THE RELATIONSHIPS BETWEEN MATERNAL VISITATION PATTERNS IN THE NEONATAL INTENSIVE CARE UNIT AND MATERNAL CARE IN THE HOME ENVIRONMENT

by

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CHAPTER I

INTRODUCTION

As advances have been made in medical knowledge regarding the treatment of the premature infant and members of the neonatal intensive care team become highly skilled in caring for the "high-risk" infant, there has been a trend of continually increasing survival rates of the premature infant (Fitzhardinge & Ramsey, 1973; Fitzhardinge, Pape, Arstikaitis, Boyle, Ashby, Rowley, Netley & Swyer, 1976). Because more premature infants are surviving the neonatal period, within the last two decades, research has been directed towards identifying the effects of the infant's prolonged hospitalization upon the developing maternal-infant affectional relationship.

Unfortunately, some of the treatments aimed at reducing the morbidity and mortality of the premature infant deprive the mother and infant of early interactions. One such treatment is the transport of these infants to regional neonatal intensive care units (NICU). As these infants are transferred or transported to regional care centers, the likelihood of maternal-infant separation occurring for long periods of time increases. This separation usually occurs soon after birth allowing the mother minimal, if any, time to become acquainted with her premature infant. Since it is the mother who experiences

the pregnancy and expects to assume the role of primary care-taker for this infant, she is the family member most "extremely disturbed" when she has limited opportunities in which to interact with the infant in the NICU (Caplan, Mason, & Kaplan, 1965; Jeffcoate, Humphrey, & Lloyd, 1979). This deprivation of early maternal-infant interaction in the human species has been hypothesized to cause serious long term effects on the development of a mother's attachment to her infant (Barnett, Leiderman, Grobstein, & Klaus, 1970; Kennell, Jerauld, Wolf, Chesler, Kreger, McAlpine, Steffa, & Klaus, 1974; Kennell & Klaus, 1970). At the extreme, such long term effects may include: deprivation of maternal care, child abuse, and the infant's failure to thrive. The detrimental effects of early separation may be even more profound when the mother does not visit her infant in the regional neonatal intensive care center (Fanaroff, Kennell, & Klaus, 1972; Hunter, Kilstrom, Kraybill, & Loda, 1978).

Maternal visitation patterns are important to assess prior to the infant's discharge from the hospital. They have been found to be suggestive of the quality of the sub-sequent maternal-infant relationship. Studies have suggested that mothers who do not visit their infant very often in the NICU tend to abuse their infants more often than mothers who visit their infants more frequently in the NICU (Fanaroff,

Kennell, & Klaus, 1972; Hunter et al., 1978). This study explored the possibility that the frequency of maternal visitations and the amount of maternal interaction with the infant in the NICU are related to later maternal behaviors in the home environment.

According to Orem (1971), the primary focus of nursing is to assist the patient in his or her ability to care for himself. When the patient is a dependent, such as an infant, the focus of nursing becomes to assist the caretaker or parent in caring for the infant. Thus, returning the infant to a mother who is able to provide a nuturing environment is important because the parents influence the development of their infant by the environment they provide. Parmalee (1974) found that the premature infant is even more affected by his enviornment than the full-term infant. Hence, the nurse caring for a premature mother-infant dyad may be more motivated to intervene and assist the mother if she believes that the number of a mother's visitations to the NICU and her interactions with her infant during her visits may be related to the mothering she will provide her sensitive premature infant in the home.

Review of the Literature

The literature concerning the predictive value of maternal visitations to the NICU on the subsequent maternal-infant

relationship was reviewed. Aspects of the maternal-infant relationship which were focused upon included: the crisis associated with a premature delivery, the frequency of maternal visitations to the NICU, child abuse, maternal attachment, and maternal-infant interaction.

Crisis Associated With a Premature Delivery

The birth of a premature infant has been labeled a situational crisis for the entire family. Each family member's psychological and social integrity may be threatened and they may experience some degree of disequilibrium resulting from the external event. It is believed that the mother is the member of the family most extremely affected by the situational crisis of a premature birth (Caplan, Mason, & Kaplan, 1965; Jeffcoate, Humphrey, & Lloyd, 1979).

Kaplan and Mason (1960) studied 60 families experiencing an event of a premature birth. Their data collection included an interview during the period immediately following the delivery, and an interview conducted two months after the infant had been released from the hospital. Analysis of the interview data suggested that there is a typical psychological experience for the mother of a premature infant which is unlike the mother's experience following a term delivery.

Kaplan and Mason (1960) found that the onset of premature labor is a shock to the pregnant female and she is

emotionally unprepared for its outcome. Often the onset of labor may be denied or even unrecognized. After delivery, these mothers usually have an increased concern regarding whether the baby will live, and they may remember the infant's small size, poor color, weak cry, or unattractive appearance. They may even anticipate their infant's death. At this time, it may be difficult for a mother to visit her baby in the premature nursery because she may fear becoming too attached to an infant who may not survive. However, failure to visit her baby during its stay in the hospital may lead to a more difficult adjustment when the baby goes home.

From this data, Kaplan and Mason identified four common psychological tasks which are characteristic of the mother when she is adapting successfully to the crisis of prematurity. These tasks include:

1. She experiences anticipatory grief at delivery. She withdraws from the relationship already established with the coming infant when she realizes she may lose the baby. She hopes for the survival of the infant, while at the same time she prepares for the baby's death.
2. She acknowledges her failure to deliver a healthy full-term infant.

3. After she has been separated from her infant for a prolonged period of time during the infant's hospital stay, she resumes the previously interrupted process of relating to her infant.
4. She prepares herself for her future job of caring for the infant. She learns that her infant is different from a full-term infant with regards to its needs and growth patterns.

Using these psychological tasks as framework, Kaplan (1961) conducted a study involving 30 premature infants and their mothers. He attempted to predict healthy or unhealthy maternal care on the basis of the mother's handling of the tasks imposed by the crisis of a premature delivery. Accomplishment of the psychological tasks were evaluated by 11 items. One of these items was the mother's pattern of visiting the premature nursery. The data indicated that maternal visitation alone was an excellent indicator of maternal task accomplishment. This is significant as maternal task accomplishment has been found to be predictive of a healthy quality of maternal care (Kaplan & Mason, 1960). Kaplan (1961) suggested that if maternal visitation patterns are found in future research to be indicators of healthy/unhealthy maternal care, then knowledge about the mother's visitation patterns would be of great value to the health care team.

Mason (1963) randomly selected 28 mothers admitted to the hospital in premature labor in order to study the healthy or unhealthy adaption these mothers had in response to the crisis of prematurity. Interviews were conducted within five days of delivery and again in the home six to 10 weeks after the infant's discharge. The interviews dealt with the mother's cognitive and affective response to the crisis and the mother's relationship with available helping persons.

Mason defined an adaptive response to the crisis of prematurity or a "good outcome" as: the mother was fairly successful in meeting the infant's physical and emotional needs; the baby gained weight; and the family seemed pleased with the baby. A maladaptive response or a "poor outcome" was defined as: the mothers was hostile, irritable, and impatient; the infant was neglected or in poor health; or the family was disrupted. A "good outcome" was predicted when the mother demonstrated and expressed a great deal of anxiety, actively sought information concerning her infant's condition, and showed strong maternal feelings for the baby. Mothers predicted to have a "poor outcome" often denied they were anxious and their concerns were directed to other areas rather than their infant's severe condition; these mothers were less likely to have support from their husbands or other family members. Mason found that he was able to predict with

90 percent accuracy those mothers and infants who would experience a "poor outcome". Mason concluded by suggesting that efforts should be directed towards increasing the interaction between mothers and premature infants with hopes of decreasing the incidence of "poor outcomes".

Child Abuse

Child abuse is a growing concern in the United States. Studies indicate that the premature infant is abused or neglected 3.9 times more often that his full-term counterpart (Hunter et al., 1978). Researchers have attempted to explain the origin of this pathological condition. Hunter and associates (1978) studied 255 premature infants and their families during the child's first year of life. Of these 255 infants, 10 were later reported as having been maltreated during the study period. Family psychosocial characteristics evaluated on an admission interview showed significant statistical association with later maltreatment. Mothers of maltreated children had significantly less formal education than mothers of children not reported as maltreated ($p < 0.05$). A mother not living with her mother or the child's father was more likely to maltreat her child than the mother living with her own mother or the baby's father ($p < 0.005$). The maltreated infants were less mature at birth (mean gestational age 31.5 weeks) than the infants not reported as abused (mean gestational

age 35.3 weeks) ($p < 0.005$). Mean birth weights were less for the reported group (1477 grams) compared with the non-reported group (2224 grams) ($p < 0.005$). Finally, the infants who remained in the hospital more than 40 days were maltreated more often than their nursery mates ($p < 0.005$) who were hospitalized less than 40 days. Analysis of each family member's visiting record revealed that maltreated infants received less frequent visits than other infants in the nursery. Mothers of maltreated infants visited the nursery on the average of 0.152 times per day compared with 0.406 visits per day by mothers of the unreported infants. Hunter's data also revealed that the distance parents traveled was not a factor in the frequency of visitations.

Lynch (1975) intensively studied the families of 25 abused children who had one or more siblings. Data were collected retrospectively regarding the pregnancy with the abused child, events during the perinatal period, and any illnesses experienced by either the mother or the abused child during the first year of life. Lynch described striking differences in the prenatal and perinatal periods which differentiated the abused child from his non-abused sibling. It was suggested that an abnormal pregnancy, an abnormal labor and delivery, neonatal separation from mother, a separation between mother and infant during the first six months of life,

an illness of the infant during the first year of life, and an illness of the mother during the first year following the delivery were significantly overrepresented characteristics associated with the incidence of abuse. Lynch reported that no single socio-economic group was more likely to be associated with child abuse; however, mothers who were less than 20 years of age at the time of their first child's birth were more likely to abuse their children.

In another retrospective study, ten Bensel and Paxson (1977) examined information concerning 346 neonates triaged to a special care nursery. Data concerning these infants were collected over a three year period. Of the 346 infants included in the study 10 (3%) were severely abused during the first three years of life. The abused infants were compared to a control group of infants who were not reported as abused during the follow-up period. Each matched infant selected for the control group had a birth weight that was within 100 grams of its abused nursery cohort's birth weight. There were two differences noted between the two groups: the number of mothers who experienced a gestational illness, and the length of time prior to the mother's first visits to the special care nursery. Seven of the 10 abusing mothers were not able to visit the nursery during the first 12 hours following the delivery because they experienced an illness during

the postpartum period. Thus, only one-third of the abusing mothers visited their infants during the first 12 hours of the infant's life, whereas all of the non-abusing mothers had visited the nursery by that time ($p < 0.01$). Two important research questions were generated by this study: Does the unavoidable separation between mother and infant due to maternal gestational illness contribute to the infant's eventual child abuse? Or, is the separation between mother and infant immediately following the delivery a cause of eventual child abuse?

Maternal Visitation in the Neonatal Intensive Care Unit

During the last two decades, many newborn intensive care units have adopted policies which allow parental visitation around the clock. Since this practice has been adopted, studies have demonstrated that maternal visitation to the NICU may be associated with the quality of the developing maternal-infant relationship.

In 1973, Fanaroff, Kennell, and Klaus conducted a study to identify mothers of premature infants at risk. The frequency of maternal visitations to the NICU was used as a crude, yet simple, technique for predicting grossly aberrant maternal behavior. Their sample contained a total of 146 mother-premature infant dyads. The majority of the mothers included in the sample were black, multiparous, married women.

The infants were followed from birth until six to 23 months of age.

The mothers were distributed into two groups: those mothers visiting more than three times, and those visiting fewer than three times in a two week period. They found that 41 of the mothers visited their infants less than three times in two weeks, and three relinquished their infants for adoption during the neonatal period. There were seven cases of reported child abuse or failure to thrive which occurred exclusively in the group of 28 mothers who seldom visited the NICU. The results showed that mothers who visited less frequently were more commonly black, multiparous women; the fact that the majority of the sample consisted of black, multiparous, married women may have influenced this finding. The data also revealed that unmarried mothers and mothers less than 20 years of age tended to visit less frequently, although no statistical significance was reported with this finding.

The focus of the research undertaken by Minde, Trehub, Corter, Boukydis, Celhoffer, and Marton (1978) was to compare the visiting patterns of 18 mothers of premature infants during the infant's hospitalization. Maternal and infant behaviors were observed during their first five visits together, and in the home one, two, and three months after the infant's discharge from the hospital. Due to the

researchers' desire to minimize their intrusion on each family's privacy, only two visits to the NICU per week were observed.

The 18 mothers were separated into three groups: high activity mothers, medium activity mothers, and low activity mothers. This was done by calculating the median number of times each of the five observed maternal behavior occurred during each visit. The five maternal behaviors included: smiling, looking en face, touching, vocalizing to baby, and looking. Within each separate behavior, each mother was designated as falling above or below the median for each behavior. Four mothers found to fall above the median in four out of five behaviors were labelled "high activity mothers"; six mothers falling below the median in four out of five behaviors were labelled "low activity mothers"; and eight remaining mothers were assigned to the "medium activity" group.

The results indicated that mothers in the high activity group visited their infants significantly more often than mothers in the low activity group ($p < 0.05$). High activity mothers spent a longer time with their infants during each visit, whereas the low activity mothers had the shortest nursery visits of the entire group ($p < 0.10$). Other findings of interest included the observation that "high activity"

mothers had a more adequate social support system, which included a good relationship with her husband and many friends. Conversely, the "low activity" mother was more likely to have a husband in the process of leaving her (two mothers), one who physically abused her (two mothers), or one who was absent from the home (one mother). Statistical significance was not reported for these findings. The data also showed that during the mother's first two visits to the hospital, she often was hesitant to touch her infant, and primarily spent her time viewing her infant. However, from the third visit onward, which usually occurred when the infant was approximately two weeks of age, more maternal handling was reported. This was attributed to a more definite prognosis regarding the infant's survival, and it is believed that this overt handling during the second week of life may be a manifestation of the beginning of a more active attachment process.

Attachment

Introduced by Bowlby (1969) the term attachment has come to refer to a hypothetical construct indicating an enduring affectional relationship which gradually develops between an infant and his parents, especially his mother. No individual behavior or constellation of behaviors can be taken as evidence of attachment because the overt expression

of the developing affectional relationship between mother and infant varies depending on the developmental level of the child and the individual interaction pattern of each mother-infant dyad (Campbell & Taylor, 1979). Some behaviors have been identified in the literature as valuable in suggesting that an affectional relationship or attachment is developing between mother and infant. Some of these behaviors include: smiling, en face gazing, touching, visualizing, and looking (Curry, 1979; de Chateau, 1976; Funke & Irby, 1978; Hales et al., 1977; Kontos, 1978).

The affectional relationship between mother and infant has its onset months before the birth. This relationship develops in rather a unique manner; the mother begins to envision her infant, while in utero, based on the sensations she experiences with fetal movement and her own fantasies. Clark and Affonso (1976) have stated, the mother's perception of her dream child and the beginning mother-infant relationship may be influenced by the mother's self-concept, culture, social relationships, economic status, and state of health.

After the infant's birth the mother begins to compare her real-life baby with her dreams, fantasies, and expectations. If her baby is similar to her dream child then maternal behaviors are prompted. All mothers may experience

some grief following delivery due to the loss of their fantasized child. It is believed, that the greater the discrepency between the newborn and the dream child, the more grief a mother may experience. When the mother delivers a premature infant, the interaction between mother and infant is often delayed because the mother must deal with the grief of losing the fantasized or dream child (Clark & Affonso, 1976; Goldberg, 1979; Kaplan, Kaplan, & Mason, 1960). As the mother's fantasies of her infant give way to her conscious awareness of the live infant before her, she attempts to gain knowledge about her baby's appearance, behavior, and physical intactness (Clark & Affonso, 1976; Cropley, Lester, & Pennington, 1976; Robson & Moss, 1970; Rubin, 1972).

Rubin (1963) identified a progressive sequence of tactile behaviors exhibited by mothers becoming acquainted with their infants. Initially, fingertip touch occurs. Fingertip touch precedes a commitment to the infant. Then, the mother contacts her infant using the whole palm of her hand for the greatest amount of contact with her baby's body. This body language now indicates the mother is beyond the information seeking stage and desires to become involved with the infant's care.

Mothers seeing their premature infants for the first time have been reported to touch their infants less than

mothers of full term infants. They also spend more time using fingertip touch than palmar contact, as compared to mothers of full term infants who use more palmar contact than fingertip touch during the first six to nine minutes in which they have contact with their infants. By the third visit to the premature nursery, mothers are touching their infants more and they provide almost equal amounts of fingertip touch and palmar contact (Klaus, Kennell, Plumb, & Zuehlke, 1970).

The Effects of Early Separation Upon Attachment

As early as the turn of the century, professionals questioned the effect of early maternal-infant separation on the development of the human mother-infant affectional relationship. It was noted by an early neonatologist in London, Pierre Budin, that:

> Unfortunately....a certain number of mothers abandon the babies whose needs they have not been able to meet, and in whom they have lost all interest. The life of the little one has been saved, it is true, but at the cost of the mother (Budin, 1907).

Over half a century later, Jeffcoate et al. (1979) studied the disturbance which occurs in the maternal-infant relationship following a premature delivery. In this retrospective study, the possible early bonding difficulties experienced by parents of preterm infants were compared to

parents of full term infants. All together, 17 families were interviewed in each group. All parents were married and were similar with regard to social class, educational preparation, and ethnic origin. Other characteristics which were similar in both groups included: poor relationships between parents and distressing separation from parents in childhood, childhood experience of parental abuse or neglect, previous experience caring for small babies, amount of social support available from significant personal friends or relatives, and social or financial problems during or following the pregnancy. No unmarried mothers were included in the study.

Each parent was interviewed separated during one home visit when the infant was approximately one year of age. Also, during the visit, an adapted version of the Neonatal Perception Inventory (Broussard & Gortner, 1970) was used to assess the parents' perception of their baby in comparison to the average baby.

Striking differences were reported between the two groups studied. In the preterm group, one baby had suffered a non-accidental injury, diagnosed when readmitted to the hospital with diarrhea, and a second baby was readmitted with a diagnosis of failure-to-thrive at four and one-half months of age. The mother of the second baby was also admitted for advice regarding care of her baby. No similar

cases were noted in the control group.

Another interesting finding reported by Jeffcoate et al. (1979) was the fact that when mothers were asked when they intially felt real warmth or love of their new baby, eight of the 17 mothers in the premature group admitted real affection had been delayed at least two months, unlike 13 of the 16 mothers in the control group who claimed a feeling of love for their infant within 24 hours following delivery. Among the mothers included in the preterm group, a difference was found between "early attachers" and "late attachers". Five of the six mothers feeling attached to their infants during the first two weeks following delivery were able to hold their baby during their first week of life, unlike the "late attached" mothers who had not been given an opportunity to hold their infants until the second week of life or later. Both mothers of the children who had been abused admitted that maternal affection toward the baby had been delayed until the infant came home from the hospital. Also, several fathers reported they had been concerned regarding their "late attached" wife's apparent lack of affection for her baby.

Evaluation of the groups results on the Neonatal Perception Inventory revealed that the preterm mothers obtained lower scores than full term mothers ($p < 0.01$), and preterm mothers obtained lower scores than preterm group fathers

($p < 0.02$). Thus, the mother of a premature infant tends to view her infant more negatively in comparison to the average infant than the full term mother and the preterm father. The difference in scores between the preterm mother and the preterm father provides further evidence that the mother is the parent most extremely affected by the birth of a preterm infant.

Barnett, Leiderman, Grobstein, and Klaus (1970) conducted a pilot study at Stanford University to determine if maternal deprivation of tactile and caretaking contact with her premature infant, in the postpartum period, resulted in less maternal responsiveness to her infant. The authors identified three components of maternal-infant interaction which they intended to study: 1) the timing and length of maternal contact with her infant, 2) the sensory pathways utilized during the interaction, and 3) the maternal caretaking nature of the interaction. Through manipulation of these components of interaction, they developed a theoretical framework regarding interactional deprivation. They hypothesized that all mothers giving birth in a hospital, except those mother experiencing rooming-in, encounter at least partial deprivation of interaction with their newborn. It was projected that mothers of premature infants who were allowed to touch their infants would experience less deprivation than mothers denied the experience. To test their

assumption regarding separation, 13 mothers were randomly selected from a population of 41 mothers who were experimentally permitted to visit and make contact with their premature infants in the NICU. These 13 mothers were compared to 16 control mothers whose initial physical contact with their premature infants was approximately three to 12 weeks after birth. Both groups were studied over a two year period. The data indicated that mothers allowed to visit their premature infants differed from mothers deprived of visitation in three ways: 1) mother's commitment to the infant, 2) mother's confidence in herself regarding caretaking skills, and 3) mother's stimulation of her infant and caretaking activities.

Leifer, Leiderman, Barnett, and Williams (1972) utilized the theoretical framework developed in the preceding study when investigating the effects of maternal-infant separation on maternal attachment behavior. Three categories of overt maternal attachment behaviors were utilized when studying mothers of premature and full term infants. These categories were: 1) close bodily contact between mother and infant, 2) distal contact between mother and infant, and 3) the amount of time the mother devoted solely to interaction with her infant. Three groups of mothers were observed to test the effects of separation. The first group consisted of 22 mothers allowed full sensory contact with their premature

infants in the intensive care nursery beginning approximately 48 hours after birth. The second group included 22 mothers allowed only visual contact with their premature infants until the infants were three to twelve weeks of age. The final group was comprised of 24 mothers who were allowed full sensory contact with their full term infants. Mothers in the latter group were matched to mothers in the premature group by parity, age, and sex of the infant.

Three observations of these mothers interacting with their infants were conducted: 1) during the mother's fifth visit to the discharge nursery just prior to the infant's release from the hospital, 2) in the home one week following discharge from the hospital, and 3) in the pediatrician's office one month following discharge from the hospital. The most consistent differences were seen in the control group. During all three observations, mothers of full term infants who had experienced periodic full contact with their infants during the two or three days of hospitalization were reported to smile at their infants more often and to hold their infants close to their body more often than mothers of premature infants. There were no significant differences between the two groups of mothers of premature infants regarding the maternal behaviors focused on in the study. Although, during the second observation the mothers of premature infants allowed early contact with their babies

did hold their infants more than either the separated or control groups. Perhaps, one of the most important findings in this study was the effect of separation on the family unit. Subsequent follow-up found noticeable differences between the mothers allowed full sensory contact with their premature infants and the mothers allowed only visual contact with their premature infants. Two of the separated mothers chose to relinquish care of their infants, and five marriages of the mothers in the separated group ended in divorce. Among the families in the full sensory contact group, only one marriage ended in divorce and there were no mothers relinquishing custody of their infants. Leifer et al. felt their data revealed that mothers in the separated group may have experienced "severe" disturbances in their maternal and marital behavior.

Kennell and Klaus (1970) conducted a similar study at Case Western Reserve University. Fifty-three mothers of premature infants were assigned to either an early contact or late contact group. Early contact mothers were allowed to handle and care for their infants within the first five days following birth; while the late contact mothers were allowed only visual contact with their infants through the nursery windows for 21 days following the infant's birth. Two observations of the mother caring for her infant were made: 1) an observation of the first ten

minutes of a feeding episode shortly before discharge, and 2) an observation in the home one month following discharge where 25 maternal activities were observed. Each mother's caretaking skills were evaluated and a measure of maternal affection was calculated. The results indicated that mothers given a chance to have early contact with their infants spent more time looking at their babies during feedings, and these children had significantly higher IQ's on the Stanford-Binet intelligence test at 42 months of age.

Maternal-Infant Interaction

During the early post delivery period, opportunities for reciprocal interaction between mother and infant may occur which may help to "lock" mother and infant together and facilitate further attachment (Kennell & Klaus, 1975).

Although the mother may provide the animate stimulation which initiates interaction between parent and child, this interaction process is not unidirectional. The infant at a very early age responds to the care and stimulation his mother provides for him, this in turn affects the manner in which the parent approaches the infant in the future. The infant also initiates interaction with his mother in order to communicate his demands. In a healthy state, maternal and infant behaviors are mutually complimentary and result in repeated social interactions which are satisfying to both members of the dyad.

However, when the infant is premature the interactive skills of both the mother and the infant may be hampered (Goldberg, 1979). When the infant is seriously ill and hospitalized in the NICU, neither parents or infants may have opportunities to practice or develop interactive skills. However, one partner may be able to compensate for the other member's inadequate or absent skills. In the case of the premature mother-infant dyad, the burden of compensating for the infant's inadequacies falls upon the mother because the infant's repertoire of skills and flexibility are limited.

Goldberg (1979) studied the behaviors of parents of premature infants during feedings in the hospital and again at four months in the home. She related these parental behaviors to infant behaviors occurring in the newborn period. Her findings suggested that infants who were more difficult to arouse during the newborn period received higher degrees of stimulation from their parents during the four month feeding, and infants who were unresponsive to auditory stimulation in the neonatal period received more auditory and tactile stimulation.

Determinants of mother-infant interaction in the premature nursery were studied by Minde, Marton, Manning, and Hines (1980). They observed 32 mothers and their low birth weight infants twice a week while their infants were hospitalized, and conducted home visits one, two and three

months after the infants were discharged from the hospital. The mothers were separated into three groups: 1) high activity mothers, 2) medium activity mothers, and 3) low activity mothers. The guidelines for placement of a mother in a specific group were identical to those used in the Minde et al. (1978) study. As presented in their previous research, they found that maternal activity levels, during a mother's interaction with her infant in the nursery, can be helpful in predicting the amount of activity a mother will show toward her infant during the first few months of his or her life at home. In later research, follow-up psychiatric interviews were conducted with each mother in order to determine which factors might influence a mother's interaction with her infant. The regression analysis showed that the following variables contributed most to the variation found in maternal interaction: the mother's relationship with her own mother, mother's relationship with the father of the infant, and a previous abortion (See Table 1).

These researchers attempted to determine the direction of influence in the maternal-infant interaction process. Was the infant of a highly active mother stimulating his or her mother, or did the highly interactive mother cause more social and gross motor activity in the infant? They concluded

that mothers primarily respond to their infant's signals, and there is at least some bidirectional influence.

Table 1

Relationship of Some Demographic Variables to Maternal Activity Level

Factor	B	Percentage in Activity Group With Favorable Score		
		High	Medium	Low
Relationship with own mother	0.47	83	69	9
Relationship with infant's father	0.33	83	73	17
Absence of spontaneous or therapeutic abortion	0.28	67	56	25
Socio-economic status	0.17	83	50	17
Parity	0	50	63	50

Note: The data in Table 1 are from Minde et al., 1980, p. 11.

Field (1977) studied the effects of early separation and interactive deficits upon later mother-infant interaction. She studied 36 infants. The group of premature infants were approximately 32 weeks gestation with Respiratory Distress Syndrome (RDS), and they were separated from their mothers for approximately 32 days. The premature nursery had an open parental visitation policy. Mothers' visiting patterns were very erratic, and the mothers' first contact with their infants was usually only visual. The

post mature infants were born an average of 16 days following the estimated date of confinement (EDC). Mothers of full term and postterm infants had contact with their babies soon after birth followed by a rooming-in experience.

Field observed these mothers and infants three and one-half months following the EDC. Three different types of interactions were videotaped in a studio: 1) spontaneous face-to-face interaction where the mother pretended she was playing with her infant at home, 2) attention getting situation where the mother attempted to keep the infant looking at her face , and 3) mothers imitating their infant's behaviors as they occurred. The results indicated that during infant gaze, mothers of full term infants were significantly less active than mothers of premature and post mature infants ($p < 0.005$). Significant differences were seen only during attention getting and spontaneous situations. During infant gaze aversion, mothers of normal full term infants were least active and mothers of premature infants were most active ($p < 0.005$). During spontaneous and attention getting situations, there were no significant differences between post mature and premature groups during infant gaze aversion. The lack of differences between the premature and the post mature dyads may not imply that early separation has no effect upon mother-infant interaction at a later date. Field believes that the effect of separation

is not as important as the baby's style of interaction or ability to interact at birth, the continuation of that style, and its influences upon maternal behavior during subsequent maternal-infant interactions.

The relationship between neonatal style and the development of the early mother-infant relationship was investigated by Osofsky and Danzger (1974). The population they studied included 51 non-white, low socio-economic mothers between the ages of 15 and 39. Fifty-one percent were primiparous. Mothers and infants were observed during a feeding situation on the third or fourth postpartum day after the mother had four previous opportunities in which to feed her baby. Their findings suggested that male infants were more responsive to their mother's auditory stimulation than female infants, the mother's auditory stimulation was positively related to the infant's responsiveness in the auditory domain ($p < 0.01$). Further, the mother's visual stimulation was positively related to the infant's auditory and tactile responsiveness ($p < 0.01$), and the mother's tactile stimulation was related positively to the infant's responsiveness in the visual ($p < 0.05$), auditory ($p < 0.001$), and tactile ($p < 0.01$) domains. Another important observation was the fact that maternal attentiveness and sensitivity toward her baby were related to the infant's visual ($p < 0.05$), auditory ($p < 0.05$),

and tactile ($p < 0.01$) behaviors. The authors concluded that the attentive sensitive mother tends to have a responsive infant, or perhaps, the responsive baby tends to elicit attentive sensitive behaviors from his caretaker.

In 1976 Osofsky reported additional research concerning the relationship between neonatal characteristics and the interaction which occurs between mother and infant. In this report, she studied 134 non-white, lower socio-economic mothers and their newborns. The procedure used in this study included a newborn assessment with the Brazelton Neonatal Assessment Scale and two observations of the mother and infant interacting. One observation was conducted during a feeding situation, and the other occurred during a semi-structured situation. The findings of this study were consistent with the results just cited (Osofsky & Danzger, 1974).

In the latter study, a strong interrelationship between the mother's stimulation in a specific domain and the newborn's responsivity in that domain as well as other domains emerged. Again it was found that maternal attentiveness and sensitivity toward the infant were related to eye contact ($p < 0.05$, and the auditory ($p < 0.05$) and tactile ($p < 0.01$) responsivity demonstrated by the infant. The amount of visual stimulation the mother provided her infant was positively correlated with the infant's auditory responsivity

($p < 0.01$). The mother's tactile stimulation was positively correlated with the infant's auditory ($p < 0.01$) and tactile ($p < 0.05$) responsivity, but was negatively related to eye-to-eye contact ($p < 0.01$). An important finding reported in this study was that less mature newborns with poorer tone received less auditory ($p < 0.01$) and tactile ($p < 0.01$) stimulation from the mother.

In synthesizing the data from the two studies, Osofsky suggested that the styles of the interaction taking place between mother and child may be established very early in the developing relationship. She believes that there is a consistency in maternal and infant styles which is evident from the very beginning of the infant's life. If these styles remain consistent from birth throughout childhood, then the predictability of the effect of these early behaviors upon the developing maternal-infant relationship becomes extremely important. Unfortunately, little research has been reported which substantiates the consistency of these early maternal and infant behaviors over a long period of time.

Summary

The birth of a premature infant is a stressful situation for the entire family. However, the mother is the family member most "extremely" affected by the crisis of prematurity.

The mother's ability to deal with the crisis in a healthy manner may be related to the amount of time she spends with her infant in the neonatal intensive care unit (NICU) (Caplan, 1960; Caplan, Mason, & Kaplan, 1965; Kaplan & Mason, 1960).

During the early postpartum period, opportunities for interaction between mother and infant have been shown to facilitate maternal attachment to her newborn (Kennell & Klaus, 1976; Kennell et al., 1974; Klaus & Kennell, 1970; Leifer et al., 1972; Robson & Moss, 1967; Rubin, 1963; Rubin, 1972). Invariably, the mother of a premature infant experiences a severe deprivation of interaction with her infant during the postpartum period. This deprivation of interaction has an even more profound effect upon the developing maternal-infant affectional relationship if the mother has little contact with her infant while the infant remains in the NICU. Researchers have shown that mothers having minimal amounts of contact with their premature infants in the nursery may experience severe disturbances in their maternal behavior (Barnett et al., 1970; Fanaroff et al., 1972; Hunter et al., 1978; Kaplan, 1960; Leifer et al., 1972). Disturbances in maternal behavior are identifiable when the infant is later diagnosed as failing to thrive or is abused.

Limited research is available regarding the relationship between maternal contact and interaction with her

infant in the NICU and later maternal caretaking behavior in the home environment. The data presented by Minde et al. (1980) revealed that the highly interactive mother in the NICU is also the highly interactive mother in the home environment. It is the intent of this study to further investigate if the amount of maternal visitation and contact with her infant in the hospital is related to the type of mothering the infant will receive in the home environment. In addition, this study will also describe some key characteristics of mothers who have high and low amounts of interaction with their infants both in the hospital and at home.

Conceptual Framework

In many mammalian species the mother of the infant is responsible for providing the care necessary for the infant's survival, growth, and development. One, therefore, may make the assumption that these species have developed an adaptive system of maternal infant interaction to assist the mother in her care of the newborn. This interactive system may consist of two components. One, newborns are capable of emitting cues in order to communicate their needs to their mother, and secondly, mothers interpret these cues and learn to respond appropriately to their infant's signals for care. Thus, this interactive system suggests that mothers and infants are both initiators and responders during their shared interactions (Barnard, 1977; Goldberg, 1979).

When the infant has been born prematurely, it may be more difficult for the mother-infant dyad to develop the normal pattern of interaction in which both infant and mother initiate and respond to mutually complementary behavior (Goldberg, 1979). On the infant's side, it is assumed that the immature baby may not be likely to give the mother clear care soliciting signals. On the mother's side, it is believed that the mother may have difficulty interpreting the few cues her premature infant communicates to her.

The research of Klaus and Kennell (1970) has suggested that early interaction or deprivation of interaction between mother and infant which occurs soon after the delivery process, may be important to eventual maternal behavior. When an infant is born prematurely, s/he is often immediately rushed to the neonatal intensive care unit allowing minimal maternal-infant interaction following delivery. Mothers are even further deprived of interaction with their babies when their premature infant remains hospitalized for extended periods of time (Barnett et al., 1970). Thus, the mother has very few opportunities to learn to recognize the cues her infant may emit when attempting to communicate to her. This information suggests that both the mother's and infant's abilities to contribute to the interaction process may be impaired by a premature delivery, because the development

of interactive capacities has been disrupted, and the mother and infant have little time together in which to become acquainted.

Usually when one member of the interactive pair has a limited ability to interact, the other member of the dyad makes adjustment to compensate for their less responsive partner. In reference to the premature mother-infant dyad, the premature infant may not demonstrate as much responsiveness to his mother as his full-term counterpart. Thus, it is usually the responsibility of the mother of a premature infant to adapt to her less responsive partner which she may do by investing more effort in the interaction (Beckwith & Cohen, 1978; Field, 1977; Goldberg, 1977; Goldberg, 1979).

It is important to realize that the mother of a premature infant may be thrust into the maternal role before she is psychologically prepared for it. Kaplan and Mason (1960) noted that a mother of a premature infant often experiences grief and depression following the delivery as a result of her failure to produce a healthy full-term baby and because she fears the death of her premature infant. Kennell and Klaus (1976) have suggested that a mother's frequent visitation to the neonatal intensive care unit may accelerate the mother's working through her grief and subsequently accepting and relating to her premature baby. It is assumed that a mother's interaction with her infant in

the NICU will facilitate attachment of the mother to her infant because a mother needs opportunities to become acquainted with her infant in order for the developing affectional relationship to blossom. It is also believed that when a mother has more opportunities to be near her infant, she becomes increasingly aware and sensitive to the discrete care soliciting cues her infant emits. In order for a positive interaction to occur between the mother and the premature infant, the mother must adjust to her less responsive partner by becoming sensitive and sympathetic to her baby's needs.

Yet to be demonstrated is that early maternal involvement with her premature infant, and the early development of an affectional relationship between mother and infant are predictive of the quality of the subsequent maternal-infant relationship. If this were found to be true, then the assessment of a mother's interaction with her infant in the NICU would be extremely important in order to identify those mother-infant dyads at risk for developing an unhealthy relationship. If a high-risk dyad could be identified early in the neonatal period, then appropriate intervention could be initiated reducing the probability that the infant would eventually be abused or neglected.

Therefore, this study has addressed the following research questions:

1. Do mothers who visit the NICU more often also demonstrate more maternal behaviors during their NICU visit than those mothers visiting the NICU less often?
2. Do mothers who visit their infants more often in the NICU during the first two weeks of the infant's life demonstrate more maternal behaviors during a feeding situation one month after the infant is discharged from the hospital than mothers who visit their infants in the NICU less often during the first two weeks of life?
3. Do mothers who demonstrate more maternal attachment behaviors during their visits with their premature infants in the NICU demonstrate more maternal behaviors during a feeding situation one month after the infant is discharged from the hospital than mothers who demonstrate fewer maternal attachment behaviors during their visits with their premature infant in the NICU?
4. Do mothers who demonstrate more maternal behaviors during a feeding situation in the home one month after the infant's discharge from the hospital have infants who demonstrate more responsive behavior and emit clearer cues than mothers who

demonstrate fewer maternal behaviors during a feeding?

5. Are there characteristics which differentiate between mothers who visit the NICU more frequently and mothers who visit the NICU less frequently?
6. Are there characteristics which differentiate mothers who interact a great deal with their infants during their visitation in the NICU from mothers who interact little with their infants during their visitation in the NICU?

CHAPTER II

METHODS

Introduction

The aim of this study was to examine the relationship between the patterns of maternal visitations in the neonatal intensive care unit (NICU) and maternal care activities in the home environment. This study also collected data to describe characteristics which differentiated those mothers who visited the NICU most frequently from those mothers visiting the NICU seldom. Additional data were collected to describe characteristics which differentiated mothers demonstrating more maternal behaviors in the NICU from those mothers demonstrating fewer maternal behaviors in the NICU.

Subjects and Setting

The sample for this study consisted of 12 premature infants and their mothers. These mother-infant dyads were from a variety of cultural backgrounds. The subjects were obtained from a regional NICU located at Yakima Valley Memorial Hospital in Yakima, Washington, a private community hospital in southeastern Washington. This NICU has a capacity of nine beds and maintains an open visitation policy for parents which allows parental visitation at any time other than when the infant is experiencing emergency

resuscitative procedures or major diagnostic tests.

The researcher selected this NICU because the infant's who are admitted comr from a variety of backgrounds. The maternal behaviors demonstrated by the mothers of these infants were expected to vary because of the mother's different characteristics.

The infants included in this study were those infants admitted to this NICU between July 1, 1980 and November 1, 1980. They had gestational ages between 29 and 37 weeks, and they were diagnosed as premature by either a staff physician or a private physician. Infants less than 29 weeks gestation were not included because Minde's (1978) research has shown that infants whose gestational age is less than 29 weeks respond very little to maternal stimulation. This is important because a mother's interaction with her infant is influenced by her infant's behavior (Beckwith & Coehn, 1978; Field, 1977; Goldberg, 1979).

All the infants had birth weights less than 3000 grams, were singleton births, and were confined to an isolette or an Ohio Open Care Center for periods of not less than two weeks. The infants had no known congenital anomalies, but may or may not have had respiratory distress syndrome. Some of the infants required respirator care, tube feedings, oxygen therapy, intravenous puncture, and bilirubin phototherapy during their hospitalization.

Only the mothers who indicated they would be responsible for over 50% of their infant's care after the infant's discharge from the hospital were included. Mothers included were at least 16 years of age, and they spoke and understood English. All mothers lived within a 100 mile radius of the NICU. This criteria was necessary so all mothers had a fairly equal opportunity to visit their infants while hospitalized.

Sample Recruitment

Prior to contacting the mothers regarding their willingness to participate in the study, the infant's chart, and the mother's chart (if accessible) were reviewed to ascertain if the mother-infant dyads met the criteria for inclusion. The charts were also reviewed to identify if the mother had any concurrent problems which possibly could have been aggravated by the researcher suggesting she be included in the study (i.e., psychiatric disturbances, history of child abuse etc.).

Mothers who delivered at Yakima Valley Memorial Hospital (YVMH) were approached while they were in the hospital, following the first visit to the NICU. The mothers were asked if they would be willing to participate in a study to help nurses learn more about the early experiences of a mother and her premature infant. The mothers were told that

nurses would be collecting information regarding how often they visited their infant; that the investigator would observe one of their visits with their infant during the baby's second week in the hospital; and one month after the baby was discharged the investigator would visit their home to observe one of the infant's feedings by his or her mother. The mothers were informed that in order to allow each of them an equal opportunity to become oriented to the setting and their new baby prior to observation, data would not be collected on the mother's first visit. The number of visits prior to the observation period was recorded to permit subsequent evaluation of the possible effect of frequency on the mother's comfort in the environment.

It was also discussed with the mothers that there would be no monetary reimbursement for their participation in the study and that they could withdraw from the study at any time without affecting their relationship with the health professionals caring for their infant. If the mothers agreed to participate in the study, an informed consent form was signed. The researcher attempted to schedule the observation periods at times which were convenient for the mother.

Mothers who delivered at another hospital and whose infants were transported to the NICU at YVMH were initially contacted by telephone after they returned home from the

hospital. These mothers were given the same information about the study as the mothers delivering at YVMH. If the mother indicated she was willing to participate in the study, the researcher arranged to visit her at the NICU. The investigator visited the NICU in an attempt to meet with the mother. The mother was not approached regarding inclusion in the study until she indicated she had completed her first visit with her newborn and she was leaving the NICU (i.e., she removed her gown or stated "I am leaving the hospital"). At this time the investigator explained the study to the mother and obtained a completed consent form if the mother was willing to participate in the study. If the investigator was unable to visit the NICU during the mother's stay at the NICU, then the registered nurse caring for the infant was responsible for obtaining a completed informed consent form. When the form was completed, the nurse placed it in the infant's chart.

Independent Variables

The quantity of maternal visitations in the NICU during the infant's first two weeks of hospitalization, and the amount of maternal behaviors demonstrated in the NICU were the independent variables in this study. The relationship between the number of maternal visitations in the NICU and maternal caretaker behaviors in the home environment were

investigated. Also, the relationships between the number of maternal behaviors demonstrated during a visitation of the NICU and maternal caretaker behaviors in the home environment were investigated.

Quantity of Maternal Visitations

The number of maternal visitations in the NICU which were at least 15 minutes in duration, during the infant's initial 14 days of hospitalization were recorded by nurses on a flow sheet in the infant's chart. The flow sheet was devised by this author (see Appendix A).

Maternal Behaviors Demonstrated in the NICU

Researchers have attempted to evaluate the maternal-infant relationship by the direct observation of interactions occurring between mother and infant (Ainsworth, 1972; Cropley, Lester, & Pennington, 1976; Rheingold, 1960). Many investigators have focused upon specific maternal behaviors occurring during this interaction process which have been suggested to be indicators of a mother's attachment to her newborn (Cropley et al., 1976; Curry, 1979; de Chateau, 1976; Hales, 1977; Klaus, 1970; Kontos, 1978).

Although several authors have identified maternal behaviors which are suggestive of a mother's attachment to her newborn infant, few specific instruments have been

developed to assess these maternal attachment behaviors. An observation guide developed by Cropley (1979) was chosen for this study (see Appendix B). This observation guide lists 36 maternal behaviors which are believed to be indicators of a mother's attachment to her newborn. The Cropley observation guide for maternal behaviors was originally developed for use with mothers of full term infants during the week following the delivery and for mothers of high-risk infants during the infant's hospitalization. Thus, it was appropriate for this study. Also, because this tool was designed to record maternal behaviors during a mother's short interaction with her infant, it was thought to be suitable for use when evaluating maternal behaviors during a mother's single visitation in the NICU.

Reliability and validity. Cropley (1979) did not report any established reliability or validity regarding the observational guide for maternal behaviors. The tool was chosen despite the absence of reported validity and reliability, because it is the only observational guide available in the literature which has been developed for the purpose of assessing the developing maternal-infant relationship. Although Cropley has not established validity regarding this tool, it becomes apparent upon reviewing the literature that the 36 maternal behaviors contained in the guide are consistent with the maternal attachment behaviors described by a

variety of researchers in the literature. Thus, content validity is a primary source of validity for Cropley's instrument.

Content validity of Observation Guide for Maternal Behavior. Many researchers have attempted to define a mother's attachment to her newborn operationally. Affectional behaviors which have been utilized to measure a mother's attachment to her newborn infant include: soothing (Kennell et al., 1974; Klaus et al., 1980), fondling (Funke & Irby, 1978; Hales et al., 1977; Kontos, 1978), smiling (de Chateau, 1976; Funke & Irby, 1978; Hales et al., 1977; Kontos, 1978), and kissing the infant (Funke & Irby, 1978; Hales et al, 1977; Kontos, 1978). Verbal behaviors classified as indicating maternal attachment include: calls baby by name (Clark & Affonso, 1967; Funke & Irby, 1978), talks or sings to infant (Curry, 1979; de Chateau, 1976; Funke & Irby, 1978; Hales et al., 1977; Kontos, 1978; Rheingold, 1960), associates infant's characteristics with those of another family member (Robson & Moss, 1970; Rubin, 1972), recognizes infant's positive features (Robson & Moss, 1970; Rubin, 1971); and attempts to gain knowledge about her baby's appearance, behavior, and physical intactness (Clark & Affonso, 1976; Cropley et al., 1976; Robson & Moss, 1970; Rubin, 1972). The touch of a mother has often been utilized as an indicator of maternal attachment to her newborn.

Specific types of touch which have been focused upon include: when handed infant, reaches out to receive (Clark & Affonso, 1976; Cropley et al., 1976), uses fingertip touch (Funke & Irby, 1978; Klaus, Kennell, Plumb, & Zuelhke, 1974; Rubin, 1963), uses palmar touch (Funke & Irby, 1978; Klaus et al., 1974; Rubin, 1963), enfolds infant in arms and holds infant next to her body (Funke & Irby, 1978; Hales et al., 1977; Rheingold, 1960), and kisses infant (Funke & Irby, 1978; Hales et al., 1977; Kontos, 1978).

Many researchers have included distal contact behaviors in their operational definition of maternal attachment such as: spends time looking at infant other than when providing care (Funke & Irby, 1978), partially unwraps or undresses baby to observe bodily features (Hales et al., 1977), changes own position to establish eye contact and uses en face position (Curry, 1979; de Chateau, 1976; Hales et al., 1977; Kontos, 1978). Among the maternal caretaking behaviors which have often been used to operationalize the concept of attachment are: changes diapers in response to infant's need for cleaning (Funke & Irby, 1978; Hales et al., 1977; Rheingold, 1960), feeds baby immediately upon demand (Funke & Irby, 1978), responds to baby's behavior by changing own behavior (Funke & Irby, 1978), responds to baby's need for postural comfort (Funke & Irby, 1978; Rheingold, 1960), and

discontinues feeding when infant appears to be finished eating (Funke & Irby, 1978).

Finally, Cropley included the mother's perception of herself as one of the criteria of attachment indicators. A mother's perception of herself, and how others react to and appraise her have been found to be either a great help or a hinderance to her ability to become attached to her infant (Clark & AFfonso, 1976). Among the 20 primiparous mothers Curry (1979) studied, 25 percent experienced a difficult adaption to parenthood. These difficult adapters demonstrated fewer maternal attachment behaviors three months after delivery and their self concept scores had fallen during this three month period.

Scoring of the Observation Guide for Maternal Behaviors. When utilizing this instrument, the investigator observed the mother's visit with her infant in the NICU for 15 minutes and recorded which of the 36 maternal behaviors listed on Cropley's tool were demonstrated. Those maternal behaviors listed on the tool which were not possible for the mother to demonstrate were recorded. The number of behaviors which were not possible for the mother to exhibit were subtracted from 36 to arrive at the total number of behaviors included in the observational guide which the mother could potentially display. The actual number of behaviors included on the

observation guide was divided by the potential number of behaviors and multiplied by 100 to transform the value to a percentage figure. Thus, mothers who scored closer to 100 percent demonstrated more of the potential maternal behaviors than mothers with lower percentage scores.

Extraneous Variables

It was assumed that many factors could influence maternal visitation patterns in the NICU and subsequent maternal behaviors in the home environment. Thus, data was collected regarding: maternal ethnicity, age, marital status, education, and parity; yearly family income, whether the infant was transported to the NICU, distance the mother lived from the hospital, available means of transporation to the hospital, maternal gestational illness, mode of infant feeding, the infant's sex, birth weight, gestational age, and severity of illness. Data were collected to provide a description of mothers who visited the NICU frequently and those who visited the NICU less frequently and to describe later maternal interaction patterns with the infant (see Appendix C).

Dependent Variable

The quantity of maternal behaviors demonstrated during a feeding experience in the home environment one month after the infant's discharge was the dependent variable in this study. The quantity of maternal behaviors observed during the infant's feeding was assessed using a feeding scale developed at the University of Washington by Barnard and Gortner (1979). The investigator chose to study a feeding situation because research has shown that reliable indicators of maternal behavior have been found to be those related to the mother's style of feeding (Brody, 1956; Funke & Irby, 1978). An observational tool was chosen because a method of measuring maternal care in terms of the actual operations the mother performs in caring for her infant was desired.

The Nursing Child Assessment Satellite Training Project Feeding Scale (NCAST Feeding Scale) was used to assess maternal activities in a natural setting (see Appendix D for a copy of this instrument). This tool consists of 76 items: 50 which describe maternal behaviors and 26 which describe infant behaviors. The categories of maternal behaviors include: maternal sensitivity to the cues her infant emits during a meeting, maternal response to any distress her infant may communicate during a feeding, maternal behaviors

to foster her infant's social-emotional growth during the feeding, and maternal behaviors to foster her infant's cognitive growth during the feeding. Sixteen behaviors are included under the category "sensitivity to cues"; 11 behaviors are included under the category "response to distress"; 14 behaviors are included under the category "social emotional growth fostering"; and nine items are included under the category "cognitive growth fostering". Each observed behavior is worth one point. The number of behaviors observed in each category or subscale are summed to obtain four subscale totals. The subscale totals in the category "sensitivity to cues" can range from zero to 16. Those subjects scoring closer to 16 were classified as demonstrating more maternal behaviors regarding sensitivity to their infant's cues. Scoring of the other categories was done in a similar manner. A summative score for each individual mother was calculated by addition of the four subscale totals. The summative scores could potentially range from zero to 50. Those mothers who scored closer to 50 were identified as demonstrating more maternal behaviors during the feeding of their infants. Scoring of the two categories regarding infant behavior was done in a similar manner. A summative score for each infant was calculated by adding together the two subscale totals. The summative scores could potentially range from zero to 26, with those infants scoring closer to

26 identified as demonstrating more behaviors during feedings.

NCAST Training

Prior to the utilization of the Nursing Child Assessment Feeding Scale (NCAFS), the researcher obtained training at the University of Washington regarding its administration. In addition to the training, the researcher and a professional certified in the administration of NCAFS achieved 85 percent inter-observer reliability when observing five mother-infant dyads during a feeding situation.

Reliability of NCAFS. King (1979) reported information regarding the reliability of NCAFS. Three professionals trained in the use of the feeding scale rated 32 mother-infant dyads. King only looked at five of the six categories of maternal and infant behaviors included in NCAFS. Of the five categories studied, the internal consistency reliability estimates for NCAFS, when the infant was one month of age, ranged from 0.28 to 0.71. A reliability of 0.28 is reported for the category "responsiveness to mother", and a reliability of 0.71 is reported for the category "responsiveness to cues" (refer to Appendix E).

King (1979) reported a lack of stability of the five constructs measuring characteristics of caregiver-infant interactions over four administration periods during the

infant's first year of life. The administration periods are: one month after birth, four months after birth, eight months after birth, and 12 months after birth. Test-retest reliability comparing the results of testing at one month and the results of testing at four months ranged from 0.25 to 0.46 (refer to Appendix F). King (1979) questions whether the instability noted was due to anomalies in the instrument or the process in which new parents adapt their lives around the newborn infant, and the infant's subsequent reaction to his or her altered environment.

Validity. Current and predictive validity of NCAFS were developed by the use of multiple regression of the five constructs, at a specific time period, on a variety of selected dependent variables related to an infant's cognitive growth and its outcomes. The measure selected for validation of NCAFS include: Bayley Scale of Infant Development, Birth-Two years: Mental Development Index (MDI), and Physical Development Index (PDI) (Bayley, 1977); Preschool Behavior Questionnaire (PBQ) (Behar, 1977); Home Observation for Measurement of Environment (HOME) (Caldwell, 1977); Sequenced Inventory of Communication Development (SICD) (Hendrick, Prather, & Tobin, 1975); McCarthey's Scales of Children's Ability (McCarthey, 1972); and Stanford Binet Intelligence Test (Terman & Merrill, 1960). The initial

correlation coefficients reported between the HOME total score at four months, eight months, 12 months, 24 months, and 36 months, and the feeding constructs at one month ranged in values from 0.32 to 0.63 (see Appendix G). Multiple correlation coefficients between the NCAFS constructs and the measures selected for validation yielded the following averages: Bayley MDI - 0.41; Bayley PDI - 0.36; Behar PDQ - 0.49; Caldwell HOME - 0.42; SICD expressive language - 0.48; SICD receptive language - 0.48; McCarthey Scales - 0.43; and Standford Binet - 0.48 (King, 1979, p. 160). King (1979) suggested that the absence of significant relationships may have been affected by the small sample size utilized to assess the reliability and validity of NCAFS.

Norms. A sample of 846 caretaker-infant dyads were the standardization group from which the norms of the NCAFS were developed. The sample included: infants ranging in age from one to 31 months; approximately equal numbers of male and female infants; black, white, Hispanic, and other subjects; and breast, bottle and solid fed infants. The academic levels of the caretakers ranged from six to 20 years; both married and unmarried caretakers were included in the study; and an overwhelming majority of the caretakers were mothers. The data revealed that children of unmarried mothers scored lower on the feeding scales; that younger children had lower average scores; and the more

schooling a mother had acquired, the higher the average score. Racial differences were moderately consistent over the 36 months testing period. On four of the six constructs, white caretakers had statistically higher mean scores than black caretakers. On the constructs "sensitivity to cues" and "response to distress", significant differences between ethnic groups were not revealed (Barnard, 1979, p. 173) (see Appendix H).

Procedure

Flow sheets were placed in the infant's chart after the informed consent form was obtained from the mother. Nurses were asked to record information daily from the infant's third day of hospitalization through and including the infant's 17th day of hospitalization. The initiation of data collection on the third day postpartum was to allow the investigator time to contact most mothers and obtain an informed consent. Another reason for delaying the onset of data collection until the third postpartum day was to allow mothers who delivered at outlying hospitals equal opportunities to visit their infant's in the NICU as mothers giving birth at the hospital where their infants were hospitalized. It was assumed that the mother who delivered at another hospital would usually be discharged from the hospital by the third postpartum day.

The nurse caring for the infant at the time of the mother's visitation was asked to complete a flow sheet. Nurses working the evening shift were asked to double check to make certain that the form was completed when finishing their nurse's notes for the shift. The content of the nurse's notes was reviewed by the investigator to assure that all the mother's visits in the NICU which were recorded in the nurse's notes were also included on the flow sheets. If a discrepancy existed, the investigator contacted the nurse caring for the infant on the specific day in which the discrepancy occurred. This was done to obtain more accurate information regarding the mother's visitation or non-visitation of the NICU on that particular day.

At the time the informed consent form was obtained from the mother, the mother was told that the investigator would call the mother at the beginning of the infant's second week of hospitalization to arrange a time for the investigator to observe a mother-infant interaction in the NICU. On the first or second day of the infant's second week of hospitalization, the investigator arranged a time with the mother to observe this interaction.

Cropley has not suggested a specific time frame in which to use her observation guide in the NICU. For this particular study, mothers were observed interacting with their infants for exactly 15 minutes. The observation and recording

of maternal behaviors occurred once the mother had become gowned, scrubbed, and was within two feet of her infant.

Prior to using this guide, the investigator and a registered nurse employed in the NICU simultaneously observed three mother-infant dyads not included in the study sample. Maternal behaviors were recorded independently and an interrater reliability of at least 90 percent was achieved on all dyads observed.

After the investigator alone observed five mother-infant dyads included in the study, the investigator and the same registered nurse recorded the items of maternal behavior they observed during the sixth mother-infant dyad interaction. The value of interrater reliability was 95 percent, thus the investigator continued to collect data on the seventh through the 12th mother-infant dyads.

After observing a sample mother's visit with her newborn for 15 mintues, the investigator reminded the mother that she would be visiting the mother and her infant at home one month after the infant's discharge from the hospital. Also, at this time, the mother was given a prestamped postcard addressed to the investigator. She was instructed to complete the postcard and mail it if she and the baby had or expected to have a change of address or telephone number (see Appendix I).

One to two days after the infant was discharged from the hospital, the investigator contacted the mother by telephone and reminded her of the home visit in approximately four weeks. Two weeks after the infant had been discharged, the investigator mailed the mother a postcard saying she was looking forward to visiting the mother and infant in the home during a specific time (i.e., "I am looking forward to seeing you and Timmy during the first week of August"). For a copy of the postcard, the reader may refer to Appendix J. One week prior to the home visit, the investigator telephoned the mother and arranged a convenient time for a home visitation the following week. The mother was told that the investigator would again call on the morning of the scheduled home visit. On the day of the home visit, the investigator called to confirm the previous arrangements, and to make any readjustments in order that the observation time was arranged around the infant's feeding schedule. Thus, after the infant had been home for approximately four weeks, an observation of the mother feeding her infant was conducted utilizing the feeding scale developed by Barnard and her associates (1979).

Focusing on the mother's interaction with her infant approximately one month after birth has been found to be suggestive of the quality of the developing maternal-child relationship. Clark states "apparently the processes for

successful mother-child interaction have been set in motion by the time the child is one month old" (Clark, 1976, p. 105).

Minde et al. (1978) found that 70 percent of the mothers who interacted most with their infants in the NICU continued to interact more with their infants at one, two, and three months after the infants discharge from the hospital. This study, similar to the study of Minde et al., examined maternal-infant interaction soon after the infant's discharge from the hospital, because it was thought that if a mother-infant dyad at risk could be identified as early as one month after the infant's discharge from the hospital, then early intervention by the health team is more likely to occur. The investigator felt it was important for the infant to be home from the hospital for one month prior to the assessment of maternal behaviors, using NCAFS, in order to allow the mother a chance to become better acquainted with her infant and an opportunity to begin to establish a routine regarding the infant's care.

Prior to the initiation of the feeding interaction, the investigator told the mother several things. The feeding should be as natural as possible. It would be important for the investigator to remain quiet. The investigator would observe both the mother and infant continuously during the feeding and the mother should inform the investigator when the feeding was over.

CHAPTER III

RESULTS AND DISCUSSION

Introduction

The sample and the results of this study related to the research questions, maternal characteristics, and infant characteristics are discussed in this chapter. Because the sample size was very small, all the factors influencing the independent and dependent variables could not be looked at simultaneously and conclusions could not be made, but each extraneous variable which was studied was addressed systematically and the findings were linked to the literature.

Sample

Using the recruitment procedures described in the preceding chapter, 12 mothers and their premature infants who met the inclusion criteria for the study were obtained. The mothers were observed during one visitation to the neonatal intensive care unit (NICU) during their infant's first two weeks of hospitalization, and each visit they made during their infant's first two weeks of stay in the NICU was recorded. The investigator was unable to locate two of the mothers following the infant's discharge from the hospital. Both mothers had changed their residence, and one had relinquiched the care of her newborn. Thus, only 10 mother-infant dyads were observed in the home one month after discharge.

Findings Related to Research Questions

Relationship Between Number of Maternal Visitations to the NICU and Maternal Behaviors Demonstrated in NICU

This study focused on the following research question: Do mothers who visit the NICU more often also demonstrate more maternal behaviors during their visit than those mothers visiting the NICU less often? As seen in Figure 1, a positive correlation was found between the number of times each mother visited her infant during the first two weeks of hospitalization and the number of maternal attachment behaviors she demonstrated while visiting her infant ($r = 0.47$; $p < 0.10$). This finding is similar to the findings of Minde et al. (1980). They also found that mothers who interact a great deal with their infants in the NICU upon visitation also tend to visit their infants more often. Their study also suggested that during the mother's first two visits to the hospital, she is hesitant to touch her infant. But, often from the third visit onward, which usually occurred during the first two weeks following delivery, more maternal handling was reported. This increased interaction is thought to be an overt manifestation of attachment (Klaus et al., 1970; Minde et al., 1980; Rubin, 1963).

Relationship Between Number of Maternal Visitations to the NICU and Maternal Behaviors Demonstrated in the Home

Another research question included in the study was: Do mothers who visit their infants more often in the NICU during the first two weeks of the infant's life demonstrate more maternal behaviors during a feeding situation one month after the infant's discharge from the hospital than mothers who visit their infants in the NICU less often during the first two weeks of life? As seen in Figure 2, a slight positive correlation between the number of maternal visitations during the first two weeks of her infant's hospitalization and the maternal behaviors demonstrated in the home during a feeding was found ($r = 0.33$). This correlation is consistent with Minde's data (1980; 1978) which indicated that mothers visiting their infants most often not only interact more with them while visiting, but these highly interactive mothers continue their greater degree of interaction following their baby's discharge. This is significant as the extent to which a mother interacts with her infant is considered to be an indication of her attachment.

Studies regarding the frequency of maternal visitation in the NICU have suggested that mothers who visit their babies very little are much more likely to show extreme maladaptive maternal behavior such as child abuse, and relinquishment of the child's care. These maladaptive maternal

behaviors are believed to be overt manifestations of the mother's apparent lack of affection for her infant which is thought to be related to a mother's decreased or delayed ability to become attached to her infant (Barnett et al., 1970; Fanaroff et al., 1974; Hunter et al., 1978; Jeffcoate et al., 1979; Kennell & Klaus, 1970; Leifer et al., 1972).

However, Minde et al (1980) reported that currently there is no evidence that any of the premature infants of the low activity mothers they studied had been seriously abused or neglected within the initial 12 months following discharge. It is noted, however, that two of the infants of consistently low activity mothers had been readmitted to the hospital due to low weight gain and an older male sibling had been physically abused during the infant's stay in the NICU.

Relationship Between Maternal Behaviors Demonstrated in the NICU and Maternal Behaviors Demonstrated in the Home

Another research question addressed by this study was: Do mothers who demonstrate more maternal attachment behaviors during their visits with their premature infants in the NICU demonstrate more maternal behaviors during a feeding situation, one month after the infant is discharged from the hospital, than mothers who demonstrate fewer maternal attachment behaviors during their visits with their premature infants in

the NICU? As seen in Figure 3, a significant positive correlation was found between the amount of maternal adaptive behaviors demonstrated during hospitalization and maternal behaviors shown during a feeding situation at home ($r = 0.57$; $p < 0.05$). This data suggests that the mother who demonstrates adaptive maternal behaviors in the NICU continues to demonstrate similar maternal behaviors at home one month following the infant's discharge. Again, these findings support the work of Minde et al. (1980; 1978) which have shown that the mother who interacts a great deal with her infant in the NICU continues to be highly interactive at one, two, and three months following the infant's discharge from the hospital.

Relationship Between Maternal Behaviors Demonstrated During Feeding and Infant Behaviors Demonstrated During Feeding

The following research question concerning maternal-infant interaction was focused on: Do mothers who demonstrate more maternal behaviors during a feeding in the home, one month after the infant's discharge from the hospital, have infants who demonstrate more responsive behavior and emit clearer cues than mothers who demonstrate fewer maternal behaviors during a feeding?

Assessment of the feeding situation in the home environment revealed that mothers who displayed more maternal behaviors and expressed more verbalization toward their infant,

which were suggestive of attachment, had infants who displayed more affectional or care soliciting behaviors. Thus, as seen in Figure 4, these infants appeared to be more responsive to their mothers ($r = 0.83$; $p < 0.005$).

This is similar to the findings of Osofsky (1976) and Osofsky and Danzger (1974) regarding two and four day old full term infants and their mothers. They found consistent relationships between maternal and infant behaviors. Specifically, more alert and responsive infants had more responsive and sensitive mothers. By contrast, Minde et al. (1978) found that mothers and their premature infants did not match up in terms of degree of activity either in the nursery or at home. However, Minde et al. did find that infants who were touched by their mothers, and who were at least 28 weeks of gestation, had their eyes open more often than those who were not touched. Later, Minde et al. (1980) studied the direction of influence in the maternal-infant interaction process. They concluded that mothers respond primarily to their infant's signals, and there is at least some bidirectional influence occurring, which is supported by this study's data.

Other studies, however, have found different results. Goldberg (1978) reported that parents of unresponsive infants appear to work harder during feedings to stimulate their infants in the first few months of life than parents of more responsive infants. Thus, it appeared that parents of less

responsive infants tended to overcompensate for their disadvantaged partner by offering the infant more vocal and tactile stimulation. However, Goldberg stated that this overcompensation fades during the first year of life. Therefore, it may be possible that the mother may indeed provide added amounts of stimulation to her less responsive partner during the early days following delivery and the infant who has received sufficient amounts of maternal stimulation may become more responsive to his highly interactive mother than the infant whose mother has interacted very little with him. Thus, if these alterations in the interactive process do occur at differing time periods, it might explain why different studies have reported varied findings. If this explanation were true, one would expect to see a highly interactive mother compensating for her disadvantaged infant during the early neonatal period. Further, a highly interactive mother would most likely have a highly interactive infant as a partner later as the mother-infant relationship develops.

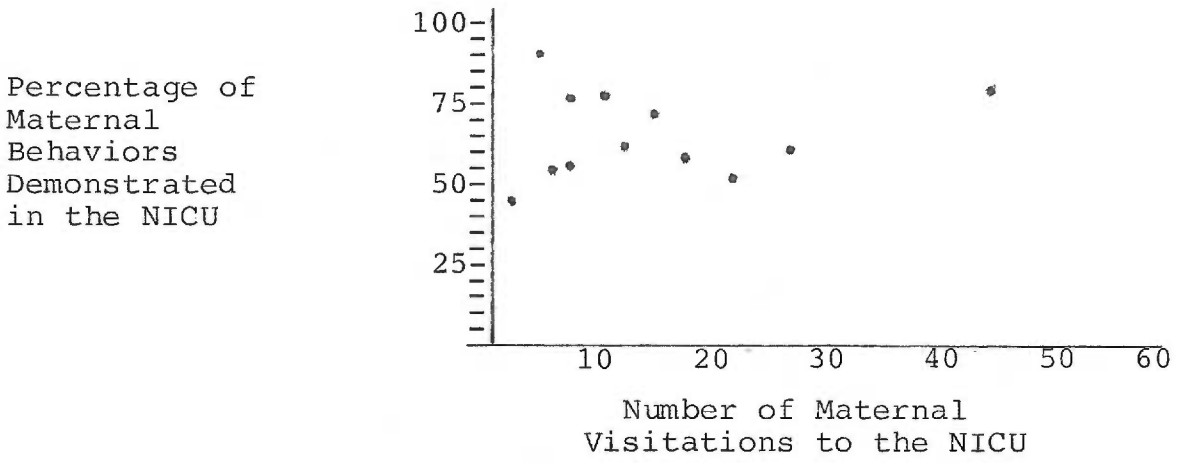

Figure 1. Correlation between number of maternal visitations to the NICU and the percentage of maternal behaviors demonstrated while visiting the NICU during the infant's second week of life ($n = 12$; $r = 0.47$; $p < 0.10$).

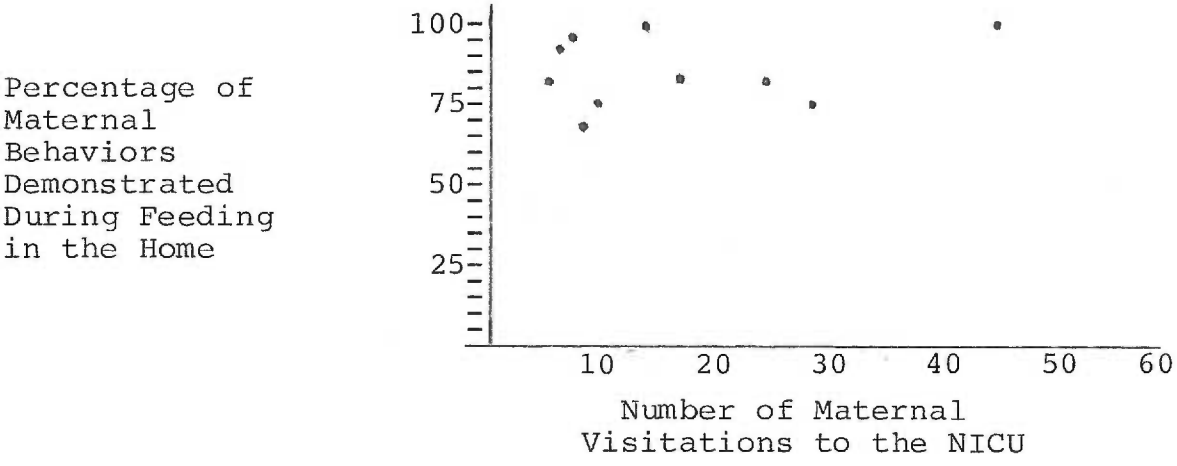

Figure 2. Correlation between number of maternal visitations to the NICU and the percentage of maternal behaviors demonstrated during a feeding one month following the infant's discharge ($n = 10$; $r = 0.33$).

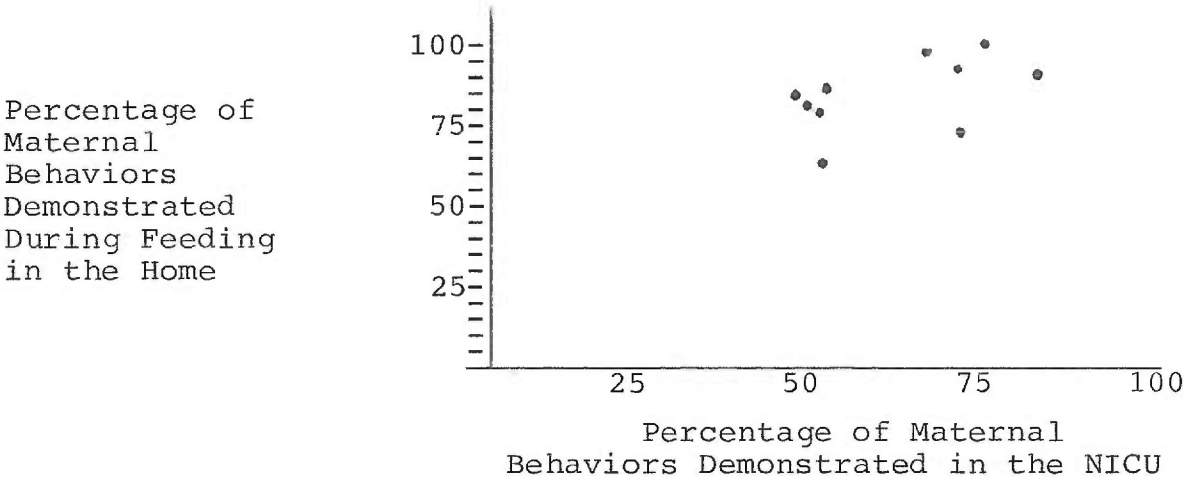

Figure 3. Correlation between percentage of maternal behaviors demonstrated in the NICU and the percentage of maternal behaviors demonstrated at home during a feeding ($n = 10$; $r = 0.57$; $p < 0.05$).

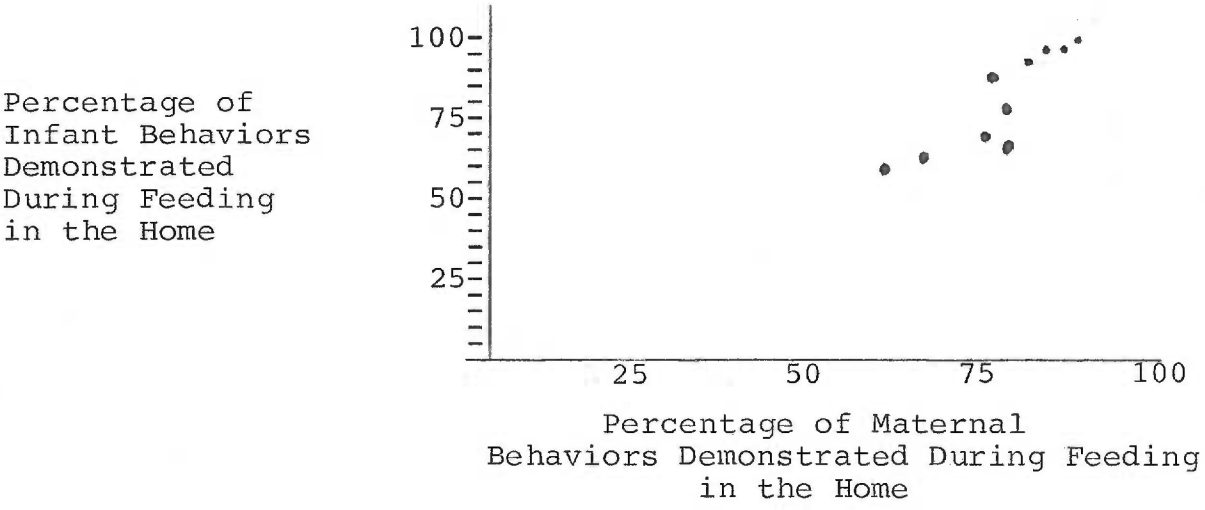

Figure 4. Correlation between the percentage of maternal behaviors demonstrated during a feeding in the home and the percentage of infant behaviors demonstrated during the same observation ($n = 10$; $r = 0.83$; $p < 0.005$).

Findings Related to Maternal Characteristics

Relationship Between Culture and Maternal Behavior

As revealed in Table 2, white mothers tended to visit their infants more often in the NICU, displayed more adaptive behaviors during their visits and demonstrated more maternal behaviors that were suggestive of attachment during a feeding in the home than either Hispanic or Indian mothers. Very little information is available in the literature regarding cultural variations in maternal behavior, although Barnard and Gortner (1979) found that white mothers of full term infants scored significantly higher on the NCAST feeding scale than Hispanic mothers ($p < 0.05$).

Table 2

NICU Visits, NICU Behavior, and Home Behaviors of White, Hispanic, and American Indian Mothers

	Number NICU Visits			Percent NICU Behavior			Percent Home Behavior		
Group	n	$\bar{x}$	median	n	$\bar{x}$	median	n	$\bar{x}$	median
White	6	18.5	12.5	6	73.5	75.0	6	85.5	87.0
Hispanic	5	13.6	12.0	5	53.2	54.0	3	74.7	78.0
Indian	1	7.0	7.0	1	53.0	53.0	1	80.0	80.0

A possible explanation for the differences found in this study may be that white mothers are more comfortable in the hospital environment with its highly technical equipment and almost sterile environment. Thus, they tended to visit more often and their behavior was less inhibited. Likewise, the white mother may be more at ease in her home during a feeding when a white female observer is present. By contrast, the Indian and Hispanic mothers may be somewhat uncomfortable when a person from another culture observes them while feeding their infant. However, all mothers included in the study denied being uncomfortable during the feeding, and said that the observed feeding was a typical feeding.

Another explanation is the possibility that the instruments used measured behaviors that are common maternal behaviors in white mothers, and mothers from other cultures may actually demonstrate other adaptive behaviors which were not included in the tools.

Several important characteristics which differentiate the Indian and Hispanic mothers from the white mothers in this study include: The six white mothers had a higher degree of formal education than the five Hispanic mothers. The population of white mothers included one college graduate, three mothers with some college, and two mothers who were high school graduates. The population of Hispanic

mothers included one mother with some college, one high school graduate, one mother with 10 years of formal education, and two mothers with less than six years of schooling. The mother of Indian heritage had 11 years of formal education.

There were also differences in the number of fathers present in the home. The father was present in four of the six white families. Whereas, in only two of the five Hispanic families studied was the father present in the home. The father in the Indian family which was included in the study resided in the home. White mothers were more likely to be in a higher socio-economic group than Hispanic mothers. Five of the six white mothers and infants did not require Welfare financial assistance. Whereas, only two of the five Hispanic mothers and infants did not require Welfare financial assistance. The Indian mother and her infant were not in need of Welfare financial assistance.

Maternal education, the presence of the infant's father in the home, and the family's financial status have been found to have an effect on maternal behavior. Because the Hispanic-Indian and white mothers do differ regarding these characteristics, one questions if the variances in maternal behavior were a result of differences in culture or education, the father's presence in the home, and socio-economic status, or some combination of these factors.

Relationship Between Socio-Economic Status and Maternal Behavior

Table 3 shows that mothers not requiring Welfare financial assistance visited their infants more often and demonstrated more maternal behaviors in the nursery and at home. This has not been a consistent finding in the literature. Minde et al. (1978) found that a combination of characteristics including: socio-economic status, maternal age, infant's birth weight, infant's gestational age, infant's sex, and the number of children living in the home increased the accuracy in predicting maternal behaviors by less than 22 percent. When studying aberrant maternal behavior, Lynch (1975) found that no one socio-economic group was more likely to be associated with child abuse.

Table 3

Mean and Median Maternal Behaviors of Families Requiring and Not Requiring Welfare

	Number NICU Visits			Percent NICU Behavior			Percent Home Behavior		
Group	n	$\bar{x}$	median	n	$\bar{x}$	median	n	$\bar{x}$	median
No Welfare	8	16.7	12.5	8	69.3	73.5	8	86.5	87.0
Welfare	4	11.5	10.5	4	51.5	51.5	2	73.0	73.0

It is important to note that all of the mothers in the current study who required Welfare financial assistance were

either single and not living with the infant's father, or married and separated from the infant's father and were not receiving financial assistance from the fathers for themselves or for the baby. Therefore, it is unclear whether the variable of socio-economic status or the absence of the father in the home is responsible for the variability in maternal behaviors noted in this study.

Relationship Between Paternal Presence in the Home and Maternal Behavior

It is difficult to interpret the results presented in Table 4. It is questionable whether mothers who resided with the infant's father visited the nursery more often. Although, Fanaroff et al. (1974) found that mothers who were married tended to visit the nursery more often than unmarried mothers. It does appear that those women who had the support of the infant's father at home showed more maternal adaptive behaviors when visiting the nursery. The finding which is most surprising is that the mothers who were single or separated from their husbands demonstrated more maternal behaviors during a feeding situation at home than married mothers. Unlike this study, Barnard and Gortner (1979) found that married mothers of full term infants did display significantly more maternal behaviors during a feeding in the home than unmarried mothers ($p < 0.05$). Mason (1963) reported that those mothers who had the support of their husbands or other

family members were best able to deal with the crisis of prematurity. Minde et al. (1978) reported that mothers who had good relationships with the father of the infant tended to interact more with their infants than mothers not having the same quality relationships with the infants' fathers.

Table 4

Mean and Median Maternal Behaviors When Fathers are Present or Not Present in the Home

	Number NICU Visits			Percent NICU Behavior			Percent Home Behavior		
Group	n	$\bar{x}$	median	n	$\bar{x}$	median	n	$\bar{x}$	median
Father in the Home	7	17.4	10.0	7	68.0	67.5	7	82.9	80.0
Father not in the Home	5	12.8	12.0	5	56.8	56.0	3	86.0	82.0

Two reasons why the results of this study are not consistant with the literature may be attributed to the very small sample size, and this study did not thoroughly investigate each mother's social support system. Perhaps, a few of the unmarried mothers had very supportive close friends and relatives who were able to help them cope with the crisis of prematurity, and to help them deal with their premature infants. Likewise, some of the married mothers may have had husbands who were not very supportive.

It is important to note that the three mothers who were unmarried and required Welfare financial assistance visited

their infants in the NICU less frequently and demonstrated fewer maternal behaviors both in the NICU and at home than the two mothers who were unmarried and did not require Welfare financial assistance. Because the sample size is small, no conclusions can be drawn. But an explanation for the findings might include: Those mothers who were unmarried and required Welfare financial assistance may have existed in socially disrupted environments and they may have had little social, emotional, and financial support from either their estranged husbands, close friends or relatives. Therefore, it might have been more difficult for each of these mothers to deal with the crisis of a premature birth and to develop an attachment for her infant than it was for the mothers with more adequate support systems.

Relationship Between Maternal Age and Maternal Behavior

Mothers included in this study ranged from 16 to 34 years of age. Maternal age was found to have basically no correlation to either the number of maternal visitations to the NICU ($r = 0.14$); the number of behaviors each mother demonstrated in the NICU ($r = 0.20$); or the number of maternal behaviors displayed in the home during a feeding ($r = -0.18$). These findings do not concur with the findings from published research which indicate that there may be a slight positive but not statistically significant correlation between maternal

age and adaptive maternal behavior (Fanaroff et al., 1974; Minde et al., 1978). However, as seen in Table 5, when the mothers were separated into groups of mothers more than 20 years at the time of their first infant's birth and mothers less than 20 years at the time of their first infant's birth, differences were found. Mothers giving birth for the first time after the age of 20 years visited their premature infants more often in the nursery, interacted more with their infants in the nursery, and displayed more maternal behaviors in the home than mothers having their first infant prior to 20 years of age.

Table 5

Mean and Median Maternal Behaviors of Mothers Younger or Older Than 20 Years When First Infant Born

	Number NICU Visits			Percent NICU Behavior			Percent Home Behavior		
Group	n	$\bar{x}$	median	n	$\bar{x}$	median	n	$\bar{x}$	median
Less than 20 years	6	11.6	9.5	6	56.3	53.5	4	73.5	75.0
More than 20 years	6	19.8	16.5	6	70.3	73.5	6	90.7	93.0

The findings presented in Table 5 are consistent with current research. Fanaroff et al. (1974) did report that mothers who were less than 20 years old tended to visit their premature infants while hospitalized less often than older mothers. Similarly, Lynch (1975) found that mothers less

than 20 years of age at the time of the birth of their first infant were more likely to abuse a child.

Relationship Between Maternal Parity and Maternal Behavior

The information presented in Table 6 reveals that the primiparous mothers visited their infants more often and demonstrated more maternal behaviors during these visits than the multiparous mothers. Primiparous mothers also continued to demonstrate more maternal behaviors toward their infants in the home at one month than multiparous mothers.

Perhaps it was easier for the primiparous mothers to visit their infants because they were not responsible for other children in the home. The fact that primiparous mothers visited their infants with increased frequency and had more opportunities to be with their infants may have helped them feel more comfortable interacting and caring for their infants. Thus, the fact that the multiparous mothers had not visited their infants very often in the NICU, and therefore had limited experiences interacting with their infants, may explain why they demonstrated fewer maternal behaviors during their visits.

The multiparous mother's responsibility and affection for her other children may have had a profound influence upon the number of maternal behaviors she demonstrated directly and solely toward her premature infant during the feeding

observation. Because she may have had to interact with her other children at the same time, she may not have been able to score as high on the feeding scale as the primiparous mother who devoted her undivided attention to her infant.

Table 6

Mean and Median Maternal Behaviors of Primiparous and Multiparous Women

	Number NICU Visits			Percent NICU Behavior			Percent Home Behavior		
Group	n	$\bar{x}$	median	n	$\bar{x}$	median	n	$\bar{x}$	median
Primiparous	5	18.4	12.0	5	64.6	58.0	6	88.5	86.0
Multiparous	7	13.4	10.0	7	62.4	54.0	4	80.7	80.0

Relationship Between Degree of Maternal Education and Maternal Behavior

Maternal education was positively related to the study's major variables. Mothers with more formal education visited their infants more often ($r = 0.33$); they demonstrated significantly more maternal adaptive and attachment behaviors while visiting ($r = 0.79$; $p < 0.005$); and they continued to demonstrate more maternal behaviors suggestive of attachment one month following the infant's discharge ($r = 0.38$).

These correlations are consistent with the literature. Hunter et al. (1978) found that mothers of maltreated infants had significantly less formal education than mothers of children not reported as maltreated ($p < 0.05$). Likewise, in their

study of 795 mothers and infants, Barnard and Gortner (1979) found that the more formal education a mother had received, the more maternal behaviors she demonstrated during a feeding situation in the home.

Relationship Between Maternal Gestational Illness and Maternal Behavior

Table 7 shows that mothers who experienced a gestational illness did not visit their infants as often in the NICU, demonstrated fewer maternal behaviors in the NICU, and demonstrated fewer maternal behaviors in the home than mothers who had not experienced a gestational illness. The gestational illnesses included in this study were: abruptio placenta, thrombophlebitis, pleurisy, and choleocystitis. This may be quite significant because Lynch (1975) and ten Bensel and Paxson (1977) have previously reported data which suggests that maternal gestational illness and postpartum separation are associated with severe child abuse. Thus, the findings of this study suggest that an early indication of the development of impaired or maladaptive relationship between the mothers affected by gestational illnesses and their infants may have been that these mothers demonstrated few maternal adaptive or attachment behaviors in the early postpartal period.

Table 7

Mean and Median Maternal Behaviors of Mothers Who Did and Did Not Experience a Gestational Illness

	Number NICU Visits			Percent NICU Behavior			Percent Home Behavior		
Group	n	$\bar{x}$	median	n	$\bar{x}$	median	n	$\bar{x}$	median
Illness	4	11.5	8.5	4	56.8	53.5	3	76.7	78.0
No Illness	8	17.5	13.5	8	66.7	65.0	7	86.9	92.0

Relationship Between Distance Mother Lives From the Hospital and Maternal Behavior

The data presented in Table 8 indicate that mothers who lived closer to their premature infants during the infant's hospitalization visited their infants more often and displayed more maternal behaviors during their visits than mothers living farther away from the hospital. Following the infant's discharge, the mothers who lived closer to their infants during the infants' hospital stays did not show more maternal behaviors suggestive of attachment one month after discharge than mothers who lived farther away. Unlike this study, Hunter et al. (1978) found no relationship between the distance a mother lived from the hospital and the frequency of her visits to the NICU.

Table 8

Mean and Median Maternal Behaviors of Mothers Living Less than 10, 10-25, and More than 25 Miles From the Hospital

	Number NICU Visits			Percent NICU Behavior			Percent Home Behavior		
Group	n	$\bar{x}$	median	n	$\bar{x}$	median	n	$\bar{x}$	median
Less than 10 miles	6	21.6	19.0	6	64.2	63.0	6[a]	82.0	80.0
10-25 Miles	3	12.7	12.0	3	67.0	58.0	2	85.0	85.0
More than 25 miles	3	12.0	7.0	3	58.0	53.0	2	87.0	87.0

[a]Two of these mothers lived 30 and 110 miles from the hospital, but they made arrangements to reside near the NICU during their infant's hospitalization.

Factors which may have influenced these findings include: the small number of mothers residing more than 10 miles from the hospital during the infant's hospitalization and the fact that two mothers were lost to follow through after the infant's discharge. Thus, data were not able to be collected regarding the behaviors of these two mothers during a feeding. One of these two mothers lived 18 miles from the hospital and the other lived 60 miles from the hospital. They were 16 and 20 years of age, had less than 10 years of education, and were Hispanic. One was single and the other was separated from her husband. Both scored lower than the means and medians regarding the frequency of their visits and

maternal behaviors in the NICU than other mothers who lived the same distance from the hospital. Thus, their scores on the NCAST Feeding Scale may have altered the results presented here.

Mode of Feeding Related to Maternal Behavior

When studying Table 9, it becomes apparent that mothers who breast fed their infants visited their infants more often in the hospital and interacted more with their infants during their visitations than bottle feeding mothers. Mothers who chose to breast feed also demonstrated more maternal behaviors on the NCAST Feeding Scale than mothers who chose to bottle feed. Barnard and Gortner (1979) did not report similar findings when comparing bottle-feeding and breast feeding mothers of full term infants.

Table 9

Mean and Median Maternal Behaviors of Mothers Breast and Bottle Feeding

	Number NICU Visits			Percent NICU Behavior			Percent Home Behavior		
Group	n	$\bar{x}$	median	n	$\bar{x}$	median	n	$\bar{x}$	median
Breast	4	24.0	19.0	4	65.3	65.0	3	92.0	96.0
Bottle	8	11.3	9.0	8	62.4	54.0	7	80.3	80.0

All of the mothers in the current study who chose to breast feed resided within 10 miles of the NICU. However, two of the breast feeding mothers had permanent residences 30 and 110 miles from the hospital, but they made arrangements to temporarily reside closer to the hospital. The breast feeding mothers may have felt that they assumed a major role in their infant's care, and they visited the hospital as often as possible in order to breast feed their infant. It is possible that during these frequent visits, the breast feeding mothers were able to interact more and more with their infants and this led to the development of an attachment to their infants. This attachment may have been reflected in the maternal behaviors displayed in the hospital and at home.

It is possible that there exists a difference in mothers who choose to breast feed and mothers who choose to bottle feed their premature infants. Mothers choosing to breast feed may be more giving of themselves, and thus they are able to commit themselves to breast feed as often as the infant requires while the infant is hospitalized, unlike the bottle feeding mother who may not be able to make that commitment.

It is also important to note that none of the breast feeding women were affected by a gestational illness. By contrast, 50 percent of the bottle feeding mothers suffered a gestational illness.

Relationship Between Mode of Delivery and Maternal Behavior

The results presented in Table 10 are somewhat difficult to interpret. Table 10 reveals that mothers giving birth by Cesarean section visited their infant's slightly more often in the hospital during the infant's first two weeks of hospitalization and displayed more maternal adaptive behaviors upon these visits than mothers delivering their infants vaginally. In the hospital in which the data was collected, mothers usually remain hospitalized five days following a Cesarean section, unlike mothers who deliver vaginally who may be discharged one to two days following the delivery. Therefore, there usually are a few days following the delivery where a mother delivering by Cesarean section is within closer proximity to her infant than a mother delivering vaginally. Thus, during these days, it may be easier for her to visit her infant than the mother delivering vaginally who has already been discharged from the hospital. One month after the infant's discharge, mothers giving birth vaginally demonstrated more maternal behaviors than mothers delivering by Cesarean section. This inconsistency between the findings in the hospital and the home environment may be due to the small sample size, although a Cesarean delivery may be more traumatic than a vaginal delivery, and abnormal or more traumatic deliveries have been found to have adverse effects

on the developing maternal-child affectional relationship (Lynch, 1975).

Table 10

Mean and Median Behaviors of Mothers Experiencing Vaginal and Cesarean Births

	Number NICU Visits			Percent NICU Behavior			Percent Home Behavior		
Group	n	$\bar{x}$	median	n	$\bar{x}$	median	n	$\bar{x}$	median
Vaginal	6	16.8	10.5	6	62.7	57.0	5	94.4	81.0
Cesarean	6	14.2	12.5	6	64.0	63.0	5	75.3	69.0

Findings Related to Infant Characteristics

Relationships Between Infant's Birthweight and Gestational Age and Maternal Behavior

Since the infant's birth weight and gestational age are both indicators of the infant's degree of prematurity, they will be discussed together. This study found a statistically significant correlation between an infant's birth weight and the number of maternal visitations in the NICU during the infant's first two weeks of life ($r = 0.80$; $p < 0.005$). A similar relationship was found between the infant's gestational age and the number of maternal visitations ($n = 12$; $r = 0.43$; $p < 0.10$). These relationships probably occurred because the mothers of larger and older infant's were generally allowed a more active role in their infant's care. Whereas, the mothers of smaller and more severely premature

infants were often only allowed to touch, watch, talk to, and possibly hold their infants during the first few days. Thus, these latter mothers were given very little responsibility for the care of their infants during the first few weeks.

An interesting finding was a slight negative correlation between the infant's gestational age and the amount of maternal attachment demonstrated in the NICU ($r_{xy} = -0.32$). A similar tendency was found between the infant's birth weight and of maternal attachment behaviors displayed in the NICU ($r = -0.13$).

A negative correlation was also revealed between the infant's gestational age and the amount of maternal behaviors displayed during a feeding at home ($r_{xy} = -0.38$). Not surprisingly, a relationship between the infant's birth weight and the amount of maternal behaviors displayed during the home feeding situation ($r = -0.46$; $p < 0.10$) was also evident. Thus, mothers of infants who were more severely premature demonstrated more maternal behaviors in the NICU and at home.

If it is assumed that infants who are severely premature (i.e., decreased gestational age and birth weight) may be less responsive, then these negative correlations may offer support to previous research findings which indicate that mothers may compensate for their less responsive premature

partners by providing the infants with a great deal of stimulation (Field, 1977; Goldberg, 1978). This was supported in the study by the negative correlations between the infant's gestational age and the number of infant behaviors demonstrated in the home environment during a feeding ($r = -0.38$) and the infant's birth weight and the number of infant behaviors demonstrated during a feeding at home ($r = -0.39$).

Relationship Between Length of Infant's Hospitalization and Maternal Behaviors

A moderate positive correlation between the length of the infant's hospitalization and the number of maternal behaviors demonstrated during a feeding situation in the home was found ($r = 0.31$). This may be the result of the mother compensating for her less responsive partner by providing him or her with additional attention (Goldberg, 1978). Because these infants were the most severely premature, it was assumed that they were probably less responsive in the early neonatal period.

A moderate positive correlation was also evident between the length of the infant's hospitalization and the number of infant behaviors demonstrated during the feeding ($n = 10$; $r_{xy} = 0.32$). These infants may have been responding to their mother's increased amounts of stimulation or the mothers may have been responding to their infant's signals. There

are two possible explanations for this positive relationship. The mother of the premature infant had been giving her less responsive partner a great deal of stimulation over the previous two to four months and by the time the observation of the feeding was conducted, the infant may have become more responsive due to his mother's consistent attention. It is also possible that the less responsive infant may become more responsive as he matures. His increased alertness, responsiveness and ability to emit clear care soliciting cues to his mother may bring about an increase in maternal behavior in the mother who is more perceptive and sensitive to his needs.

The two infants included in this study who were hospitalized for the longest duration had the youngest gestational ages and the lowest birth weights. As seen in Table 11, these infants who were hospitalized longer than 40 days were visited less often during their first two weeks of life than infant's with less extensive hospital stays. But, it is also apparent that the mothers of these two infants displayed more maternal adaptive or attachment behaviors during their visits to the hospital and during the feeding in the home. These findings are not consistent with the results of Hunter et al. (1978) which showed that premature infants hospitalized longer than 40 days were more likely to be abused than those infants whose stay in the NICU was not as lengthly ($p < 0.005$). Also,

the infants who were reported as abused were visited less frequently than their non-abused nursery counterparts. Due to the small sample size in this study, it makes it difficult to compare the two studies.

Table 11

Mean and Median Behaviors of Mothers Having Infants Hospitalized Less Than 40 Days or More Than 40 Days

	Number NICU Visits			Percent NICU Behavior			Percent Home Behavior		
Group	n	$\bar{x}$	median	n	$\bar{x}$	median	n	$\bar{x}$	median
More than 40 days	2	7.5	7.5	2	70.5	70.5	2	87.0	87.0
Less than 40 days	10	17.1	13.5	10	61.9	57.0	8	83.3	82.0

Relationship Between Infant's Sex and Maternal Behavior

As seen in Table 12, mothers of male infants visited the NICU more often than mothers of female infants. However, the mothers of female infants displayed more attachment behaviors both while visiting in the NICU and during the one month observation in the home.

Leiderman, Leifer, Seashore, Barnett, & Grobstein (1973) found when studying premature mother-infant dyads, that one week following the infant's discharge from the hospital, mothers of girls showed more ventral contact, although boys

were held by their mothers just as often. Moss (1967) reported at three weeks of age, boys experienced more extensive and stimulating interactions with their mothers than girls. de Chateau (1979) has also reported that mothers of boys seem to provide their infants with greater amounts of contact. One possible explanation may be that male infants have been found to be more responsive than female infants to their mother's auditory stimulation (Osofsky & Danzger (1974). As a result, the more responsive male infant may influence his mother to provide increased amounts of auditory or verbal stimuli.

Table 12

Mean and Median Behaviors of Mothers Having Male and Female Infants

	Number NICU Visits			Percent NICU Behavior			Percent Home Behavior		
Group	n	$\bar{x}$	median	n	$\bar{x}$	median	n	$\bar{x}$	median
Mothers of Males	9	16.2	12.0	9	60.7	56.0	7	81.4	80.0
Mothers of Females	3	13.3	9.0	3	71.0	75.0	3	89.3	92.0

The findings of this current study do not appear to be consistent with the literature. As expected, mothers of boys did visit their infants more often in the NICU than mothers of girls. What remains puzzling, is that mothers of females

in this study demonstrated more maternal behaviors in the hospital and at home than mothers of males. This finding may be due to the small sample size of mothers of female infants, a difference in the instruments utilized to measure maternal behaviors in the varied studies, or perhaps an infant's gender may be associated with different behaviors in mothers of premature infants as compared to mothers of full term infants.

Demographic differences between the mothers of males and mothers of females included in the study may also have influenced their maternal behavior. Mothers of female infants were white and older than mothers of males. As will be recalled, white mothers in this study were found to visit the nursery more often, interact more with their infants during visitation and show more maternal behaviors in the home than mothers from other cultural backgrounds. Maternal age in this study was not found to correlate with the number of visits to the NICU and the number of behaviors demonstrated in the NICU and at home, except when mothers less than 20 years and mothers more than 20 years at the time of their first infant's birth were compared.

Relationship Between Infant's Respiratory Status and Maternal Behavior

In this study, an infant's ventilatory status (i.e., whether he or she required the ventilatory assistance of a respirator) was used as an indicator of the severity of his or her prematurity or illness. When reviewing Table 13, it becomes apparent that the infants who required a respirator received fewer visits, and their mothers interacted with them less during their visits and in the home than infants who did not require this ventilatory assistance. These findings may indicate that it is more difficult for the mother to begin an affectional relationship with an infant she does not know will survive. Also, mothers may be initially frightened by all the technical equipment surrounding an infant who requires a respirator for ventilatory assistance. Perhaps, this also influenced their interaction in the NICU and subsequent maternal behaviors in the home.

Table 13

Mean and Median Behaviors of Mothers of Infants Requiring and Not Requiring the Ventilatory Assistance of a Respirator

	Number NICU Visits			Percent NICU Behavior			Percent Home Behavior		
Group	n	$\bar{x}$	median	n	$\bar{x}$	median	n	$\bar{x}$	median
No need for Respirator	9	18.6	15.0	9	65.2	58.0	8	85.8	97.0
Needed Respirator	3	9.5	3.0	3	57.7	53.0	2	76.0	76.0

CHAPTER IV

CASE STUDIES

Introduction

Because the sample size was limited, it was not possible to examine and draw conclusions regarding all the variables which could have influenced maternal attachment. However, two selected case studies are presented to illustrate the complexity of factors entering into maternal behavior.

Case Study A

Socio-Economic Factors

Mrs. A was a 20 year old mother of three children. She was Hispanic and currently separated from her husband. She lived 60 miles from the neonatal intensive care unit and resided with her two older children and her estranged husband's extended family. The home in which she lived had no plumbing. She had a sixth grade education, was unemployed during her pregnancy, and received Welfare financial assistance. She did not receive prenatal care and the pregnancy was not planned. Following the delivery, the infant's father did visit the hospital and voiced pride in having a son.

Maternal Health

Mrs. A's pregnancy was complicated by pre-eclampsia and an abruptio placenta. The pregnancy was terminated at 33

weeks when premature labor associated with an abruptio placenta began. When admitted to the labor and delivery department, Mrs. A appeared emaciated and she admitted to having a diet during her pregnancy that consisted of coffee and cigarettes. Following a repeat Cesarean birth, Mrs. A suffered a post-operative infection which led to a 10 day postpartum hospitalization. Approximately one week following discharge from the hospital, she suffered a postpartum hemorrhage and was readmitted to the hospital for a stay of four additional days.

Infant Health

Baby boy A weighed 1750 grams. He suffered respiratory distress syndrome and was placed on the Baby Bird ventilator for approximately three days during which time he required an oxygen fraction of inspired air (FIO_2) as high as 70 percent. He remained in oxygen for one week following birth. While oxygen was administered, a transcutaneous pO_2 monitor probe was placed on either his chest or upper back. The leads to a respiratory and cardiac monitor were also on his chest. An umbilical artery catheter remained in place two weeks, and he had three scalp intravenous punctures for the infusion of blood. Patches of hair were shaved around the intravenous infusion site. He also required phototherapy for four days. A blood culture was obtained through the umbilical

artery catheter and a lumbar puncture was performed to rule out the possibility of sepsis. Five days after birth, naso-gastric feeding was initiated and continued for two weeks. He was initially placed in an Ohio open care center, but was removed to an isolette at three days of age, where he remained until his third week of life, except during feedings and parental visitations.

Maternal Interaction With Infant

This mother had previously given birth to a viable premature infant, thus the experience of having a premature infant was not totally new to her. She made two visits to her infant during his 30 day hospitalization which lasted 15 minutes in duration. She made four other visits which lasted only two to three minutes in duration. During these six visits, she did offer the infant verbal and tactile stimulation. On the third day of life, when the infant was critically ill, his pO_2 fell following vigorous maternal tactile stimulation. After this occurred twice, and Mrs. A was asked to touch him very gently, she voiced that she was "frightened to touch him anymore".

Mrs. A demonstrated 45 percent of the maternal adaptive behaviors observed for in the NICU. During this interaction, she stated that she disliked the infant's name "because his father named him". Mrs. A relinquished care of her infant.

Summary and Discussion

Upon reviewing the case history describing Mrs. A and her premature infant, one is able to identify a multiplicity of factors which suggest the developing maternal-infant relationship is at risk for maladaption. Factors which were characteristic of Mrs. A and have been identified as being related to maladaptive mothering include: lack of formal education (Hunter et al., 1978); lower socio-economic status (Minde et al., 1980); poor emotional support system in the home (Hunter et al., 1978; Mason, 1963); absence of infant's father in the home (Hunter et al., 1978; Mason, 1963; Minde et al., 1980; Minde et al., 1978); initial maternal pregnancy prior to 20 years of age (Fanaroff et al., 1974; Lynch, 1975); maternal gestational illness (Lynch, 1975; ten Bensel & Paxson, 1977); and delivery complications (Lynch, 1975). Other factors found to have a poor influence on the developing maternal infant relationship included: the fact that the infant was significantly premature (Hunter et al., 1978; Minde et al, 1980), and had experienced a prolonged hospitalization (Hunter et al., 1978; Lynch, 1975).

Mrs. A visited her infant very little while she was hospitalized in the same hospital; decreased amounts of maternal visitations to the nursery have been found to be suggestive of later maternal maladaptive behavior (Fanaroff et al., 1974;

Hunter et al., 1978; Kaplan & Mason, 1963; Minde et al., 1978; ten Bensel & Paxson, 1977). Mrs. A also did not demonstrate many maternal behaviors during her two longer visits to the nursery which is important because mothers who interact little with their infants in the newborn intensive care unit have been found to interact little with their infants in the home (Minde et al., 1978; Minde et al., 1980). There was also a prolonged separation between this mother and her infant during the first month after the infant's birth, and deprivation of maternal-infant interaction has been found to be related to deviations in maternal behavior (Barnett et al., 1970; Leifer et al., 1972; Lynch, 1975; ten Bensel & Paxson, 1977). Following this period of prolonged separation, Mrs. A chose to relinquish the care of her newborn. Several questions remain unanswered: Did the many factors which identified her at risk for maladaptive mothering directly influence her maternal behavior? Did the prolonged separation between mother and infant cause such a severe amount of maternal deprivation that the attachment process was interrupted? Or, was it a combination of all factors identified?

Case Study B

Socio-Economic Factors

Mrs. B was a 22 year old Caucasion primiparous woman. She was married and living in a single family dwelling with

her husband. Their residence was approximately 100 miles from the neonatal intensive care unit (NICU). Her husband was a carpenter who was on strike during the week of her delivery. Fortunately, the strike lasted only one week. Mrs. B was employed at a local newspaper during the early months of her pregnancy. She had 15 years of formal education and the family income was greater than $10,000 per year. This pregnancy was planned and Mrs. B received regular prenatal care.

Maternal Health

Mrs. B had an uncomplicated pregnancy until 34 to 35 weeks of gestation when the onset of premature labor occurred. She had a vaginal delivery without complications, and was released from the hospital three days following the delivery.

Infant Health

Infant boy B weighed 1810 grams. He suffered mild respiratory distress syndrome and was placed under 40 percent FIO_2 for 12 hours and then remained under 27 percent FIO_2 for an additional four hours. He was placed in an isolette soon after birth and there he stayed until two days prior to discharge. He was hospitalized for a total of 18 days. The leads to the cardiac and respiratory monitor were placed on his chest, and he received fluids through an umbilical artery catheter for the first two days following birth. During the

first five days of life, the infant received naso-gastric feedings of breast milk which Mrs. B had expressed. By the sixth day, he was nursing successfully at the breast. The infant's primary problem during his initial hospitalization was hyperbilirubinemia which required 17 days of phototherapy. Three weeks following the infant's discharge, he was readmitted for surgical treatment of pyloric stenosis. This second hospitalization was for two days in a hospital located five miles from the family's home.

Maternal Interaction With Infant

Mrs. B arranged to reside with a local physician and his family during her infant's hospitalization to make it easier for her to visit her infant frequently. She visited 46 times during his first two weeks of hospitalization, and attempted to breast feeding during all feedings except those late at night. When observed interacting with her infant during the second week of hospitalization, she demonstrated 81 percent of the maternal adaptive behaviors.

During a feeding situation in the home environment one month following the infant's initial discharge from the hospital, Mrs. B demonstrated 98% of the maternal behaviors listed on the NCAST Feeding Scale. Likewise, baby B demonstrated 100% of the infant behaviors listed in the NCAST Feeding Scale.

Summary and Discussion

Unlike Mrs. A, there were a variety of factors which could have favorably influenced Mrs. B's maternal behaviors. Characteristics which could possibly have been related to her adaptive maternal behaviors included: her high degree of formal education (Hunter et al., 1978); the fact that she was 22 at the time of her first pregnancy (Fanaroff et al., 1974; Lynch, 1975); and the fact that she was from a middle income family with medical insurance covering both her hospitalization and the infant's hospitalization (Minde et al., 1978). Further, she felt she had a good emotional support system, and she was happily married to the infant's father (Hunter et al., 1978; Mason, 1963); her pregnancy was uncomplicated prior to the premature labor and there were no delivery complications (Lynch, 1975; ten Bensel & Paxson, 1977).

There also were significant differences between the two infants which may have contributed to the differences in outcome. These differences included: Baby A was more premature, he weighed less, and his gestational age was estimated to be two weeks more premature than baby B (Hunter et al., 1978; Minde et al., 1978). The severity of baby A's illness was also much greater (ten Bensel, 1977), and he was surrounded by a great deal more equipment than baby B, which may have interfered with his mother's interactions with him. Baby A

was also hospitalized for a longer duration than baby B (Hunter et al., 1978; ten Bensel, 1977).

Mrs. B visited her infant more often than Mrs. A. Thus, Mrs. B had more opportunities to interact with her infant. Mrs. B also demonstrated many more maternal adaptive behaviors when visiting her infant in the NICU. The frequency of Mrs. B's visitations to the NICU and her high degree of interaction with her infant in the NICU were strongly suggestive of a healthy maternal-infant relationship in the home (Fanaroff et al., 1974; Hunter et al., 1978; Mason & Kaplan, 1963; Minde et al., 1980; Minde et al., 1978). Thus, consistent with these predictions, Mrs. B demonstrated many maternal affectional behaviors in the home environment.

CHAPTER V

SUMMARY AND CONCLUSIONS

Introduction

The major findings, implications for nursing practice, limitations and implications for future research associated with this study are presented in this chapter.

Research Questions and Major Findings

Maternal visitation patterns while an infant is hospitalized in the NICU have been found to be suggestive of the quality of the developing maternal-infant relationship. Studies have suggested that mothers who do not visit their infants very often in the NICU tend to abuse their infants more often than mothers frequently visiting their infants (Fanaroff et al., 1974; Hunter et al., 1978). This current study was conducted to explore the possibility that the frequency of maternal visitations and the amount of maternal interaction with her infant in the NICU are suggestive of later maternal behaviors in the home environment. The current study focused upon 12 mother-premature infant dyads from white, Hispanic, and American Indian cultural backgrounds. The following relationships were found: Mothers who visited the NICU more frequently demonstrated more maternal attachment behaviors at an observation during the

infant's first two weeks of hospitalization than mothers who visited the NICU less frequently (n = 12; r = 0.47; $p < 0.10$). mothers who visited their infants more often in the NICU during the first two weeks of the infant's life tended to demonstrate more maternal attachment behaviors during a feeding situation one month after the infant was discharged from the hospital than mothers who visited their infants less often in the NICU (n = 10; r = 0.33); mothers who demonstrated more maternal attachment behaviors during their visits with their premature infants in the NICU were found to demonstrate more maternal behaviors during a feeding situation one month after the infant was discharged from the hospital than those mothers who demonstrated fewer maternal attachment behaviors during their visits to the NICU (n = 10; r = 0.57; $p < 0.05$); mothers who displayed more maternal behaviors during a feeding situation one month after the infant's discharge from the hospital had infants who displayed more affectional, responsive, and care soliciting behaviors during the feeding situation (n = 10; r = 0.83; $p < 0.005$) than mothers who demonstrated fewer maternal behaviors during a feeding situation.

The investigator examined maternal characteristics, infant characteristics, demographic data and data regarding the pregnancy and delivery in order to describe the characteristics of mothers who interacted more with their premature

infants both in the hospital and at home. Mothers found to visit their infants most often in the NICU, demonstrate more maternal attachment behaviors while visiting the NICU, and interact more with their infants during a feeding situation in the home had the following characteristics in common: They were white, did not require Welfare financial assistance, were more highly educated, did not experience a gestational illness, were more likely primiparous women, and breast fed their infants. Further, infants who did not require the ventilatory assistance of a respirator, and therefore were less severely ill, had more highly interactive mothers.

Implications for Nursing Practice

A mother who seldom visits or interacts with her premature infant, during his initial stay in the hosital, is a concern to all health care providers involved in the infant's care, especially to the NICU nurse. This is of concern because of the findings of this study and other studies which have indicated that the amount and quality of maternal interactions with her premature infant, during the early neonatal period, may be indicators of the quality of the developing maternal affectional response. Appropriate nursing interventions, during this period when the maternal-infant affectional

relationship is developing, has the potential for influencing a more adaptive maternal response.

Two interventions which NICU nurses can use to evaluate maternal visitations and interactions in the NICU include: the recording of the number of maternal visits to the NICU, and observing maternal interaction with the infant in the NICU by using a guide, such as The Observation Guide for Maternal Behaviors. Both of these actions may be helpful for identifying mothers "at risk" for developing impaired maternal affectional responses to their infants.

If a mother does not visit the nursery, the NICU nurse can encourage her visitation through a variety of ways. The mother may need verbal encouragement to make the visit. If the mother remains hospitalized, and especially if she is suffering a gestational illness, it may be helpful for the NICU nurse to visit the mother's room to discuss the infant and his care. Also, a mother may appreciate a photograph of her infant at this time. If the mother is not hospitalized, telephone contact, initiated by the nurse, to keep the mother informed regarding her infant's status may be helpful in prompting a maternal response. When the mother does visit the nursery prior to her entrance in the NICU, the technical equipment and her infant's condition should be explained to her in simple terms. If the mother is uncomfortable visiting

alone, she should be encouraged to bring with her a supportive relative or friend. Also, if one nurse on each shift is generally responsible for the infant's care, the mother may feel more comfortable visiting because she has grown to know these nurses. Each mother should be allowed as much contact with her infant as possible, but each individual mother should initially be given the opportunity to gradually become involved with her infant at the pace in which she is comfortable.

Many of the previously discussed nursing interventions may promote maternal-infant interaction. There are additional interventions a nurse might attempt to encourage a higher quality of maternal-infant interaction. One is to provide generous amounts of positive reinforcement for the appropriate maternal behaviors demonstrated. Also, if the infant does demonstrate some affectional behaviors directed toward his mother, the mother may appreciate the nurse's verbally acknowledging the infant's unique response to her. The mother may need to be provided with information regarding the infant's abilities and responses (i.e., his ability to see and hear, his preference for observing his mother's face, his favorable response to being touched gently, and the pleasure he finds in hearing his mother's voice). Also, the nurse should encourage the mother to visit at a time when the infant will

be more responsive (i.e., after a bath or before a feeding). If possible, when the mother visits, she should be allowed some time to privately interact with her infant so she does not feel uncomfortable due to the presence of the health care providers.

It is recognized that all mothers of premature infants need social and emotional support in order to deal with the crisis of prematurity in a healthy manner. But, extra support is necessary for those mother-infant dyads "at risk" for developing an impaired affectional relationship. Encouraging a mother's involvement in a support group of parents of premature infants may be helpful. Also, a social service or community health nursing referral may be needed in order that a more complete assessment of the family's needs be made so that the appropriate assistance can be offered (i.e., family counseling, financial assistance or transportation).

Limitations

The sample size was small and heterogenous, and thus the results are not generalizable.

Two different tools were used to record maternal behaviors suggestive of attachment: The Observation Guide for Maternal Behaviors was used to record maternal behaviors in the NICU and the NCAST Feeding Scale was used to record maternal

behaviors during a feeding situation in the home. The Observation Guide for Maternal Behaviors does not have predictive validity or reliability. King (1979) reported fairly low values of content validity and test-retest reliability for the NCAST Feeding Scale. Thus, the significance of the findings revealed by the use of these tools may be questionable. Also, the use of two separate tools may have influenced the relationship revealed between maternal behaviors in the NICU and maternal behaviors in the home.

Due to the limited scope of this study, the investigator chose to observe each mother-infant dyad on only two occasions, once during the infant's second week of hospitalization and once in the home during a feeding, approximately one month after the infant's discharge from the hospital. Additional observations of the pair in the hospital and at home would have provided information which might have altered the results reported.

Implications for Future Study

Future studies should include a larger sample in which the simultaneous and interactive effects of the large number of variables believed to effect maternal attachment would be tested. Also, the reliability and validity of the Observation Guide for Maternal Behaviors should be established and further modifications may need to be made and tested.

Further questions for future study include:

1. Do mothers who visit their premature infants infrequently and interact little with their infants in the NICU have difficulty becoming attached to their infants?
2. If a mother has difficulty becoming attached to her infant in the NICU, is this lack of attachment suggestive of a permanently impaired maternal-child relationship, or is there a "catch-up period" for this initially disadvantaged dyad, perhaps after the infant's discharge from the hospital?
3. Do mothers tend to overcompensate for their less responsive disadvantaged premature infant partners during their interactions, or do highly interactive mothers of premature infants have highly interactive infants as partners?
4. What are the common characteristics of mothers of premature infants from lower socio-economic groups that may influence the maladaptive or adaptive behaviors these mothers demostrate?
5. Are the findings related to maternal visitation patterns in the NICU and subsequent maternal behaviors in the home generalizable cross-culturally?
6. Does the severity of a premature infant's condition

exert an influence upon the developing maternal-infant relationship?

7. Do more highly educated mothers demonstrate more maternal attachment behaviors when interacting with their infants than mothers with less formal academic preparation?
8. Is there a relationship between the mode of feeding a mother chooses for her infant and the adaptive mothering behaviors she displays?

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APPENDIX A

Frequency of Maternal Visitation in NICU

Day of hospitalization_____ Today's date_____

Did the mother visit the NICU today? Yes_____ No_____

If so, please record the approximate duration of each visit to the NICU on this specific day.

Visit 1 (Please circle the correct answer)

1) less than 15 minutes*
2) 15 to 30 minutes
3) more than 30 minutes

Visit 2

1) less than 15 minutes
2) 15 to 30 minutes
3) more than 30 minutes

Visit 3

1) less than 15 minutes
2) 15 to 30 minutes
3) more than 30 minutes

Visit 4

1) less than 15 minutes
2) 15 to 30 minutes
3) more than 30 minutes

Visit 5

1) less than 15 minutes
2) 15 to 30 minutes
3) more than 30 minutes

*Beginning of stay is when mother comes within six feet of the isolette; end of stay is when mother leaves the NICU.

APPENDIX B

Observation Guide for Maternal Behaviors

Criteria of Attachment Indicators

Critical Attachment Tasks		Observed Behaviors (√)
Observes Infant's Appearance	Spends time looking at baby, other than when providing care.	[ ]
	Inspects or reviews head, trunk, and extremities.	[ ]
	Partially unwraps or undresses baby to observe body features.	[ ]
	Comments on baby's features, e.g., size, sex, hair, etc.	[ ]
Observes Infant's Behaviors	Talks to baby or smiles in response to infant's movements.	[ ]
	Comments on baby's behavior, e.g., opening eyes, grasping with hand.	[ ]
	Comments on infant's bodily functions, e.g., wetting, sucking, burping, etc.	[ ]
Identified Infant's Physical Condition	Makes realistic statements about condition. "Her eyes are not so puffy today." Or, "He looks so pale."	[ ]
	Asks questions about condition, e.g., "What is the mark on her head?" Or, Is he getting better?"	[ ]
Sees Infant as Another Human Being	Has selected a name for the baby.	[ ]
	Uses given or affectionate name when talking to or about baby.	[ ]
	Associates infant's characteristics with human characteristics, e.g., "He looks like a football player." Or, "She looks like a real baby now."	[ ]

Criteria of Attachment Indicators

Critical Attachment Tasks		Observed Behaviors (√)
Includes Infant in the Family	Attempts to associate infant's characteristics with those of other family members, e.g., "She has her daddy's eyes." Or, "He doesn't look like anyone else in the family."	[ ]
Talks to Infant	Talks or sings to infant.	[ ]
Establishes Eye Contact	Uses en face position.	[ ]
	Changes own position or that of infant to establish eye contact.	[ ]
	Stimulates infant to open eyes by shielding them from the light or by using other maneuvers.	[ ]
Demonstrates Physical Closeness	When handed infant, reaches out to receive baby.	[ ]
	Uses fingertips on head and extremeties.	[ ]
	Uses palms on infant's trunk.	[ ]
	Enfolds infant in arms and holds against her body.	[ ]
	If infant hospitalized after mother discharged, visits a minimum of twice a week, for not less than thirty minutes per visit.	[ ]

Criteria of Attachment Indicators

Critical Attachment Tasks		Observed Behaviors (✓)
Changes Behaviors in Response to Infant's Behavior	When infant is fussy, attempts to soothe by patting, cuddling, rocking or talking to baby.	[ ]
	Does not continue behaviors which upset infant, or behaviors to which infant does not respond.	[ ]
	When infant is quiet and alert, makes eye contact and talks to baby.	[ ]
	Meets infant's needs prior to her own, e.g., "I'll feed him now and have breakfast later."	[ ]
Recognizes Infant's Needs and Provides Appropriate Care	Readily participates in care when asked.	[ ]
	Recognizes baby's needs and attempts to meet them or communicate them to someone who can, e g., changes shirt after baby spits up, or changes wet diaper.	[ ]
	Handles baby in a manner which is comfortable for infant, e.g., infant's head and body are well supported and infant is handled gently with smooth rather than jerky movements.	[ ]
Plans for Ways to Care for Infant at Home	Has obtained basic supplies for infant's care; prior to infant's discharge.	[ ]
	Asks questions about care, e.g., feeding schedule, formula preparation, cord care, etc.	[ ]
	Has made plans for or asks assistance with plans for well baby care.	[ ]

Criteria of Attachment Indicators

Critical Attachment Tasks		Observed Behaviors (✓)
Perception of Infant	Comments about baby are predominantly positive.	[ ]
	Smiles frequently when looking at infant or when talking to or about baby.	[ ]
Perception of Self	Comments about self are predominantly positive.	[ ]
	Expresses satisfaction with mothering role.	[ ]
Total Number of Behaviors Observed		[ ]

Date _____ Time _____

Situation _____

APPENDIX C

University of Washington
School or Nursing

Nursing Child Assessment Satellite Training Project

UNIVERSITY OF WASHINGTON
SCHOOL OF NURSING
NURSING CHILD ASSESSMENT SATELLITE TRAINING PROJECT

FEEDING SCALES (BINARY FORM)
(BIRTH—1 YEAR)

NCAST ID No. _____
CITY _____

PERSON OBSERVED IN INTERACTION (CIRCLE)
MOTHER FATHER OTHER

MAJOR CAREGIVER (CIRCLE)
YES NO

TYPE OF FEEDING (CIRCLE)
BREAST BOTTLE SOLID

LENGTH OF FEEDING (CIRCLE)
10 OR LESS 10-20 20-30 30 OR MORE

SETTING (CIRCLE)
HOME CLINIC OTHER

CHILD'S FIRST NAME _____

CHILD'S AGE IN MONTHS _____

CHILD'S SEX (CIRCLE)
MALE FEMALE

CHILD'S RACE _____

MOTHER'S EDUCATION (CIRCLE)
8 YRS. OR LESS 7-8-9-10-11-12-13-14-15-16-17-18-19-20+

MARITAL STATUS (CIRCLE)
MARRIED NOT MARRIED

	YES	NO
I. SENSITIVITY TO CUES		
1. PARENT POSITIONS CHILD SO THAT CHILD IS SAFE BUT CAN MOVE HIS ARMS.		
2. PARENT POSITIONS CHILD SO THAT THE CHILD'S HEAD IS HIGHER THAN HIPS.		
3. PARENT POSITIONS CHILD SO THAT TRUNK-TO-TRUNK CONTACT IS MAINTAINED DURING MORE THAN HALF OF THE BREAST OR BOTTLE FEEDING (50%).		
4. PARENT POSITIONS CHILD SO THAT EYE-TO-EYE CONTACT IS POSSIBLE.		
5. PARENT'S FACE IS AT LEAST 7-8 INCHES OR MORE FROM THE CHILD'S FACE DURING FEEDING EXCEPT WHEN KISSING, CARESSING, HUGGING OR BURPING THE CHILD.		
6. PARENT SMILES, VERBALIZES, OR MAKES EYE CONTACT WITH CHILD WHEN CHILD IS IN OPEN-FACE-GAZE POSITION.		
7. PARENT COMMENTS VERBALLY ON CHILD'S HUNGER CUES PRIOR TO FEEDING.		
8. PARENT COMMENTS VERBALLY ON CHILD'S SATIATION CUES BEFORE TERMINATING FEEDING.		
9. PARENT VARIES THE INTENSITY OF VERBAL STIMULATION DURING FEEDING.		
10. PARENT VARIES INTENSITY OF ROCKING OR MOVING THE CHILD DURING THE FEEDING.		
11. PARENT VARIES THE INTENSITY OF TOUCH DURING THE FEEDING.		
12. PARENT ALLOWS PAUSES IN FEEDING WHEN THE CHILD INDICATES BY CRY FACE, HALT HAND, BACK ARCHING, PULLING AWAY, PUSHING FOOD AWAY, TRAY POUNDING, TURNING HEAD, SHAKING HEAD NO OR SAYING "NO" OR FALLING ASLEEP OR WHEN CHILD IS IN PAUSE PHASE OF THE BURST-PAUSE SEQUENCE OF SUCKING (75% OF THE TIME).		
13. PARENT SLOWS PACE OF FEEDING OR PAUSES WHEN CHILD AVERTS GAZE, PLACES HAND-TO-EAR, HAND-TO-MOUTH, HAND-BEHIND-HEAD, HAND-BACK-OF-NECK, HANDS OVER STOMACH, YAWNS, RUBS EYE OR DISPLAYS FEET MOVEMENT (75% OF THE TIME).		
14. PARENT TERMINATES THE FEEDING WHEN THE CHILD TURNS HEAD, FALLS ASLEEP, COMPRESSES LIPS, PUSHES FOOD AWAY, SHAKES HEAD "NO" OR SAYS "NO," ONCE OR MORE OR AFTER OTHER METHODS (REPOSITIONING, BURPING, OR WAITING) HAVE PROVED UNSUCCESSFUL.		
*15. PARENT DOES NOT INTERRUPT CHILD'S SUCKING OR CHEWING BY REMOVING THE NIPPLE, JIGGLING THE NIPPLE, OR OFFERING THE CHILD MORE OR OTHER KINDS OF FOOD WHILE CHILD IS EATING.		
*16. PARENT DOES NOT OFFER FOOD WHEN THE CHILD LOOKS AWAY, LOOKS DOWN, TURNS AWAY OR TURNS AROUND.		
SUBSCALE TOTAL (NO. OF YES ANSWERS		
II. RESPONSE TO DISTRESS (INDICATE IN BOX WHETHER OCCURRED OR NOT. IF NO DISTRESS, MARK EACH BOX "YES".)		
IF CHILD SHOWS DISTRESS DURING THE FEEDING DOES THE PARENT:		
17. STOP OR START FEEDING IN RESPONSE TO THE CHILD'S DISTRESS.		
18. CHANGE THE CHILD'S POSITION IN RESPONSE TO CHILD'S DISTRESS.		
19. MAKE POSITIVE OR SYMPATHETIC VERBALIZATION IN RESPONSE TO CHILD'S DISTRESS.		
20. CHANGES VOICE VOLUME TO SOFTER OR HIGHER PITCH IN RESPONSE TO CHILD'S DISTRESS.		
21. MAKES SOOTHING NON-VERBAL EFFORTS IN RESPONSE TO CHILD'S DISTRESS.		
22. DIVERTS CHILD'S ATTENTION BY PLAYING GAMES, INTRODUCING A TOY, OR MAKING FACES IN RESPONSE TO CHILD'S DISTRESS.		
23. PARENT DOES NOT MAKE NEGATIVE VERBAL RESPONSE IN RESPONSE TO CHILD'S DISTRESS.		
24. PARENT DOES NOT MAKE NEGATIVE COMMENTS TO HOME VISITOR ABOUT CHILD IN RESPONSE TO CHILD'S DISTRESS.		
25. PARENT DOES NOT YELL AT THE CHILD IN RESPONSE TO HIS DISTRESS.		
26. PARENT DOES NOT USE ABRUPT MOVEMENTS OR ROUGH HANDLING IN RESPONSE TO CHILD'S DISTRESS.		
27. PARENT DOES NOT SLAP, HIT, OR SPANK CHILD IN RESPONSE TO DISTRESS.		
SUBSCALE TOTAL (NO. OF YES ANSWERS)		
III. SOCIAL-EMOTIONAL GROWTH FOSTERING		
28. PARENT PAYS MORE ATTENTION TO CHILD DURING FEEDING THAN TO OTHER PEOPLE OR THINGS IN ENVIRONMENT.		
29. PARENT IS IN EN FACE POSITION FOR MORE THAN HALF OF THE FEEDING (50%).		
30. PARENT SUCCEEDS IN MAKING EYE CONTACT WITH CHILD ONCE DURING FEEDING.		
31. PARENT'S FACIAL EXPRESSION CHANGES AT LEAST TWICE DURING FEEDING.		
32. PARENT ENGAGES IN SOCIAL FORMS OF INTERACTION (PLAYS GAMES WITH CHILD) AT LEAST ONCE DURING THE FEEDING.		
33. PARENT USES POSITIVE STATEMENTS IN TALKING TO CHILD DURING THE FEEDING.		
34. PARENT PRAISES CHILD OR SOME QUALITY OF THE CHILD'S BEHAVIOR DURING THE FEEDING.		
35. PARENT HUMS, CROONS, SINGS OR CHANGES THE PITCH OF HIS/HER VOICE DURING THE FEEDING.		
36. PARENT LAUGHS OR SMILES DURING THE FEEDING.		
37. PARENT USES GENTLE FORMS OF TOUCHING DURING THE FEEDING.		
38. PARENT SMILES, VERBALIZES OR TOUCHES CHILD WITHIN 5 SECONDS OF CHILD SMILING OR VOCALIZING AT PARENT.		
39. PARENT DOES NOT COMPRESS LIPS, GRIMACE, OR FROWN WHEN MAKING EYE CONTACT WITH CHILD.		
40. PARENT DOES NOT SLAP, HIT, SHAKE, OR GRAB CHILD OR CHILD'S EXTREMITIES DURING THE FEEDING.		
41. PARENT DOES NOT MAKE NEGATIVE OR UNCOMPLIMENTARY REMARKS TO THE CHILD OR HOME VISITOR ABOUT THE CHILD OR CHILD'S BEHAVIOR.		
SUBSCALE TOTAL (NO. OF YES ANSWERS)		
IV. COGNITIVE GROWTH FOSTERING		
42. PARENT PROVIDES CHILD WITH OBJECTS, FINGER FOODS, TOYS, AND/OR UTENSILS		
43. PARENT ENCOURAGES AND/OR ALLOWS THE CHILD TO EXPLORE THE BREAST, BOTTLE, FOOD, CUP, BOWL OR THE PARENT DURING FEEDING.		
44. PARENT TALKS TO THE CHILD USING TWO WORDS AT LEAST THREE TIMES DURING THE FEEDING.		
45. PARENT VERBALLY DESCRIBES SOME ASPECT OF THE FOOD OR FEEDING SITUATION TO CHILD DURING FEEDING.		
46. PARENT TALKS TO CHILD ABOUT THINGS OTHER THAN FOOD, EATING, OR THINGS RELATED TO THE FEEDING.		
47. PARENT USES STATEMENTS THAT DESCRIBE, ASK QUESTIONS OR EXPLAINS CONSEQUENCES OF BEHAVIOR MORE THAN COMMANDS IN TALKING TO THE CHILD.		
48. PARENT VERBALIZES TO CHILD WITHIN FIVE SECONDS AFTER CHILD HAS VOCALIZED.		
49. PARENT VERBALIZES TO CHILD WITHIN FIVE SECONDS AFTER CHILD'S MOVEMENT OF ARMS, LEGS, HANDS, HEAD, TRUNK.		
50. PARENT DOES NOT TALK BABY TALK.		
SUBSCALE TOTAL (NO OF YES ANSWERS)		

*NEED ONLY OCCUR ONCE TO SCORE "NO."

	YES	NO
V. CLARITY OF CUES		
51. CHILD SIGNALS READINESS TO EAT.		
52. CHILD DISPLAYS A BUILD-UP OF TENSION AT THE BEGINNING OF FEEDING.		
53. CHILD DEMONSTRATES A DECREASE IN TENSION WITHIN A FEW MINUTES AFTER FEEDING HAS BEGUN.		
54. CHILD HAS PERIODS OF ALERTNESS DURING THE FEEDING.		
55. CHILD DISPLAYS AT LEAST TWO DIFFERENT EMOTIONS DURING THE FEEDING.		
56. CHILD HAS PERIODS OF ACTIVITY AND INACTIVITY DURING THE FEEDING.		
57. CHILD'S MOVEMENTS ARE SMOOTH AND COORDINATED DURING THE FEEDING.		
58. CHILD'S ARM AND LEG MOVEMENTS ARE GENERALLY DIRECTED TOWARD PARENT DURING FEEDING (NOT DIFFUSE).		
59. CHILD MAKES CONTACT WITH PARENT'S FACE OR EYES AT LEAST ONCE DURING FEEDING.		
60. CHILD VOCALIZES DURING FEEDING.		
61. CHILD SMILES OR LAUGHS DURING FEEDING.		
62. CHILD AVERTS GAZE, LOOKS DOWN OR TURNS AWAY DURING FEEDING.		
63. CHILD ACTIVELY RESISTS FOOD OFFERED.		
64. CHILD DEMONSTRATES SATISFACTION AT END OF FEEDING THROUGH SLEEP, FACIAL EXPRESSIONS, DECREASED MUSCLE TONE, ARMS EXTENDED ALONG SIDE, VOCALIZATIONS OR CHANGE IN ACTIVITY LEVEL OR MOOD.		
65. CHILD DOES NOT HAVE MORE THAN TWO RAPID STATE CHANGES DURING FEEDING.		
SUBSCALE TOTAL (NO. OF YES ANSWERS)		
VI. RESPONSIVENESS TO PARENT		
66. CHILD RESPONDS TO FEEDING ATTEMPTS BY PARENT DURING FEEDING.		
67. CHILD RESPONDS TO GAMES, SOCIAL PLAY OR SOCIAL CUES OF PARENT DURING FEEDING.		
68. CHILD LOOKS IN THE DIRECTION OF THE PARENT'S FACE AFTER PARENT HAS ATTEMPTED TO ALERT THE CHILD VERBALLY OR NON-VERBALLY DURING FEEDING.		
69. CHILD VOCALIZES TO PARENT DURING FEEDING.		
70. CHILD VOCALIZES OR SMILES WITHIN 5 SECONDS OF PARENT'S VOCALIZATION.		
71. CHILD SMILES AT PARENT DURING FEEDING.		
72. CHILD EXPLORES PARENT OR REACHES OUT TO TOUCH PARENT DURING FEEDING.		
73. CHILD SHOWS A CHANGE IN LEVEL OF MOTOR ACTIVITY WITHIN 5 SECONDS OF BEING HANDLED OR REPOSITIONED BY PARENT.		
74. CHILD SHOWS POTENT NEGATIVE CUES DURING LAST HALF OF FEEDING.		
75. CHILD SHOWS POTENT NEGATIVE CUES WITHIN 5 SECONDS AFTER PARENT MOVES CLOSER THAN 7 TO 8 INCHES FROM CHILD'S FACE		
76. CHILD DOES NOT TURN AWAY OR AVERT GAZE FROM PARENT DURING FIRST HALF OF FEEDING.		
SUBSCALE TOTAL (NO. OF YES ANSWERS)		

ENTER TOTALS FOR EACH CATEGORY:	
SENSITIVITY TO CUES	
RESPONSE TO DISTRESS	
SOCIAL-EMOTIONAL GROWTH FOSTERING	
COGNITIVE GROWTH FOSTERING	
CLARITY OF CUES	
RESPONSIVENESS TO PARENT	
TOTAL (NO. OF YES ANSWERS)	

HOME VISIT QUESTIONS:

1. WOULD YOU SAY THIS WAS A TYPICAL FEEDING?
   A. YES B. NO
   IF NO, WHY NOT?

2. WERE YOU UNCOMFORTABLE DURING ANY PART OF THE FEEDING DUE TO MY PRESENCE?
   A. YES B. NO
   IF YES, WHY?

3. DO YOU HAVE ANY CONCERNS ABOUT THE FEEDING OR YOUR CHILD'S EATING?
   A. YES NO
   IF YES, SPECIFY.

4. OBSERVER'S COMMENTS:

APPENDIX D

Maternal Characteristics Questionnaire

Maternal Characteristics

Code Number___ ___

1. Ethnic Background

_____White
_____Black
_____American Indian
_____Hispanic
_____Other (Please Specify) _____

2. Does mother speak English?

_____Yes
_____No

3. Age of Mother _____

4. Maternal Marital Status

_____Single
_____Married
_____Separated
_____Divorced
_____Widow

5. Living Arrangements

_____Living alone
_____Living with husband
_____Living with infant's father
_____Living with friends or relatives

6. Education (Please circle number of years)

0-6 7 8 9 10 11 12 13 14 15 16 17 18+

7. Maternal Parity

_____Gravida
_____Para___ ___

8. What is the family's yearly income? (Please circle appropriate answer)

0-$6,000 $6,001-$9,999 $10,000-$14,999

$15,000-$19,999 $20,000-$24,999 $25,000+

9. Was baby transported to YVMH to receive special care?

_____Yes
_____No

10. Number of miles mother lives from the hospital. _____

11. Does mother have a car?

_____Yes
_____No

12. Does mother have a friend with a car who could bring her to the hospital?

_____Yes
_____No

13. Prenatal Illness of Mother

	Yes	No
Diabetes	_____	_____
Pre-eclampsia	_____	_____
Placenta previa	_____	_____
Abruptio plancenta	_____	_____
Other (Please Specify)	_____	_____

_____

14. Mother's Gestational Illness

	Yes	No
Cesarean section (primary)	_____	_____
Cesarean section (repeat)	_____	_____
Infection post-operatively	_____	_____
Hepatitis	_____	_____
Postpartum blues	_____	_____
Other (Please Specify)	_____	_____

_____

15. Length of mother's hospitalization (days) _____

16. Mode of Feeding

	Yes	No
Breast only	_____	_____
Bottle only	_____	_____
Breast and Bottle	_____	_____
Tube feeding	_____	_____
Other	_____	_____

17. Infant's Sex

_____Male
_____Female

18. Infant's Birth Weight (grams) _____

19. Infant's Gestational Age (weeks) _____

20. Infant's Illness

	Yes	No
Prematurity	_____	_____
Jaundice	_____	_____
RDS	_____	_____
Neonatal sepsis	_____	_____
Meconium aspiration	_____	_____
Other (Please Specify)	_____	_____

_____

21. Infant's treatment during the first week of hospitalization.

	Yes	No
Oxygen therapy	_____	_____
CPAP or IMV	_____	_____
Apnea monitor	_____	_____
Cardiac monitor	_____	_____
Phototherapy	_____	_____
Intravenous therapy	_____	_____
Gavage feeding	_____	_____
Blood exchange transfusion	_____	_____
Other (Please Specify)	_____	_____

_____

22. Infant's treatment during the second week of hospitalization

	Yes	No
Oxygen therapy	_____	_____
CPCP or IMV	_____	_____
Apnea monitor	_____	_____
Cardiac monitor	_____	_____
Phototherapy	_____	_____
Intravenous therapy	_____	_____
Gavage feeding	_____	_____
Blood exchange transfusion	_____	_____
Other (Please Specify)	_____	_____

_____

23. Infant's treatment during observation of maternal-infant interaction in the NICU using Cropley's tool.

	Yes	No
Oxygen therapy	_____	_____
CPAP or IMV	_____	_____
Apnea monitor	_____	_____
Cardiac monitor	_____	_____
Phototherapy	_____	_____
Intravenous therapy	_____	_____
Gavage feeding	_____	_____
Blood exchange transfusion	_____	_____
Other (Please Specify)	_____	_____

_____

24. Length of infant's hospitalization (days)_____

APPENDIX E

Internal Consistency Reliability Estimates for NCAFS

Construct	1 mo.	4 mo.	8 mo.	12 mo.	No. of Items
Responsiveness of mother	0.28	0.59	0.63	0.53	12
Clarity of cues	0.69	0.51	0.66	0.67	16
Social-Emotional growth fostering	0.62	0.65	0.47	0.69	14
Cognitive growth fostering	0.70	0.64	0.82	0.65	10
Sensitivity to cues	0.71	0.71	0.72	0.56	16

Note: From "Psychometric characteristics of the Nursing Child Assessment Teaching and Feeding Scale", by D.W. King, NCAST Nursing Child Assessment Satellite Training Project Final Report, August, 1979, 148.

APPENDIX F

Test-Retest Reliability for NCAFS

Responsiveness to Mother

	1 month	4 months	8 months	12 months
1 month		0.32	0.10	0.02
4 months			-0.14	0.08
8 months				0.41
12 months				

Clarity of Cues

	1 month	4 months	8 months	12 months
1 month		0.25	-0.04	-0.37
4 months			0.08	-0.05
8 months				0.29
12 months				

Social Emotional Growth Fostering

	1 month	4 months	8 months	12 months
1 month		0.49	0.32	0.30
4 months			0.38	0.51
8 months				0.50
12 months				

Cognitive Growth Fostering

	1 month	4 months	8 months	12 months
1 month		0.46	0.27	-0.12
4 months			0.37	0.28
8 months				0.39
12 months				

Sensitivty to Cues

	1 month	4 months	8 months	12 months
1 month		0.45	0.03	0.28
4 months			0.33	0.49
8 months				0.38
12 months				

Note: From "Psychometric characteristics of the Nursing Child Assessment Teaching and Feeding Scales" by D.W. King, NCAST Nursing Child Assessment Satellite Training Project Final Report, August, 1979, 151.

APPENDIX G

Content Validity for NCAFS

Home - Total Score

Feeding Constructs	4 months	8 months	12 months	24 months	36 months
1 month	0.42	0.47	0.37	0.63	0.32
4 months	0.39	0.60	0.41	0.39	0.28
8 months	----	0.64	0.50	0.72*	0.28
12 months	----	----	0.61	0.43	0.79*

Feeding Constructs	SICD Receptive Language 36 months	SICD Expressive Language 36 months
1 month	0.61	0.45
4 months	0.36	0.52
8 months	0.35	0.47
12 months	0.60	0.25

Feeding Constructs	McCarthy - 48 Months
1 month	0.36
4 months	0.39
8 months	0.51
12 months	0.46

Feeding Constructs	Stanford-Binet - 18 Months
1 month	0.31
4 months	0.38
8 months	0.65
12 months	0.59

*Significant, $p < 0.05$.

Note: From "Psychometric characteristics of the Nursing Child Assessment Teaching and Feeding Scales" by D.W. King, NCAST Nursing Child Assessment Satellite Project Final Report, August, 1979, 157.

APPENDIX H

NCAST DATA

NCAST - NCAF Distribution by Marital Status and Race of Mother

	Marital Status			Race				
	Married (M)	Not Married (NM)	Significant Differences t test at $p < 0.05$	White (W)	Black (B)	Hispanic (H)	Other (O)	Significant Differences Newman-Keuls Range test at $p < 0.05$.
Sensitivity to cues	13.5	12.8	M > NM	13.4	12.9	13.5	12.7	-----
Response to distress	9.8	9.2	M > NM	9.8	9.4	10.0	9.6	-----
Social-emotional growth fostering	11.8	10.5	M > NM	11.8	10.8	11.4	10.9	W > O, B
Cognitive growth fostering	6.9	5.8	M > NM	6.9	5.3	6.4	5.7	W > O > B
Total parent score	42.0	38.2	M > NM	42.0	38.0	41.2	38.8	W > O, B
Clarity of cues	12.8	12.1	M > NM	12.8	12.1	*	12.2	-----
Responsiveness to parent	7.5	6.8	M > NM	7.5	6.5	7.1	7.1	W > B
Total child score	20.3	18.8	M > NM	20.3	18.6	17.7	19.0	W > O, H, B
Range	692-697	96-97		661-664	34	46-48	35-41	

*Insufficient Data

Note: From K.E. Barnard and S.R. Gortner, Nursing Child Assessment Training Project Final Report: Results of the first twelve months of life, May, 1977.

APPENDIX I

Address Change Post Card

We have moved and our new address is:

_____

_____

_____

_____

Our telephone number has changed. Our new telephone number is:

_____ _____

Code Number

To: _____

_____

_____

_____

APPENDIX J

Appointment Confirmation Postcard

Dear Ms. Smith:

I am looking forward to seeing you and Timmy during the second week of August. I will telephone you to arrange a convenient time for you.

Thank you,

Debbi Baldwin, R.N.
Graduate Student

To: _____
_____
_____
_____

APPENDIX K

Informed Consent Form

INFORMED CONSENT

I, _____, herewith
(first name) (middle name) (last name)
agree to serve as a subject on the study entitled, "Maternal Visitation Patterns in the Neonatal Intensive Care Unit Related to Maternal Care in the Home Environment", conducted by Deborah Baldwin, R.N.,B.S., under the supervision of Wilma Peterson, R.N.,Ph.D., advisor.

The purpose of this investigation is to describe mother-infant behavior. In consenting to be a participant, I will agree to the following: I will be observed by Deborah Baldwin for approximately 15 minutes during one of my visits to the hospital; Deborah Baldwin will visit my home approximately one month after my baby is discharged from the hospital, to observe me and my baby during one feeding. The nursery staff will also be making notations about my visits to the hospital.

Although I will not benefit directly, my participation in this study will help nurses learn more about how the early experiences of a mother and her premature infant, when the infant is in the newborn intensive care unit, affect the mother-infant activities.

The information obtained by the investigator will be kept confidential. My name will not appear on the records, and my anonymity will be assured by the use of code numbers. Deborah Baldwin has offered to answer any questions that I might have about my participation in this study. I understand I am free to refuse to participate or withdraw from this study at any time without affecting my relationship with, or treatment at, Yakima Valley Memorial Hospital.

I understand that it is not the policy of the Department of Health, Education, and Welfare, or any other agency funding the research project in which I am participating, to compensate or provide medical treatment for human subjects in the event the research results in physical injury. The University of Oregon Health Sciences Center, as an agency of the State, is covered by the State Liability Fund. If I suffer any injury from the research project, compensation would be available to me only if I establish that the injury

occurred through the fault of the Center, its officers or employees. If I have further questions, I will call Dr. Michael Baird, M.D., at (503) 225-8014.

I have read the foregoing and agree to participate in this study.

_____ _____

Date Subject's Signature

_____

Witness's Signature

APPENDIX L

Letter Requesting Permission to Conduct Study

Yakima Valley Memorial Hospital
2811 Tieton Drive, Yakima, Washington 98902 Phone 509/575-8000
Richard W. Linneweh, Jr., Administrator

June 27, 1980

Robert Brummett, PH.D.
Chairperson, Committee on Human Research
University of Oregon Health Sciences Center
3181 S.W. Sam Jackson Park Road
Portland, OR 97201

Dear Dr. Brummett:

Deborah Baldwin has asked permission to conduct a study under the supervision of Wilma E. Peterson, Ph.D. concerning "Maternal Visitation Patterns in the NICU Related Maternal Care in the Home Environment" in the Yakima Valley Memorial Hospital. I understand that this study has been approved by the Committee on Human Research at the University of Oregon Health Sciences Center.

This letter is to inform you that this institution agrees to give Deborah Baldwin access to the facilities of this institution for the purpose of collecting the data for this study.

Deborah Baldwin has provided a copy of her approved proposal including the informed consent form for the institution file.

Yours sincerely,

[redacted]

R. W. Linneweh,
Hospital Administrator

ABSTRACT

AN ABSTRACT OF THE THESIS OF

Deborah A. Baldwin

For the MASTER OF NURSING

Date of Receiving this Degree: June 12, 1981

Title: THE RELATIONSHIPS BETWEEN MATERNAL VISITATION PATTERNS IN THE NEONATAL INTENSIVE CARE UNIT AND MATERNAL CARE IN THE HOME ENVIRONMENT

Approved: _____
Wilma E. Peterson, Ph.D., Thesis Advisor

Maternal visitation patterns while an infant is hospitalized in the NICU have been found to be suggestive of the quality of the developing mother-infant relationship. Studies have suggested that mothers who do not visit their infants very often in the NICU tend to abuse their infants more often than mothers frequently visiting their infants (Fanaroff et al., 1974; Hunter et al., 1978). The present study was conducted to explore the possibility that the frequency of maternal visitations and the amount of maternal-infant interaction in the NICU are suggestive of later maternal behaviors in the home environment. The current study focused on 12 mother-premature infant dyads from white, Hispanic, and American Indian cultural backgrounds. The five primiparous and seven multiparous mothers were 16 to 34 years and spoke English. A descriptive correlational design was utilized.

Information regarding the frequency of maternal visitation in the NICU was obtained from a flow sheet in the infant's chart. An assessment tool for measuring maternal adaptive behaviors (Cropley, 1979) was used to observe the mother-infant dyad during the infant's second week of hospitalization.

One month following the infant's discharge from the hospital, the NCAST infant feeding scale was used to assess the amount of mothering behaviors demonstrated during an infant's feeding. The following relationships were revealed when addressing the research questions generated by this study:

1. Mothers who visited the NICU more frequently were found to demonstrate more maternal attachment behaviors during their visitations to the NICU than mothers who visited the NICU less often ($n = 12$; $r_{xy} = 0.47$; $p < 0.10$).

2. Mothers who visited their infants more often in the NICU tended to demonstrate more maternal behaviors during a feeding situation in the home one month after the infant's discharge from the hospital than mothers who visited their infants less often in the NICU ($n = 10$; $r_{xy} = 0.33$).

3. Mothers who demonstrated more maternal attachment behaviors during their visits to the NICU were found to demonstrate more maternal behaviors during a feeding situation in the home than mothers who displayed fewer maternal behaviors in the NICU ($n = 10$; $r_{xy} = 0.57$; $p < 0.05$).

4. Mothers who displayed more maternal behaviors during the feeding in the home had infants who appeared more interactive than mothers who displayed fewer maternal behaviors during the feeding ($n = 10$; $r_{xy} = 0.83$; $p < 0.005$).

5. Mothers who visited the NICU most often, demonstrated more maternal behaviors during the observation and were highly interactive with their infants at home were likely to be white, not on Welfare, more highly educated and primiparous. They also did not experience a gestational illness and chose to breast feed their infants.

6. Infants who did not require the ventilatory assistance of a respirator had more highly interactive mothers in the nursery and at home.

The major implications for nursing practice include: Nurses may record the quantity of maternal visitations to the NICU and observe maternal interactions with their infants, using the Observation Guide for Maternal Behaviors, in order to identify mothers "at risk" for developing impaired maternal affectional responses to their infants.

The small heterogeneous sample and the use of recently developed measures of maternal-infant interaction which had low reliability were limitations of the study. Future studies should focus on a larger sample in which the simultaneous and interactive effects of a large number of variables believed to affect maternal behavior could be tested.