early Infancy Infant Temperament Questionnaire (ITQ) (NICHD ECCRN, 1999a, b). The NICHD-SECC called this instrument the "MY BABY" questionnaire (see Appendix C). The questionnaire consisted of 39 items and each item was scored on a scale from one to six with "almost never" being scored 1 and "almost always" being scored 6. A composite measure for difficult temperament was formed from items that were used to create Approach, Activity, Intensity, Mood, and Adaptability subscales. A mean of the non-missing items with appropriate reflection of items was calculated so that a larger score reflected more difficult temperament.

For the purpose of this study only 3 of the 5 categories of temperament were combined to create *infant negative emotional reactivity*. By combining non-missing items, with proper reflection of items (3, 4, 7, 11, 14, 15, 17, 20, 28, 32, 33, 39, 42, 47, 49, 52, and 53) Intensity, Mood, and Adaptability subscales were used to create an average score ranging from 1 to 6 which reflected *infant negative emotional reactivity* (see Appendix F). Intensity was calculated by the average of items 4*, 8, 14*, 19, 24, 29, 36, 42*, 47*, 52*, * indicated reflected items). For example, item 4 was "My baby takes feedings quietly with mild expression of likes and dislikes." The score on this item was reversed to make higher score reflect higher intensity of infant distress. Similarly, to measure mood, items were reversed so that higher score reflects negative mood. Higher scores on the adaptability sub scale reflected lower adaptability in infants. The internal consistency and the items used to measure each sub-scale are included in Appendix F.

Reliability for the current sample on the three temperamental categories was α = .53 for intensity, α = .55 for mood, and α = .61 for adaptability. The internal consistency for the overall measure of *infant negative emotional reactivity* was α = .43. Even when "if item deleted" function in SPSS 13.0 was used the internal consistency only improved to α = .65 if intensity subscale was deleted (see Appendix G). The focus of the current study being infant difficulty, the researcher did not find it appropriate to drop the intensity subscale while measuring infant negative emotional reactivity. The majority of the studies measuring child temperament use some form of parent report to assess temperament. These measures are standardized and widely used with good inter-rater reliability. This study similarly used parent report to assess infant temperament. The reliability scores on some categories of temperament are low even for the sample

used to standardize the Early Infancy Temperament Questionnaire (EITQ). In their review Medoff-Cooper, et al. (1993) report low reliability scores for the early infancy period. Their internal consistency scores on the intensity subscale were very low for their standardization sample of 1-2 month old infants ($\alpha = .43$) and 3-4 month old infants ($\alpha = .43$). They report that the reliability on some of the subscales improve as the child's age increases and are more reliable and stable for children above one-year old. NICHD-SECC used a modified version of the EITQ for measuring infant temperament. The NICHD- SECC study also has reported problems with the internal consistency of subscales used in measuring infant temperament at 6 months due to a large number of "Does Not Apply" responses on various items. They also suggest using the "total battery composite" (in their data documentation file CCDR-33, p.7) from mothers' reports of temperament at 6 months instead of using the subscales separately for statistical reasons.

Maternal Sensitivity. During semi-structured play sessions mother-child interactions were videotaped during six month home visits. This session was observed for 15 minutes (NICHD ECCRN, 1999a, b). Each session was divided into two parts. During the first half, mothers were asked to play with their infants as usual. In the second part, mothers' interactions were observed in a structured setting. Mothers were asked to use at least one toy provided by the researchers while playing with the infants.

Mother–child interaction at 6 months was rated on 4-point global rating scales developed for the original NICHD-SECC study. At 6 months the following maternal behaviors were rated: sensitivity to non-distress, sensitivity to distress, intrusiveness, detachment, stimulation of cognitive development, positive regard for the child, negative

regard for the child, and flatness of affect (see Appendix D). All items were rated on a 4-point rating scale developed by Owen and Vandell from "not at all characteristic" to "highly characteristic" (NICHD ECCRN, 1999a, b). Tapes were assigned randomly to coders and inter-coder reliability was assessed on a periodic basis (NICHD, 1999a, 1999b). The *maternal sensitivity* composite score was obtained from the sum of sensitivity to non-distress, non-intrusiveness (reversed score on intrusiveness item), and positive regard for child. Composite scores ranged from 4-12 at 6 months and Cronbach's alpha for the *maternal sensitivity* composites was .73 for the current sample. This composite score - obtained by adding the scores on mothers' sensitivity to distress, non-intrusiveness, and positive regard - will be used to measure *maternal sensitivity* in the current study. A high score will indicate high levels of *maternal sensitivity* towards their infants.

Father Involvement. Fathers' self-report was used to measure their involvement in daily caregiving activities for their infants at 6 months home visit. This measure assessed how fathers and mothers divided their responsibilities pertaining to their infants (NICHD ECCRN, 2000). The fathers in the study were asked to report how they spent their time, and how involved they were in their infant's caregiving activities.

The 16 items that measured total *father involvement* in their infant's life included items like "bathing the child, feeding the child, diapering the child, dressing the child, putting the child to bed, attending to the child at night, playing with the child," etc. (see Appendix E). A total score was calculated by averaging the 5-point ratings (1 = partner's job, 3 = we share equally, 5 = my job). For the purpose of this study total *father involvement* in infants' life was computed as an average of items 1, 2, 3, 4, 5, 6, 7, 8, 9,

11, 13, 15, 16, 17, and 20. A higher score indicates more *father involvement* in their infants' life, relative to their perception of mother's involvement. In this study, a higher score on father involvement measures means fathers are more involved than mothers in infant's caregiving activities. Medium score (e.g. 2.5) would indicate equal sharing of responsibilities between the father and the mother while caring for their infant. A low score indicates that the caregiving responsibilities were more the mothers' job than the fathers'. Cronbach's alphas in the father sub sample for this questionnaire (*n* = 423) was α = .80.

Methods of Analysis

The data analysis utilized all the 423 valid families in the sample. SPSS computer analysis program was used to analyze the archival NICHD-SECC data to test the hypotheses and the researcher question. The researcher ran Pearson's one-tailed and two-tailed correlations among the scores on *infant negative emotional reactivity*, *maternal sensitivity*, and *father involvement.* Significance level was based on a one-tailed test where *p* < .05 represents a significant statistical correlation. The moderation HYP. 3 were analyzed using two methods, by looking at *father involvement* as a continuous and as a categorical variable.

Method 1 - Traditional Regression Approach. To test the moderation hypothesis using *father involvement* as a continuous variable, hierarchical multiple regression was used. The regression equation was computed to assess the relations between *infant negative emotional reactivity (INER)*, *father involvement (FI)*, and *maternal sensitivity (MS)*. The two independent variables *infant negative emotional reactivity* and *father involvement* were centered by subtracting each score for the two variables in the sample

from their mean (Aiken & West, 1999). For example, the mean for *infant negative*

emotional reactivity variable was 2.86 and if the first score on the sample was 3, then

the centered value for that score is (2.86 - 3 = -.14). The centered variables are

represented as *INERx* (*centered infant negative emotional reactivity*) and *FIx* for *father*

involvement scores in the regression table. A multiplicative interaction term was then

computed for the centered values for the two variables *infant negative emotional*

reactivity times' *father involvement (INERx * FIx)*. Variables were then entered into

the regression model in the following order: centered values on *infant negative*

emotional reactivity (INERx), centered values on *father involvement (FIx)*, followed by

the interaction term *(INERx * FIx). Infant negative emotional reactivity* and *father*

involvement variables were entered as main effects and the interaction term was entered

in the last step in predicting *maternal sensitivity* (see Appendix G).

   Method 2 - Categorical Approach. To test the moderation hypothesis using

father involvement and *infant negative emotional reactivity* as a categorical variable,

one-way ANOVA was used (see Appendix G). The unusual nature of the father

involvement variable, as measured in this study suggests that there may be different

"types" of father involvement. In other words, high involvement is not necessarily

"more" father involvement; as measured here but it suggests a shift in responsibility

between the parents as perceived by the fathers. Therefore, the current study explored

the possibility that conceptually, out measure of father involvement may not be best

captured as a continuous variable, but rather as a variable that represents 2 or 3 types of

father involvement. For these reasons, both *infant negative emotional reactivity* and

father involvement scores were split into three categories of approximately equal sizes

at 1/3rd and 2/3rd percentile. The lowest tertile category for *infant negative emotional reactivity (L-INER)* had infants who were low in negative emotional reactivity. The lowest one-third tertile group for fathers consisted of fathers low in involvement *(L-FI)*. The highest tertile or the upper tertile had infants with high negativity (*H-INER*) and fathers high in involvement (*H-FI)*.   The middle groups consisted of the remaining sample for the two categories (*M-INER, M-FI*). Mean and standard deviations for each group were calculated (see Table 6a, 6b). A one-way *ANOVA* was computed for the three levels on the two categorical variables (low, medium and high, see Table 6c). The mean difference in maternal sensitivity for the three levels of *infant negative emotional reactivity* when father involvement is held constant at low, medium, and high values was used to plot graphs to understand the moderating effect of father involvement on the link between *infant negative emotional reactivity* and *maternal sensitivity.*

Chapter IV

Findings

The overall purpose of this study was to examine the moderating effect of *father involvement* on the relation between *infant negative emotional reactivity* and *maternal sensitivity*.

Descriptive Analysis

The final study sample consisted of 423 two-parent families. The sample consisted of 220 boys (52%) and 203 girls (48%). Most children in this study were white 380 (89.83%). Out of the 423 children 171(40.43%) were first-born 178(42.08%) second born, and so on (see Table 1).

Demographic information was also collected on both mothers and fathers (see Table 2a). The majority of mothers were white 387 (91.49%). Mothers' age for this sample ranged from 18-50 with a mean of 28.74. The majority of the mothers (91.5 %) were married and living with their child's father or were partnered (6.7 %) and living with their child's father. Mother's job categories are as shown in Table 2a. Fathers were employed in a variety of jobs as shown in Table 2b. Overall family income ranged from $2500-$245,000 per year, with an average income for the sample being $49,572.46. Only 40(9.51%) of the families were on some type of public assistance (see Table 2a). Descriptive statistics were calculated for all measures used in the study and are reported in Table 3.

Quantitative Analysis

  Hypothesis 1. A one-tailed Pearson's correlation test was computed on *infant negative emotional reactivity* and the level of *maternal sensitivity*. Data suggested that as infant emotional reactivity increased in negativity the level of *maternal sensitivity* decreased from high to low. In other words, analysis showed a statistically significant negative association ($r = -.11$, $p = .01$) between *infant negative emotional reactivity* and *maternal sensitivity* (see Table 4).

  Research Question 1. For exploring the research question a similar two-tailed Pearson's correlation analysis was run between *infant negative emotional reactivity* and level of *father involvement*. The results showed that there is no significant ($r = -.01$, n. s.) relation between the two variables (see Table 4).

  Hypothesis 2. After performing a one-tailed correlation test on scores of *father involvement* and *maternal sensitivity*, correlation results showed a negative association between the two variables. Data suggested that when level of *father involvement* increased the level of *maternal sensitivity* decreased. In other words, analysis showed a marginally significant negative correlation at .10 significance ($r = -.07$, $p = .08$) between *father involvement* and *maternal sensitivity* (see Table 4).

  Hypothesis 3. Method 1. For testing the final hypothesis a multiple hierarchical regression model was used. When centered values for the *father involvement (FIx)* variable were entered into the regression model, it did not show any significant relation to *maternal sensitivity*. The overall model was significant $F (3, 422) = 2.53$, $p = .05$, but this significance was largely due to the *infant negative emotional reactivity* variable.

Therefore, moderation hypothesis was not significant for *father involvement* as a continuous variable (see Table 5).

   Hypothesis 3. Method 2. Following this the independent variables *infant negative emotional reactivity* and *father involvement* were split into three categories of approximately equal sizes using tertile values ($1/3^{rd}$ and $2/3^{rd}$ Percentile). Means and Standard Deviation for each group on both the variables are included in Table 6a and Table 6b. When univariate analyses of variance (*ANOVA*) between these groups were run the overall model was significant $F (8, 422) = 2.28$, $p = .02$ (see Table 6c). There was a marginal significant effect for infant negative emotional reactivity $F (2, 422) = 2.69$, $p = .07$ (see table 6c). The three categories of *father involvement* did not have any significant relation to *maternal sensitivity* but the interaction between the groups of *infant negative emotional reactivity* and *father involvement* showed significance $F (4, 422) = 2.62$, $p = .04$ (see Table 6c). Having found a significant interaction effect, graphs were plotted to study the moderating effect that father involvement had on the link between *infant negative emotional reactivity* and *maternal sensitivity*. The mean differences of *maternal sensitivity* for the three levels of *infant negative emotional reactivity* (L-INER, M-INER, H-INER) were used to plot graphs while holding *father involvement* constant at L-FI, M-FI, and H-FI (see Figures 6, 7, 8). When *father involvement* is low, *maternal sensitivity* decreases as *infant negative emotional reactivity* increases (see Figure 6). This is similar to the correlation result on HYP. 1, there is a negative association between *infant negative emotional reactivity* and *maternal sensitivity* (see Table 4). When *father involvement* is high, *maternal sensitivity* is again seen to decrease with increase in *infant negative emotional reactivity*. There is no moderation effect when *father involvement* is

low and high. But interestingly, when *father involvement* is medium (around mean value

of 2.52, see Table 6b), *maternal sensitivity* increases between low and high levels of

infant negative emotional reactivity (i.e., from 9.163 to 9.622, see Figure 8 and Table 6d).

Therefore, when father involvement is medium, which implies that mothers and fathers in

that group share their responsibilities equally maternal sensitivity increases as infant

negative emotional reactivity increases. This finding suggests that fathers who share their

responsibilities equally with the mothers have a positive impact on the link between

maternal sensitivity and infant negative emotional reactivity, thereby illustrating a

moderating or buffering effect.

Chapter V

Discussion

The focus of this study was to examine the relation between infant difficult temperament, mother's interactive behavior, and *father involvement*. Four-hundred-twenty-three two-parent families provided data for the current when their infants were 6 months. This study used data from a larger NICHD-SECC research study. Infant difficult temperament measured as *infant negative emotional reactivity* was reported by mothers using a revised version of the Early Infancy Temperament Questionnaire (EITQ). *Maternal sensitivity* was measured using observation coding of mother's behavior during mother-child play session. Level of *father involvement* in the child's life was measured using a self-report questionnaire assessing father's role in daily childcare activities.

Summary of Results

The results showed a significant negative association between *infant negative emotional reactivity* and *maternal sensitivity*. The link between level of *father involvement* and *maternal sensitivity* was marginally negatively associated which was in the opposite direction to the proposed hypothesis. The positive moderating effect that was hypothesized was only significant for the medium tertile group of fathers. When father involvement was medium, there was an increase in maternal sensitivity with a difficult infant (see Figure 8).

Reflection from Past Research

The findings in the current study add evidence to the existing literature supporting the relation between *infant negative emotionality* and *maternal sensitivity*. Various studies reviewed in Chapter II have shown a negative association between infant difficulty or distress and maternal behavior (Crockenberg et al., 1983; Crockenberg, 1986; Mangelsdorf et al., 1990). Even though this is not the case always, studies have also shown that there is a need to consider contextual factors of stress and support while studying maternal behavior. There are factors outside the family system that can impact maternal behavior towards her infant. One such setting is the childcare setting, which is becoming the most common type of alternative care for children, starting from a very young age as more and more mothers enter work force (Shonkoff & Phillips, 2000). An earlier NICHD (ECCRN, 1999b) study found a significant association between the amounts of time children spends in childcare and *maternal sensitivity*. When children spent more time in childcare mothers were less sensitive. The current study used a part of that larger NICHD data set and mothers in the current study were also mostly employed (87%). Even though the current study did not measure any childcare variables, it is highly possible that the mothers in this sample may have required some kind of alternative care for their infants, when they returned to work. If these infants were enrolled in low quality care and spend more time there that might have affected their relationship with their mothers. Mothers might not have got the opportunity and time to understand their infant's temperamental trait and their needs because of their challenging responsibilities at job and home. Crockenberg and Leerkes (2003) reported two types of risk that can make mothers less engaged with their infants. One risk for low risk samples was when mothers

had challenging responsibilities and low support; they were more likely to be less sensitive. In the current study with mothers who were mostly employed, their challenge to get back to work and cope with a distressed infant might be the reason that they were not able to respond sensitively to their infants' cues. There are studies that have found that mothers with shorter maternal leave were less sensitive when they had a distressed infant than mothers who had longer maternal leave (Clark, Hyde, Essex, Klein, 1997).

NICHD (ECCRN ,2000) study examined various factors that impact fathers' caregiving and sensitivity with young children and found that there is not one predictor for father's participation in caregiving activities. Among child characteristics that affected father's participation in caregiving, temperament did not affect caregiving or involvement (2000). This is similar to the finding in the current study; the data analysis did not show any significant impact of *father involvement* on temperament or vice versa. There are studies that have shown that fathers are less involved when they have a difficult infant (Belsky et al., 1991). This may not be just because of infant temperament. The current study did not control for gender of the child, or any other maternal characteristics like maternal employment status. The NICHD (ECCRN, 2000) study reported fathers being more involved when they had a boy baby and when their wives or partner worked more hours.

The current study also looked at how instrumental support from fathers changed the relation between infant negative emotional reactivity and maternal sensitivity. The findings support the need to include fathers while studying mother-infant interactions. When Pearson's correlation was run between *maternal sensitivity* and *father involvement*, a marginally significant negative association was found. *Maternal sensitivity* did not

increase when *father involvement* increased. This may be due to the fact that mothers did not perceive fathers as being involved and were not satisfied with their participation because the father involvement measure used was father's self report of their involvement and not as reported by the mothers. This could also have been due to how father involvement was reported using this particular questionnaire. According to the questionnaire used in the current study, a higher score on the questionnaire indicates more father involvement in their infants' life, relative to their perception of mother's involvement. In other words, a higher score on father involvement measure means fathers are more involved than mothers with their infant's caregiving activities. Mothers might have perceived this as fathers taking over their responsibilities and not allowing mothers more time with her infant. There is a possibility that this over involvement on the fathers' side could have had a negative effect on how mothers perceive their role in parenting and that could have indirectly affected maternal sensitivity (mother's parenting skills). An earlier NICHD (ECCRN, 1997) study has shown that even when mothers are not sensitive to their infants during play session; if mothers and infants spent more time together they had a better chance of being able to cerate a secure relationship in the long term. Therefore, mothers may find it difficult to be sensitive when fathers are highly involved in caregiving activities as that reduces their time with their new born infant. Another NICHD (ECCRN , 2000) study also reported that when maternal and paternal employment status and age were considered while looking at father's level of involvement, in families were the mother and father were young and had similar working hours, the responsibilities related to caregiving was evenly distributed. In the current study factors like maternal age, paternal age, and their working hours were not accounted

for during data analysis. However, in the current study, contradicting to the correlation effect on HYP. 2, the finding on the moderation hypothesis (HYP. 3) suggest that in families, were fathers and mothers shared their responsibilities equally, means of maternal sensitivity increased between low and high levels of *infant negative emotional reactivity.* The current study explored the moderating effect that *father involvement* may have on the link between infant negative emotional reactivity and maternal sensitivity. When the mean difference for *maternal sensitivity* were plotted against the low, medium, and high tertile groups of infant negative emotional reactivity by keeping father involvement constant, there was increase in maternal sensitivity as infant negativity increased for the medium level of father involvement (see Figure 8). Only when father involvement was medium, which according to the measure means fathers and mothers equally share responsibilities related to their infant, maternal sensitivity increased (Note: no statistical test were run, just did graph plots using mean difference in MS for low, medium, and high INER, so findings are only suggestive). This may be the case because mothers felt more supported when fathers tried to share their responsibilities instead of taking over their responsibilities totally. This might have increased mothers ability to be more sensitive to her distressed infant. Belsky (1984) talks about both direct and indirect effect that social and marital support can have on maternal behavior and in the current study the findings suggest that father involvement may have an indirect effect on maternal sensitivity. This finding could have been explained better if, other factors that are shown to impact paternal caregiving such as maternal age, maternal and paternal work hours (NICHD, 2000) were considered. There is also research that looks at marital relationships and how that affects parents' perception of their parenting roles. Studies

have shown that parents who are more satisfied and happy in their marital relationships have better co-parenting skills (Bonney et al., 1999; NICHD ECCRN, 2000). This could be one of the factors that can be considered in future research, while looking at father involvement and its affect on maternal behavior.

Limitations of the Study

The results of the current study cannot be generalized to all two-parent families with difficult infants. The current study used data from a larger NICHD study that used conditional sampling in getting their sample (NICHD ECCRN, 1997). They used different criteria mentioned in the methodology of this study to get their sample. The families selected for their study were mostly low-risk families. Sample used was predominantly white (91.5%) and in most cases father lived in the same home or were married to the mothers in the study. Mostly mothers in the study were employed and the family income was high. The results might have differed for a high-risk sample. The summary for the descriptive on each of the measures used in the current study (Table 3) shows that the sample did not have extremely difficult infants in the sample as reported by mothers. This may have been due to the low internal consistency between the items used to measure the construct. Infant temperament was measured on a scale of 1-6 in the current study. A minimum on infant temperament was a score of 2 and maximum was 4, which shows the sample did not have too difficult or too easy infants (see Table 3).

The measures used for this study also need to be properly reviewed before considering the findings. Infant temperament was reported by mothers, which could impact the results due to mothers' perception of her infant. Even though the ITQ questionnaire used was a standardized measure used in many other studies the overall

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internal consistency at 6 months was very low for the current sample ($\alpha = .43$) and even when the "if item deleted" function in SPSS 13.0 was used there was no significant increase in the internal consistency of the measure. Similarly, the *father involvement* measure used was a father's self-report which is not a standardized measure and there is no evidence of its validity. *Maternal sensitivity* was also measured during a brief 15-minute home observation. Mothers who know they are being observed may try to be more sensitive than usual with their infants. Despite the above-mentioned limitations, the study used a large sample *(n = 423)* to test its hypothesis.

Implication and Recommendation for Future Research

As suggested in the NICHD (ECCRN, 2000) study of father participation in caregiving activities, the findings in the current study also have implications for educators and policy makers. The current study surely gives evidence to involve fathers in their infant's life. Father's participation is important to both children and their mothers. Interventions aimed at helping mothers cope with a distressed or difficult infant should try to involve fathers. With more and more mothers entering work force and enrolling infants in childcare there is an increased need for fathers to provide alternative care for their infants. Mothers tend to seek outside care for their young ones, which is not always the best choice due to mediocre service provided by most childcare centers (Shonkoff & Phillips, 2000). By encouraging fathers to participate in their infant's life and caregiving activities, the risk posed by low quality childcare can be diminished. Parent educators need to provide good role models to help new fathers gain more confidence in handling childcare responsibilities and learn how to share their responsibilities with the mothers. There is a need for involving fathers starting from the time of pregnancy, which can make

mothers feel more secured and supported while entering parenthood. This can change

mother's perception of *father involvement* with their infant and also give mothers

confidence in allowing fathers to handle more childcare activities. Mothers may feel

more supported by fathers who give mothers equal importance in their families' daily

activities and treat them as equal partners in parenting roles. Parents who have a balanced

relationship can also help each other in creating good relationships with their children.

According to Belsky's determinants of parenting model, mothers' personal

characteristics like childhood history and parenting beliefs, attitude also needs to be

considered while studying parenting process (Belsky, 1984). Mothers who faced rejection

in their childhood are seen to be less sensitive towards their infants when their infants are

difficult (Crockenberg et al., 2003). Mothers who are suffering from postpartum

depression are not able to provide appropriate responses to their infant's cues. So, for

future research, mothers' personal characteristics need to be considered along with infant

characteristics and other contextual factors. Earlier NICHD (ECCRN, 1997) study found

infants who were insecurely attached received less sensitive care both at home and at

childcare. This study also found that during home observations, children whose mothers

were less sensitive towards them were more likely to be securely attached if they spend

more time with their mother and less time at a low quality child care setting. This study

could be a reference for the findings in the current study. Mothers in the current study

were mostly employed and might be using full time day care service. If mothers could

spend more time with their infants they may be able to provide more sensitive care and

also form secure attachment relationship with their infants. Future research should look at

different aspects of childcare that may moderate the link between infant difficulty and

maternal sensitivity. Research implications related to the finding of this study are that there is a need for research using standardized measures and multiple informants in assessing various family level variables like *father involvement* and infant temperament. Empirical studies are needed to test the validity and reliability of fathers self-report of paternal involvement. There is a need to look at how parents who have balanced roles in caregiving responsibilities respond to a highly distressed infant. There is also a need to look at factors outside the family context while studying maternal behavior towards infants as more and more infants are entering childcare at a very young age. Factors like quality of childcare, time spent in childcare setting, and maternal leave pattern following delivery are required. There is need to explore other sources of support for both mothers and fathers with a new infant. This can provide additional evidence on the type and source of support that is most helpful in enhancing optimal parenting strategies.

Conclusion

This study has added new evidence to existing research on father's participation in child care responsibilities. This study suggests that when fathers and mothers share their responsibilities equally mothers' interactions with her infant improve. Therefore, this study suggests considering parents child rearing attitudes while studying the impact of child characteristics on maternal or paternal parenting style. This study also provides recommendation for looking at child care and its impact on maternal and paternal behavior when they have an emotionally reactive infant. This study recommends researchers to consider prenatal characteristic of both mothers and fathers such as parenting attitude, childhood history, and depressive symptoms while studying *maternal sensitivity* and *father involvement*.

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Appendices

Appendix A

Tables

Table 1

Summary of Child Demographic Variables (*n* = 423)

Variable	Frequency	%
Gender		
Male	220	52.01%
Female	203	47.99%
Ethnicity		
American Indian	4	0.95%
Asian Islander	2	0.47%
African American	26	6.15%
White	380	89.83%
Others	11	2.60%
Birth Order		
1st Born	171	40.43%
2nd Born	178	42.08%
3rd Born	53	12.53%
4th Born	19	4.49%
5th Born	1	0.24%
6th Born	1	0.24%

Table 2a

Summary of Mother Demographic Variables

Variable	Frequency	%
Mother's Age years (*n* = 423)		
18-20	37	8.75%
21-30	225	53.19%
31-40	155	36.64%
41-50	6	1.42%
Mother's Ethnicity (*n* = 423)		
American Indian	1	0.24%
Asian Islander	2	0.47%
African American	25	5.91%
White	387	91.49%
Others	8	1.89%
Mother's Marital Status (*n* = 423)		
Married living together	387	91.49%
Partnered living together	32	7.57%
Never married/romantically involved not living together	4	0.95%
Mother's Occupation (*n* = 394)		
Executive	37	9.39%
Professional	108	27.41%
Technician	14	3.55%

Sales	30	7.61%
Administrative or clerical	106	26.90%
Private household	5	1.27%
Protective Services	10	2.54%
Service	36	9.14%
Farm operation	2	0.51%
Mechanic, construction	2	0.51%
Machine operator or inspector	18	4.57%
Transportation, material moving	20	5.08%
Helper, laborer	6	1.52%
Family Income (per year) ($n = 421$)		
Less than $ 49,999	265	62.95%
$50,000-$89,999	113	26.84%
$90,000-$149,999	31	7.36%
More than $ 150,000	12	2.85%
Living on Public Assistance ($n = 421$)		
No	381	90.50%
Yes	40	9.50%

Table 2b

Summary of Father Demographic Variables

Variable	Frequency	%
Father's Ethnicity (*n* = 423)		
American Indian	2	0.5%
Asian Islander	4	0.9%
African American	29	6.9%
White	381	90.1%
Others	7	1.7%
Father's Occupation (*n* = 394)		
Executive	78	18.4%
Professional	70	16.5%
Technician	27	6.4%
Sales	44	10.4%
Administrative or clerical	21	5.0%
Protective Services	12	2.8%
Service	24	5.7%
Farm operation	6	1.4%
Mechanic, construction	46	10.9%
Machine operator or inspector	35	8.3%
Transportation, material moving	16	3.8%
Helper, laborer	17	4.0%

Table 3

Summary of descriptive statistics of measures (*n* = 423)

Measures	Min	Max	Mean	SD
INER	1.59	4.13	2.86	0.42
MS	3.00	12.00	9.30	1.72
FI	1.14	3.53	2.49	0.36

Note. INER = infant negative emotional reactivity; MS = maternal sensitivity; FI = father involvement; SD = Standard Deviation.

Table 4

Summary of One-tailed Pearson's Correlation (*n* = 423)

Measures	FI	MS
INER	-.008	- .11**
FI	--	-.07*

Note. INER = infant negative emotional reactivity; MS = maternal sensitivity; FI = father involvement.

**$p < .05$ level, * $p < .10$ level.

Table 5

Summary of Hierarchical Regression for Variables Predicting Maternal Sensitivity (n = 423)

Variable	B	SE B	Beta
Step 1			
FIx	-.33	.23	-.07
INERx	-.47	.20	-.11*
Step 2			
FIx	-.33	.23	-.07
INERx	-.48	.20	-.16*
INERx * FIx	-.17	.55	-.02

Note. INERx = infant negative emotional reactivity (centered); FIx = father involvement (centered); SE B = Standard Error B; *p < .05.

Table 6a

Mean and Standard deviation for Father Involvement Categories (Low, Medium, High)

FI	Mean	SD
Low	2.08	0.47
Med	2.52	0.04
High	2.86	0.19

Note. FI = father involvement; SD = Standard Deviation

Table 6b

Mean and Standard Deviation for Infant Negative Emotional Reactivity Categories (Low, Medium, High)

INER	Mean	SD
Low	2.408462	0.077782
Med	2.872044	0.155563
High	3.295385	0.106066

Note. INER = infant negative emotional reactivity; SD = Standard Deviation

Table 6c

ANOVA using Tertile categories (Low, Medium, High) Infant negative emotional reactivity and Father Involvement: Dependent variable maternal sensitivity

Source	Type III	df	Mean Square	F	Sig.
			Between Subjects		
Corrected Model	52.93(a)	8	6.62	2.28	.03
Intercept	36531.15	1	36531.15	12608.08	.00
INER (L-INER, M-INER, H-INER)	15.52	2	7.76	2.68	.07
FI (L-FI, M-FI, H-FI)	6.64	2	3.32	1.15	.32
Group interactions	30.35	4	7.59	2.62	.04
Error	1199.54	414	2.89		
Total	37821.00	423			
Corrected Total	1252.47	422			

Note. Type III = Sum of Squares; (a) = r Squared = .042 (Adjusted r Squared = .024)

Table 6d

Maternal Sensitivity Means for the three levels of Infant Negative Emotional Reactivity

and Father Involvement

FI	INER	MEAN
LOW	LOW	9.94
	MED	9.63
	HIGH	8.92
MED	LOW	9.26
	MED	9.16
	HIGH	9.62
HIGH	LOW	9.67
	MED	9.00
	HIGH	8.74

Appendix B

Figures

Figure 1
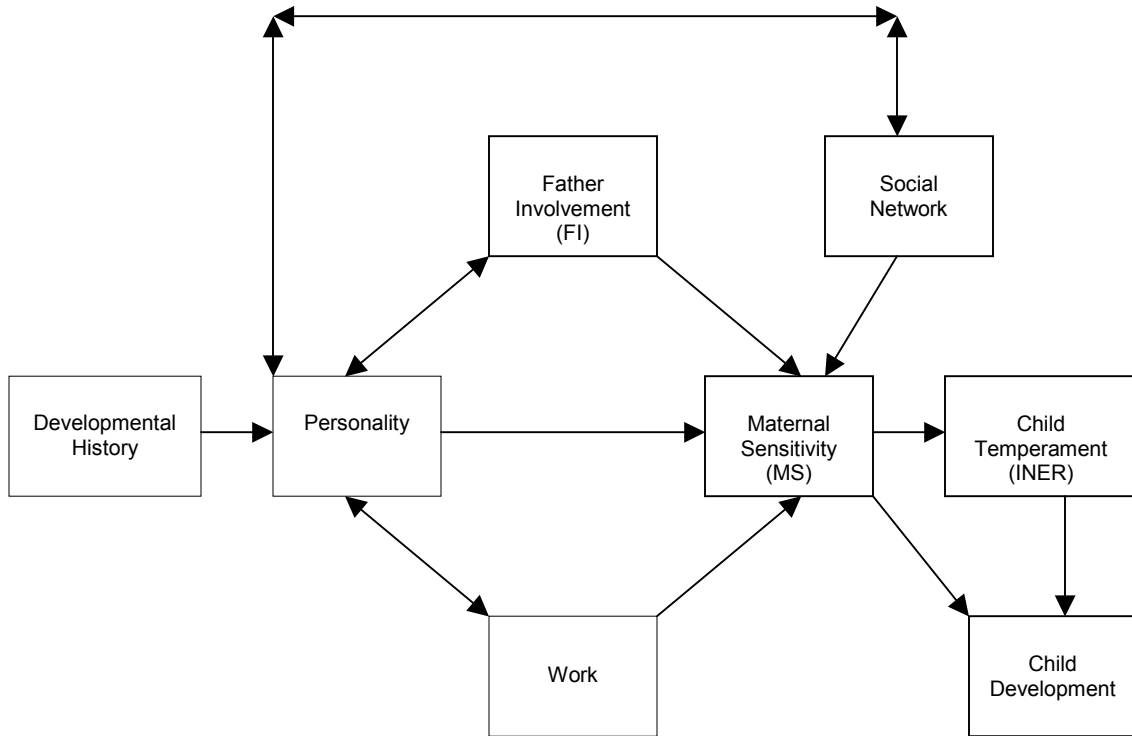
Adapted from Belsky, J. (1984). The determinants of parenting: A process model. *Child Development, 55,* 83- 96.

Figure 2
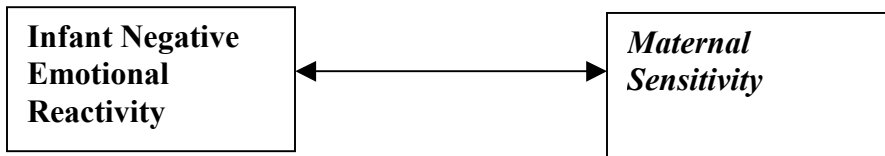
| Infant Negative Emotional Reactivity | ← → | *Maternal Sensitivity* |

Association between infant negative emotional reactivity and maternal sensitivity (HYP. 1)

Figure 3

| Infant Negative Emotional Reactivity | ← → | Father Involvement |
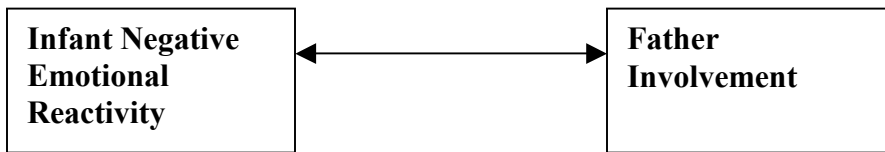
Association between infant negative emotional reactivity and father involvement (RQ. 1)

Figure 4

| Father Involvement | ← → | Maternal Sensitivity |
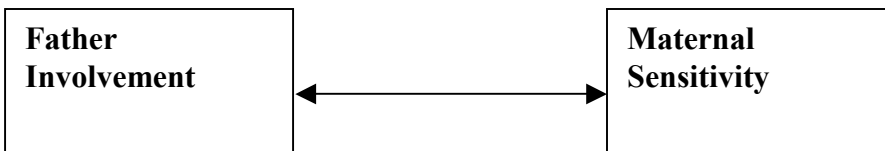
Association between father involvement and maternal sensitivity (HYP. 2)

Figure 5
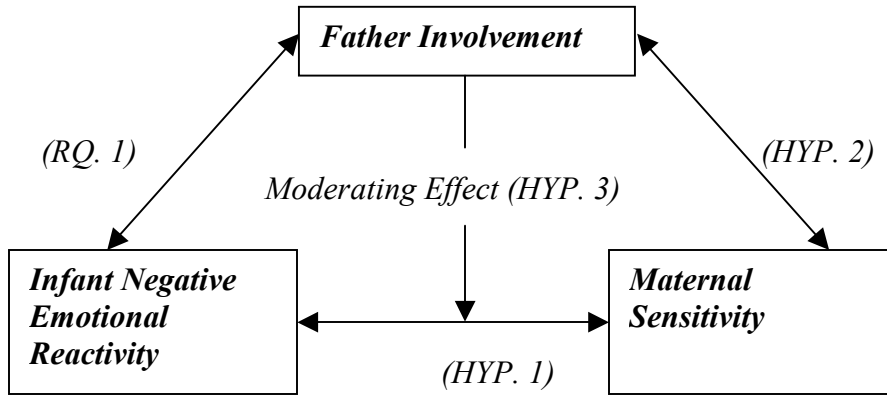
Final Conceptual Model (Adapted from Belsky's Model, 1984) HYP. 3

Figure 6

When Father Involvement is Low
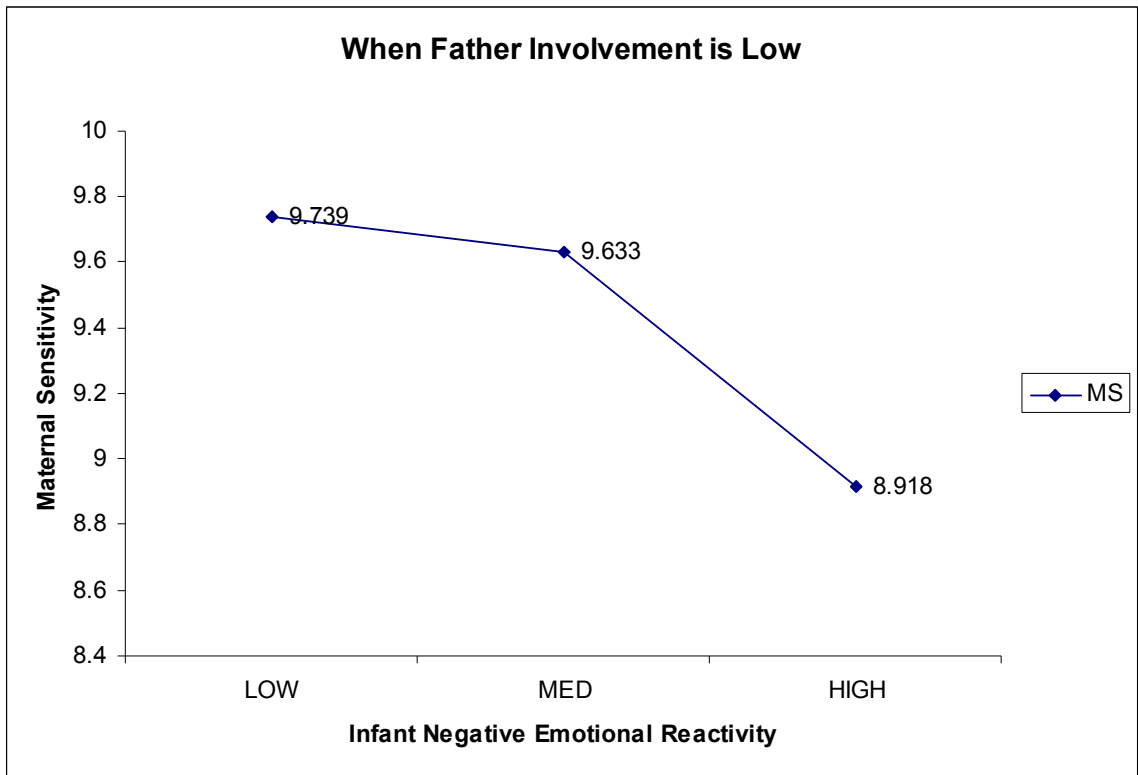
Graph Plot of Mean Difference in Maternal Sensitivity when Father Involvement is Low

Figure 7

When Father Involvement is Medium
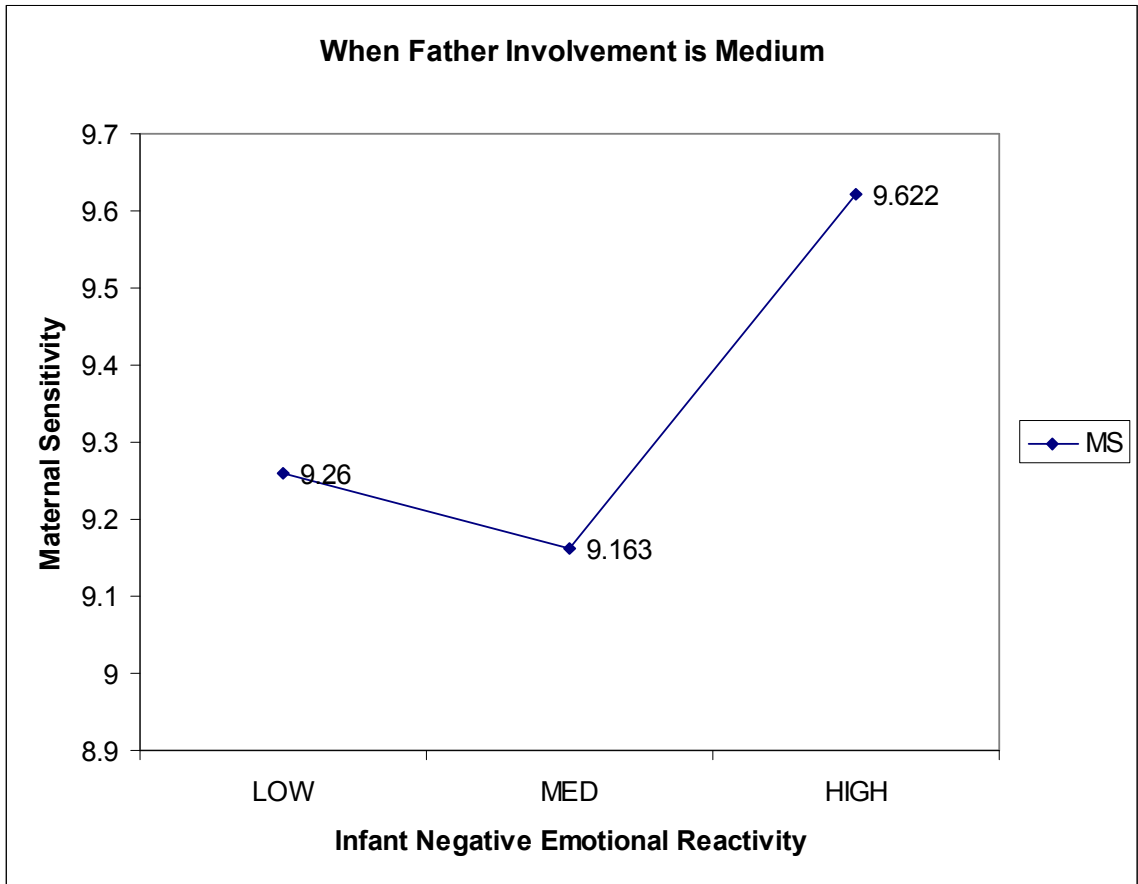
Graph Plot of Mean Difference in Maternal Sensitivity when Father Involvement is Medium

Figure 8
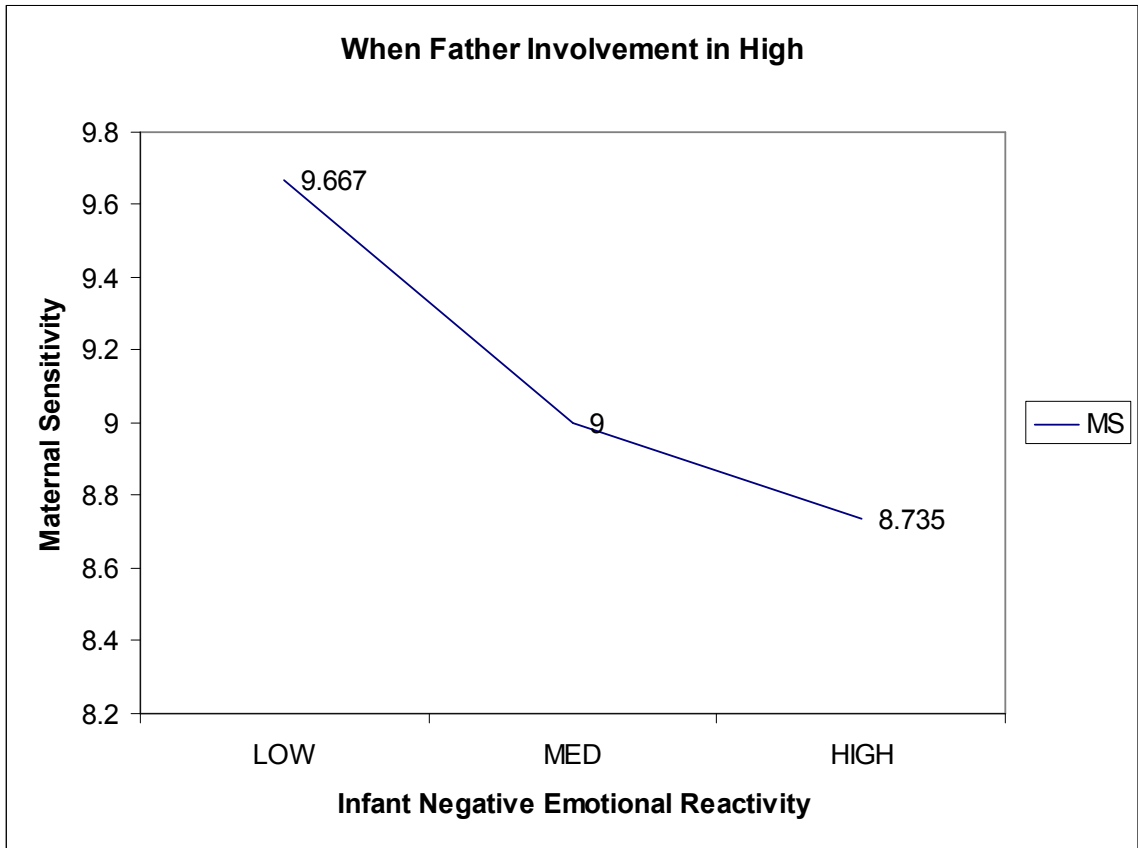
Graph Plot of Mean Difference in Maternal Sensitivity when Father Involvement is High

Appendix C

My Baby Questionnaire

MY BABY

The purpose of these questions is to determine the general pattern of your baby's reactions to the world. For each question, please fill in the response indicating how often you think the statement is true for your baby. Although some of the statements seem to be similar, they are not the same, and we would appreciate your response to each question.

If your baby has changed with respect to any of the questions, fill in the response that best describes the recently established pattern. If a question asks about a situation that your baby has not experienced, you may fill in CA, for "Can't Answer". There are no good, bad, right or wrong answers, only descriptions of what your baby does.

USING THE SCALE SHOWN BELOW, PLEASE FILL IN THE SPACE THAT TELLS HOW OFTEN YOUR BABY'S BEHAVIOR HAS BEEN LIKE THE BEHAVIOR DESCRIBED IN EACH STATEMENT.

IF YOUR BABY HAS NOT EXPERIENCED A SITUATION, FILL IN CA (for Can't Answer).

Almost never	Rarely	Usually does not	Usually does	Frequently	Almost always	Can't Answer
1	2	3	4	5	6	CA

1. My baby accepts right away any change in place or position of feeding or person giving it.   Almost never 1 2 3 4 5 6 Almost always CA

2. My baby sits still while watching TV or other nearby activity.   Almost never 1 2 3 4 5 6 Almost always CA

3. My baby accepts nail cutting without protest.   Almost never 1 2 3 4 5 6 Almost always CA

4. My baby takes feedings quietly with mild expression of likes and dislikes.   Almost never 1 2 3 4 5 6 Almost always CA

5. My baby is fussy (frowns, cries) on waking up or going to sleep.   Almost never 1 2 3 4 5 6 Almost always CA

6. My baby lies quietly in the bath.   Almost never 1 2 3 4 5 6 Almost always CA

7. My baby accepts his/her bath any time of the day without resisting it.   Almost never 1 2 3 4 5 6 Almost always CA

8. My baby vigorously resists additional food or milk when full (spits out, clamps mouth closed, bats at spoon, etc.)   Almost never 1 2 3 4 5 6 Almost always CA

9. My baby moves about much (kicks, grabs, squirms) during diapering and dressing.   Almost never 1 2 3 4 5 6 Almost always CA

| Almost never | Rarely | Usually does not | Usually does | Frequently | Almost always | | Can't Answer |
| 1 | 2 | 3 | 4 | 5 | 6 | | CA |

10. My baby is shy (turns away or clings to mother) on meeting another child for the first time.
Almost never 1 2 3 4 5 6 Almost always CA

11. My baby makes happy sounds (coos, smiles, laughs) when being diapered or dressed.
Almost never 1 2 3 4 5 6 Almost always CA

12. My baby resists changes in feeding schedule (1 hour or more) even after two tries.
Almost never 1 2 3 4 5 6 Almost always CA

13. My baby sits still (little squirming) while traveling in car seat or stroller.
Almost never 1 2 3 4 5 6 Almost always CA

14. My baby reacts mildly Gust blinks or startles briefly) to bright light such as flash bulb or letting sunlight in by pulling up shade.
Almost never 1 2 3 4 5 6 Almost always CA

15. My baby is pleasant (smiles, laughs) when first arriving in unfamiliar places (friend's house, store).
Almost never 1 2 3 4 5 6 Almost always CA

16. My baby accepts new foods right away, swallowing them promptly.
Almost never 1 2 3 4 5 6 Almost always CA

17. My baby accepts regular procedures (hair brushing, face washing, etc.) at any time without protest.
Almost never 1 2 3 4 5 6 Almost always CA

18. My baby moves much (squirms, bounces, kicks) while lying awake in crib.
Almost never 1 2 3 4 5 6 Almost always CA

19. My baby reacts strongly to foods, whether positively (smacks lips, laughs, squeals) or negatively (cries).
Almost never 1 2 3 4 5 6 Almost always CA

20. My baby is pleasant (coos, smiles, etc.) during procedures like hair brushing or face washing.
Almost never 1 2 3 4 5 6 Almost always CA

21. My baby's initial reaction to seeing doctor is acceptance (smiles, coos).
Almost never 1 2 3 4 5 6 Almost always CA

22. My baby plays actively with parents-much movement of arms, legs, body.
Almost never 1 2 3 4 5 6 Almost always CA

23. My baby objects to being bathed in a different place or by a different person even after 2 or 3 tries.
Almost never 1 2 3 4 5 6 Almost always CA

24. My baby greets a new toy with a loud voice and much expression of feeling (whether positive or negative).
Almost never 1 2 3 4 5 6 Almost always CA

1_1_1_1_1_1 '-I

Almost never	Rarely	Usually does not	Usually does	Frequently	Almost always	Can't Answer
1	2	3	4	5	6	CA

25. My baby moves about much during feedings (squirms, kicks, grabs).
Almost never 1 2 3 4 5 6 Almost always CA

26. My baby cries when left to play alone.
Almost never 1 2 3 4 5 6 Almost always CA

27. My baby's initial reaction to a new babysitter is rejection (crying, clinging to mother, etc.).
Almost never 1 2 3 4 5 6 Almost always CA

28. My baby adjusts within 10 min. to new surroundings (home, store, play area)
Almost never 1 2 3 4 5 6 Almost always CA

29. My baby displays much feeling (vigorous laugh or cry) during diapering or dressing.
Almost never 1 2 3 4 5 6 Almost always CA

30. My baby lies still when asleep and wakes up in the same place.
Almost never 1 2 3 4 5 6 Almost always CA

31. My baby's first reaction to any new procedure (first haircut, new medicine, etc.) is objection.
Almost never 1 2 3 4 5 6 Almost always CA

32. My baby is content (smiles, coos) during interruptions of milk or solid feeding.
Almost never 1 2 3 4 5 6 Almost always CA

33. My baby adjusts .easily and sleeps well within 1 or 2 days with changes of time or place.
Almost never 1 2 3 4 5 6 Almost always CA

34. My baby shows much bodily movements (kicks, waves arms) when crying.
Almost never 1 2 3 4 5 6 Almost always CA

35. For the first few minutes in a new place or situation (new store or home) my baby is fretful.
Almost never 1 2 3 4 5 6 Almost always CA

36. My. baby reacts strongly to strangers: laughing or crymg.
Almost never 1 2 3 4 5 6 Almost always CA

37. My baby continues to react to a loud noise (hammering, barking dog, etc.) heard several times in the same day.
Almost never 1 2 3 4 5 6 Almost always CA

38. My baby actively grasps or touches objects within his/her reach (hair, spoon, glasses, etc.).
Almost never 1 2 3 4 5 6 Almost always CA

39. My baby cries for less than one minute when given an injection.
Almost never 1 2 3 4 5 6 Almost always CA

40. My baby is still wary or frightened of strangers after 15 minutes.
Almost never 1 2 3 4 5 6 Almost always CA

41. My baby's initial reaction at home to approach by strangers is acceptance.
Almost never 1 2 3 4 5 6 Almost always CA

	Almost never 1	Rarely 2	Usually does not 3	Usually does 4	Frequently 5	Almost always 6	Can't Answer CA

42. My baby reacts mildly (quiet smiles or no response) to meeting familiar people.
Almost never 1   2   3   4   5   6   Almost always CA

43. My baby lies still and moves little while playing with toyS.
Almost never 1   2   3   4   5   6   Almost always CA

44. My baby is fussy or moody throughout a cold or an intestinal virus.
Almost never 1   2   3   4   5   6   Almost always CA

45. My baby requires introduction of a new food on 3 or more occasions before he/she will accept (swallow) it.
Almost never 1   2   3   4   5   6   Almost always CA

46. My baby lies still during procedures like hair brushing or nail cutting.
Almost never 1   2   3   4   5   6   Almost always CA

47. My baby plays quietly and calmly (little vocalization or other noise) with toys.
Almost never 1   2   3   4   5   6   Almost always CA

48. My baby accepts within a few minutes a change in place of bath or person giving it.
Almost never 1   2   3   4   5   6   Almost always CA

49. My baby remains pleasant or calm with minor injuries (bumps, pinches).
Almost never 1   2   3   4   5   6   Almost always CA

50. My baby moves much (kicking, waving arms and bouncing) and for several minutes or more when playing by self.
Almost never 1   2   3   4   5   6   Almost always CA

51. My baby's initial reaction is withdrawal (turns head, spits out) when consistency, flavor, or temperature of solid foods is changed.
Almost never 1   2   3   4   5   6   Almost always CA

52. My baby is calm in the bath. Like or dislike is mildly expressed (smiles/frowns).
Almost never 1   2   3   4   5   6   Almost always CA

53. My baby accepts changes in solid food feedings (type, amount, timing) within 1 or 2 tries.
Almost never 1   2   3   4   5   6   Almost always CA

54. My baby appears bothered (cries, squirms) when first put down in a different sleeping place.
Almost never 1   2   3   4   5   6   Almost always CA

55. My baby is fussy or cries during the physical examination by the doctor.
Almost never 1   2   3   4   5   6   Almost always CA

Page 4

56. My baby's temperament (style of behaving) is:
    a about average
    b more difficult than average
    c easier than average

Appendix D

Maternal Sensitivity Rating

6-MONTH HOME VISIT STRUCTURED INTERACTION QUALITATIVE RATING SCALES

RE
L

0	0	0	0	0	0	0
1	I	1	I	1	1	1
2	2	2	2	2	2	2
3	3	3	3	3	3	3
4	4	4	4	4	4	4
5	5	5	5	5	5	5
6	6	6	6	6	6	6
7	7	7	7	7	7	7
8	8	8	8	8	8	8
9	9	9	9	9	9	9

1- Not at all characteristic

2- Minimally characteristic

3- Moderately characteristic

4- Highly characteristic

9- No opportunity to observe

Mother Ratings

1.	Sensitivity/responsivity to distress	1	2	3	4	9
2.	Sensitivity/responsivity to nondistress	1	2	3	4	9
3.	Intrusiveness	1	2	3	4	9
4.	Detachment disengagement	1	2	3	4	9
5.	Stimulation of cognitive development	1	2	3	4	9
6.	Positive regard for the child	1	2	3	4	9
7.	Negative regard for the child	1	2	3	4	9
8.	Flatness of affect	1	2	3	4	9

Appendix E

Father Involvement Questionnaire

MY TIME SPENT AS A PARENT PART 1 - CHILD CARE
ACTIVITIES (6 MONTHS)

ID NUMBER

These items are about how parents spend their time. Please tell us how much you and your partner are involved in the following activities.

0	0	0	0	0	0	0
1	1	1	1	1	1	1
2	2	2	2	2	2	2
3	3	3	3	3	3	3
4	4	4	4	4	4	4
5	5	5	5	5	5	5
6	6	6	6	6	6	6
7	7	7	7	7	7	7
8	8	8	8	8	8	8
9	9	9	9	9	9	9

1- Partner's "job"
2- Mostly partner's "job"
3- We share it "equally"
4- Mostly my "job"
5- My "job"
6- Not applicable

1.   Changing diapers.   1   2   3   4   5   6

2.   Giving the baby a bath.   1   2   3   4   5   6

3.   Taking baby to sitter or day care.   1   2   3   4   5   6

4.   Feeding the baby.   1   2   3   4   5   6

5.   Taking the baby to doctor visits.   1   2   3   4   5   6

6.   Buying toys for the baby.   1   2   3   4   5   6

7.   Attending to the baby when he/she cries.   1   2   3   4   5   6

8.   Dressing the baby.   1   2   3   4   5   6

9.   Getting up at night to attend to the baby.   1   2   3   4   5   6

10. Selecting the toys the baby plays with.   1   2   3   4   5   6

11. Getting the baby to sleep.   1   2   3   4   5   6

12. Holding the baby.   1   2   3   4   5   6

13. Making child-care arrangements (scheduling day care or sitters).   1   2   3   4   5   6

14. Doing the baby's laundry.   1   2   3   4   5   6

15. Reading to the baby.   1   2   3   4   5   6

16. Buying clothes for the baby.   1   2   3   4   5   6

1- Partner's "job"
2- Mostly partner's "job"
3- We share it "equally"
4- Mostly my "job"
5- My "job"
6- Not applicable

17. Playing with the baby.	2	3	4	5	6
18. Talking to the baby.	2	3	4	5	6
19. Kissing the baby.	2	3	4	5	6
20. Taking the baby on outings.	2	3	4	5	6

The N1CHD Study of Early Child Care
Form 8C   Revision 04/08/91

Appendix F

Items and internal consistency for temperament subscales

Intensity, mood, and adaptability

TABLE 10	
Pod	Child Outcome
Construct	Temperament - Intensity
Age	Six Months
Data Form	F06B - My Baby
Variable Definition	BTINT6 = Mean(of 4*,8,14*,19,24,29,36,42*,47*,52*) where base variable is MYB06_n * indicates the variable is reflected

CRONBACH'S ALPHA	
No. of Variables	10
Raw	.524
Standardized	.533

SUMMARY STATISTICS

Site	N	Mean	Std. Dev.	Skewness	Kurtosis	Missing
Sample	1279	3.60	.646	-.046	.227	0
Ark - 0	132	3.75	.634	-.341	1.669	0
Cal - 1	128	3.48	.632	.017	-.080	0
Kan - 2	128	3.58	.681	-.005	-.435	0
NHmp - 3	132	3.59	.701	.286	.915	0
Penn - 4	120	3.60	.568	.216	-.034	0
Temp - 5	126	3.58	.699	-.149	-.307	0
Vir - 6	122	3.62	.666	.014	-.057	0
Wash - 7	125	3.59	.602	.114	-.652	0
WCar - 8	139	3.64	.588	.086	.213	0
Wisc - 9	127	3.59	.665	-.533	-.317	0

ANOVA for SITE

$F(9,1269) = 1.34 \quad p < .2124$

TABLE 11	
Pod	Child Outcome
Construct	Temperament - Mood
Age	Six Month
Data Form	F06B - My Baby
Variable Definition	BTMOO6 = Mean (of 5,11*,15*,20*,26,32*,39*,44,49*,55) where base variable is MYB06_n * indicates the variable is reflected

CRONBACH'S ALPHA

No. of Variables	10
Raw	.597
Standardized	.602

SUMMARY STATISTICS

Site	N	Mean	Std. Dev.	Skewness	Kurtosis	Missing
Sample	1279	2.88	.660	.081	.435	0
Ark - 0	132	3.00	.702	-.134	.023	0
Cal - 1	128	2.84	.619	.029	.231	0
Kan - 2	128	2.78	.605	-.168	-.089	0
NHmp - 3	132	2.84	.726	.419	.637	0
Penn - 4	120	2.85	.640	.574	.893	0
Temp - 5	126	2.88	.660	-.047	-.422	0
Vir - 6	122	2.94	.717	.354	-.156	0
Wash - 7	125	2.93	.602	-.189	.072	0
WCar - 8	139	2.93	.648	-.212	-.360	0
Wisc - 9	127	2.84	.656	-.142	-.317	0

ANOVA for SITE

$F(9, 1269) = 1.26 \quad p < .2549$

TABLE 12	
Pod	Child Outcome
Construct	Temperament - Adaptability
Age	Six Months
Data Form	F06B - My Baby
Variable Definition	$BTADA6$=Mean (of $3^*,7^*,12,17^*,23,28^*,33*,37,40,45,53^*$) where base variable is $MYB06\_n$ * indicates the variable is reflected

CRONBACH'S ALPHA

No. of Variables	11
Raw	.663
Standardized	.684

SUMMARY STATISTICS

Site	N	Mean*	Std. Dev.	Skewness	Kurtosis	Missing
Sample	1279	2.25	.619	.342	-.163	0
Ark - 0	132	2.38[a]	.604	.084	-.419	0
Cal - 1	128	2.14[a]	.598	.506	-.112	0
Kan - 2	128	2.20	.552	.375	-.290	0
NHmp - 3	132	2.18	.638	.278	-.090	0
Penn - 4	120	2.25	.627	.569	.601	0
Temp - 5	126	2.28	.661	.466	-.114	0
Vir - 6	122	2.38	.649	.328	-.276	0
Wash - 7	125	2.23	.579	.293	-.300	0
WCar - 8	139	2.30	.602	.240	-.349	0
Wisc - 9	127	2.21	.650	.290	-.247	0

ANOVA for SITE

$F(9, 1269) = 2.20$ $p < .0199$

*Means with the same letter represent significant differences at the .05 level using Tukey HSD.

Appendix G

SPSS 13.0 SYNTAX

```
*Internal consistency for the measures

*internal consitency for the EITQ
RELIABILITY
 /VARIABLES=Intensity Mood Adapt
 /FORMAT=NOLABELS
 /SCALE(ALPHA)=ALL/MODEL=ALPHA
 /STATISTICS=DESCRIPTIVE SCALE
 /SUMMARY=TOTAL .

*relaibility calculations for FI
RELIABILITY
 /VARIABLES=FI_01 FI_02 FI_03 FI_04 FI_05 FI_06 FI_07
        FI_08 FI_09 FI_11 FI_13 FI_15 FI_16 FI_17 FI_20
 /FORMAT=NOLABELS
 /SCALE(ALPHA)=ALL/MODEL=ALPHA
 /STATISTICS=DESCRIPTIVE SCALE
 /SUMMARY=TOTAL .

*reliability for MS
RELIABILITY
 /VARIABLES=QSM06_02 QSM06_06 RQSM06_03
 /FORMAT=NOLABELS
 /SCALE(ALPHA)=ALL/MODEL=ALPHA
 /STATISTICS=DESCRIPTIVE SCALE
 /SUMMARY=TOTAL .

*bivariate correlations
CORRELATIONS
/VARIABLES= FI MS INER
/PRINT=ONETAIL NOSIG.

*centering
Compute INERx= (INER-2.86).
Compute FIx= (FI-2.49).

*interaction variable
Compute FIxINERx= (INERx * FIx).

REGRESSION
/MISSING LISTWISE
/STATISTICS COEFF OUTS R ANOVA
/CRITERIA=PIN(.05) POUT(.10)
/NOORIGIN
/DEPENDENT MS
/METHOD ENTER INERx FIx
/enter FIx INERx.

*ANOVA using FI as a categorical variable
UNIANOVA
 MS  BY INERLMH FILMH
 /METHOD = SSTYPE(3)
 /INTERCEPT = INCLUDE
 /EMMEANS = TABLES(INERLMH*FILMH)
```

/EMMEANS = TABLES(FILMH)
/EMMEANS = TABLES(INERLMH)
/CRITERIA = ALPHA(.05)
/DESIGN = INERLMH FILMH INERLMH*FILMH .

*END OF SPSS Syntax

Appendix H

Approvals

Attachment C
Supplemental Agreement with Research Staff
for the Use of Sensitive Data from
The NICHD Study of Early Child Care

I.   The undersigned research staff, in consideration of their use of sensitive data from The NICHD Study of Early Child Care, agree:

    A.   That they have read the associated Agreement for the Use of Sensitive Data from The NICHD Study of Early Child care and the Sensitive Data Security Plan incorporated by reference into it.

    B.   That they are "research staff" within the meaning of the agreement.

    C.   To comply fully with the terms of the agreement, including the Sensitive Data Security Plan.

II.   The undersigned investigator agrees that the persons designated herein are research staff within the meaning of the associated Agreement for the Use of Sensitive Data from The NICHD Study of Early Child Care.

Research Staff

Smitha Earath	E. Smith	08/31/05
Name	Signature	Date
Name	Signature	Date
Name	Signature	Date
Name	Signature	Date
Name	Signature	Date
Name	Signature	Date

Investigator

Amanda Harrist	_(signature)_	8/31/5
Name	Signature	Date

Attachment D
Sample Security Pledge
for the Use of Sensitive Data from
The NICHD Study of Early Child Care

Pledge of Confidentiality

I, _____Smitha Earath_____ , through my involvement with and work on the {name of ~Social Development Research Team~ research project} will have access to data collected by The NICHD Study of Early Child Care. By virtue of my affiliation with this project, I have access to confidential information and use of data about respondents generally perceived as personal and private. I understand that access to this confidential information and data carries with it responsibility to guard against unauthorized use and to abide by the Sensitive Data Security Plan. To treat information as confidential means not to divulge it to anyone who is not a project member, or to cause it to be accessible to anyone who is not a project member. Anything not specifically named as "public information" is considered confidential.

I agree to fulfill my responsibilities on this project in accordance with the following guidelines:

1.   I agree to not permit non-project personnel access to these sensitive data, either electronically or hard copy.

2.   I agree to not attempt to identify individuals, families, households, or care providers.

3.   I agree that in the event an identity of an individual, family, household, or care provider is discovered inadvertently, I will (a) make no use of this knowledge, (b) advise the investigator of the incident who will report it to Tyler Hartwell at Research Triangle Institute, (c) safeguard or destroy the information as directed by the investigator after consultation with Tyler Hartwell, and (d) not inform any other person of the discovered identity.

SMITHA EARATH   E. Smith   08/31/05
Name   Signature   Date

Institutional Signatures

Investigator	Representative of Receiving Institution

(signature)   Signature _(signature)_   Date 6-17-03

Amanda W. Harrist   6/13/03   Joseph W. Alexander
Name typed or printed   Name typed or printed

Assistant Professor   Vice President for Research
Title   Title

Oklahoma State University   Oklahoma State University
Institution   Institution

339 HES, Dept of HDFS, OSU   203 Whitehurst, OSU
Building address   Building address

Street address   Street address

Stillwater, OK 74078   Stillwater, OK 74078
City State Zip   City State Zip

If investigator is a graduate student, please supply the followin

Supervising Faculty or Researcher

Signature   Date

Name typed or printed

Title

Institution

Building address

Street address

City State Zip

(handwritten note: MY ORIGINAL APPROVAL - AMANDA HARRIST)

Representative of Research Triangle Institute	Representative of Research Triangle Institute

(signature)   9/30/03   _(signature)_   8/7/0?
Signature   Date   Signature   Date

Tyler Hartwell   Don K. Enichen
Principal Investigator   Senior Contracting Officer
Research Triangle Institute   Research Triangle Institute
P.O. Box 12194   P.O. Box 12194
Research Triangle Park, NC 27709   Research Triangle Park, NC 27709

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Graduate College
202B Whitehurst
Oklahoma State University
Stillwater, OK 74078

RE: Ms. Smitha Earath, ID# 446-15-1780

Dear Dean Emslie: April 17, 2006
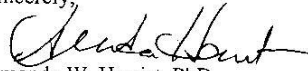
I have an advisee, Smitha Earath, preparing to defend her Master's Thesis in HDFS next week.

She has used archival data for her thesis project. The data were from the NICHD Study of Early Childhood. In June of 2003 I was certified by the Research Triangle Institute (RTI) in Research Triangle Park, NC, and by OSU's IRB to access the data (a copy of that certification will be in the appendix of her Thesis). Subsequently, Ms. Earath was added to the RTI's list of **Approved Research Staff** for **Supplemental Use** of the Data Set. A copy of her Supplemental Use Agreement with the ATI also will be included as a Thesis appendix.

Last summer I spoke with OSU's IRB office and it was suggested that I write a letter to the Graduate College informing them of her use of the data. Please consider this that letter.

If you have any questions, please feel free to call me at 744-7043 or email amanda.harrist@okstate.edu. Thank you,

Sincerely,

Amanda W. Harrist, PhD
Associate Professor

VITA

Smitha Earath

Candidate for the Degree of

Master of Science

Thesis: IMPACT OF NEGATIVE INFANT EMOTIONA REACTIVITY ON
MATERNAL SENSITIVITY WITH FATHER INVOLVEMENT AS A
MODERATOR

Major Field: Human Development and Family Science

Biographical:

Personal Data: Born in Kerala, India on December 13th 1978, daughter of
Krishna Subbiah Pillai and Earath Sarasa Pillai, sister to Sajith Pillai and
married to Jinaga, Bhaskar Kumar.

Education: Graduated from Dayananda Anglo Vedic School in 1996; Received
Bachelor of Engineering Degree in June of 2000 from Madras
University, India. Will complete requirements for Master of Science
Degree from Oklahoma State University, Stillwater in May, 2006.

Experience: Worked on several important projects during graduate studies in
Oklahoma State University both on Stillwater and Tulsa campus.
Worked for Dr. Deborah Norris to create brochures for undergraduate
studies in Human Development and Family Sciences; worked with Dr.
Patricia Self and Dr. Mona Lane as a Teaching Assistant; Worked with
Dr. Harrist as her Research Assistant on the "Defining Quality Early
Childhood Education in Oklahoma" project; Worked with Dr. Glade
Topham's Research Team on the Zorrow Project; Worked with Dr.
Barbara Sorrels on the Source Project. Completed a summer internship
for Child Development Specialist position at the State Health
Department and the Sooner Start Program in Tulsa County, Oklahoma in
2005.