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RELATIONSHIP OF FAMILY ENVIRONMENT, SOCIAL SUPPORT AND INFANT BEHAVIOUR TO MATERNAL INTERACTIONS WITH TERM AND PRETERM INFANTS

BY

MARGARET JOAN HARRISON

(C)

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE

OF DOCTOR OF PHILOSOPHY

IN

FAMILY STUDIES

FACULTY OF HOME ECONOMICS

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Mental Retardation Center

July 2, 1987

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Kathryn E. Barnard

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Manuel Barrera, Jr., Ph.D.
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Dear Dr. Barrera:

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Thank you.

Yours sincerely,

Margaret J. Harrison

Margaret J. Harrison
Ph.D. Candidate

MJH/jlh

Yes it can be included in your appendices. Core reference is 1981 paper in American Journal of Community Psychology. (Barrera, Sandler, & Ramsay, 1981).

MB
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FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled Relationship of Family Environment, Social Support and Infant Behaviour to Maternal Interactions with Term and Preterm Infants submitted by Margaret Joan Harrison in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Family Studies.

(Supervisor)

Date: October 21, 1987

ABSTRACT

The purpose of the study was to examine from an ecological perspective, the relationship of three factors, infant behaviour, social support from extended family and friends, and family environment to the pattern of maternal interactions with term and preterm infants. Sixty-two families (32 with term infants and 30 with preterm infants) participated in the study. Data on the quality of the marital relationship, the pattern of family relationships and the mother's support from kin and friends were collected from both the mothers and fathers at the time of the infant's discharge from hospital (T1) and three months later (T2). The instruments used were Spanier's Dyadic Adjustment Scale, Moos' Family Environment Scale and Barrera's Inventory of Socially Supportive Behaviors. Prior to discharge, the infant's ability to alert and make eye contact was measured by the orientation cluster score on a Brazelton Neonatal Behavioral Assessment. In the home setting at T2, two observers used the Nursing Child Assessment Teaching Scale to record observations of maternal-infant interactions. Results of the study indicate that although preterm infants were significantly less responsive in interaction than term infants, their ability at T1 to alert and make eye contact did not predict their interaction scores. Maternal support from kin and friends was not associated with maternal behaviour in interaction with the infant. For both families with term and preterm infants, the mother's perception of a supportive marital relationship

at T2 was significantly associated with responsive maternal behaviour during interaction with the infant. In addition, the larger the discrepancy between the mother's and father's perceptions of the marital relationship at T1 or T2 or their perceptions of family relationships at T2, the less responsive the mother was in interaction with her infant.

ACKNOWLEDGEMENTS

I gratefully acknowledge: the nursing staff for their help in contacting families; Barbara Borkent and Sharon Woronuk for their participation in data collection; Wayne Watson for computer consultation; and all of the families for their willingness to participate in the study. I also wish to acknowledge the support and ideas of my committee members and the patience and encouragement of my family.

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CHAPTER 1

INTRODUCTION AND STATEMENT OF THE PROBLEM

Recent studies have found that the environment is an important variable associated with a child's development (Gottfried, 1984). Holmes, Reich and Gyurke (in press) suggest that the family environment may be able to compensate for early deficits (either perinatal traumas or early behavioural differences) resulting in more optimal long term outcomes for the infant. In an effort to determine what aspects of the family environment influence the development of a child, researchers have begun to examine the dynamics and pattern of parent-infant interactions.

Most of the observational studies of parent-infant interaction have examined mothers and infants in an attempt to determine differences associated with maternal or infant characteristics. Warm responsive mothering, appropriately provided in response to infant cues, appears to foster optimal development of the child (Lamb & Easterbrooks, 1980). However, the infant is not a passive participant in interactions but provides cues to the caregiver. Some infants, such as infants born prematurely, are less responsive than other infants and give unclear cues to their parent. The lack of clarity of cues and decreased responsiveness of the preterm infant may make it more difficult for the parent to be sensitive in interactions with the infant (Barnard, Bee, & Hammond, 1984; Crnic, Ragozin, Greenberg, Robinson, & Basham, 1983; Field, 1979; Goldberg, Bachfeld, & DiVitto, 1980).

The pattern of interaction between parent and infant is an important aspect of the infant's environment but the parent-infant dyad exists within a larger environment of family members and friends. There is very little information available on how the pattern of mother-infant interaction is influenced by the family environment in which it exists. Cochran and Brassard (1979) believe that the parent's ability to engage in meaningful and sustained interaction with the child is determined, in part, by the support the social network offers the parents, making the parenting role easier or more difficult to fulfill. Belsky (1984) argues that the quality of the marital relationship is one of the most immediately available sources of support to parents. More research is needed to identify which important aspects of the family environment are associated with sensitive parenting and optimal parent-child interactions.

Purpose of the Study

The purpose of this study is to examine the relationship of three factors, infant behaviour, social support from extended family and friends, and family environment to the pattern of maternal interactions with term and preterm infants. This study is limited to the examination of mother-infant interactions because in North America, mothers still are the major caregivers for infants, spending more time with their infants than do the fathers (Belsky, 1980; Katsh, 1981).

Definition of Terms

The following definitions will be used in this study.

Family

A family is considered to consist of a couple, married or cohabiting, who have one or more children. The study is limited to families who have recently given birth to an infant, not necessarily their first child. For convenience, in the rest of this report the relationship between the parents will be referred to as the marital relationship, recognizing that some of the parents may not be legally married.

Preterm Infant

A preterm infant is an infant born at 36 or fewer weeks of gestation. An infant born at 37 or more weeks gestation is therefore a term infant.

Infant Behaviour

Infant behaviour refers to the infant's ability to maintain periods of alertness and to respond by orienting towards sound and movement. This ability is assessed during interaction with a trained examiner before the baby leaves the hospital.

Social Support

Social support refers to the assistance given the mother. Social support is seen as including tangible forms of assistance such as the provision of goods and services as well as intangible forms such as guidance and expressions of esteem. This definition is consistent with Caplan's (1976) conceptualization of social support. In this study, social support is limited to assistance given the mother by relatives (other than her spouse) and friends.

Family Environment

Family environment is a term that describes the pattern of

relationships between all family members with respect to the amount of conflict and mutual support. The marital relationship is considered to be part of the family environment.

Conceptual Framework

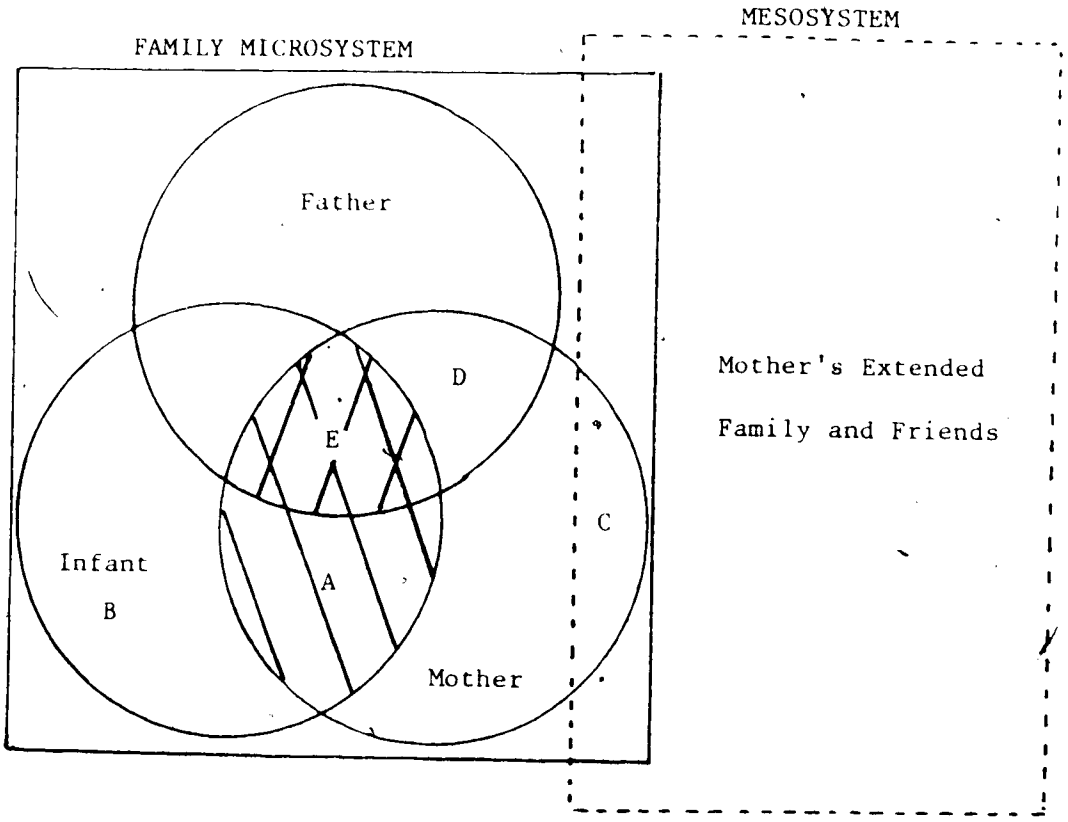
An ecological perspective is used as a conceptual framework in this study to provide a view of the factors influencing mother-infant interaction. Bronfenbrenner (1977) conceives of the process of development as a progressive, mutual accommodation over time of a growing individual and the changing environments in which the individual lives. The environment is visualized as a nested arrangement of structures or successive levels: microsystem, mesosystem, exosystem and macrosystem. Garbarino (1977) calls this arrangement an interactive set of systems or subsystems. The microsystem or first level is the complex of relationships between the individual and the immediate setting containing that person. The relationships are reciprocal; each individual contributing to the interaction between himself and the others in the setting. Depending on the number of individuals involved, there are various subsystems in the microsystem and consequently there are potential second- and higher order effects associated with the different subsystems. The mesosystem is a network of microsystems that contains an individual at a particular point in his or her life. For example, a young child may participate in a mesosystem that includes three microsystems: his nuclear family, his extended family such as the grandparents, and his daycare setting. The exosystem includes formal and informal social structures that influence but do not contain an individual. For most

children such a structure would be the father's place of work. The encompassing values and institutions of a culture are included in the highest level, the macrosystem. The macrosystem, for example, determines the priority and value placed on children and those responsible for them.

In this study the home is the microsystem under investigation. The infant is seen in reciprocal interaction with the mother and the interaction between the infant and mother is believed to be influenced by the pattern of relationships between all family members. In addition, the mother is a participant in a network of extended family and friends. Bronfenbrenner (1977) would place this social network into the mesosystem of the mother, some aspects of which might be part of the mesosystem of the infant. Although there are other levels of the environment proposed by Bronfenbrenner, for the purpose of this study, attention is focused on the microsystem of the infant's immediate family. The study examines the interaction of the infant and mother in relationship to the infant's ability to participate in the interaction; the support the mother has from kin and friends and the family relationships in the home.

Figure 1 illustrates a model of the microsystem of one child and his or her parents and the variables in this study (infant behaviour, family environment and maternal social support). The focus of the study is maternal-infant interaction, indicated as "A", the lined portion of Figure 1. It is assumed that the behavioural capacity of the neonate, "B", will have an effect on the infant's interaction skills and this will be reflected in the analysis of maternal-infant interactions. Social support from the mother's kin and friends, "C",

Figure 1. Model of the Relationship of Study Variables to the Microsystem of the Infant



A Interaction between mother and infant

B Infant behaviour

C Maternal social support

D Marital relationship

E Family relationships

is assumed to have an effect on the interaction through influence on the mother's ability to be sensitive and responsive to the child. The family environment in this study is defined as the pattern of relationships between the family members. Two aspects of this environment are shown in Figure 1. The marital or couple relationship is illustrated as "D", the portion of the overlap between the mother and father which excludes the infant. The relationships between all family members is "E", the hatched intersection of all three circles. This hatched section would include relationships with other children in those families who have more than one child. It is assumed that analysis of maternal-infant interactions will reflect the influence of infant behaviour, maternal social support and family environment (marital relationship and family relationships).

Research Questions

The following research questions were posed in this study.

What is the relationship of infant behaviour to maternal-infant interactions?

What is the relationship of family environment to maternal-infant interactions?

What is the relationship of a specific aspect of family environment, the marital relationship, to maternal-infant interactions?

What is the relationship of social support to maternal-infant interactions?

What is the relationship of group membership and each of the preceding variables to maternal-infant interactions?

What is the relationship between three variables, infant

behaviour, family environment and social support, and maternal-infant interactions?

Significance of the Study

Much of the previous research on families with infants has been done by two separate groups: developmental psychologists interested in the factors influencing child development and family sociologists examining the impact the birth of a child (particularly the first child) has on family relationships. Only recently have the interests of these two disciplines been combined in research and discussions of theory (Belsky, 1981). This study will add to the growing body of literature that attempts to determine the interdependencies between family and marital relationsips, social support from outside the nuclear family, differences in infant characteristics, and maternal-infant interactions.

The relationship between infant behaviour, family environment, social support and mother-infant interaction is a complex one. This exploratory study may provide some preliminary information on the type of environment associated with responsive maternal interactions with preterm and term infants. Contemporary medical care has resulted in an increased rate of survival for preterm infants, infants who are less responsive in interactions with caregivers. Professionals working with families would benefit from knowing what social contexts are supportive to mothers in their parenting of newborns of different behavioural capacities. As maternal-infant attachment has been positively associated in some studies with the later socioemotional and cognitive development of the child (Campos, Barrett, Lamb, Goldsmith, & Stenberg,

1983), information that assists professionals to plan care for families that enhances maternal-infant interactions may pay important dividends for children and their families.

Outline of the Report

A summary of the literature on the possible relationship of infant behaviour, social support and family environment, to maternal-infant interaction is presented in Chapter Two. The design of the study is outlined in Chapter Three and includes descriptions of the instruments used, the process of sample selection and data collection, and the analysis completed. The findings of the study are contained in Chapter Four. The final chapter, Chapter Five, presents a summary and discussion of the major findings with recommendations for future research.

CHAPTER 2

REVIEW OF RELATED RESEARCH

The literature review includes the following topics the importance of mother-infant interaction, the contribution of infant behaviour to the interaction, the possible influence of family environment particularly the marital relationship on parenting and maternal interactions with infants, and the relationship of social support to parenting and mother-infant interactions. The literature review is limited to research on infants from birth to 24 months

Importance of Mother-Infant Interaction

In their review of research studies, Campos, Barrett, Lamb, Goldsmith, and Stenberg (1983) indicated that there is a growing body of evidence that warm, sensitive, responsive care from an adult, usually the mother, helps foster optimal development in the child. Observational studies of mother-infant interaction support the position that this style of maternal parenting is linked with intellectual and social-emotional development of infants. Infants whose mothers are nurturant, responsive to their needs, and accepting of their limits tend to develop secure, as opposed to resistant or avoidant, attachments to their caregivers (Ainsworth, Bell, & Stayton, 1972; Belsky, Rovine, & Taylor, 1984; Egeland, & Farber, 1984). A secure attachment to the caregiver has been linked with later child development. For example, competence in problem solving and peer relationships at two and five years of age were found to be associated

with secure attachment (Arend, Gove, & Sroufe, 1979; Matus, Arend, & Sroufe, 1978). These studies provide some support for the argument that the style of maternal infant interactions is important for later development of the child.

Contribution of Infant Behaviour to Maternal Infant Interactions

Some infants, such as those born prematurely, appear to be involved in less complementary and less sensitive interactions with their mothers. Findings from some studies have shown that premature infants in interactions with their mothers are unresponsive in comparison with term infants (Alfasi, Schwartz, Brake, Fifer, Fleischman, & Hofer, 1985; Barnard, Bee, & Hammond, 1984; Field, 1977, 1979; Goldberg, Bachfeld, & DiVitto, 1980). Preterm infants prior to discharge from hospital consistently score lower on the attention-orientation factor of the Brazelton Neonatal Behavioral Assessment Scale (Emory & Walker, 1982; Lester, Emory, Hoffman, & Eitzman, 1976). This factor includes behaviour such as degree of alertness as well as attention and orientation to various stimuli. In play interactions at six months, preterm infants, as compared to term infants, have shown significantly more instances of moving their attention away from a toy their mother is using (Landry, 1986). In addition, preterm infants have been reported to be more irritable, fussy and more difficult to soothe (Field, Demsey, & Shuman, 1981; Medoff-Cooper & Schraeder, 1982).

Magyary (1983) completed a sequential analysis of second-by-second behavioural exchanges between mothers and preterm infants at the time

of the infant's hospital discharge and at four and eight months chronological age. She found that preterm infants were unlikely to initiate gaze contact with the mother, rarely adapted to the mother's persistent attempts to establish gaze contact and when mutual gaze was finally obtained, were likely to quickly avert their gaze. Malatesta, Grigoryev, Lamb, Albin, and Culver (1986) also found that preterm infants at two, five and seven months spend less of their face-to-face interaction in eye contact with their mothers. As mothers have reported increased feelings of attachment when engaged in prolonged eye-to-eye contact with their infant (Blehar, Lieberman, & Ainsworth, 1977), Magyary (1983) argues that the infrequent occurrence of mutual gaze may negatively influence maternal feelings of attachment and the evolving relationship between parent and child.

In contrast with their children, mothers of preterm infants become overactive possibly in an effort to stimulate the child. This behaviour has been observed in interactions between mothers and preterm infants in play situations at three months (Field, 1979), during feedings at four months (Barnard, Bee, & Hammond, 1984; DiVitto & Goldberg, 1979) and during play at eight months (Goldberg, Bachfeld, & DiVitto, 1980). However, by the time the infant is one year of age; the infant is more responsive and the mother is less intrusive and more reciprocally responsive with her child (Goldberg, Bachfeld, & DiVitto, 1980). Difficulties in interaction appear to persist longer for mothers with preterm infants with neonatal complications (Greene, Fox, & Lewis, 1983; Minde, Whitelaw, Brown, & Fitzhardinge, 1983).

In summary, some children, such as preterm infants, exhibit behaviour that makes them less responsive in interactions. Their lack

of responsiveness negatively influences the interaction between the mother and infant and may possibly influence the development of attachment and the relationship between the mother and child.

Family Environment and Maternal-Infant Interaction

There are varying ways to conceptualize family environment. In this study, family refers to the nuclear family of parents and children and the term, family environment, refers to the pattern of relationships between family members with respect to the amount of conflict and mutual support.

Most of the literature on families with infants examines the impact that the birth of a child has on family roles and the marital relationship (e.g., Belsky, Lang, & Rovine, 1985; Belsky, Spanier, & Rovine, 1983; Dyer, 1963; Hobbs & Cole, 1976; LeMasters, 1957; Russell, 1974). Very few studies have investigated the influence of the family environment on parent-child interactions and the development of the child.

Some evidence exists that the quality of the marital relationship is related to patterns of mother-infant interactions. Pedersen (1975) found a positive relationship between the degree of the husband's emotional supportiveness and the mother's responsiveness to term infants during feeding. The mother's satisfaction with spousal relationships is reported to be a significant predictor of maternal affect in interaction with the infant (Crnic, Greenberg, Ragozin, Robinson, & Bashman, 1983) as well as of the frequency with which mothers visit their hospitalized premature infants (Minde, Marton, Manning, & Hines, 1980). Trause and Kramer (1983) noted that the more

aware the father is of the mother's needs and feelings, the less difficulty she reports in adapting to having a preterm baby at home. The mother's and father's satisfaction with their marital relationship has been shown to be associated with more secure attachment in toddlers (Goldberg & Easterbrooks, 1984). However, Lamb and Elster (1985) did not find the couple relationship to be related to the pattern of maternal-infant interactions in a group of adolescent mothers and their partners. They suggest that their research design, observation of mother-father-infant triad rather than the usual observation of mother-infant or father-infant dyad, might account for the difference in findings.

The previously cited literature used the marital or couple relationship to assess the family psychosocial environment. Other researchers have chosen to assess the cohesiveness of all family relationships as compared to only the marital relationship. Cohesive family relationships have been found to be associated with complementary mother-infant interactions during a teaching situation at four months (Sturm, 1985) and with decreased likelihood of parenting problems with ill and preterm infants (Siefert, Thompson, Bensel, & Hunt, 1983).

In summary, the results of some research studies indicate that for women a supportive relationship with their partner may help provide an environment that is conducive to sensitive, responsive mothering. Only two studies were located that examined the pattern of all relationships in the nuclear family and the association with maternal-infant interactions. At present the evidence that there is a relationship between positive family environments and optimal maternal-infant

interactions is scant and more research needs to be done.

Social Support and Parenting

The results of the studies on social support are difficult to compare because of the different definitions of support and the different instruments used to measure support. At this time no general consensus exists on a definition for the concept of social support (Leavy, 1983; Pearson, 1986). One approach has been to examine the individual's social network for the number, diversity and availability of individuals who might be supportive (e.g., Levitt, Weber, & Clark, 1986). The other approach has been to focus on the process of social support, describing what types of interaction are perceived as supportive (e.g., Gottlieb, 1978). There is also continued discussion in the literature on social support as to whether the concept is multidimensional or unidimensional. When some of the instruments based on multidimensional definitions of social support are analyzed they appear to measure one dominant construct of social support (e.g., Brown, 1986). No one instrument is commonly used in studies of social support; instruments are developed for a particular study and focus on specific populations (e.g., Tietjen & Bradley, 1985).

Despite the limitations due to a lack of consensus on a definition for and means of measuring social support, there is evidence that social support is important for children and families. Most of the literature on social support and childbearing families examines the influence of perceived social support on the parent's, predominantly the mother's, emotional state or self esteem. Perceived satisfaction with support from her spouse is positively associated with maternal

feelings of well-being postpartum (Cronenwett, 1985a; Levitt, Weber, & Clark, 1986; Stemp, Turner, & Noh, 1986; Tietjen & Bradley, 1985; Unger, & Wandersman, 1985; Wandersman, Wandersman, & Kahn, 1980). Results of studies on the influence of other members of a woman's social network are conflicting. Some researchers have found support from friends and extended family to be related to maternal psychological well-being postpartum (Crnic, Greenberg, Ragozin, Robinson, & Basham, 1983; Unger, & Wandersman, 1985; Wandersman, Wandersman, & Kahn, 1980) but others have found no significant relationships (Stemp, Turner, & Noh, 1986; Tietjen & Bradley, 1985).

One of the assumptions underlying the measurement of psychological well-being in the parent is that the parent's emotional state influences his/her behaviour with the child. Only a few researchers have chosen to investigate the relationship between social support and actual parenting behaviours. Pascoe and Earp (1984) and Unger (1979) found that women were more responsive to their children if the mothers reported receiving social support. The generalizability of these findings is limited as Unger (1979) studied a small sample of 18 low-income mothers, while Pascoe and Earp (1984) followed only families with an infant at risk for developmental problems. In the latter study the type or source of support is not described. The results of other studies are conflicting. Sturm (1985) and Lamb and Elster (1985) found perceived emotional support from either family or friends was not associated with mother-infant interaction scores, but Crnic, Greenberg, Ragozin, Robinson and Basham (1983) reported that emotional support from spouse, but not support from friends, was positively related to responsive maternal-infant interaction.

The most consistent finding from these studies is that perceived emotional support from the spouse or partner may be associated with psychological well-being of the mother and possibly her behaviour in interaction with the infant. This finding supports the previous discussion of the importance of the family environment. The role of support from the rest of the mother's social network is unclear.

When all three areas of the literature review are examined jointly, the literature indicates that mothers in families with supportive relationships, especially a supportive marital relationship, who receive social support from others outside the family and who have an infant who is able to provide clear cues for interaction, may be more able to participate in responsive, reciprocal interactions with their infant. As limited research has been done on the relationships of the family environment and social support to maternal interactions with term and preterm infants, these relationships will be examined in this study.

CHAPTER 3

DESIGN OF THE STUDY

This observational study of maternal-infant interaction included families with term and preterm infants. Infants and mothers were observed in their home during a structured teaching task. Data on the infant and his/her family were collected both when the infant was in hospital and at the time of the interaction observation, three months after the infant's discharge from hospital.

Sample

A purposive sample was obtained from families who delivered their child at a large urban hospital. Families were included in the study if they were two-parent families (not necessarily married), English speaking, and residing in Edmonton or within a one hour drive from the city. Half of the families had healthy infants born at term. The other families had a clinically normal and healthy preterm infant who met the following criteria: born at less than 37 weeks gestation as assessed by physical characteristics and stage of neurological development on the Dubowitz Scale (Dubowitz, Dubowitz, & Goldberg, 1970), birth weight appropriate for gestational age, no history of cranial bleeding, no congenital malformations, and on a respirator for less than seven days. These preterm infants were selected to reduce the risk that differences in infant behaviour might result from medical complications rather than immaturity. Parents taking twins or triplets home were excluded from the sample. Based on Meehl's (1970) argument

that controlling for nuisance variables in ex post facto research designs may result in artificially increasing the correlation between the independent variable and some other outside variable, no attempt was made to match the families with preterm infants to families with term infants.

Permission to conduct the study was obtained after ethical reviews by the Committee on Human Research at the University of Alberta and by the Clinical Investigation Committee of the hospital from which the sample was obtained. Families who met the criteria were approached by the nursing supervisor during the mother's postpartum hospitalization or after the preterm infant's condition had stabilized, given an introductory letter and asked to consider participation in the study. If the mother expressed interest, the researcher met with the parents to explain the study and to obtain their consent. In order for the family to be included in the study, both the father and the mother had to agree to participate. Samples of the introductory letter and consent forms are in Appendix 2.

As this was a longitudinal study, the initial sample at Time 1 included 31 families with preterm infants and 32 families with term infants to allow for some attrition over the three month period of the study. A sample size of 30 term and 30 preterm families was felt to be adequate for the planned statistical analyses and was believed to be feasible to obtain within six months. It took eight months, May to December 1986, to enroll 31 families with a preterm infant in the study. As the hospital was a referral centre for northern Alberta, twenty-six other preterm infants met the study criteria but were part of families residing outside the selected study area and could not be

included. To control for the effects of history over the eight months, a term family was enrolled in the study when a family with a preterm infant agreed to participate.

For those families who discussed participation in the study with the researcher, the refusal rates were 40 percent for parents with preterm infants and 27 percent for parents with term infants. In both groups the most common reason for refusal to participate (50 percent) was the husband's disinterest (Table 1). Parents with preterm infants were more likely to refuse to participate. Their refusal may possibly be a reflection of their anxiety about the child and the strain involved in visiting and caring for a small infant who arrived unexpectedly early.

Table 1

Frequency of Reasons for Refusal to Participate

Reason	Type of family	
	Preterm n = 21	Term n = 12
Father did not want to participate	10	6
Father working out of town	3	3
Family "too busy", not interested	5	2
Father unable to read questionnaire	0	1
Family moving out of the area	1	0
Family's command of English inadequate	2	0

Instruments

Two measures of family environment were used in this study: the Family Relationship Index of the Moos Family Environment Scale (Moos & Moos, 1981) and Spanier's Dyadic Adjustment Scale (Spanier & Filsinger, 1983). It was anticipated that these instruments would share some common information on the family environment as it is defined in this study but that each instrument would also provide unique information. The Family Relationship Index asks family members to describe all family relationships while the Dyadic Adjustment Scale focuses specifically on the marital relationship. Copies of these scales are in Appendix 3.

Moos Family Environment Scale Form R

Using ten subscales, this self report rating scale measures three dimensions of family life: relationships, values for personal growth and mechanisms of system maintenance (Moos & Moos, 1981). The Family Environment Scale (FES) contains 90 items which are scored true or false. The instrument was developed from a large pool of items believed to describe family environments and generated from interviews with family members. No specific theoretical orientation was used. However, the relationship dimension contains subscales on cohesion, conflict and expressiveness, all traits related to the affective aspects of family which are stressed in current models of family functioning (e.g., Beavers, 1982; Olson, Sprenkle, & Russell, 1979). The subscales of organization and control in the system maintenance dimension contain items that appear to relate to structure and adaptability, aspects of family functioning seen as important by other theorists such as Minuchin (1974) and Olson, Sprenkle and Russell

(1979).

Moos and Moos (1981) have shown the FES has adequate internal consistency (.64 to .78) and stability over time (.68 to .86). The scale has been shown to discriminate between distressed and nondistressed families (Scoresby & Christensen, 1976), between families of recovered and relapsed alcoholics (Finney, Moos, & Newborn, 1980; Moos, Finney, & Chan, 1981), and to predict higher morale in families of hemodialysis patients (Dimond, 1979).

The Family Relationship Index is a composite of the FES cohesion, conflict and expressiveness subscales. This Index was chosen for this study as a measure of supportive relationships for the family as a whole. The specific items that are included in the Index are marked by an asterisk on the FES in Appendix 3. High scores on the Family Relationship Index have been shown to predict less depression and fewer psychosomatic symptoms in family members (Holahan & Moos, 1981; Moos, Finney, & Gamble, 1982). The Family Relationship Index has high internal consistency (.89) and the included subscales: cohesion, conflict and expressiveness, have two month test-retest reliabilities of .86, .85, .73 respectively.

Dyadic Adjustment Scale

This widely used questionnaire measures dyadic adjustment in married or cohabitating couples (Spanier & Filsinger, 1983) and was chosen for this study as a measure of the support available specifically within the couple relationship. The Dyadic Adjustment Scale (DAS) was developed from a pool of 300 items collected from previously used scales measuring marital adjustment or a similar concept and which fit within the chosen theoretical definition of

marital adjustment. The 32 questions on the finalized form of the DAS are measured on five or six item Likert scales. The DAS can be divided into four subscales: dyadic satisfaction, dyadic cohesion, dyadic consensus and affectional expression. This scale has been reported to have an internal consistency of .91 to .96 and to discriminate between distressed and nondistressed couples (Spanier, 1976; Spanier & Thompson, 1982).

Inventory of Socially Supportive Behaviours

The Inventory of Socially Supportive Behaviours (ISSB) (Barrera, Sandler, & Ramsay, 1981) is a 40-item questionnaire that measures support behaviours by asking the respondent to indicate the frequency of supportive acts they received within the past four weeks. The respondent can select a response from the following: never, once or twice, once a week, several times a week or every day. The scale provides a total score by summing the frequency ratings across all 40 items. Item selection was guided by Caplan's (1976) definition of social support and the results of Gottlieb's (1978) qualitative investigation of support behaviours. Specific items refer to tangible forms of assistance such as the provision of goods and services as well as intangible forms such as guidance and expressions of esteem. A copy of the scale is in Appendix 3.

In research on college students and pregnant adolescents, the questionnaire has been shown to have an internal consistency of .925 (Stokes, & Wilson, 1984) and a short term test-retest reliability of .882 (Barrera, Sandler, & Ramsay, 1981). The ISSB has demonstrated modest, but significant correlations with measures of network size (Barrera, 1981; Stokes & Wilson, 1984). Factor analysis has identified

four components similar to the theoretical dimensions of support used in the questionnaire's construction: emotional support, tangible assistance, cognitive information and feedback, and directive guidance (Stokes & Wilson, 1984).

The original questionnaire measured support received from all sources, from within the immediate family and from relatives, friends and others. In order to measure support received from sources other than the spouse, the directions for answering the scale were altered in this study. Mothers were asked how often friends and relatives (other than their spouse) assisted them.

Brazelton Neonatal Behavior Assessment Scale

The Brazelton Neonatal Behavior Assessment Scale (BNBAS) was selected to measure the infant's ability to contribute to interactions. The BNBAS (Brazelton, 1984) is an observation scale that measures 20 reflexes and 26 behaviours in the neonate. The behavioural items can be grouped into four dimensions: interactive capacities, motoric capacities, state control and physiological responses to stress. The infant's optimal performance in interaction is elicited and scored by a trained examiner and the examination takes about 30 minutes. The BNBAS has been widely used in the behavioural assessment of preterm infants at 36 or more weeks gestational age even though it was developed for full term neonates.

Data from the BNBAS can be analyzed using either four a priori cluster scores (Adamson, Als, Tronick, & Brazelton, 1975) or seven factorially-derived cluster scores (Lester, Als, & Brazelton, 1982). As the results of other studies have found premature infants to be less alert and less able to establish or maintain eye contact (Magyary,

1983, Malatesta, Grigorvev, Lamb, Albin, & Culver, 1986), the orientation cluster score was chosen to measure the infant's ability to contribute to the interaction. This ability has been suggested to be important to the establishment of positive maternal infant interaction (Magyary, 1983) and the BNBAS does differentiate between preterm and term infants on attention-orientation capabilities (Emory & Walker, 1982)

As the selected sample contains clinically healthy preterm infants at 37 to 39 weeks gestational age, some individual preterm infants may have higher scores on the orientation cluster than term infants. For this reason it was deemed more appropriate to collect information on each individual infant's ability to be alert and to orient, rather than classify infants by group membership. The behavioural descriptions for scoring the items in this cluster score are in Appendix 4

Nursing Child Assessment Teaching Scale

Many of the observation scales developed to measure parent-infant interactions have been used only in a specific study. It was decided to use an observation scale that had previously been developed so that some comparison of results could be obtained. In addition it was important to choose an observation scale that could be used in the home, that had previously been used on young infants, that measured both infant and parent individual behaviour and contingent behaviours, for which there was some evidence of validity and for which there was a training program available for interrater reliability.

The Nursing Child Assessment Teaching Scale (Barnard, 1978) is a binary scale of 73 behaviours that are scored yes if a behaviour occurs and no if the behaviour does not occur during the observation period.

The scale has four parental subscales (sensitivity to cues, response to distress, socioemotional growth fostering and cognitive growth fostering) and two infant subscales (clarity of cues and responsiveness to parent). The scale includes items where one individual's behaviour is contingent upon the other's behaviour. Subscale and total scores are determined by adding the number of yes responses. Higher scores indicate more optimal interaction.

Teaching tasks used during the observation are based primarily on the motor performance items on the Bayley Infant Scales and the task selected for the observation is the one most appropriate for the infant's developmental age. For this research, the parent was asked to teach the infant to reach toward the red ring which the parent held on a string before the child.

The NCATS has been used with infants under one year and in the home setting. The NCATS has been shown to differentiate between mother interactions with preterm and term infants (Barnard, Bee, & Hammond, 1984) and between abusive and nonabusive mothers (Bee, Disbrow, Johnson-Crowley, & Barnard, 1981). Cronbach's alpha for the total NCATS was reported as .94 (Barnard, Booth, Mitchell, & Telzrow, 1984). A copy of the scale is in Appendix 5.

Father Participation in Child Care

It can be argued that both the FRI and the DAS measure one type of support, the parent's satisfaction with emotional support in relationships with other immediate family members. Other types of support the mother receives from her partner, such as assistance with the care of the infant, may be more strongly related to maternal-infant interaction. To measure the degree of the father's participation in

child care and the mother's satisfaction with the father's participation, three semi-structured open-ended questions were adapted from a study done by Katsh (1981). The first question asked the mother to indicate how often the father gave specific types of care to the infant in the past seven days. In addition, as a measure of the father's willingness to assume responsibility for child care as well as the mother's willingness to relinquish responsibility, the mother was asked how often in the last week she left the infant alone in the father's care. The last question asked whether the mother would like the father to participate more frequently, the same amount, or less frequently in child care. Katsh had used similar questions in a study of father participation in child care with 169 families with infants. The questions were pretested by the investigator on three couples and found to be satisfactory for the purpose of this study.

Data Collection

Data were collected at two different times. Table 2 summarizes when information was collected and what instruments were used.

Time 1: Prior to the Infant's Discharge from Hospital

During the parental interview when signed consents were obtained, the researcher also gathered demographic information on the family (Appendix 6). Then each parent was given a questionnaire booklet, asked to complete this independently of their partner and to return the booklet in a sealed envelope to either the researcher or the nursing unit supervisor. The mother's booklet contained the Inventory of Socially Supportive Behaviors (ISSB), the Family Environment Scale (FES), and the Dyadic Adjustment Scale (DAS). The father's booklet

Table 2

Summary of Data Collection Plan

Time of Data Collection	Variable	Instrument
I Prior to Infant's Discharge From Hospital	Infant Behaviour	Brazelton Neonatal Behavior Assessment Scale: Orientation Cluster Score
	Social Support	Inventory of Socially Supportive Behaviors[1]
	Family Environment a) marital relationship	Dyadic Adjustment Scale[2]
	b) family relationships	Family Relationship Index from Family Environment Scale[2]
	Demographic Information	Questionnaire[2]
II. Three Months After Infant's Discharge	Social Support	Inventory of Socially Supportive Behaviors[1]
	Family Environment a) marital relationship	Dyadic Adjustment Scale[2]
	b) family relationships	Family Relationship Index from Family Environment Scale[2]
	Father's participation in child care	Questionnaire[2]
	Maternal-Infant Interaction	Nursing Child Assessment Teaching Scale

[1] Completed by mothers only.
[2] Completed by mothers and fathers.

contained the Family Environment Scale and the Dyadic Adjustment Scale. The booklets were designed to be attractiye, easy to handle in the hospital setting and to remove the necessity for separate answer sheets.

The parents were asked to return the booklets prior to the infant's discharge. Most families were able to meet this request. Three families mailed the husband's questionnaire to the researcher after the infant's discharge; the mothers had returned their questionnaires to the nursing unit supervisor prior to their infant's discharge. The researcher collected the questionnaires from the parents of three families when the infant assessment was done at home shortly after discharge. In two other families, the researcher made home visits to obtain the completed questionnaires after the infant's discharge as the parents forgot to bring the questionnaires to the hospital.

The Brazelton Neonatal Behavior Assessment Scale (Brazelton, 1984) was administered by the investigator who had previously reached 90% interrater reliability during training with an instructor from the Neonatal Behavior Assessment Scale reliability training centre at the Child Development Unit, Children's Hospital Medical Center, Boston. In this study, the assessment of infant behaviour was done on the infant prior to or within 48 hours of discharge from the hospital. For term infants the assessment was completed on the third or fourth day after birth. For preterm infants the assessment was done at 37-39 weeks gestational age depending on the time of discharge. Only three infants were examined at home. These infants were preterm infants who were discharged from the hospital sooner than originally anticipated. In

order to increase the reliability of the assessments of infant behaviour, the investigator dictated observations into a voice-activated recorder during the assessment, scored the scale immediately after the assessment was completed and then reviewed the recorded tape in comparison to the assigned scores. From the infant's medical records, information was obtained on the type of delivery, weight and gestational age at birth, length of hospital stay, medical problems, type of feeding and length of time after birth until the parents had their first contact with the infant (Appendix 3).

Time 2: Three Months after Infant Goes Home

During a home visit three months after the infant's discharge from the hospital, both parents independently completed questionnaire booklets containing the FES, DAS and (for the mothers only) the ISSB. The parents' questionnaires also asked for information on the father's participation in child care. All families completed the second questionnaire booklet during the home visit except one family who returned their booklets by mail as they were busy that day and wanted to have a shorter visit than was planned.

Also during the home visit, the mother-infant interaction was observed by two observers, the investigator and a research assistant, using the Nursing Child Assessment Teaching Scale (NCATS) developed by Barnard (1978) at the University of Washington. The father was not present in the room while the mother-infant interaction was observed. Two research assistants were used and alternated home visits made with the investigator.

Previously all three observers had been trained in the use of the Nursing Child Assessment Teaching Scale by an instructor certified by

the Nursing Child Assessment Satellite Training Center at the University of Washington using standardized training films and home visits. Prior to data collection for this study, each observer reestablished their reliability in the NCATS by reviewing training films and making home visits with a partner to 10 mothers with infants.

During this retraining period, the observers achieved at least 85% interrater reliability on their observations of mother-infant interaction using item by item agreement and .60 using Cohen's (1960) kappa correlational statistic. Inflated reliability estimates may result using percent agreement when observed behaviours occur at extreme rates. Kappa provides formal corrections for chance agreements (Hartmann & Gardner, 1981) and a conservative estimate of interrater reliability. As an example, the NCATS uses a binary observation code of yes or no depending on whether a behaviour is present or absent. It is more likely that extreme values will occur if there are only two possible codes for each category. One mother who was highly skilled in interaction had a responsive infant and scored yes on most of the 73 items on the NCATS. Although the observers reached 93 percent agreement on the items, the kappa correlation was only .51. The same observers achieved 93 percent agreement on another mother and infant who were less responsive to each other and had a greater number of items scored no. This observation had a kappa of .78.

During the home visits made for data collection, each observer scored the interaction independently. Immediately following each visit the observers compared their ratings for each item on the NCATS and a joint score was compiled for data analysis. When there was disagreement in the assigned rating of an item, a consensus was reached

on the rating to be assigned. During the home visit each observer had a unique position from which to watch the interaction and sometimes was able to observe behaviours the other observer could not see.

It was not possible for the observers to be blind to which families had preterm or term infants as it was apparent by the infant's appearance and development. However, data collected at Time 1 were not coded nor analyzed until after the maternal-infant interactions were observed to lessen the possibility of observer bias.

Three months was selected as an appropriate time for the observations as other studies (Jeffcoate, Humphrey, & Lloyd, 1979; Trause, & Kramer, 1983) have reported that by two months parents of both term and preterm infants have acquired caretaking skills and adjusted to the newborn infant. A teaching task was selected for observation as it was a more novel situation than a caretaking task such as feeding. Observing a teaching interaction allowed observation of infant and parent behaviours outside of well rehearsed routines.

Data Analysis

The planned data analysis required the use of total scores from the ISSB, FRI and DAS questionnaires. In order to detect any possible bias due to missing data, the completed questionnaires were examined for unanswered questions. A small number of each type of questionnaire (ISSB, FRI or DAS) had the occasional unanswered question. For example, of the 125 analyzed ISSB questionnaires each with 40 items, there were five questionnaires that had one of the 40 items unanswered and the items were not the same ones. There was no consistent pattern in either respondent or item to the missing data at either Time 1 or

Time 2 on any questionnaire. The mean score on a questionnaire item for the specific respondent group (term mothers, preterm mothers, term fathers, or preterm fathers) for the appropriate time of data collection was substituted for the missing response. The disadvantage to inserting mean values is that the correlations between a variable with a mean inserted in several slots and other variables will be lowered (closer to zero) (Tabachnick & Fiddell, 1983). However, the amount of reduction in the correlations depends on the amount of missing data for which means were inserted. As this study had little missing data for each variable, this problem will be limited.

When research is done on families, input from more than one family member helps provide a wider perspective on family functioning and issues. This study obtained information from both mothers and fathers on the family environment. There is continued debate in the literature on the best method to use to calculate dyadic or family scores from information obtained independently from each member of the group. Two methods were used in this study. Each type of score reflects a different perspective on the family. Additive dyadic scores on the DAS and on the FRI were obtained by summing the mother's and father's scores. This type of score is a measure of the common perspective shared by the spouses. Discrepancy dyadic scores on either the DAS or FRI were obtained from the absolute value of the difference between the mother's and father's score. Discrepancy scores can be said to describe the amount of difference in the perspective of the individuals in the dyad. The results of other studies have shown that discrepancies in how a couple view their relationship are associated with marital stress (Murstein & Beck, 1972; Tiggle, Peters, Kelley, &

Vincent, 1982).

The Brazelton Neonatal Behavioral Assessment Scale was analyzed using the seven cluster scores derived by Lester, Als, & Brazelton (1982). The orientation cluster score was used as the measure of infant behaviour in the subsequent analyses.

For the questions pertaining to the father's participation in child care, a sum of the individual items in the first question provided a total score for the frequency of caregiving by the father. The responses to the mother's desire for the amount of father participation was coded as a dichotomous variable, "the mother's satisfaction with the amount of participation" as follows: 0 - not satisfied (responses - less frequently, more frequently), 1 - satisfied (response - same amount). This was done as the predominant responses were: same amount (58%), and more frequently (40%). Only one mother indicated that she wished her partner would participate less frequently.

The family's socioeconomic status was calculated from the demographic data using the Hollingshead Four Factor Index (Hollingshead, 1975). This index calculates family socioeconomic status using paternal education and income and, if she is employed, maternal education and income.

The statistical procedures were completed using the SPSSx statistical program with the significance level set at $p<.05$. The characteristics of parents and infants were examined using descriptive statistics. Zero order correlations between all possible pairs of the variables were calculated using the Pearson correlation procedure. To determine whether group membership added significantly to the

prediction of maternal-infant interaction scores, stepwise regression analyses were conducted entering first, a selected independent variable (social support, infant behaviour, or a measure of family environment) and second, group membership. The regression analysis used group membership (term or preterm) as a categorical variable.

Multiple regression was used to assess the simultaneous contribution of the independent variables to the prediction of maternal-infant interaction scores. A hierarchical model of regression was utilized entering first, the infants' orientation scores and group membership, second, measures of social support and family environment at the time of the infant's hospitalization and third, measures of social support and family environment three months after the infant's discharge. The rationale for this hierarchical ordering was that the order reflected the initial state of the infant and the changes that might occur over time in social support and family environment. The multiple regression analysis was done three times, using first maternal scores, then couple additive scores and last couple discrepancy scores on measures of family environment (the FRI and the DAS).

To assess whether the father's participation in child care added significantly to the prediction of the maternal-infant interaction from family environment measures, hierarchical regression was done. First scores on the DAS or (FRI) and group membership were entered in the regression. Next the scores on the father's frequency of child care tasks, the father's frequency of sole responsibility, and the mother's satisfaction with father's participation were entered.

Research Hypotheses

The specific research hypotheses tested were as follows:

1. Infant behaviour as measured by the orientation score from the BNBAS is related to maternal-infant interaction as measured by the NCATS.

2. Family environment as measured by the FRI is related to maternal-infant interaction as measured by the NCATS.

3. A specific aspect of the family environment as measured by the DAS is related to maternal-infant interaction as measured by the NCATS.

4. Social support from relatives and friends as measured by the ISSB is related to maternal-infant interaction as measured by the NCATS.

5. For each of the preceding hypotheses, the addition of group membership will make no significant difference in the relationship of the independent variable to maternal-infant interaction.

6. Considered simultaneously, infant behaviour, family environment and social support are related to maternal-infant interaction.

CHAPTER 4

FINDINGS

This chapter begins with a description of the parents and infants in the study. Next the results of the study are outlined first in general and then under each specific research hypothesis.

Description of the Sample

In general, the 63 families in this investigation could be described as middle or working class (Table 3). All parents were white except for one mother who was Oriental and one father who was black. A multivariate analysis of variance showed that the term and preterm families did not differ significantly with respect to demographic characteristics, maternal education, paternal education, maternal age, paternal age and family socioeconomic class [$F(5,57) = .31$; $p = .91$]. As seen on Table 4, most parents had completed high school; both the mothers and fathers averaged 12.9 years of education. The mean age of mothers and fathers, respectively, was 26.9 and 29.0 years. Thirty-one families were first time parents and 32 families had more than one child (Table 5). There was no significant association between parity and group membership (χ^2 (1, $N = 63$) = 1.20, $p > .05$). Two-thirds of the families (42/63) resided in Edmonton. At the time that the mother-infant interaction was observed one preterm and six term mothers had returned to part-time or full-time work.

There were 38 male and 25 female infants in the sample (Table 5). Although males were a greater percent of the infants born prematurely (71%) than infants born at term (50%), there was no significant association

Table 3

Family Socioeconomic Status: Frequency of Hollingshead Four Factor Index Groupings

	Number of Families		
	All (n = 63)	Preterm (n = 31)	Term (n = 32)
Major business and professional	7	2	5
Medium business, minor professional, technical	18	11	7
Skilled craftsmen, clerical, sales workers	29	12	17
Machine operators, semiskilled workers	9	6	3
Unskilled laborers, menial workers	0	0	0

Table 4

Maternal and Paternal Age and Education in Years and Family Socioeconomic Status Means and (Standard Deviations)

	Families		
	Total	Term (n = 32)	Preterm (n = 31)
Maternal age	26.9 (4.7)	27.3 (4.2)	26.5 (5.1)
Paternal age	29.0 (5.1)	29.7 (5.1)	28.2 (5.0)
Maternal education	12.9 (2.2)	13.0 (1.9)	12.8 (2.5)
Paternal education	12.9 (2.1)	13.0 (2.1)	12.8 (2.2)
Hollingshead Four Factor Index	38.0 (10.9)	38.5 (10.4)	37.4 (11.5)

Table 5

Comparison of Term and Preterm Mother-Infant Dyads: Parity, Method of Delivery and Infant Sex

	Mother Infant Dyads	
	Term (n = 32)	Preterm (n = 31)
Parity		
primipara	15	16
multipara	17	15
Delivery		
vaginal	29	24
cesarean section	3	7
Sex of infant		
male	16	22
female	16	9

between sex of infant and group membership (χ^2 (1, N = 63) = 2.89, p = .09). Fifty-three of the 63 infants were born vaginally. The term infants were healthy babies with a mean gestational age of 39.2 weeks and a mean birth weight of 3509.5 grams. At birth the preterm infants in the sample ranged from 27 weeks to 36 weeks gestational age ($\bar{x}$ = 33.2 weeks) and weighed from 1220 grams to 2910 grams ($\bar{x}$ = 2070.6 grams). Twenty-five preterm infants spent no time after birth on a respirator. Of the remaining six preterm infants, four were on a respirator less than 48 hours. At the time of discharge from hospital, only one preterm infant went home on an apnea monitor. The parents of this infant lived in a rural area and requested the use of the monitor for their reassurance.

Prior to the infant's discharge from the hospital, the Brazelton Neonatal Behavioral Assessment (BNBAS) was completed. The orientation cluster score from the BNBAS had been selected as a measure of the infant's ability to alert and to make and maintain eye contact. The preterm infants' mean orientation score of 3.78 was significantly lower than the term infants' mean score of 4.68 ($t(61) = 2.81$, $p < .01$).

After discharge from the hospital, one preterm infant became ill, was rehospitalized and died of meningitis. No data were collected from this family at Time 2 when the observations of mother-infant interaction were made. The following report of the findings of the study is based on the 62 families for whom all data were obtained.

General Findings

The Nursing Child Assessment Teaching Scale (NCATS) used to measure responsiveness in mother-infant interaction provides a total score as well as subscores for the mother and for the infant. For all the mother-infant

dyads observed during the teaching episode, the mean total score on the NCATS was 55.0. Using a t-test for the difference between means of two independent samples, there were no significant differences between the term and preterm mother-infant dyads either on the total NCATS score or on the maternal subscores (Table 6). However, term infants had significantly higher scores on the infant subscale than preterm infants ($t(60) = 2.4$, $p < .05$).

Table 7 gives the overall and group means for the measures of family environment (DAS and FRI) and the measures of social support. A three factor repeated measures analysis of variance was used to examine the FRI scores and the DAS scores. There was one factor between groups (group membership) and two factors within subjects (parent and time). Analysis of the FRI scores found a significant main effect for group membership ($F(1,60) = 7.75$, $p < .01$) but the other main effects (parent or time) and the interactions (parent x time, group x parent, group x time, group x parent x time) were not significant. Term mothers and fathers had a higher average score on the FRI ($\bar{x} = 23.90$) than preterm mothers and fathers ($\bar{x} = 21.94$). Analysis of the DAS scores revealed only one significant finding, a parent x time interaction ($F(1,60) = 5.41$, $p < .05$). The mean score for mothers on the DAS decreased from 117.9 at Time 1 to 115.0 at Time 2. However, the mean score for fathers remained stable (Time 1, $\bar{x} = 117.3$; Time 2, $\bar{x} = 117.7$). A two factor repeated measure of analysis of variance was used to examine the social support scores. There was only a significant main effect for time ($F(1,60) = 5.97$, $p < .05$); the average score on social support decreased from 96.0 at Time 1 to 87.9 at Time 2. The relationship of these scores on the independent variables with the observations on maternal-infant interaction are discussed in the following section of this chapter.

Table 6

Overall and Group Scores on the NCATS: Means and (Standard Deviations)

NCATS Score	Maternal-Infant Dyads		
	All (n = 62)	Preterm (n = 30)	Term (n = 32)
Total	55.0 (5.3)	53.8 (5.5)	56.2 (4.8)
Maternal subscore	37.7 (3.3)	37.5 (3.6)	38.0 (3.1)
Infant subscore	17.2 (3.2)	16.3 (3.3)	18.2 (2.8)*

*Significant group difference $p < .05$

Table 7

Overall and Group Means and (Standard Deviations) on Measures of Infant Behaviour, Social Support, and Family Environment

Variable	Types of Families		
	All	Term	Preterm
Orientation (infant)[a]	4.2 (1.4)	4.6 (1.4)	3.8 (1.1)
Social Support			
Mother Time 1	95.6 (24.5)	91.1 (23.3)	100.3 (25.3)
Mother Time 2	87.9 (23.7)	85.9 (22.1)	89.9 (25.6)
FRI[b]			
Mother Time 1	23.5 (3.0)	24.2 (2.2)	22.7 (3.5)
Mother Time 2	22.9 (3.9)	24.0 (3.0)	21.6 (4.4)
Father Time 1	22.6 (3.8)	23.7 (2.8)	21.5 (4.3)
Father Time 2	22.8 (3.4)	23.7 (2.6)	21.8 (3.8)
DAS			
Mother Time 1	117.8 (9.9)	118.6 (8.1)	117.0 (11.5)
Mother Time 2	115.0 (12.9)	116.3 (13.5)	113.7 (12.3)
Father Time 1	117.2 (11.0)	119.8 (9.4)	114.5 (12.0)
Father Time 2	117.7 (11.3)	119.4 (11.3)	115.8 (11.1)

a. *t* test showed significant group difference $p < .01$

b. Repeated measures analysis of variance: significant main effect for group $p < .01$

Research Hypotheses and Findings

Hypothesis 1. Infant behaviour as measured by the orientation score from the BNBAS is related to maternal-infant interaction as measured by the NCATS. As mentioned previously, the NCATS used to measure maternal-infant interaction provides a total score as well as maternal and infant subscores. The correlations between the infant's orientation score and the total NCATS score or either the maternal or infant subscore were not significant (Table 8). This hypothesis was not supported by the findings of the study.

Hypothesis 2. Family environment as measured by the FRI is related to maternal-infant interaction. The measures of family environment were completed by the mother and father while the infant was in hospital and at the time the maternal-infant interaction was observed. This hypothesis was partially supported by the findings of the study; there were several statistically significant correlations between maternal scores on the FRI and the NCATS scores (Table 8.) Maternal scores on the FRI at Time 1 were significantly correlated with the total NCATS scores (r = .35; p = .005; 2-tailed) and with the infant subscale scores of the NCATS (r = .37; p = .003; 2-tailed). The correlation between the mothers' scores on the FRI at Time 1 and the maternal subscores of the NCATS, however, was not statistically significant. The results at Time 2 were similar. The correlations between the maternal FRI at Time 2 and the total NCATS (r = .31; p = .015; 2-tailed) and the infant subscore (r = .34; p = .007; 2-tailed) were statistically significant. The correlation between the maternal FRI at Time 2 and the maternal subscore of the NCATS was not statistically significant.

Table 8

Zero-Order Correlations of NCATS Scores with Group Membership, Infant Orientation Score, Social Support, Maternal and Paternal Scores on Family Environment (DAS and FRI)

	NCATS Scores		
Variable	Total	Infant	Mother
Orientation (infant)	.09	.23	-.08
Group membership	.23	.30*	.08
Maternal Scores			
Time 1			
FRI	.35**	.37**	.21
DAS	.22	.15	.21
Social Support	.06	-.04	.13
Time 2			
FRI	.31*	.34**	.17
DAS	.38**	.26*	.36**
Social Support	-.10	-.08	-.09
Paternal Scores			
Time 1			
FRI	.06	.13	-.04
DAS	.16	.03	.22
Time 2			
FRI	.31*	.28*	.22
DAS	.19	.24	.07

*$p < .05$ **$p < .01$ for 2-tailed tests n = 62

The fathers' scores on the FRI at Time 1 were not significantly associated with maternal and infant behaviour in interaction (Table 8). Only the fathers' scores on the FRI at Time 2 were significantly correlated with the infant subscores on the NCATS (r = .28; p = .03; 2-tailed) and the total NCATS (r = .31; p = .015; 2-tailed).

Hypothesis 3. A specific aspect of the family environment as measured by the DAS is related to maternal-infant interaction as measured by the NCATS. This hypothesis was partially supported by the findings of the study. The average score on the scale measuring the marital adjustment component of the family environment (DAS) at Time 2 was lower than at Time 1 for both term and preterm mothers. The fathers' scores, in contrast, did not show a similar decrease (Table 7). None of the correlations between the maternal scores on the DAS at Time 1 and the total NCATS scores, the maternal subscores, or the infant subscores were statistically significant (Table 8). In contrast, the maternal scores on the DAS at Time 2 were significantly correlated with the total NCATS (r = .38; p = .002; 2-tailed test), with maternal subscore (r = .36; p = .004; 2-tailed test) and with the infant subscore (r = .26; p = .043; 2-tailed test). The fathers' scores on the DAS at Time 1 and Time 2 were not significantly correlated with any of the NCATS scores (Table 8).

Hypothesis 4. Social support from relatives and friends as measured by the ISSB is related to maternal-infant interaction. At both Time 1 and Time 2, social support from relatives and friends was not significantly correlated with either the total NCATS scores or with the maternal and infant subscores (Table 8). This hypothesis was not supported by the

findings of the study.

Hypothesis 5. For each of the preceding hypotheses, the addition of group membership will make no difference in the relationship of the independent variable to maternal-infant interaction. Group membership was treated as a categorical variable. As mentioned in Chapter 3, preterm mother-infant dyads were coded 0; term mother-infant dyads were coded 1. When the zero-order correlations were examined, correlations of group membership with either the total NCATS or the maternal subscores of the NCATS were not significant (Table 8). Correlation of group membership with the infant subscores of the NCATS was statistically significant (r = .30; p = .017; 2-tailed test).

To examine further the possible influence of group membership, each NCATS score (total, maternal and infant) was regressed stepwise first on a selected independent variable and then on the categorical variable of group membership. Only maternal scores on measures of family environment were entered into the regressions. Examination of the residuals plotted against the predicted values indicated that the assumptions of linearity and constant variance were met; there was no relationship between the predicted and residual values.

Group membershp did not add significantly to the R square of the regression of the maternal NCATS subscores on any independent variable (Table 9). In contrast, group membership did add significantly to the R square for the regression equations of the infant NCATS subscores on several variables (Table 10). Group membership added significantly to the R square for the regression on the DAS at Time 1 (F_{change} (1,59) = 5.61, p = .02) and for the regression on the DAS at Time 2 (F_{change} (1,59) = 5.27, p = .03).

Table 9

Stepwise Regression of NCATS Maternal Subscores on Each Independent Variable and Group Membership

	Step 1 (Variable)		Step 2 (Group)			
	R^2	F	R^2	F	F Change	
Orientation	.01	.35	.02	.54	.74	p=.39
Time 1 Measures						
Social Support	.02	.99	.03	.85	.72	p=.40
FRI	.04	2.64	.04	1.33	.07	p=.79
DAS	.05	2.84	.05	1.54	.27	p=.61
Time 2 Measures						
Social Support	.01	.38	.01	.35	.33	p=.57
FRI	.03	1.68	.03	.85	.06	p=.81
DAS	.13	8.91	.13	4.46	.13	p=.71

Table 10

Stepwise Regression of NCATS Infant Subscores on Each Independent Variable and Group Membership

	Step 1 (Variable)		Step 2 (Group)			
	R^2	F	R^2	F	F Change	
Orientation	.05	3.27	.11	3.62	3.81	p=.06
Time 1 Measures						
Social Support	.00	.09	.09	2.97	5.84	p=.02*
FRI	.14	9.61	.19	6.78	3.55	p=.06
DAS	.02	1.35	.11	3.53	5.61	p=.02*
Time 2 Measures						
Social Support	.01	.45	.09	3.08	5.67	p=.02*
FRI	.11	7.72	.16	5.48	2.98	p=.09
DAS	.07	4.26	.14	4.91	5.27	p=.03*

*$p < .05$

Group membership also added significantly to the R square of the regression of the infant subscores on the amount of social support at Time 1 (F_{change} (1,59) = 5.84; p = .02) and the amount of social support at Time 2 (F_{change} (1,59) = 5.67; p = .02). However, the overall regressions for social support and group membership at either Time 1 and Time 2 were not significant. For the remaining independent variables, orientation, FRI at Time 1 and the FRI at Time 2, when group membership was added to the regression of the infant subscores, the R square change did approach significance (Table 10).

The maternal subscores and infant subscores are added to give the total NCATS scores. When the stepwise regression was done with the total NCATS score as the dependent variable, the effect of group membership became less obvious (Table 11). Only the regression of social support at Time 1 had a R square change with the addition of group membership that approached significance (F_{change} (1,59) = 3.91; p = .05). The overall R square for the regression for social support and group membership was not significant.

The findings of the study partially supported the hypothesis. The addition of group membership to the regression of the maternal subscores of the NCATS resulted in no significant change in the relationship of the independent variables to maternal behaviour in interaction. However, the addition of group membership to the regression of the infant subscores of the NCATS did result in increases in the R square of the regressions that were either significant or approached significance.

Tables 12, 13, and 14 summarize the regression coefficients and the R square for the final step in the regressions just discussed. When the individual items within each significant regression were examined, the FRI at Time 1 and at Time 2 were significant individual contributors in the

Table 11

Stepwise Regression of NCATS Total Scores on Each Independent Variable and Group Membership

	Step 1 (Variable)		Step 2 (Group)			
	R^2	F	R^2	F	F Change	
Orientation	.01	.50	.05	1.68	.47	p=.10
Time 1 Measures						
Social Support	.00	.20	.07	2.06	3.91	p=.05
FRI	.12	8.56	.15	5.15	1.65	p=.20
DAS	.05	3.17	.10	3.17	3.06	p=.09
Time 2 Measures						
Social Support	.01	.63	.06	1.90	3.15	p=.08
FRI	.09	6.26	.12	3.83	1.37	p=.25
DAS	.15	10.31	.18	6.67	2.72	p=.10

Table 12

Standardized Coefficients from Regression of NCATS Maternal Subscores on Each Independent Variable and Group Membership

	Variable	Group			
	Beta	Beta	Intercept	R^2	F
Orientation	.11	.12	38.53	.02	.54
Time 1 Measures					
Social Support	.15	.11	35.39	.03	.85
FRI	.20	.04	32.35	.04	1.33
DAS	.21	-.07	29.24	.05	1.54
Time 2 Measures					
Social Support	-.07	.07	38.40	.01	.35
FRI	.16	.03	34.58	.03	.85
DAS	.36**	.04	26.98	.13	4.46*

*p < .05 **p < .01

Table 13

Standardized Coefficients from Regression of NCATS Infant Subscores on Each Individual Variable and Group Membership

	Variable	Group			
	Beta	Beta	Intercept	R^2	F
Orientation	.14	.25	14.99	.11	3.62*
Time 1 Measures					
Social Support	.03	.31*	15.94	.09	2.97
FRI	.32*	.23	8.46	.19	6.78**
DAS	.13	.29*	11.51	.11	3.53*
Time 2 Measures					
Social Support	.06	.30*	17.00	.09	3.01
FRI	.27*	.22	11.51	.16	5.48**
DAS	.23	.28*	9.87	.14	4.91*

*$p < .05$ **$p < .01$

Table 14

Standardized Coefficients from Regression of NCATS Total Scores on Each Independent Variable and Group Membership

	Variable	Group			
	Beta	Beta	Intercept	R^2	F
Orientation	.01	.23	53.53	.05	1.68
Time 1 Measures					
Social Support	.11	.26*	51.33	.07	2.07
FRI	.32*	.16	40.81	.15	5.15**
DAS	.21	.22	40.75	.10	3.17*
Time 2 Measures					
Social Support	-.08	-.23	55.40	.06	1.91
FRI	.26*	.15	46.09	.11	3.83*
DAS	.36**	.20	36.85	.18	6.67**

*$p < .05$ **$p < .01$

context of group to the regression of the infant subscores (Table 13). It could be argued that the family environment should be a significant contributor to the prediction of maternal behaviour rather than infant behaviour as the mother would have a longer history of relationships in the family. There would be more opportunity for her to be aware of the pattern of family relationships and to be influenced by them. In fact this relationship was seen with the DAS as a measure of family environment. The DAS at Time 2 was a significant individual contributor to the regression of maternal subscores (Table 12) and not the infant subscores (Table 13). The data were examined for possible outliers that might influence the relationship of the FRI to the NCATS scores. There were no outliers on the infant subscores of the NCATS. Two possible outliers identified on the maternal FRI scores were deleted and the regressions rerun. There was no change; the FRI continued to be a significant individual contributor to the prediction of the infant NCATS subscores.

Hypothesis 6. Considered simultaneously, infant behaviour, social support and family environment are related to maternal-infant interaction. In testing this hypothesis, three types of family environment scores from the DAS and FRI were used: maternal scores only, couple additive scores and couple discrepancy scores. The procedure used to obtain the couple additive and the couple discrepancy scores was described previously in Chapter Three.

When the DAS and the FRI were chosen as measures of family environment, it was argued that the scores from these scales would measure some common aspects of family relationships. However, as the FRI asks respondents to consider all family relationships and the DAS focuses only on the marital relationship, each scale would also measure some unique aspects of family

relationships. The correlations between the two measures of family environment using maternal and couple additive scores do indicate this pattern (Table 15). For example using maternal scores, the correlation of the DAS at Time 2 with the FRI at Time 2 was .67. The scores share 45 percent of the variance. The remaining 55 percent of the variance in the scores includes the unique aspects of family relationships measured by each scale as well as variance due to error in measurement. The correlations between the FRI and the DAS using couple discrepancy scores are smaller. This is probably a reflection of the manner in which the discrepancy scores are derived; the scores were obtained mathematically from the absolute difference between the father's score and the mother's score. The resulting difference consists of unique as well as error components on the measure, the commonality factor having been removed.

The zero-order correlations between couple scores on the measures of family environment and NCATS scores are included in Table 16. All couple scores on the measures of family environment, except the couple discrepancy score on the FRI at Time 1, were significantly associated with at least one of the maternal-infant interaction scores.

When the residuals for the following regressions were plotted against the predicted values, there appeared to be a random relationship indicating that the assumptions of linearity and constant variance had been met.

Maternal Scores

Using multiple regression, the original data analysis plan was to regress the NCATS scores on the orientation score for infant behaviour, social support from relatives and friends and on measures of family environment (DAS and FRI). However, as group membership had been shown to be significantly correlated with the orientation score and to contribute

Table 15

Zero-Order Correlations of Measures of Family Environment by Type of Score (Maternal, Couple Additive and Couple Discrepancy)

	DAS 1	DAS 2	FRI 1	FRI 2
Maternal Scores				
DAS 1	1.00	.75***	.53***	.49***
DAS 2		1.00	.52***	.67***
FRI 1			1.00	.64***
FRI 2				1.00
Couple Additive Scores				
DAS 1	1.00	.80***	.59***	.54***
DAS 2		1.00	.63***	.70***
FRI 1			1.00	.82***
FRI 2				1.00
Couple Discrepancy Scores				
DAS 1	1.00	.13	.41***	.01
DAS 2		1.00	.22	.29*
FRI 1			1.00	.14
FRI 2				1.00

*p < .05 ***p < .001

Table 16

Zero-Order Correlations of NCATS Scores with Couple Additive Scores and Couple Discrepancy Scores on the DAS and FRI

Couple Scores	NCATS Scores Total	Infant	Mother
Couple Additive Scores			
Time 1			
FRI	.22	.28*	.08
DAS	.22	.10	.26*
Time 2			
FRI	.34**	.34**	.21
DAS	.35**	.20	.36**
Couple Discrepancy Scores			
Time 1			
FRI	-.06	.01	-.10
DAS	-.36**	-.19	-.38**
Time 2			
FRI	-.39**	-.25	-.39**
DAS	-.31*	-.17	-.32*

*$p < .05$ **$p < .01$ for 2-tailed tests n = 62

significantly to the regressions of the infant subscores on the orientation score, on the social support at Time 1 and Time 2, and on the DAS at Time 1 and Time 2, this variable was added to the multiple regression.

Total, maternal and infant scores from the NCATS were each regressed on the orientation score, group membership, social support at Time 1 and Time 2, and maternal scores on the DAS Time 1, the DAS Time 2, the FRI Time 1 and the FRI Time 2. Twenty-seven percent of the variance of the total NCATS score was predicted by the regression equation and the DAS Time 2 was a significant contributor (Table 17). Twenty-six percent of the variance of the infant subscores was predicted by the regression but none of the entered variables were individually significant (Table 18). The regression of the maternal subscores was not significant (Table 19).

Couple Additive Scores

The same multiple regression analysis was repeated using couple additive scores. None of the regressions of the NCATS scores (total scores, maternal subscores or infant subscores) were significant (Tables 17 to 19).

Couple Discrepancy Scores

Multiple regression using couple discrepancy scores predicted a larger percent of the variance of the total NCATS score than the previous analyses. Thirty-seven percent of the variance of the total NCATS scores was predicted by the regression with the DAS Time 1, DAS Time 2, the FRI Time 2 and group membership as significant individual contributors (Table 17). The regression equation predicted twenty-four percent of the variance of the infant subscores; group membership was a significant contributor (Table 18). For the first time in the analysis, the regression of the maternal subscores was significant. Thirty-five percent of the variance was predicted and the DAS Time 1 and the FRI Time 2 were significant individual contributors

Table 17

Standardized Coefficients from Regression of NCATS Total Scores on Infant Behaviour, Group, Social Support and Family Environment Measures

	Variation in type of scores on DAS and FRI		
Independent Variable	Mother	Couple Additive	Couple Discrepancy
Orientation (infant)	.11	.04	-.02
Group membership	.18	.17	.31*
DAS Time 1	-.22	-.22	-.27*
FRI Time 1	.24	-.07	.17
DAS Time 2	.52*	.39	-.27*
FRI Time 2	-.15	.21	-.26*
Social Support Time 1	.19	.16	.03
Social Support Time 2	-.15	-.12	.03
Intercept	34.65	40.39	56.74
R^2	.27	.20	.37
F	2.45*	1.71 N.S.	3.83**

n = 62

*p < .05 **p < .01

Table 18

Standardized Coefficients from Regression of NCATS Infant Subscores on Infant Behaviour, Group, Social Support and Family Environment Measures

	Variation in Type of Scores on DAS and FRI		
Independent Variable	Mother	Couple Additive	Couple Discrepancy
Orientation (infant)	.24	.19	.17
Group membership	.13	.15	.31*
DAS Time 1	-.20	-.31	-.12
FRI Time 1	.29	.08	.19
DAS Time 2	.23	.17	-.21
FRI Time 2	.05	.28	-.14
Social Support Time 1	.03	.06	.05
Social Support Time 2	-.13	-.13	-.13
Intercept	8.31	14.26	16.65
R^2	.26	.22	.24
F	2.20*	1.86 N.S.	2.07 ($p=.06$)

n = 62

*$p < .05$

Table 19

Standardized Coefficients from Regression of NCATS Maternal Subscores on Infant Behaviour, Group, Social Support and Family Environment Measures

	Variation in Type of Scores on DAS and FRI		
Independent Variable	Mother	Couple Additive	Couple Discrepancy
Orientation (infant)	-.05	-.12	-.18
Group membership	.16	.13	.19
DAS Time 1	-.16	-.06	-.32*
FRI Time 1	.11	-.18	.10
DAS Time 2	.61*	.45	-.23
FRI Time 2	-.28	.06	-.27*
Social Support Time 1	.28*	.20	.20
Social Support Time 2	-.12	-.07	-.07
Intercept	26.34	26.13	40.10
R^2	.22	.19	.35
F	1.91 N.S.	1.58 N.S.	3.61**

n = 62

*p < .05 **p < .01

(Table 19).

The multiple regression using couple discrepancy scores did explain a greater percent of the variance of the NCATS scores than the individual predictors. The best single predictors of the total NCATS scores were the maternal scores on the DAS at Time 2 (R^2 = .15) and the couple discrepancy scores on the FRI at Time 2 (R^2 = .15). The best single predictor of the infant NCATS subscores was the maternal score on the FRI at Time 1 (R^2 = .14). The couple discrepancy scores on the DAS Time 1 (R^2 = .15) and the FRI Time 2 (R^2 = .15) were the best single predictors of maternal NCATS subscores.

Father Participation in Child Care

Only the mother's responses to the questions on the father's participation in child care were analyzed. There was a consistent pattern of missing data in the fathers' responses. The missing data may have been related to the position of the questions (on the inside front cover) in the questionnaire booklet or to the fathers' reluctance to reply or inability to remember.

None of the scores on the father's participation in child care (frequency of child care activities, frequency of sole responsibility or mother's satisfaction with the father's participation) added significantly to the R square of the regressions of the NCATS scores on either the maternal DAS scores and group or the maternal FRI scores and group. The same nonsignificant changes in R square were obtained when scores on the father's participation in child care were added to the regressions of NCATS scores on couple additive scores for the DAS or the FRI. However, the frequency of the father's sole responsibility (F_{change} (1,56) = 4.41; $p < .05$) and the mother's satisfaction with the father's participation in child

care (F_{change} (1,55) = 5.74; $p < .05$) both added significantly to the R square of the regression of the maternal NCATS subscores on the couple discrepancy scores for the DAS (Table 20). Mothers had higher scores in interaction with their infant if the fathers more frequently took sole responsibility for their infant ($r = .24$) and if the mothers were satisfied with their partner's participation in child care ($r = .22$).

Table 20

Stepwise Regression of Maternal NCATS Subscores on DAS Couple Discrepancy Scores, Group Membership, and Father Participation in Child Care

Variables in Order Entered	R	R^2	R^2 increase
1 DAS 1 discrepancy score	.38	.15**	.15**
2 DAS 2 discrepancy score	.47	.22***	.07*
3 Group	.47	.22**	.01
4 Father's frequency of child care	.48	.24**	.01
5 Father's frequency of sole responsibility	.54	.29**	.06*
6 Mother's satisfaction with father's participation	.60	.36***	.06*

*p < .05 **p < .01 ***p < .001

All variables forced into the regression (n = 62)

CHAPTER 5

SUMMARY, DISCUSSION, RECOMMENDATIONS AND IMPLICATIONS

Summary of the Study

Using an ecological framework, this study examined the relationship of three variables, infant behaviour, social support and family environment, to maternal interactions with term and preterm infants. The microsystem under investigation in the study was the nuclear family. The infant was viewed as an active contributor to the interactions with his/her mother. The young infant's ability to participate actively in interactions was defined as the infant's ability before discharge from hospital, to be alert and to orient towards sound and movement of an object. This ability was measured by the orientation cluster score of the Brazelton Neonatal Behavioral Assessment Scale (BNBAS) (Brazelton, 1984). Maternal-infant interactions were assumed to be influenced by the family environment, the context within which the interactions took place. Family environment was defined as the pattern of relationships between all family members. Two measures of family environment were included: the Dyadic Adjustment Scale (DAS) (Spanier, & Filsinger, 1983), an instrument that asked questions about each spouse's perception of the marital relationship, and the Family Relationship Index (FRI) of the Moos Family Environment Scale (Holahan, & Moos, 1981), a scale that assesses the amount of cohesion, conflict and expressiveness among all family members. The parents answered a questionnaire on family relationships prior to the infant's discharge from hospital and also

prior to the observation of maternal infant interaction. The mothers also answered questions on social support from sources external to the immediate family, that is, support from relatives and friends. The questions on social support were used to measure an aspect of the mesosystem of the mother that was believed to influence the mother's ability to interact with her infant. Social support was defined as the frequency of supportive acts the mother received in the four preceding weeks. The instrument used was the Inventory of Socially Supportive Behaviors (ISSB) (Barrera, Sandler, & Ramsay, 1981). Maternal-infant interaction was observed in the family's home during a teaching situation where the mother encouraged her infant to play with a red ring dangling from a cord. Behaviours observed were recorded using the Nursing Child Assessment Teaching Scale (NCATS) (Barnard, 1978). At that time parents were asked questions about the father's participation in child care.

Sample

The final sample consisted of 62 two-parent families, 32 with a term infant and 30 with a preterm infant. The families were middle or working class. There were no significant differences between term and preterm families on maternal or paternal age and education, family social class, or parity. Half of the families were first time parents. The term infants were healthy newborns. The preterm infants had a mean gestation age at birth of 33.2 weeks (range 27 to 36 weeks). Most of the preterm infants had no significant medical problems other than prematurity. Six preterm infants had mild respiratory distress due to prematurity and required the assistance of mechanical ventilation for short periods.

Findings

The term and preterm infants did differ significantly on their orientation scores; preterm infants were less alert and less able to orient to sound and movement of an object prior to leaving the hospital. However, the infant's behavior at the time of discharge was not significantly correlated with the infant's behaviour in interaction three months later. Group membership was a better predictor of the infant's behaviour in interactions with the mother; term infants were more responsive in interactions than preterm infants. Group membership also added significantly to the regressions of the infant subscores of the NCATS on several variables but did not add significantly to the regressions of the maternal NCATS subscores on any variable.

The amount of support the mother received from extended family and friends while the infant was in hospital or at home did not predict her behaviour in interaction with her infant. In contrast, at the time of the observed maternal-infant interactions, the mother's satisfaction with her marital relationship was associated with her behaviour. Mothers with higher scores on the DAS at Time 2 were more responsive in interactions. Interestingly when mothers reported high scores on the FRI, describing family relationship that were cohesive, expressive and low in conflict at either Time 1 or Time 2, the infant but not the mother was more responsive in interactions.

The simultaneous contribution of the independent variables to the prediction of maternal-infant interaction scores was examined using a variety of types of scores on the measures of family environment: maternal scores, couple additive scores and couple discrepancy scores. Jointly, the infant's orientation score, group membership, social

support and maternal scores on the measures of family environment (DAS at Times 1 and 2, and the FRI at Times 1 and 2) accounted for 26 percent of the variance of the infant's behaviour and 22 percent of the mother's behaviour in the interaction. The use of couple additive scores in place of maternal scores on the measures of family environment explained slightly less variance; 22 percent of the variance in the infant's behaviour and 19 percent of the variance in the mother's behaviour. The couple discrepancy scores on family environment in conjunction with group membership, the infant's orientation score and social support accounted for approximately the same amount, 24 percent, of the variance in the infant's scores. However, couple discrepancy scores plus group membership, orientation scores and social support were much better predictors of maternal behaviour, accounting for 35 percent of the variance. The couple discrepancy scores on the DAS at Time 1, DAS at Time 2, the FRI at Time 2 as well as group membership were each significant individual contributors to the regression of the total NCATS scores.

Information on the amount of participation of the father in child care (as reported by the mother) did not add significantly to the prediction of the NCATS scores. However, the frequency of the father's sole responsibility for child care and the mother's satisfaction with the father's participation in child care did add significantly to the prediction of maternal behaviour in interaction when couple discrepancy scores for the DAS were used as a measure of family environment.

Discussion

Although the small sample size and the relatively homogeneous

nature of the sample limit the generalizability of the study, the findings do converge with other studies on maternal-infant interactions and provide support for Belsky's (1981) theoretical argument that the marital relationship may be an important source of support for competent parenting. Because of the nature of the research design and the method of data analysis, caution should be used in assuming cause-effect relationships in the following discussion of findings.

Based on the ecological framework discussed in Chapter One, it is reasonable to argue that the variables examined in the study and presented in Figure 1 (page 6) would have an association with maternal-infant interactions proportionate to the degree of proximity to the mother-infant dyad. Infant behaviour would have the strongest association, followed by family environment. Social support from kin and friends would have the weakest association. Each of the key findings in the study will be discussed in more detail beginning with the relationship of the infant's behaviour to the later patterns of maternal-infant interaction.

Infant Behaviour and Maternal-Infant Interactions

The orientation score from the BNBAS had been chosen as a measure of the infant's ability to make eye contact, an ability that Magyary (1983) suggests is important in the establishment of positive maternal-infant interaction. The term and preterm infants did differ significantly on the orientation score as measured at the time of discharge but there was no relationship to later behaviour in maternal-infant interaction.

Several possible reasons exist for why the infant's behaviour as

measured by the orientation score was not associated with later maternal-infant interaction. First the orientation scores of the BNBAS were obtained prior to discharge from hospital. With the rapid rate of development in newborns and with the opportunity for change in infant and maternal behaviour, a measure of infant behaviour taken at this time may not predict behaviour of the infant in interactions three months later. However, Field (1977) and Goldberg, Brachfeld and DiVitto (1980) found that the BNBAS scores in their studies did predict infant behaviour at four months. Their samples included ill preterm infants. The inclusion of preterm infants with more severe health problems than in the current study may have resulted in a greater variability in infant behaviour.

Second, inadequate sampling of infant behaviour might account for the lack of significant findings. The goal of observational research is to gather a sample of behaviour that is representative of the subject's actual range of behaviour and sampling decisions will influence the representativeness of the behaviour observed (Sackett, 1976). One assessment of infant behaviour was done in this study. In a recent study, Steichen Asch, Gleser and Steichen (1986) found that there was a great deal of unpredictable variability in BNBAS orientation scores from occasion to occasion within each individual and relatively small true differences between individual neonates. They suggest that the average of two closely spaced observations with ratings by two observers per occasion would provide a more acceptable generalizability for prediction purposes. Lester (1984) suggests that profile or recovery curves based on the cluster scores of three BNBAS examinations over the first month of life might better show the

individual infant's pattern of recovery from birth and reflect the coping capacity of the infant which develops in interactions with the environment. Although the collection of data from multiple assessments would be time consuming and expensive, a clearer picture of the relationship of the orientation score with the maternal-infant interaction scores might be obtained through the use of the average of several examinations or a profile curve based on assessments over the first month.

Third, although the orientation scores were not related to the infant NCATS scores, group membership was; term infants had higher scores in interactions. Preterm infants in this sample differed significantly from the term infants on other BNBAS cluster scores (motor, habituation, state regulation, and autonomic stability). In other words, the preterm infants were more floppy, had more startles and tremors, were less able to maintain skin colour and to self console, and were less able to habituate to sudden noises and lights. Some of these group differences in behaviours may be as or more important to the infant's ability to participate in interactions than the ability to make eye contact and may account for the relationship between group membership and the infant NCATS scores. When specific items on the infant subscale of the NCATS are examined, it seems possible that the preterm infant's less mature motor development might account for some portion of the lower scores these infants obtained. Items such as "clearly recognizable arm movements", "movements clearly directed towards the task", or "resists or responds aggressively when parent attempts to intrude physically in child's use of the task material" all require some degree of motor maturity. As group

membership is also an important characteristic of the mothers, group membership is discussed further in the following section.

Group Membership and Maternal-Infant Interactions

Group membership appears to be associated only with the infant subscores. As mentioned previously, there was a significant difference on the infant subscore of the NCATS between term and preterm infants. However, there was no significant difference between term and preterm mothers on the maternal subscores of the NCATS. Others have also found that while preterm infants are less responsive in interactions, preterm mothers at three or four months show equal or heightened levels of stimulation in comparison to term mothers (Barnard, Bee, & Hammond, 1984; Field, 1977). One explanation that has been given is that preterm mothers try to compensate for an unresponsive infant (Barnard, Bee, & Hammond, 1984; Crnic, Ragozin, Greenberg, Robinson, & Basham, 1983). The NCATS is a binary scale that measures the presence or absence of a behaviour but does not provide information on the frequency of the behaviour over the period of observation. For this reason it is difficult to use the NCATS to determine the possibility that the preterm mothers were intrusive or overstimulating in their interactions. Examination of the length of the teaching interaction (which was determined by the mother) showed that term mothers had interactions that lasted an average of 7.2 minutes compared to preterm mothers whose interactions averaged 8.1 minutes. This difference was not significantly large enough to support the argument that preterm mothers persisted longer in an attempt to encourage their less responsive infants to be more responsive during the teaching interaction.

Family Environment and Maternal-Infant Interactions

A supportive family environment, the second independent variable examined in this study, is related to positive maternal-infant interaction. The families that participated in the study were volunteers and as such likely represented better-functioning families; distressed families being self-selected out of the study. Despite this limitation in the sample, high scores on the DAS or FRI, indicating supportive family environments, were predictive of higher scores in maternal-infant interactions.

The time of measurement made some difference; at three months after the infant's discharge from hospital, all types of family environment scores (maternal, couple additive and couple discrepancy) were significantly correlated with the total NCATS scores. In contrast, at Time 1 (prior to the infant's discharge), maternal scores on the FRI, and couple discrepancy scores on the DAS were the only family environment scores significantly correlated with total maternal-infant interaction scores. The difference in the relationships from Time 1 to Time 2 may be partly explained by the change that occurred in the mothers' scores on the measures of family environment. After the infant had been home three months, both term and preterm mothers were less satisfied with their partner relationship as measured by the DAS and preterm mothers reported experiencing less supportive family relationships as measured by the FRI. This decrease in womens' satisfaction with marital relationships following the birth of an infant has been reported in other longitudinal studies (Belsky, Lang, & Rovine, 1985; Belsky, Spanier, & Rovine, 1983; Miller & Sollie, 1980). Cronenwett (1985) found that 47 percent of first time mothers

at five months postpartum reported increased conflict with their spouse.

The family environment measures were chosen as indicators of the amount of mutual support obtained from intimate relationships in the family. The findings are consistent with studies that indicate support available in marital or intimate relationships in families is associated with positive maternal affect in interactions (Crnic, Greenberg, Ragozin, Robinson, & Basham, 1983), complementary maternal-infant interactions (Pedersen, 1975; Sturm, 1985), and with decreased likelihood of parenting problems (Siefert, Thompson, Bensel, & Hunt, 1983). These results support Belsky's (1981) position that a positive marital relationship provides a basis for competent parenting and is more important than other sources of support possibly because it is readily available to mothers with infants.

Relationship of Family Environment to Infant Scores in Interaction

It had been anticipated that the family environment would have a stronger association with maternal than infant behaviour because of the mother's longer participation in the family. A mother would contribute more to the pattern of relationships as well as be more influenced by them. When the subscales of the NCATS were correlated with maternal scores on measures of family environment, a different pattern of relationships emerged. Only high scores on the DAS at Time 2 were associated with high scores on the maternal subscale of the NCATS. In contrast, high scores on the FRI at Times 1 and 2 as well as the DAS at Time 2 were associated with more responsive infant behaviour.

Crnic, Greenberg, Ragozin, Robinson, and Basham (1983) also found

a positive relationship between support from spouse or partner and infant behaviour in interaction. In their study, support from the mother's partner significantly predicted both the infant's responsiveness to the mother and the infant's affect in interactions. As they also found that support from the partner predicted responsive maternal behaviour in interactions, Crnic and colleagues argue that the effect of this spousal support on the infant's behaviour is indirect. Support from the spouse bolsters the mother's ability to be warm and responsive with her child, thereby encouraging the infant to be alert and responsive.

In the current study, there is another possible explanation for the association of supportive family environment with responsive infant behaviour in interactions. The relationship between maternal scores on measures of family environment and the infant NCATS subscore is confounded by group differences. There were significant differences between term and preterm families on the maternal scores for the FRI at both Time 1 and Time 2 and for the satisfaction subscale of the DAS at Time 2. Term mothers had higher scores on these measures of family environment and more responsive infants in interaction. It is possible that having a preterm infant creates differences in family relationships due to anxiety about the infant and stress in caring for the child. At present, no norms are available to determine critical values for the FRI scores which differentiate distressed or well-functioning families. It is possible that all the preterm families in this study were well-functioning families who made minor adjustments in family relationships because of the demands of caring for an infant who had irregular sleep-wake patterns and difficulty feeding.

An alternate explanation for this unexpected finding is that families who have less supportive relationships may be more at risk for delivering a premature infant. Norbeck and Tilden (1983) in a prospective study of 117 pregnant women found that women who faced high life stress the previous year had the highest rate of gestational complications (a category that included labour before 37 weeks) and women with high emotional disequilibrium were more likely to have infants with complications such as birth weight less than 2500 grams. In Norbeck and Tilden's study, the interaction of life stress during pregnancy and the amount of tangible support was a significant predictor of each type of complication.

No data on family relationships prior to or during pregnancy were collected in this study. Therefore, it is not possible to determine in this study whether mothers who experienced less support from their partner before the birth were more likely to have preterm infants or whether there was a change in the family relationships related to the preterm infant's birth.

Instrumental Support from the Father and Maternal-Infant Interaction

Instrumental support from the father, another aspect of the family environment, was measured by the father's frequency of participation in infant care (feeding, bathing, soothing, entertaining). The amount of the father's participation in child care did not predict responsive maternal behaviour in interactions. The questions used to measure the actual participation of the father in child care may have been an inadequate measure of the father's interest and willingness to participate and to be supportive to his partner. During data

collection, fathers of breastfeeding infants commented that they were unable to feed the baby although they were willing to give solid foods as soon as the infant was old enough. Also, several fathers indicated that they worked shifts or were working out of town and had limited opportunity to participate in the infant's care, a lack of opportunity that they regretted. For these fathers, the mother may have been aware of his willingness to provide care and perceived the father as supportive despite his limited involvement in the infant's care. This argument is supported by the fact that the mother's satisfaction with the father's participation in child care did add significantly to the prediction of maternal behaviour in interactions. Alternatively, not all mothers may perceive their partner as supportive when he is frequently involved in child care. The mother may see the father's actions as an intrusion into her functions in the family and a source of stress. The frequency with which the father was reported to have sole responsibility for the infant did add significantly to the prediction of maternal behaviour in interaction. Possibly for women who wanted to relinquish some responsibility for child care, the father's availability and willingness to take care of the infant was seen as supportive.

Social Support from Kin and Friends and Maternal-Infant Interactions

Social support was the final variable examined in the study and the variable which in the study model is viewed as furthest removed in influence on maternal-infant interaction. There was no significant difference in the amount of social support received from extended family members and friends as reported by the term and preterm mothers.

Also, social support from kin and friends was not associated with maternal infant interaction scores. These results support the previous suggestion, based on the ecological framework, that more distal relationships (support from kin and friends) would have a weaker association with maternal infant interactions than more proximal relationships (marital or family relationships). In addition families with young infants, particularly preterm infants, may restrict their social contacts for a period after the infant is home, with the result that the mother and child may be less directly influenced by support from these sources. Support from the mother's partner may assume more importance in early infancy because of its immediate availability and the possibility of restricted social contacts outside the family.

There are other possible explanations. It is possible that the amount of social support is less important to well being and functioning than the mother's degree of satisfaction with the support. As discussed in Chapter Two, there is a lack of consensus in the literature on a definition for and means of measuring social support. There are no clear indications how social support should be measured. The Inventory of Socially Supportive Behaviors (ISSB) was chosen in this study to measure the amount of helping behaviour (instrumental, emotional and informational) that a mother received in the past month from kin and friends. The amount of support may not be the most appropriate aspect of support to measure for mothers with young infants. One study of pregnant teenagers (Barrera, 1981) did show that satisfaction with support was related to fewer reported symptoms of ill health (depression, anxiety, and somatization) whereas the amount of support was related to higher numbers of symptoms. The study did not

answer the question why teenagers receiving the most support also had the most symptomatology. It is not possible to determine the direction of effect from correlation studies such as Barrera's (1981) study of pregnant teenagers. Because of their emotional state, depressed and anxious teenagers may evaluate their support as inadequate regardless of the amount or quality of the support. Alternatively, their lower sense of well being may have been caused by inadequate social support, support that was adequate in amount but not in content.

However, the finding in the present study that social support from extended family and friends was not related to measures of maternal infant interaction is consistent with other research. Crnic, Greenberg, Ragozin, Robinson and Basham (1983) and Sturm (1985) found that emotional support from extended family and friends was not related to maternal infant interaction although it had been shown in some studies to be related to the mother's sense of well-being (Crnic, Greenberg, Ragozin, Robinson, & Basham, 1983; Unger, & Wandersman, 1985; Wamdersman, Wandersman, & Kahn, 1980).

The ISSB asked for the frequency of helping behaviours. It is possible that even though support such as child care is provided by friends and family, the relationships involved can be stressful. In a study of 46 first time mothers five months postpartum, Cronenwett (1985) found that extended family and friends were sources of increased support and increased stress. Three-fourths or more of the mothers in Cronenwett's (1985) study reported increased support from friends with children, their mother, and relatives of their own age. However, one-third of these mothers reported increased stress from childless friends and one-quarter reported increased stress from their

mother-in law.

No information was obtained in this study on the specific family members or friends who provided the supportive behaviours. It is possible that more information on the source of assistance as well as whether the mother perceived the assistance to be helpful or stressful may begin to clarify the relationship between maternal infant interaction and support from friends and relatives.

Use of Couple Scores in Family Research

One other general finding from the research study remains to be discussed. The results of the study provide support for the position that information should be obtained from more than one family member when attempting to describe family relationships. When couple discrepancy scores were used, the multiple regression of the total NCATS scores explained 37 percent of the variance as compared to 27 percent using maternal scores. The regressions using couple additive scores were not significant. Discrepancy scores measure the absolute value of the difference between each spouse's assessment of family or marital relationships. A large discrepancy suggests a lack of consensus between a couple and possibly a lack of awareness of the other's perspective due to inadequate communication. Although much of the variance is still left unexplained and future research will need to examine other variables that are related to maternal-infant interaction, it appears that less responsive maternal behaviour in interactions is associated with larger discrepancies in couples' assessments of their marital and family relationships.

The use of couple discrepancy scores instead of maternal scores on

the measures of family environment helped clarify the relationships under investigation. Only one discrepancy score, the FRI at Time 1, was significantly correlated with group membership. The decreased confounding of group membership and family environment when couple discrepancy scores were used may account for what appears to be a clearer pattern of relationships. Using couple discrepancy scores in the correlations, supportive family environments are significantly associated with more responsive maternal behaviour (rather than infant behaviour when using maternal scores) and being a term infant is significantly associated with more responsive infant behaviour. When couple discrepancy scores were used, the family measures (DAS Time 1 and FRI Time 2) were significant individual contributors to the prediction of maternal behaviour and group membership was a significant individual contributor to the prediction of infant behaviour.

Limitations

As the sample in the study was not randomly selected, the results can be generalized only to similar populations. Mother-infant dyads in single-parent families, in non-English speaking families, and in families with twins or ill preterm infants may have different responses. The volunteer nature of the sample may have resulted in families with high levels of conflict being self-selected out of the study. In addition, a number of families chose not to participate in the study because they were unable or unwilling to be available for the follow up visit three months after the initial contact. Finally, the correlational nature of the analysis means that no cause-effect relationship in the results of the study can be assumed.

Recommendations for Future Research

The results of this study converge with other research findings that indicate emotional support from the father may help the mother to be responsive in interactions. Future research needs to examine how emotional support assists the mother. Some research indicates that women who are depressed and anxious are less likely to have responsive, sensitive interactions with their three to five month old infants (Field, Sandberg, Garcia, Vega-Lahr, Goldstein, & Guy, 1985). Qualitative research methodologies, such as grounded theory which employs in-depth repeated interviews of subjects, might be helpful in determining the mother's perspective of her interactions with her infant and partner and could provide insights into how emotional support from the spouse is beneficial to mothers.

A prospective study of families from early pregnancy to one year or longer postpartum would help answer several questions that were raised in this study. Preterm families had less supportive relationships as measured by the FRI and there was no way of determining if this was a preexisting condition or part of the family's response to having a preterm infant. A longitudinal study might help answer this question as well as clarify how the type of family environment is related to infant behaviour in interactions. Both term and preterm mothers reported less supportive marital relationships three months after their baby's discharge from hospital. Other research (Belsky, Lang, & Rovine, 1985; Belsky, Spanier, & Rovine, 1983; Miller & Sollie, 1980) has shown a decrease in womens' satisfaction with their marital relationship after the birth of a child. Longitudinal research could document whether the mother's level

of satisfaction with marital support continues to be an important predictor of maternal-infant interaction or if, as the mother and child begin to be more active in other social groups and fewer expectations are placed on the marital relationship, marital support decreases in importance.

The global measure of the amount of social support from extended family and friends was not related to maternal-infant interaction. As other research (Cronenwett, 1985) indicates that sources of support may also be sources of stress, research that asks mothers to assess the quality of the support and that identifies the extended family members and friends who provide the support or stress may provide additional information. The study included only two-parent, English speaking families whose mothers were 18 to 41 years old. It may prove instructive to examine the relationship of social support to maternal-infant interaction in other types of families. For single mothers, adolescent mothers and recent immigrant families, support from extended family and friends may assume more importance than in the sample group.

Two other issues related to measurement have implications for future studies. The first measurement issue pertains to the use of scores from the BNBAS. In this study the infant's ability to make eye contact as measured by the orientation scores was not associated with maternal-infant interaction scores. The study was limited to full term and relatively healthy preterm infants. It was not possible to determine whether the nonsignificant finding might be a reflection of the limited variability in the behaviour of the infants in the study or of difficulties with the reliability of the BNBAS cluster scores.

Future research using a larger sample of infants including more medically high risk preterm infants and using scores based on at least two BNBAS examinations may help clarify the findings

The second measurement issue was the question of the most appropriate type of score to use to measure the various aspects of the family environment. Most research on parent-infant interaction examines the mother's and/or the father's perspective on the marital or family relationships and only recently have researchers started to use family scores that attempt to integrate more than one member's perspective (Thompson & Walker, 1982; Walters, Pittman, & Worrell, 1984). Obtaining information from more than one family member is expensive and time consuming and needs to be carefully considered in terms of the amount of additional information that is provided. From the results of this study, it appears a productive effort to obtain more than one member's view on family relationships and to use a family score in the analyses. The couple additive scores added nothing to the analysis in comparison to maternal scores only. However, couple discrepancy scores were helpful in predicting a greater percent of the variance of the mothers' behaviour in interaction with her infant. Other researchers have also found that couple discrepancy scores are more useful in analyses than couple additive scores (Belsky & Isabella, 1985).

Implications for Practitioners

It is important that practitioners carefully examine research studies before altering their practice on the basis of the research findings. Burr, Mead and Rollins (1973) argue that a practitioner

should view the empirical data obtained from a research study as tentative evidence for or against a theoretical idea or proposition. When a number of studies using different samples and different research methods provide similar results, then a practitioner can be more confident that the theoretical idea is valid or invalid. The results of this study do converge with the results of other research and provide additional support for the proposition that a supportive relationship between parents is associated with positive maternal interactions with the infant. As most of the reported research consists of correlational studies, the research does not provide information on cause-effect or the direction of influence. However, professionals working with families with new infants need to be aware that there is accumulating research evidence that a relationship exists between the marital relationship and the mother's behaviour with her infant.

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APPENDIX 1

Pairwise Correlations, Means, and Standard Deviations of Study Variables

Pairwise Correlations, Means, and Standard Deviations of Scores on Study Variables

	NCATS (total)	NCATS (mom)	NCATS (infant)	Group[a]	Orient	SS1	SS2 (M)	FRI 1 (M)	FRI 2 (M)	DAS 1 (M)	DAS 2 (M)	FRI 1 (M-D)	FRI 2 (M-D)	FRI 1 (M-D)	FRI 2 (M-D)	DAS 1 (M-D)	DAS 2 (M-D)	DAS 1 (M-D)	DAS 2 (M-D)
NCATS (total)	1.00	.82***	.80***	.23	.09	.06	-.10	.35**	.31*	.22	.38**	.22	.34**	-.06	-.39**	.22	.35**	-.36**	-.31*
NCATS (mom)		1.00	.31*	.80	-.08	.13	-.08	.21	.17	.21	.36**	.08	.21	-.10	-.39**	.26*	.36**	-.38**	-.32*
NCATS (infant)			1.00	.30*	.23	-.04	-.09	.37**	.34**	.15	.26*	.28*	.34**	.01	-.25	.10	.20	-.19	-.17
Group				1.00	.33**	-.19	-.08	.25*	.31*	.08	.10	.32*	.33**	-.28*	-.02	.19	.15	-.15	.18
Orient					1.00	.14	.29*	.00	.01	-.07	-.14	.11	.07	-.10	-.07	.06	.01	-.17	.12
SS1						1.00	.40**	.00	-.03	-.07	-.14	-.08	-.09	.02	.04	.01	-.04	-.07	.01
SS2							1.00	-.07	-.06	-.09	-.10	-.01	-.07	-.03	.19	-.07	-.11	.04	-.19
FRI 1 (M)								1.00	.64***	.53***	.52***	.81***	.64***	-.21	.01	.47***	.52***	-.16	.00
FRI 2 (M)									1.00	.49***	.67***	.70***	.92***	-.42**	-.20	.53***	.65***	-.07	-.10
DAS 1 (M)										1.00	.73***	.52***	.48***	-.34**	.08	.83***	.72***	-.12	-.07
DAS 2 (M)											1.00	.46***	.60***	-.32*	-.20	.65***	.87***	-.15	-.41**
FRI 1 (M-D)												1.00	.80***	-.58***	-.04	.59***	.54***	-.24	.06
FRI 2 (M-D)													1.00	-.53***	-.27*	.63***	.70***	-.21	-.05
FRI 1 (M-D)														1.00	.13	.48***	.43***	.41**	.00
FRI 2 (M-D)															1.00	.08	.28*	.22	.29*
DAS 1 (M-D)																1.00	.82***	-.26*	-.03
DAS 2 (M-D)																	1.00	-.29*	-.18
																		1.00	.14
																			1.00
Total $\bar{X}$	55.0	37.7	17.2		4.2	95.6	88.9	23.5	22.9	117.8	115.0	46.0	45.6	2.6	2.4	235.0	232.7	8.4	9.8
(SD)	(5.3)	(3.3)	(3.2)		(.4)	(24.5)	(23.7)	(3.0)	(3.9)	(9.9)	(12.9)	(5.7)	(6.6)	(2.6)	(1.9)	(17.7)	(20.6)	(7.2)	(8.5)
Preterm $\bar{X}$	53.8	37.5	16.3		3.8	100.3	89.9	22.7	21.6	117.0	113.7	44.2	43.4	3.4	2.5	231.5	229.5	9.4	8.3
(SD)	(5.5)	(3.6)	(3.3)		(1.1)	(25.3)	(25.6)	(3.5)	(4.4)	(11.5)	(12.3)	(6.4)	(7.5)	(3.1)	(2.2)	(20.2)	(20.8)	(7.7)	(7.4)
Term $\bar{X}$	56.2	38.0	18.2		4.6	91.1	85.9	24.2	24.0	118.6	116.3	47.8	47.8	1.9	2.4	238.3	235.7	7.3	11.3
(SD)	(4.8)	(3.1)	(2.8)		(1.4)	(23.3)	(22.1)	(2.2)	(3.0)	(8.1)	(13.5)	(4.4)	(4.8)	(1.8)	(1.7)	(14.4)	(20.2)	(6.6)	(9.4)

a) Group coded 0 = preterm; 1 = term

***p < .001 **p < .01 *p < .05

n = 63 on time 1 data
n = 62 on time 2 data

APPENDIX 2

Letter of Introduction and Consent Forms

Department of Family Studies
Faculty of Home Economics
University of Alberta
Edmonton, Alberta T6G 2M8

Dear Mothers:

Having a new baby is an adventure as you discover the ways in which your child responds to you. I am interested in learning how parents relate to new babies, both term and preterm infants. The information I gather will be helpful for myself and other nurses when we care for families with new babies.

If you and your husband join the study, I will meet with you twice. While your baby is in hospital, I will ask you both some questions about your family and the help you received from friends and relatives. I will also observe your baby's behaviour while I am doing a physical examination. If you are interested, we can talk about my observations of your baby following the examination.

Three months later at your home, another nurse and I will observe you while you show your baby a new toy. I will also ask you and your spouse some questions about your family and your baby. Any information you give me will be kept confidential; in reports of the study your name will not be included.

If you are interested in helping in the study, please tell the nursing staff and I will meet with you to answer any questions you might have.

Sincerely,

Margaret Harrison, R.N., M.Sc.N.
Graduate Student

CONSENT FORM

Title of Research Project: Maternal Interaction with Preterm and Term Infants

Investigator: Margaret Harrison, Graduate Student
Department of Family Studies,
University of Alberta

The research procedures described on the attached form (of which I have a copy) have been explained to me and any questions that I have asked have been answered to my satisfaction. I know that I may ask any additional questions I have about the study or the research procedures. I have been informed that participation in this study is voluntary. I also understand the benefits of joining the research study. I have been assured that there is no risk to me or to my child from participating in the research. The results of the study will be published but neither I nor my child will be named.

I understand that I am free to withdraw from the study at anytime. If I choose not to participate or if I withdraw from the study, the quality of my medical or nursing care will not be affected. I have been informed that I may be contacted in the future and asked to participate in a follow-up study.

I consent to participate in this study and to allow my child to participate.

The persons who may be contacted about the research are:

Margaret Harrison
Telephone No. 432-5141

or

Dr. Dianne Kieren
Telephone No. 432-5770

_____
(Name of child)

_____
(Signature of mother)

_____
(Signature of father)

_____
(Signature of witness)

_____
(Date)

ATTACHMENT TO CONSENT FORM

PROJECT TITLE: Maternal Interactions with Preterm and Term Infants

INVESTIGATOR: Margaret Harrison, Graduate Student, Department of Family Studies, University of Alberta

SUPERVISOR: Dr. D. Kieren, Department of Family Studies, University of Alberta

DESCRIPTION OF THE PURPOSE OF THE STUDY

The purpose of this research is to learn more about what factors help parents relate to a new baby. The study will look at support from within families and from relatives and friends, infant behaviour patterns, and what happens when the mother shows the baby a new toy.

THE PROCEDURE

During the baby's hospitalization, both parents separately will answer questionnaires on how they describe their family and their relationship. The mother will answer a questionnaire about the support she has recently received from kin and friends. These questionnaires take approximately 30-40 minutes to complete. The infant's general style of behaviour will be observed during a physical examination done by the researcher. Three months after the baby goes home from hospital, the parents will complete the questionnaires again and the mother will be observed while she teaches her baby to play with a toy. The observations will take place in the mother's home, at her convenience, and last approximately 45 minutes.

RISKS AND BENEFITS

There is no apparent risk to either the parents or the infant in participating in the study. As families often express interest in their infant's responses during the behaviour assessment and the teaching task, they will have an opportunity to discuss the observations with the investigator.

CONFIDENTIALITY

Each family will be assigned a code number that will be used to identify their answers to the questionnaires and the observations. All information will be kept coded in locked files, available only to the researcher. Parents may wish to discuss their answers to the questionnaire, but the researcher will not share the responses of one partner with the other. The results of the study will be published, but the families' names will not be included.

CONDITIONS OF PARTICIPATION

Participants may ask any questions they have about the study. They are free to refuse to answer any question and to withdraw from the study at any time without penalty. Refusal to participate in the study will not affect the quality of medical or nursing care.

Further information about the research can be obtained from:

Margaret Harrison
432-5141

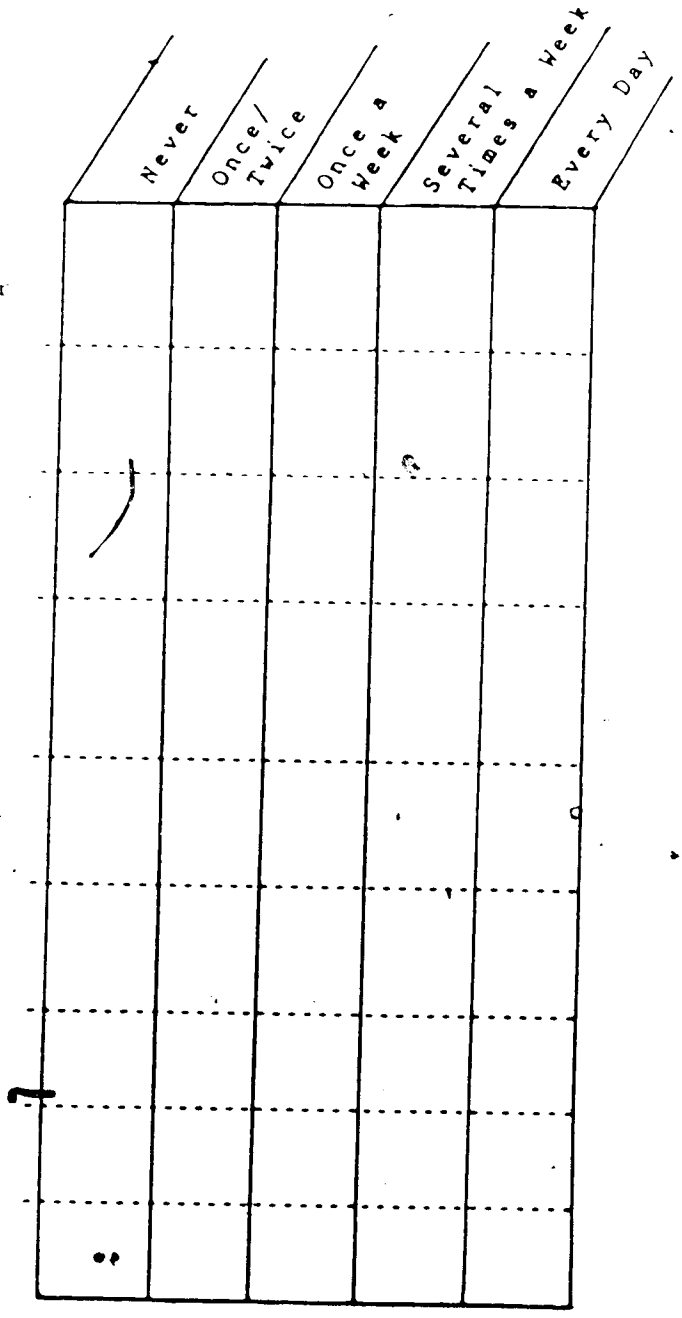
APPENDIX 3

Questionnaires

A Inventory of Socially Supportive Behaviours

We are interested in learning about some of the ways that friends and relatives help new parents or try to make life more pleasant for them. Below you will find a list of activities that people other than your spouse/partner might have done for you, to you, or with you in recent weeks.

Please read each item carefully and place an "x" in the column that says how often in the past FOUR WEEKS friends and relatives (other than your spouse) did each of these things for or with you.



1. Looked after a family member when you were away
2. Was right there with you (physically) in a stressful situation
3. Provided you with a place where you could get away for awhile
4. Watched after your possessions when you were away (pets, plants, home, apartment, etc.).
5. Told you what she/he did in a situation that was similar to you.
6. Did some activity with you to help you get your mind off of things.
7. Talked with you about some interests of yours:
8. Let you know that you did something well.
9. Went with you to someone who could take action.

	Never	Once/ Twice	Once a Week	Several Times a Week	Every Day
26 Agreed that what you wanted to do was right.					
27 Said things that made your situation clearer and easier to understand.					
28 Told you how he/she felt in a situation that was similar to yours.					
29 Let you know that he/she will always be around if you need assistance					
30 Expressed interest and concern in your well-being.					
31 Told you that she/he feels very close to you.					
32. Told you who you should see for assistance.					
33. Told you what to expect in a situation that was about to happen.					
34. Loaned you over $25.					
35. Taught you how to do something.					
36. Gave you feedback on how you were doing without saying it was good or bad.					
37. Joked and kidded to try to cheer you up.					
38. Provided you with a place to stay.					
39. Pitched in to help you do something that needed to get done.					
40. Loaned you under $25.					

	Never	Once/ Twice	Once a Week	Several Times a Week	Every Day
10. Told you that you are OK just the way you are.					
11. Told you that she/he would keep the things that you talk about private - just between the two of you.					
12. Assisted you in setting a goal for yourself.					
13. Made it clear what was expected of you.					
14. Expressed esteem or respect for a competency or personal quality of yours.					
15. Gave you some information on how to do something.					
16. Suggested some action that you should take.					
17. Gave you over $25.					
18. Comforted you by showing you some physical affection.					
19. Gave you some information to help you understand a situation you were in.					
20. Provided you with some transportation.					
21. Checked back with you to see if you followed the advice you were given.					
22. Gave you under $25.					
23. Helped you understand why you didn't do something well.					
24. Listened to you talk about your private feelings.					
25. Loaned or gave you something that you needed (a physical object other than money).					

B. Moos Family Environment Scale

There are 90 statements in this booklet. They are statements about families. You are to decide which of these statements are true of your family and which are false. Make all your marks on the separate answer sheets. If you think the statement is TRUE or mostly TRUE of your family, make an X in the box labeled T (true). If you think the statement is FALSE or mostly FALSE of your family, make an X in the box labeled F (false).

You may feel that some of the statements are true for some family members and false for others. Mark T if the statement is TRUE for most members. Mark F if the statement if FALSE for most members. If the members are evenly divided, decide what is the stronger overall impression and answer accordingly.

Remember, we would like to know what your family seems like to YOU. So DO NOT try to figure out how other members see your family, but DO give us your general impression of your family for each statement.

*1. Family members really help and support one another.

*2. Family members often keep their feelings to themselves.

*3. We fight a lot in our family.

4. We don't do things on our own very often in our family.

5. We feel it is important to be the best at whatever you do.

6. We often talk about political and social problems.

7. We spend most weekends and evenings at home.

8. Family members attend church, synagogue, or Sunday school fairly often.

9. Activities in our family are are pretty carefully planned.

10. Family members are rarely ordered around.

*11. We often seem to be killing time at home.

*12. We say anything we want to around home.

*13. Family members rarely become openly angry.

14. In our family, we are strongly encouraged to be independent

15. Getting ahead in life is very important in our family.

16. We rarely go to lectures, plays or concerts.

17. Friends often come over for dinner or to visit.

18. We don't say prayers in our family.

19. We are generally very neat and orderly.

20. There are very few rules to follow in our family.

*21. We put a lot of energy into what we do at home.

*22. It's hard to "blow off steam" at home without upsetting somebody.

*23. Family members sometimes get so angry they throw things.

24. We think things out for ourselves in our family.

25. How much money a person makes is not very important in our family.

26. Learning about new and different things is very important in our family.

27. Nobody in our family is active in sports, Little League, bowling, etc.

28. We often talk about the religious meaning of Christmas, Passover, or other holidays. other holidays.

29. It's often hard to find things when you need them in our household.

30. There is one family member who makes most of the decisions.

*31. There is a feeling of togetherness in our family.

*32. We tell each other about our personal problems.

*33. Family members hardly ever lose their tempers.

34. We come and go as we want in our family.

35. We believe in competition and "may the best man win".

36. We are not that interested in cultural events.

37. We often go to movies, sports events, camping, etc.

38. We don't believe in heaven or hell.

39. Being on time is very important in our family.

40. There are set ways of doing things at home.

*41. We rarely volunteer when something has to be done.

*42. If we feel like doing something on the spur of the moment we often just pick up and go.

*43. Family members often criticize each other.

44. There is very little privacy in our family.

45. We always strive to do things just a little better the next time.

46. We rarely have intellectual discussions.

47. Everyone in our family has a hobby or two.

48. Family members have strict ideas about what is right and wrong.

49. People change their minds often in our family.

50. There is a strong emphasis on following rules in our family.

*51. Family members really back each other up.

*52. Somebody usually gets upset if you complain in our family.

*53. Family members sometimes hit each other.

54. Family members almost always rely on themselves when a problem comes up.

55. Family members rarely worry about job promotions, school school grades, etc.

56. Someone in our family plays a musical instrument.

57. Family members are not very involved in recreational activities outside work or school.

58. We believe there are some things you just have to take on faith.

59. Family members make sure their rooms are neat.

60. Everyone has an equal say in family decisions.

*61. There is very little group spirit in our family.

*62. Money and paying bills is openly talked about in our family.

*63. If there's a disagreement in our family, we try hard to smooth things over and keep the peace.

64. Family members strongly encourage each other to stand up for their rights.

65. In our family, we don't try that hard to succeed.

66. Family members often go to the library.

67. Family members sometimes attend courses or take lessons for some hobby or interest (outside of school).

68. In our family each person has different ideas about what is right and wrong.

69. Each person's duties are clearly defined in our family.

70. We can do whatever we want to in our family.

*71. We really get along well with each other.

*72. We are usually careful about what we say to each other.

*73. Family members often try to one-up or out-do each other.

74. It's hard to be by yourself without hurting someone's feelings in our household.

75. "Work before play" is the rule in our family.

76. Watching T.V. is more important than reading in our family.

77. Family members go out a lot.

78. The Bible is a very important book in our family.

79. Money is not handled very carefully in our family.

80. Rules are pretty inflexible in our household.

*81. There is plenty of time and attention for everyone in our family.

*82. There are a lot of spontaneous discussions in our family.

*83. In our family, we believe you don't every get anywhere by raising your voice.

84. We are not really encouraged to speak up for ourselves in our family.

85. Family members are often compared with others as to how well they are doing at work or school.

86. Family members really like music, art and literature.

87. Our main form of entertainment is watching T.V. or listening to the radio.

88. Family members believe that if you sin you will be punished.

89. Dishes are usually done immediately after eating.

90. You can't get away with much in our family.

*Item included in the Family Relationship Index.

C. Spanier Dyadic Adjustment Scale

Most persons have disagreements in their relationships. Please indicate the amount of agreement or disagreement between you and your partner for each item on the following list. Place an X under the answer that you choose.

	Always Agree	Almost Always Agree	Occasionally Disagree	Frequently Disagree	Almost Always Disagree	Always Disagree
1. Handling family finances.						
2. Matters of recreation						
3. Religious matters						
4. Demonstration of affection						
5. Friends						
6. Sex relations						
7. Conventionality (correct or proper behavior)						
8. Philosophy of life						
9. Ways of dealing with parents or in-laws						
10. Aims, goals, and things believed important						
11. Amount of time spent together						
12. Making major decisions						
13. Household tasks						

Place an X under the answer that best describes your relationship.

	Always Agree	Almost Always Agree	Occa-sionally Disagree	Fre-quently Disagree	Almost Always Disagree	Always Disagree
14. Leisure time interests and activities	____	____	____	____	____	____
15. Career decisions	____	____	____	____	____	____

	All the time	Most of the time	More often than not	Occa-sionally	Rarely	Never
16. How often do you discuss or have you considered divorce, separation, or terminating your relation-ship?	____	____	____	____	____	____
17. How often do you or your mate leave the house after a fight?	____	____	____	____	____	____
18. In general, how often do you think that things between you and your partner are going well?	____	____	____	____	____	____
19. Do you confide in your mate?	____	____	____	____	____	____
20. Do you ever regret that you married? (or lived together)	____	____	____	____	____	____
21. How often do you and your partner quarrel?	____	____	____	____	____	____
22. How often do you and your mate "get on each other's nerves?"	____	____	____	____	____	____

Place an X under the answer you choose.

	Everyday	Almost Everyday	Occa-sionally	Rarely	Never
23. Do you kiss your mate?	_____	_____	_____	_____	_____

	All of them	Most of them	Some of them	Very few of them	None of them
24. Do you and your mate engage in outside interests together?	_____	_____	_____	_____	_____

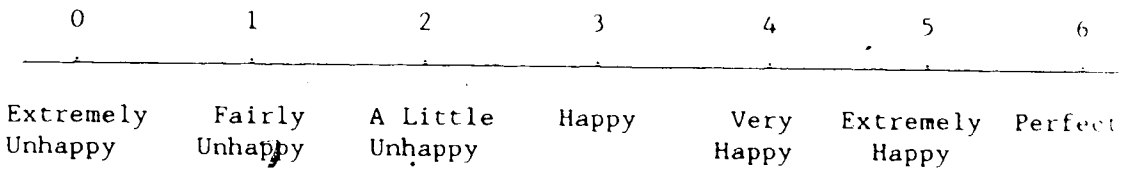
How often would you say the following events occur between you and your mate?

	Never	Less than once a month	Once or twice a month	Once or twice a week	Once a day	More often
25. Have a stimulating exchange of ideas	_____	_____	_____	_____	_____	_____
26. Laugh together	_____	_____	_____	_____	_____	_____
27. Calmly discuss something	_____	_____	_____	_____	_____	_____
28. Work together on a project	_____	_____	_____	_____	_____	_____

There are some things about which couples sometimes agree and sometimes disagree. Indicate if either item below caused differences of opinions or were problems in your relationship during the past few weeks. (Check yes or no).

	Yes	No
29. Being too tired for sex	_____	_____
30. Not showing love	_____	_____

31. The dots on the following line represent different degrees of happiness in your relationship. The middle point "happy", represents the degree of happiness of most relationships. Please circle the dot which best describes the degree of happiness, all things considered, of your relationship.



32. Which of the following statements best describes how you feel about the future of your relationship? (Check one).

_____ I want desperately for my relationship to succeed and would go to almost any length to see that it does.

_____ I want very much for my relationship to succeed , and will do all I can to see that it does.

_____ I want very much for my relationship to succeed, and will do my fair share to see that it does.

_____ It would be nice if my relationship succeeded, but I can't do much more than I am doing now to help it succeeded.

_____ It would be nice if it succeeded, but I refuse to do any more than I am doing now to keep the relationship going.

_____ My relationship can never succeed, and there is no more that I can do to keep the relationship going.

D. Father Participation

Fathers participate in different ways in caring for their child. We are interested in learning what activities your husband/partner does with or for your baby.

1. How many times in the past seven days did your husband/partner do each of the following for your baby?

feed the baby _____

bathe the baby _____

diaper or change the baby's clothes _____

put the baby to sleep _____

get up at night to care for the baby _____

rock or hold the baby to comfort him/her _____

play with the baby _____

2. How many times in the past seven days did you leave the baby in the care of your husband/partner? _____

3. Would your husband/partner like to participate in child care: (check one)

more frequently? _____

same amount? _____

less frequently? _____

Why? _____

_____

4. Are you currently employed? _____

If yes, how many hours do you work each week? _____

APPENDIX 4

Scoring Definitions for Brazelton

Orientation Cluster Score

Item from the Brazelton Neonatal Behavioral Assessment Scale

5 Orientation response inanimate visual (4 and 5)

1 Does not focus on or follow stimulus
2 Stills with stimulus and brightens
3 Stills, focuses on stimulus when presented, little spontaneous interest, brief following
4 Stills, focuses on stimulus, following for 30° arc, jerky movements
5 Focuses and follows with eyes horizontally for at least a 30° arc. Smooth movement, loses stimulus but finds it again
6 Follows for two 30° arcs with eyes and head. Eye movements are smooth
7 Follows with eyes and head at least 60° horizontally, maybe briefly vertically, partly continuous movement, loses stimulus occasionally, head turns to follow.
8 Follows with eyes and head 60° horizontally and 30° vertically
9 Focuses on stimulus and follows with smooth, continuous head movement horizontally, vertically, and follows in a circular path for a 180° arc

6 Orientation response-inanimate auditory (4 and 5)

1 No reaction.
2 Respiratory change or blink only
3 General quieting as well as blinking and respiratory changes
4 Stills, brightens, no attempt to locate source
5 Shifting of eyes to sound, stills and brightens
6 Alerting and shifting of eyes and head turns to source
7 Alerting, head turns to stimulus, and search with eyes.
8 Alerting prolonged, head and eyes turn to stimulus repeatedly (3 out of 4 times).
9 Turning and alerting to stimulus presented on both sides on every presentation of stimulus (4 out of 4 times).

7 Orientation -- inanimate visual and auditory (4 and 5)

1 Does not focus on or follow stimulus.
2 Stills with stimulus and brightens.
3 Stills, focuses on stimulus when presented, little spontaneous interest, brief following.
4 Stills, focuses on stimulus, following for 30° arc. Smooth movement, loses stimulus but finds it again.
5 Focuses and follows with eyes horizontally for at least a 30° arc. Smooth movement, loses stimulus but finds it again.
6 Follows for two 30° arcs with eyes and head. Eye movements are smooth.
7 Follows with eyes and head at least 60° horizontally, maybe briefly vertically, partly continuous movement, loses stimulus occasionally, head turns to follow.
8 Follows with eyes and head 60° horizontally and 30° vertically.
9 Focuses on stimulus and follows with smooth, continuous head movement horizontally, vertically, and follows in a circular path for a 180° arc.

8 Orientation animate visual (4 and 5)

1 Does not focus on or follow stimulus
2 Stills with stimulus and brightens
3 Stills, focuses on stimulus when presented, little spontaneous interest, brief following
4 Stills, focuses on stimulus, follows for 30° arc, jerky movements
5 Focuses and follows with eyes horizontally for at least a 30° arc. Smooth movement, loses stimulus but finds it again
6 Follows for two 30° arcs with eyes and head. Eye movements are smooth.
7 Follows with eyes and head at least 60° horizontally, maybe briefly vertically, partly continuous movement, loses stimulus occasionally, head turns to follow.
8 Follows with eyes and head 60° horizontally and 30° vertically
9 Focuses on stimulus and follows with smooth, continuous head movement horizontally, vertically and follows in a circular path for a 180° arc.

9 Orientation animate auditory (4 and 5)

1 No reaction.
2 Respiratory change or blink only.
3 General quieting as well as blinking and respiratory changes.
4 Stills, brightens, no attempt to locate source.
5 Shifting of eyes to sound, stills and brightens.
6 Alerting and shifting of eyes and head turns to source
7 Alerting, head turns to stimulus, and search with eyes.
8 Alerting prolonged, head and eyes turn to stimulus repeatedly (3 out of 4 times).
9 Turning and alerting to stimulus presented on both sides on every presentation of stimulus (4 out of 4 times).

10. Orientation animate-visual and auditory (4 and 5)

1 Does not focus on or follow stimulus.
2 Stills with stimulus and brightens.
3 Stills, focuses on stimulus when presented, little spontaneous interest, brief following.
4 Stills, focuses on stimulus, follows for 30° arc, jerky movements.
5 Focuses and follows with eyes horizontally for at least a 30° arc. Smooth movement, loses stimulus but finds it again.
6 Follows for two 30° arcs, with eyes and head. Eye movements are smooth.
7 Follows with eyes and head at least 60° horizontally, maybe briefly vertically, partly continuous movement, loses stimulus occasionally, head turns to follow.
8 Follows with eyes and head 60° horizontally and 30° vertically.
9 Focuses on stimulus and follows with smooth, continuous head movement horizontally, vertically and follows in a circular path for a 180° arc.

11 **Alertness (4 only)**

1 Inattentive - rarely or never responsive to direct stimulation

2 When alert, responsiveness brief and always delayed alerting and orientation very brief and general. Not specific to stimuli

3 When alert, responsiveness brief and often delayed quality of alertness variable

4 When alert, responsiveness brief but not generally delayed though may be variable.

5 When alert, responsiveness of moderate duration - response may be delayed and can be variable

6 When alert, responsiveness moderately sustained, not delayed and not variable.

7 when alert, episodes are of generally sustained duration Delay and variability no longer issues.

8 Always has sustained periods of alertness in best periods Alerting and orientation frequent. Stimulation brings infant to alert state and quiets infant.

9 Always alert for most of exam. Intensely and predictably alert.

APPENDIX 5

Nursing Child Assessment Teaching Scale

UNIVERSITY OF WASHINGTON
SCHOOL OF NURSING
NURSING CHILD ASSESSMENT TRAINING

TEACHING SCALE

[illegible] THREE YEARS

CHILD'S FIRST NAME
CHILD'S AGE IN MONTHS
CHILD'S SEX
CHILD'S RACE
MOTHER'S EDUCATION [illegible]
MARITAL STATUS [illegible]
MARRIED NOT MARRIED

YES NO

[illegible]

1. PARENT [illegible] SAFE [illegible]
2. PARENT POSITIONS CHILD SO THAT CHILD CAN REACH AND MANIPULATE MATERIALS
3. PARENT GETS THE CHILD'S ATTENTION BEFORE BEGINNING THE TASK AT THE ONSET OF THE TEACHING INTERACTION
4. IN NEARLY ALL CASES PARENT GIVES INSTRUCTIONS ONLY WHEN THE CHILD IS ATTENTIVE (80%)
5. PARENT ALLOWS CHILD TO EXPLORE THE TASK MATERIALS FOR AT LEAST 5 SECONDS BEFORE GIVING THE FIRST TASK RELATED INSTRUCTION
6. PARENT POSITIONS CHILD SO THAT IT IS POSSIBLE FOR THEM TO HAVE EYE TO EYE CONTACT WITH ONE ANOTHER DURING THE TEACHING EPISODE
7. PARENT PAUSES WHEN CHILD INITIATES BEHAVIORS DURING THE TEACHING EPISODE
8. PARENT PRAISES CHILD'S SUCCESSES OR PARTIAL SUCCESSES
9. PARENT ASKS FOR NO MORE THAN THREE PERFORMANCES WHEN CHILD IS SUCCESSFUL AT COMPLETING THE TASK
10. PARENT CHANGES POSITION OF CHILD AND/OR MATERIALS AFTER UNSUCCESSFUL ATTEMPT BY THE CHILD TO DO THE TASK
11. PARENT DOES NOT PHYSICALLY FORCE THE CHILD TO COMPLETE THE TASK

SUBSCALE TOTAL
(NO. OF YES ANSWERS)

RESPONSE TO DISTRESS (INDICATE WHETHER DISTRESS OCCURRED OR NOT)

12. STOPS THE TEACHING EPISODE
13. MAKES POSITIVE, SYMPATHETIC, OR SOOTHING VERBALIZATION
14. CHANGES VOICE VOLUME TO SOFTER OR HIGHER PITCH (DOES NOT YELL)
15. REARRANGES THE CHILD'S POSITION AND/OR TASK MATERIALS
16. MAKES SOOTHING NON VERBAL RESPONSE, E.G. PAT, TOUCH, ROCK, CARESS, KISS
17. DIVERTS CHILD'S ATTENTION BY PLAYING GAMES, INTRODUCES NEW TOY
18. DOES NOT MAKE NEGATIVE COMMENTS TO THE CHILD
19. DOES NOT YELL AT THE CHILD
20. DOES NOT USE ABRUPT MOVEMENTS OR ROUGH HANDLING
21. DOES NOT SLAP, HIT OR SPANK
22. DOES NOT MAKE NEGATIVE COMMENTS TO HOME VISITOR ABOUT THE CHILD

SUBSCALE TOTAL
(NO. OF YES ANSWERS)

SOCIAL EMOTIONAL GROWTH FOSTERING

23. PARENT'S BODY POSTURE IS RELAXED DURING THE TEACHING EPISODE (AT LEAST HALF THE TIME)
24. PARENT IS IN THE FACE TO FACE POSITION WITH THE CHILD DURING THE TEACHING INTERACTION (AT LEAST HALF THE TIME)
25. PARENT LAUGHS OR SMILES AT CHILD DURING THE TEACHING
26. PARENT GENTLY PATS, CARESSES, STROKES, HUGS, OR KISSES CHILD DURING EPISODE
27. PARENT SMILES OR TOUCHES CHILD WITHIN 5 SECONDS WHEN CHILD SMILES OR VOCALIZES
28. PARENT PRAISES CHILD'S EFFORTS OR BEHAVIORS BROADLY IN GENERAL AT LEAST ONCE DURING THE EPISODE
29. PARENT MAKES CONSTRUCTIVE OR ENCOURAGING STATEMENT TO THE CHILD DURING THE TEACHING INTERACTION
30. PARENT DOES NOT VOCALIZE TO THE CHILD AT THE SAME TIME THE CHILD IS VOCALIZING
31. PARENT DOES NOT MAKE GENERAL NEGATIVE OR UNCOMPLIMENTARY REMARKS ABOUT THE CHILD
32. PARENT DOES NOT YELL AT THE CHILD DURING THE EPISODE
33. PARENT DOES NOT MAKE CRITICAL NEGATIVE COMMENTS ABOUT THE CHILD'S TASK PERFORMANCE

SUBSCALE TOTAL
(NO. OF YES ANSWERS)

COGNITIVE GROWTH FOSTERING

34. PARENT PROVIDES AN IMMEDIATE ENVIRONMENT WHICH IS FREE FROM DISTRACTIONS FROM ANIMATE SOURCES (SIBS, PETS, ETC.)
35. PARENT FOCUSES ATTENTION ON CHILD'S ATTENTION ON THE TASK DURING MOST OF THE TEACHING (80% OF THE TIME)
36. AFTER PARENT GIVES INSTRUCTIONS, AT LEAST 5 SECONDS IS ALLOWED FOR THE CHILD TO ATTEMPT THE TASK BEFORE PARENT INTERVENES AGAIN
37. PARENT ALLOWS NON TASK MANIPULATION OF THE TASK MATERIALS AFTER THE ORIGINAL PRESENTATION
38. PARENT DESCRIBES PERCEPTUAL QUALITIES OF THE TASK MATERIALS TO THE CHILD
39. PARENT USES AT LEAST TWO DIFFERENT SENTENCES OR PHRASES TO DESCRIBE THE TASK TO THE CHILD
40. PARENT USES EXPLANATORY VERBAL STYLE MORE THAN IMPERATIVE STYLE IN TEACHING THE CHILD
41. PARENT'S DIRECTIONS ARE STATED IN CLEAR, UNAMBIGUOUS LANGUAGE (I.E. AMBIGUOUS = "TURN", "REACH", UNAMBIGUOUS = "TURN THE KNOB TOWARD ME.")
42. PARENT USES BOTH VERBAL DESCRIPTION AND MODELING SIMULTANEOUSLY IN TEACHING ANY PART OF THE TASK
43. PARENT ENCOURAGES AND/OR ALLOWS THE CHILD TO PERFORM THE TASK BEFORE INTRUDING IN ON THE USE OF TASK MATERIALS
44. PARENT VERBALLY PRAISES CHILD AFTER CHILD HAS PERFORMED BETTER OR MORE SUCCESSFULLY THAN THE LAST ATTEMPT
45. PARENT SMILES AND/OR NODS AFTER CHILD PERFORMS BETTER OR MORE SUCCESSFULLY THAN THE LAST ATTEMPT
46. PARENT RESPONDS TO THE CHILD'S VOCALIZATIONS WITH VERBAL RESPONSE
47. PARENT USES BOTH VERBAL AND NONVERBAL INSTRUCTIONS IN TEACHING THE CHILD
48. PARENT USES TEACHING LOOPS IN INSTRUCTING CHILD (75% OF THE TIME)
49. PARENT SIGNALS COMPLETION OF TASK TO CHILD VERBALLY OR NONVERBALLY
50. PARENT SPENDS NOT MORE THAN 5 MINUTES AND NOT LESS THAN ONE MINUTE IN TEACHING THE CHILD THE TASK

SUBSCALE TOTAL
(NO. OF YES ANSWERS)

YES NO

[illegible] CLARITY OF CUES

[illegible] CHILD IS AWAKE

[illegible]

[illegible]

[illegible]

[illegible]

56 CHILD VOCALIZES WHILE LOOKING AT TASK MATERIALS

57 CHILD SMILES OR LAUGHS DURING THE EPISODE

58 CHILD GRIMACES OR FROWNS DURING THE TEACHING EPISODE

59 CHILD DISPLAYS POTENT NEGATIVE CUES DURING THE TEACHING INTERACTION

60 CHILD DISPLAYS SUBTLE NEGATIVE CUES DURING THE TEACHING INTERACTION

SUBSCALE TOTAL
(NO. OF YES ANSWERS)

V. RESPONSIVENESS TO PARENT

61 CHILD GAZES AT PARENT'S FACE OR TASK MATERIALS AFTER PARENT HAS SHOWN VERBAL OR NONVERBAL ALERTING BEHAVIOR

62 CHILD ATTEMPTS TO ENGAGE PARENT IN EYE TO EYE CONTACT

63 THE CHILD LOOKS AT THE PARENT'S FACE OR EYES WHEN PARENT ATTEMPTS TO ESTABLISH EYE TO EYE CONTACT

64 CHILD VOCALIZES OR BABBLES WITHIN 5 SECONDS AFTER PARENT'S VERBALIZATION

65 CHILD VOCALIZES OR BABBLES WITHIN 5 SECONDS AFTER PARENT'S GESTURES, TOUCHING OR CHANGING FACIAL EXPRESSION

66 CHILD SMILES AT PARENT WITHIN 5 SECONDS AFTER PARENT'S VERBALIZATION

67 CHILD SMILES AT PARENT WITHIN 5 SECONDS AFTER PARENT'S GESTURE, TOUCH, OR FACIAL EXPRESSION CHANGES

68 WHEN PARENT MOVES CLOSER THAN 8 INCHES FROM THE CHILD'S FACE, THE CHILD SHOWS SUBTLE AND/OR POTENT NEGATIVE CUES

69 CHILD SHOWS SUBTLE AND/OR POTENT NEGATIVE CUES WITHIN 5 SECONDS AFTER PARENT CHANGES FACIAL EXPRESSION OR BODY MOVEMENTS

70 CHILD SHOWS SUBTLE AND/OR POTENT NEGATIVE CUES WITHIN 5 SECONDS AFTER PARENT'S VERBALIZATION

71 THE CHILD SHOWS SUBTLE AND/OR POTENT NEGATIVE CUES WHEN PARENT ATTEMPTS TO INTRUDE PHYSICALLY IN THE CHILD'S USE OF THE TASK MATERIAL

72 CHILD PHYSICALLY RESISTS OR RESPONDS AGGRESSIVELY WHEN PARENT ATTEMPTS TO INTRUDE PHYSICALLY IN CHILD'S USE OF THE TASK MATERIAL

73 THE CHILD STOPS DISPLAYING DISTRESS CUES WITHIN 15 SECONDS AFTER PARENT'S SOOTHING ATTEMPTS

SUBSCALE TOTAL
(NO. OF YES ANSWERS)

ENTER TOTALS FOR EACH CATEGORY

[illegible]

TOTAL NO. OF YES ANSWERS

[illegible] WERE YOU UNCOMFORTABLE DURING ANY PART OF THE TEACHING [illegible]

A. YES B. NO

IF YES, WHY?

[illegible] OBSERVER'S COMMENTS

APPENDIX 6

Demographic Data Form

DEMOGRAPHIC DATA

I. Family Information (interview)

A. Mother

1. Age at last birthday _____

2. Number of years of schooling completed _____

3. Current occupation _____

If housewife or student, previous type of employment.

_____

4. Is this your first child? _____

If no, list the year of birth for each of your other children.

a) _____ d) _____ g) _____

b) _____ e) _____ h) _____

c) _____ f) _____ i) _____

B. Father

1. Age _____

2. Number of years of schooling completed _____

3. Occupation _____

C. Yearly Family Income

1. Less than $10,000 _____ 4. $30,000-$39,000 _____

2. $10,000-$19,000 _____ 5. $40,000-$49,000 _____

3. $20,000-$29,000 _____ 6. $50,000 and over _____

D. Introduction to the Infant

1. Mother

a) age of baby when first seen by mother (hours)_____

b) age of baby when first held/touched by mother (hours) _____

2. Father

a) age of baby when first seen by the father (hours)_____

b) age of baby when first held/touched by father (hours) _____

II. Newborn Information (from medical records)

1. Sex _____

2. Birth date (month, day, year, time)

_____

3. Birth weight (grams) _____

4. Gestational age at birth (weeks) _____

5. Apgar 1 minute _____ 5 minutes _____

6. Delivery

a) vaginal _____ b) C-section _____

7. Perinatal complications (list) _____

_____

_____

8. Number of days on respirator _____

9. Method of infant feeding _____

10. Date of discharge from hospital _____