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Very low birthweight infant temperament 6 to 8 months of age on family unit health

Nelson, Deborah Brown, D.S.N.

University of Alabama at Birmingham, 1993

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VERY LOW BIRTHWEIGHT INFANT TEMPERAMENT
6 TO 8 MONTHS OF AGE ON FAMILY UNIT HEALTH

by

DEBORAH B. NELSON

A DISSERTATION

Submitted in partial fulfillment of the requirements for
the degree of Doctor of Science in Nursing in the
School of Nursing in the Graduate School,
The University of Alabama
at Birmingham

BIRMINGHAM, ALABAMA

1993

ABSTRACT OF DISSERTATION
GRADUATE SCHOOL, UNIVERSITY OF ALABAMA AT BIRMINGHAM

Degree _____ **D.S.N.** _____ Major Subject _____ **Maternal-Child Health Nursing**

Name of Candidate _____ **Deborah B. Nelson** _____

Title _____ **Very Low Birthweight Infant Temperament 6 to 8** _____

_____ **Months of Age on Family Unit Health** _____

The purpose of this study was to determine if differences in family unit health existed between family units with very low birthweight (VLBW) infants when compared with full-term infant family units. Thirty-seven mothers of second born children were recruited for study. Included were 15 family units of 6- to 8-month-old VLBW infants and 22 full-term infant family units.

An ex-post facto descriptive design was selected to examine infant behavioral style and its relationship of family unit health within the two family units. Barnhill's (1979) theory of health family dynamics, as a mutually causal system, examined family dynamics across six dimensions of health and psychopathology and included: (a) individuation-enmeshment, (b) clear communication-unclear communication, (c) stability-disorganization, (d) flexibility-rigidity, (e) mutuality-isolation, and (f) role reciprocity-role conflict. Barnhill's theory provided the organizing framework for this study. Five dimensions of Carey and McDevitt's (1978) infant temperament scale were

employed to examine infant behavioral style and included: rhythmicity, approach, adaptability, intensity, and mood. Full-term infant family units were found to be healthier on all six dimensions of family dynamics; however, statistical significance was not achieved at the .05 level. When the behavioral styles of the two infant groups were compared, statistical significant differences did not exist on any of the five dimensions of infant behavioral style at the .05 level. Family dynamic scores and behavioral style scores were combined for the two family units and correlations determined. Approach correlated with stability-disorganization ($\underline{r}$ = 3.77, $\underline{p}$ = .022) and role reciprocity-role conflict ($\underline{r}$ = .466, $\underline{p}$ = .004). Adaptability correlated with stability-disorganization ($\underline{r}$ = .328, $\underline{p}$ = .028) and mood with role reciprocity-role conflict ($\underline{r}$ = .403, $\underline{p}$ = .013).

Nine statistically significant correlation coefficients were generated within the six dimensions of family dynamics. By improving one dimension of family dynamics, other dimensions were improved, thus supporting a system of mutual causality.

Abstract Approved by: Committee Chairman _____

Program Director _____

Date _____   Dean of Graduate School _____

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CHAPTER I

Introduction

The family serves as a primary force in an infant's ability to develop socially, emotionally, and intellectually. Developmental or positive outcomes are influenced significantly by the quality of interactions created within the family (Carey, 1990). For positive outcomes to be achieved by the child, therefore, interactional qualities of healthy or nonpathologic nature must be present within the family.

The family's mental health is created by healthy family interactions. To describe healthy family interactions is a priority area for most professionals concerned with child development. In the absence of descriptive research describing such interactions, models of family health are not available. Therefore, primary prevention interventions to reduce risk factors that affect family health cannot be designed.

For many years, the family was viewed from a perspective of dyadic interactions. From this approach, mother-infant, mother-father, and father-infant interactions were examined. The dyadic approach was believed to be linear, static, and unable to focus on the family as a basic system or unit of interactions (Murphy,

1986). From such an approach, attention focused on psychopathology with problem attribution to a single family member. By using an approach of linearity, the influence of other family members on one another was revealed insufficiently. Dyadic research within this approach focused on parent-child interactions that included parenting styles, parental attitudes, and disciplinary practices (Baumrind, 1971).

To afford a richer typology of family interactions, the healthy family systems or unit approach to the family was offered. The healthy family unit approach gained increased popularity because of the dynamic nonlinear nature proposed by the approach. The child, as a system component, can create and is affected by interactions created within the unit (Minuchin, 1974). Interactions created by other children, mother, father, and other significant family members, all have the potential for affecting the child. Therefore, to achieve understanding of a particular child within the unit, is to begin to comprehend the unit. A child can affect his own outcomes by self-interactions created and modified within the context of the unit.

The importance of considering the family as a unit of health has wide implications, particularly in nursing where prevention of pathology provides the framework for professional practice. From a prevention focus, the most pressing concern is whether comprehension of pathology truly can be recognized in the absence of a comprehension

of health. At present, the family as the unit of health interactions has been revealed inadequately.

Barnhill's (1979) theory of healthy family systems was formulated from the perspective that the family can be the unit of mental health since much agreement exists that the family serves as the unit of psychopathology. From Barnhill's conceptualization, health clearly specifies something beyond average, normal, or non-pathological.

Barnhill's (1979) conceptualization of a healthy family unit consists of eight bipolar dimensions of family dynamics. For each health dimension, a psychopathologic dimension is also present. Interactions created within the family unit determine whether a family will manifest dimensions of health or psychopathology. Barnhill's eight bipolar dimensions of health and psychopathology are: (a) individuation versus enmeshment, (b) clear communication versus unclear or distorted communication, (c) stability versus disorganization, (d) flexibility versus rigidity, (e) mutuality versus isolation, (f) role reciprocity versus role conflict, (g) clear perception versus unclear or distorted perception, and (h) clear generational boundaries versus diffuse or breached generational boundaries.

Interactions within the family unit that determine a family's health or psychopathology are believed to be affected by many variables. These variables can include: health of individual family members, sociocultural values, behavioral styles, maternal expectations, maternal anxiety, household density (computed as the number of people living

in the household divided by the number of rooms in the household), mother's education, father's education, number of parents and children living in the household, length of time members have been members of the family, the mother's employment status, socioeconomic status, and marital status. Although each variable is believed to affect family unit interactions that determine health or psychopathology, in the absence of descriptive studies to identify relationships, these beliefs were not supported. Also, the interrelationships between these variables were explored insufficiently. Speculation is, however, that interrelationships do exist. Consequently, interactions that affect the family unit can be the result of many variables as well as the interrelationships between the variables.

The behavioral style or temperament of the very low birthweight (VLBW) preterm infant is an emerging area of scientific inquiry and one variable believed to affect family unit interactions. In comparison, interactions between mothers of full-term infants and VLBW infants are known to be different. Speculation is that differences in interactions can be derived from differences in behavioral styles of the VLBW infant.

From a family unit approach, the VLBW infant's behavioral style, which is known to exist at 6 months of adjusted age, allows the infant to create or modify interactions within the family unit. Because the VLBW infant has the potential for creating or modifying

interactions within the unit, the VLBW infant can define interactions that determine health or psychopathology. The quality of the interactions ultimately affects the VLBW infant's outcome.

The exact origin of VLBW infant behavioral style remains largely unexplained. However, evidence does exist suggesting that genetic and interactional factors can contribute to the VLBW infant's behavioral style. The interactional factors influencing behavioral style in VLBW infants are known to vary when compared with full-term infants.

Unlike most full-term infants who are placed in a family unit setting soon following birth, the VLBW infant spends the early months of life in a neonatal intensive care nursery (NICU). Descriptive research concluded that the NICU is a noxious environment. Thus, the behavioral style manifested by the VLBW infant is one that was influenced by such interactional factors as prolonged stress of the NICU (Bates, 1982) and interactions that disallow for behavioral organization (Gorski, Davison, & Brazelton, 1979). When eventually placed in the family unit, the VLBW infant can indeed manifest a behavioral style described as difficult or fussy, arrhythmic, and difficult to soothe. This difficult style was created from interactions within the NICU and are of a pathologic nature. To acknowledge that infants can manifest a behavioral style described as difficult or even easy is to

concede that interactions affect behavioral style (Maccoby, Snow, & Jacklin, 1984).

Behavioral differences in infants have been documented through observational methods (Thomas, Chess, Birch, Herzog, & Korn, 1963). VLBW infants frequently manifest a behavioral style described as difficult, and this prevalence for a difficult behavioral style is greater when compared with full-term infants (Medoff-Cooper, 1986). Washington, Minde, and Goldberg (1986) contend that although difficult temperaments are relatively common in VLBW infants in the first 6 months of life, the incidence is reduced substantially by 1 year. This finding would suggest that interactions that determine family unit health may account for the change in behavioral style in VLBW infants.

Purpose

The purpose of this study was to determine if differences in family unit health existed between families with VLBW infants when compared to families of full-term infants.

Research Questions

For the purpose of this study, the following research questions were posed:

1. "Is there a difference between the behavioral styles of VLBW infants at 6 to 8 months as compared with full-term infants of equivalent age?"

2. "Does a relationship exist between VLBW and full-term infant behavioral styles and family unit health when the infants are 6 to 8 months of adjusted age?"

Conceptual Framework

Ackerman's (1961) classic work on prevention provided Barnhill (1975) a focal point for conceptualizing healthy family systems. Ackerman contended that understanding the family is essential in comprehending the infant. Parents, according to Ackerman, enter parenthood with established identities. By being born into a set of ongoing interactions, the infant's interactions are created afresh. The infant is socially, emotionally, and intellectually incomplete. Infant outcomes are evaluated in response to the infant's ability to integrate into the ongoing interactions created within the family unit.

To conceptualize infant outcomes as posited by Ackerman (1961), the family unit must be considered in the conceptualization process. Ackerman's assertion is that an extension beyond pathology must be achieved to comprehend the process of prevention. The challenge set forth was to specify factors creating negative infant outcomes as a secondary prevention strategy, and to specify factors that strengthen immunity and promote positive outcomes. Concepts of health must be identified and pathological influences eliminated (Barnhill, 1975). Because the family serves as the bridge between factors of prevention, the family serves as the basic unit of health and pathology (Ackerman).

The integration of diverse theories of health and pathology in family dynamics provides the initial component in the conceptualization of a healthy family unit (Barnhill, 1979). From a comprehensive review of concepts, Barnhill identified four family themes which he further delineated into eight bipolar dimensions of family dynamics. The four family themes are: family identity processes, family change, family information processing, and family role structuring. Each theme consists of two bipolar dimensions of family dynamics.

Barnhill's (1979) first theme, identity processes, includes the two bipolar dimensions of family dynamics: (a) individuation versus enmeshment, and (b) mutuality versus isolation. Individuation is defined as the independence of thoughts and feelings and includes autonomy, identity, and boundaries of self. In contrast, enmeshment refers to poorly delineated boundaries of self, symbiosis, and shared ego fusion (Bowen, 1960; Satir, 1972).

Mutuality is defined as emotional closeness or intimacy and is achieved only when there exists clearly defined identities. Cohesion in the family unit is dependent upon mutuality. Alienation or disengagement from others occurs when there is enmeshment or isolated withdrawal from family relationships (Minuchin, 1974). Enmeshment or alienation is preventable if individuation and mutuality are present.

Barnhill's (1979) second theme, change, consists of two bipolar dimensions: (a) flexibility versus rigidity, and (b) stability versus disorganization. Flexibility is defined as the capacity to be adjustable to the process of change. Rigidity, the pathological dimension of the bipolar dimension of flexibility versus rigidity, is defined as the lack of flexibility (Minuchin, 1974). Related closely to flexibility versus rigidity is the bipolar dimension stability versus disorganization. Stability refers to consistency and security in family interactions with disorganization being the lack of consistency, including the lack of predictability (Minuchin).

Barnhill's (1979) third theme, information processing, is comprised of two bipolar dimensions: (a) clear versus unclear or distorted perception, and (b) clear versus unclear or distorted communication. A clear perception consists of a clear awareness of self and others. Lack of clarity results in vague perceptions (Bowen, 1960). Clear versus unclear or distorted communication is the second bipolar dimension of the theme information processing. Clear communication necessitates the clarification of messages. Vague or confusing messages, in contrast, constitute distorted communication. Satir (1972) contended that dysfunctional communication occurs when the communicator lacks the ability to perceive and interpret messages accurately. Consequently, the assumptions upon

which the communicator operates are faulty, and the communicators inappropriately adapt to reality.

Role structuring is Barnhill's (1979) fourth theme. Role reciprocity versus role conflict and clear versus unclear or breached generational boundaries comprise the two bipolar dimensions of this theme. Role reciprocity, the health dimension of the bipolar dimension of role reciprocity versus role conflict, refers to mutually agreed upon behavior patterns. In most cases, these behaviors are implicit. Role conflict in contrast to role reciprocity, is referred to as the lack of mutually agreed upon behavior patterns.

According to Minuchin (1974), clear generational boundaries refer to role reciprocity among family members, specifically child and sibling relationships. Members of one generation align themselves with their own members rather than across generations. Vague or unclear alliances comprise diffuse generational boundaries. The term breached generational boundaries refers to an alliance with two different generations.

Tomlinson, White, and Wilson (1990) contended that Barnhill's (1979) eight bipolar dimensions of family dynamics are interrelated across and dependent upon the four family themes. For example, to achieve individuation and mutuality (family theme: identity processes), requires flexibility (family theme: information processing), in the relationship as well as role reciprocity (family theme role structuring). Thus, this approach is one of

interlocking mutual causality. As in any mutually causal system that is a circular one, any point within the system can become the beginning. The two-way arrow between dimensions implies "checking out" of the dimensions as is illustrated in Figure 1.

The conceptual basis for examining infant behavior style is based on the temperament work of Thomas et al. (1963). Temperament, as defined by Thomas et al., is behavioral style rather than abilities or motivations and is comprised of nine dimensions: activity, rhythmicity, approach, adaptability, intensity, mood, persistence, distractibility, and threshold.

Based on Thomas et al.'s (1963) conceptualization of behavioral style, Stevenson-Hinde (1986) viewed behavioral style as a continuous variable. As such, some of the nine behavioral style dimensions are personological or within person and some are interactional. Various behavioral style dimensions might lie at different places on the continuum. Thus, behavioral style individuality can be altered or modified by postnatal genetic or maturational influences, situational context, and child-environmental interactional processes (Maccoby et al., 1984; Stevenson-Hide; Thomas & Chess, 1977). The contemporary conceptualization of behavioral style considers the child an active participant in interactions.

Dimensions of behavioral style termed personological serve as enabling forces which allow the child to become an active participant in interactions. As a participant in
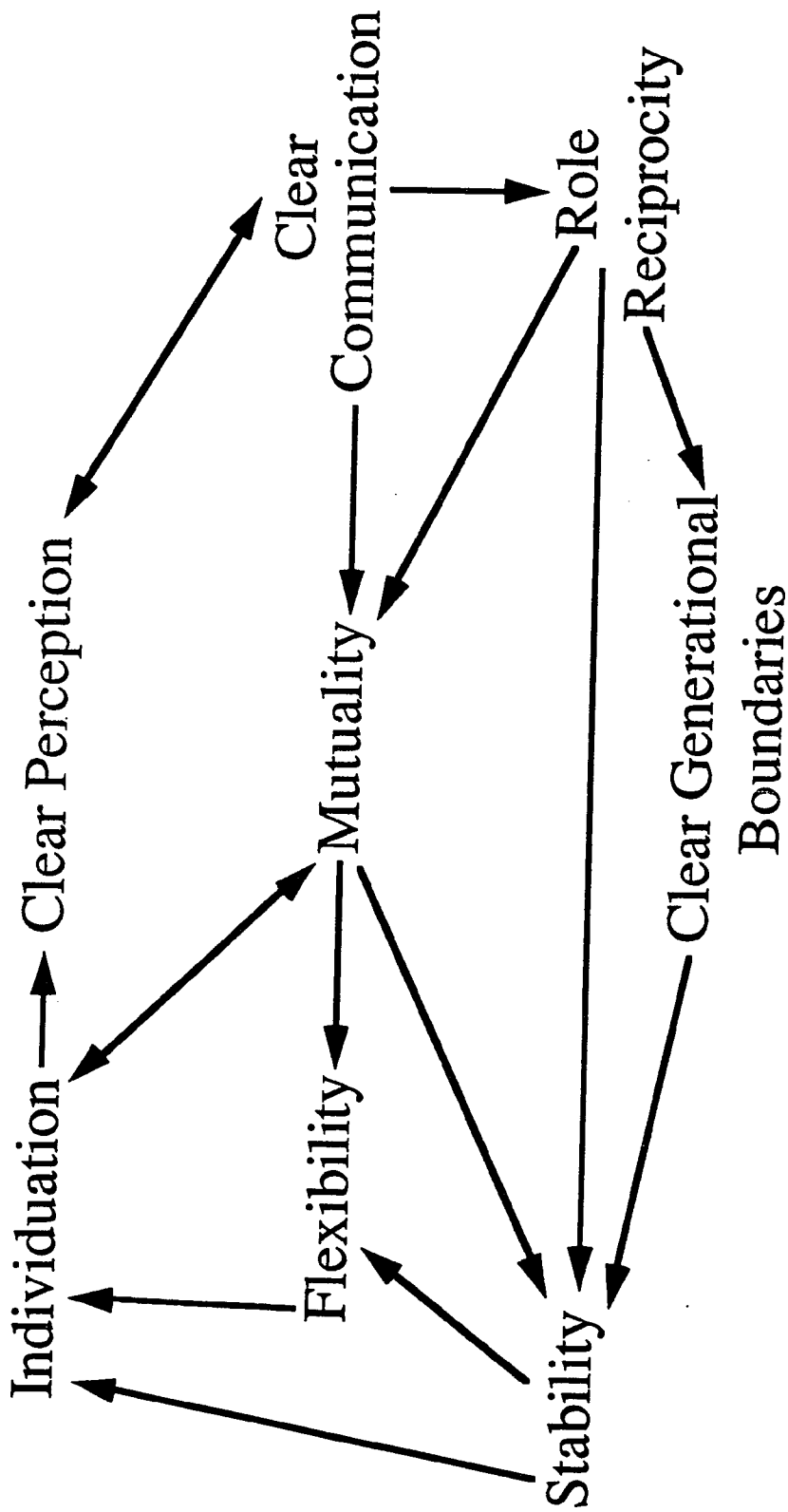
Figure 1.   Family Health Cycle
[Barnhill, L. (1979). Healthy family systems. _The Family Coordinator,
28_(1), 94-100]. Copyrighted (1979) by the National Council of Family
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interactions, the child creates interactions within the environment which become mutually modified. Thus, a child's behavioral style is not only structured by the child's personological dimensions, but also by interactions created and modified within the environment. Thomas, Chess, and Korn (1982) contend that the child is capable of influencing parental attitudes and beliefs.

Quantitatively derived temperament scores subjected to factor analysis have defined successfully four dimensions of behavioral style which define the factor easy/difficult (Thomas et al., 1982). Weighing on the factor easy/difficult were the behavioral style dimensions of approach, adaptability, intensity, and mood. Although rhythmicity did not significantly weigh on the factor easy/difficult, Thomas et al. retained the dimension of rhythmicity because of its functional relatedness. These five behavioral style dimensions of rhythmicity, approach, adaptability, intensity, and mood are those which are interactionally influenced.

Definition of Terms

Below are definitions offered for the purpose of this study:

Family - the unit in which interactions are created and modified. The family is a "psychosocial unit comprised of two adults who have a commitment to each other and who live together" (Tomlinson et al., 1990, p. 684).

Very Low Birthweight (VLBW) Infants - infants delivered weighing 1,500 grams or less.

Family Dynamics - a collection of eight bipolar dimensions of functioning, according to Barnhill (1979). The six included in this study are: (a) individuation versus enmeshment, (b) clear communication versus unclear or distorted communication, (c) stability versus disorganization, (d) flexibility versus rigidity, (e) mutuality versus isolation, and (f) role reciprocity versus role conflict.

Full-Term Infant - an infant born at 37 weeks or more gestation.

Infant Behavioral Style - a constellation of nine behavior style dimensions of activity, rhythmicity, approach, adaptability, intensity, mood, persistence, distractibility, and threshold. The five chosen for use in this study include: rhythmicity, approach, adaptability, intensity, and mood.

Adjusted Age - chronological age of the VLBW infant minus the weeks of prematurity.

Assumptions

Assumptions identified for this study include:

1. VLBW infants by the virtue of their prematurity are physiologically different from full-term infants.

2. The composition of the family unit affects the dynamics of the family unit.

3. Family unit interactions that determine family unit health are affected by many variables.

4. The mother within the family unit serves as the primary person interacting with the VLBW and full-term infant.

Significance of the Study

Role expansion in nursing has provided nurses with the unique opportunity to encounter families in a wide variety of settings and thus to recognize the multiplicity of variables that can potentially affect health. Practice models for nurses in expanded roles, however, have revealed inadequately the family as a unit of interactions. Therefore, variables that potentially could affect healthy family unit interactions such as composition and characteristics of individuals within the family unit, have been explored inadequately. Primary prevention strategies within the practice models continue to be directed toward the mitigation of individual risk factors (Gershwin & Nilsen, 1989).

Nurses' recognition of the need for more knowledge of the individual within the contextual framework of the family as a unit of interactions, have facilitated the growth of family research. To achieve a broader knowledge base of the family, nurse researchers have recognized the importance of theoretic and meteorologic pluralism (Silva & Rothbart, 1984).

Although it has long been contended that family interactions are influenced by the composition of the family unit, VLBW infant behavioral style on family interactions has been studied sparsely. With evidence to

support that VLBW and full-term infants are not homogeneous and that interactional patterns of their mothers are different is to suggest that models of health for both groups may be different. In the absence of sufficient descriptive research to determine the relationship of VLBW infant behavioral style on the family unit health, models of family health for family units with VLBW infants are not available. As a result, nursing interventions at a primary prevention level cannot be developed. Prior to the formulation of such interventions, a sound knowledge base must be established. This research is to serve as a first step in the establishment of such a foundation.

CHAPTER II

Review of Research

The VLBW infant experiences negative outcomes in a disproportionately higher number compared to full-term infants (Als, 1982; Vohr & Garcia-Coll, 1985). Included are disorders in language and reading and behavioral problems. Hyperactivity, impulsivity, and attention deficit typically characterize the behavioral problems and have the potential for disallowing the child the opportunity to attain outcomes of a positive nature. With technologic advances, survival rates for VLBW infants continues to improve and researchers are beginning to afford more attention to the more subtle problems experienced by the VLBW infants cited previously.

A well delineated etiology for VLBW infants' subtle problems has yet to be identified, but dyssyncrony in family interactions or a lack of goodness of fit in interactions has been suspected. The assumption that early patterns of interaction are important for later social, emotional, and intellectual development has led to a wide range of studies of family interactions in the first year of the preterm infant's (< 37 weeks gestation) life (Watt, 1986).

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Interactional patterns between mothers of full-term infants, as compared with VLBW infants, are known to be different. Typically, the preterm dyads with infants of less than 37 weeks gestations, are unresponsive and low in signalling levels. The mother of the dyad compensates for the infant's inactivity by demonstrating high levels of signalling. High levels of gaze aversion, avoidance of interaction, and decreased levels of vocalizing have been reported in the preterm infant (Crnic, Greenberg, Ragozin, Robinson, & Basham, 1983; Field, 1977). These studies have consistently reported high levels of maternal activity in interaction when compared to mothers of full-term infants and less overall enjoyment of the infant when the infant is preterm. Differences in these interactional patterns have been documented to extend across the infant's first year of life.

In comparison with full-term infants, VLBW infants manifest a behavioral style which is more difficult and characterized by fussiness and lack of consolibility. Infants manifesting a behavioral style as difficult are frequently placed in a position of vulnerability for child abuse and neglect (Brackbill, White, Wilson, & Kitch, 1990; Perrin, West, & Culley, 1989). Second children who are preterm appear to be the most vulnerable (Perrin et al.).

In a longitudinal study of VLBW infants from birth to 1 year, Wingert, Teberg, Bergman, and Hodgeman (1980) found families with VLBW infants to have major childrearing problems. When examining interactions from a nonlinear and

more dynamic approach, little research has been conducted, especially when one family member is a VLBW infant. To progress in such as fashion is to acknowledge that each member within this nonlinear or unit approach has the ability for affecting all the interactions created within the unit.

Three published studies utilizing Barnhill's (1979) theory of healthy family systems as the organizing framework presently exist (Brackbill et al., 1990; McCain, 1990; Tomlinson et al., 1990). Only the McCain study included VLBW infants.

In a study of 160 women and their partners, Tomlinson et al. (1990) identified the study purpose as to investigate the relationship between family dynamics and sociodemographic characteristics. Subjects were solicited from a county public health prenatal clinic (n = 96) and Lamaze classes (n = 64). Inclusion criteria were families in which the women were: (a) in the third trimester of pregnancy, (b) anticipating a normal vaginal delivery, (c) having the first or second child, and (d) living in a family that included at least one other adult (partner, parent, friend, or relative). Having met the inclusion criteria, the women and their partners were interviewed using the Lasky et al. (1985) instrument prior to the infant's birth and 8 months following the full-term infant's birth. The median Cronbach alpha coefficients for the family dynamics measured over several studies were .78, whereas the Tomlinson et al. study reported a median

Cronbach alpha of .79, with a range of .48 to .87. Additionally, demographic data collected included social status, race, parity, age, and marital status. Marital status in a 50-year review of family research on family dynamics was not cited as an exploratory variable and, therefore, was included in the Tomlinson et al. study (Adams, 1988). Social status in the Tomlinson et al. study was determined by the Hollingshead Four Factor Index of Social Status (Hollingshead, 1975). Subjects ranged in age from 16 to 41, with 92 of the families being married. Fifty-eight of the families were Black, four were Oriental, and two were Hispanic. All social groups were represented.

Using simple linear regression, socioeconomic status was found to be statistically significant on the following individual measures of family dynamics: Individuation versus enmeshment (p = .018), clear versus unclear communication (p = .0002), stability versus disorganization (p = .0004), flexibility versus rigidity (p = .003), and mutuality versus isolation (p = .001). Race was not found to be statistically significant when socioeconomic status was used as a covariate. Also found to be nonsignificant were parity and age, even when subjects ranged in age from 16 to 41 years. Statistical significance was attained on the following family dynamics when marital status was subjected to analysis: individuation versus enmeshment (p = .03), clear versus unclear communication (p = .0006), stability versus disorganization (p = .001), flexibility versus rigidity (p = .0001), and mutuality versus isolation

($\underline{p}$ = .0001). This difference remained when socioeconomic status was used as a covariate. Significant differences in family dynamics were not found following the birth of a full-term infant.

Brackbill et al. (1990), in a second study employing Barnhill's (1979) theoretical framework, conducted a longitudinal design consisting of two interviews at 1 year intervals. The Lasky et al. (1985) instrument was utilized for both interviews, with the second interview being conducted when the infant was 6 months of age. The stated purpose of the Brackbill et al. study was to determine the effects of family functioning on the infant's developing disposition. Disposition was defined as Thomas et al.'s (1982) five behavioral style dimensions which are interactionally influenced. The mother was interviewed in all but two cases. At the inception of the study, no at-risk mothers ($\underline{n}$ = 160) were interviewed in the third trimester of their pregnancy. Eighty-seven mothers were in their first pregnancy, 73 mothers were pregnant for a second time. Mothers were recruited from public health clinics ($\underline{n}$ = 95) and Lamaze classes ($\underline{n}$ = 65). In addition, 64 family members of the mothers were interviewed of whom 63 were the fathers of the infants. At the second interview, 15 mothers declined to be interviewed, 10 mothers no longer lived in a family, and 1 delivered a stillborn infant. Included in the final sample were mothers ($\underline{n}$ = 93) and adult family members ($\underline{n}$ = 47). Of the 93 mothers, the mean maternal age was 24.3 years, 63 were

married, 55 had one child, 38 had two children, 25 were Black, and 68 were white. Forty-six of the 47 family members were fathers, and the remaining family members consisted of the grandmother. Mothers in the Brackbill et al. study were also administered the family dynamics measure in addition to the infant disposition measure. Only the family dynamics measure was administered to the other family members.

Statistically significant findings were reported for socioeconomic status, marital status, and infant disposition on the six bipolar dimensions of family dynamics. For socioeconomic status, the statistically significant results were: clear versus unclear communication (p = .016), stability versus disorganization (p = .0006), and flexibility versus rigidity (p = .001). Marital status yielded significant results for individuation versus enmeshment (p = .04), and mutuality versus isolation (p = .04), when socioeconomic status was statistically controlled. Using stepwise discriminant analysis to determine which family dynamics measure contributed to infant disposition, the only variable to enter the equation was stability versus disorganization (p = .004). Maternal education and parity were not found to be statistically significant. Race was also non-significant when socioeconomic status was a covariate.

In a third study utilizing Barnhill's (1979) theoretical framework of family dynamics, McCain (1990) explored family dynamics at 2 to 4 years following preterm

birth. With the explicit purpose of examining the relationship of family functioning and risk factors related to prematurity, questionnaires were sent to the families who met the study criteria. The sample consisted of 171 families who met the following criteria: (a) families had a child between 2 and 4 years adjusted gestational age who were VLBW at birth; and (b) parents could read, write, and speak English. Fifty-eight families returned the completed questionnaires. To maintain uniformity in sampling, three families were excluded from analysis because of multiple births, two families had twins, and one family had triplets. The respondents included in the analysis consisted of mothers ($\underline{n}$ = 55) and fathers ($\underline{n}$ = 27), for a total of 55 families being represented with parental age ranging from 16 to 47 years. A Cronbach alpha coefficient of .90 was attained. Cronbach alpha coefficients for the six bipolar dimensions of the family dynamics measured in the McCain study were as follows: individuation versus enmeshment, .51; clear communication versus unclear or distorted communication, .82; stability versus disorganization, .59; flexibility versus rigidity, .53; mutuality versus isolation, .88; and role reciprocity versus role conflict, .82. Six independent variables were subjected to multiple regression analysis and included the child's developmental status, length of neonatal hospitalization, marital status, parental age, and perception of economic adequacy. The Bayley Scales of Infant Development and the Economic Adequacy Scale (Lobo,

1982) as measurement devices for child developmental status and economic adequacy were used, respectively.

Only length of neonatal hospitalization was found to be statistically significant, with one family dynamics measure, role reciprocity versus role conflict (p = .039). Length of neonatal hospitalization accounted for 9.8% of the explained variance (McCain, 1990).

In the three previously cited studies (Brackbill et al., 1990; McCain, 1990; Tomlinson et al., 1990), marital and socioeconomic status were both found to be statistically significant on family dynamics. The relationship of an adult male or female to the family unit is defined by marital status. Marital status is related directly to the family's socioeconomic status because of the ways adult family members contribute to the family's economic status (Ritter & Hargens, 1975). Both marital and socioeconomic status produce interactions that culminate in family unit health.

Few studies have examined VLBW infant behavioral style (Medoff-Cooper, 1986; Medoff-Cooper & Schraeder, 1982; Schraeder & Medoff-Cooper, 1983). The behavioral style of the VLBW infant was investigated by Medoff-Cooper and Schraeder in 1982. The study's purpose was to investigate the developmental characteristics of the VLBW infant and explore the behavior of the preterm infant and its impact on the parent-child relationship. The study consisted of 26 VLBW infants, 13 males and 13 females. The mean birthweight was 1,170 grams and the mean gestational age

was 29 weeks. Nine weeks was the mean length of hospitalization after birth, with a range of 4 to 14 weeks. The mean adjusted gestational age (chronological age minus the number of weeks premature) was 7.9 months.

Three instruments were used in the Medoff-Cooper and Schraeder (1982) study. These instruments were the Denver Developmental Screening Test (DDST), the Revised Infant Temperament Questionnaire (RITQ), and the Home Observation for Measurement of the Environment Inventory (HOME). The HOME Inventory assesses the following: emotional and verbal responses of the mother, avoidance of restriction and punishment, organization of the physical and temporal environment, provision for appropriate play materials, maternal involvement with the child, and opportunities for variety in daily stimulation (Caldwell, 1970).

Based on the DDST, 42% of the VLBW infants were at risk for developmental delay when assessed at their adjusted gestational age. When the DDST was correlated with the HOME Inventory scores, no significant relationships were found. The RITQ cluster distribution was not significantly different from the standardized population. However, the distribution of easy and difficult cluster appeared markedly different for the expected distribution. Difficult behavioral styles in infancy seems to be associated with VLBW infants.

Correlation coefficients were obtained between the HOME Inventory and the RITQ scales. On the five dimensions of behavioral style which are interactionally influenced

(rhythmicity, approach, adaptability, intensity, and mood), the following significant relationships were obtained: approach, with provision of appropriate play materials (r = .33, df = 23, p < .05); intensity, with opportunities for variety in stimulation (r = .43, df = 23, p < .05); and mood, with the emotional and verbal responsity of the mother (r = -.56, df = 23, p < .002); the provision of appropriate play materials (r = -.58, df = 23, p < .001); and maternal involvement (r = -.59, df = 23, p < .001).

Conducting a second study on VLBW infant behavioral style, Schraeder and Medoff-Cooper's (1983) stated purpose was to collect information about the characteristics of the VLBW during the second year of life, and to compare development, behavioral style, and home environment from the first to the second year. Twenty of the 26 children who participated in the original study conducted 1 year prior were located (Medoff-Cooper & Schraeder, 1982). Eleven of the 20 children were females and 9 were males. The mean adjusted age was 19.12 months. The mean birthweight of the second year sample was 1,189.5 grams.

Three instruments were used in the Schraeder and Medoff-Cooper (1982) study. The three included the DDST, Toddler Temperament Questionnaire (TTQ), and the HOME Inventory. Limited reliability and validity information on the TTQ was reported. The internal consistency for the nine dimensions within the TTQ ranged from .53 to .86, with a median of .70 for 1- to 2-year-olds, and .72 for the 2- to 3-year-olds. The TTQ was standardized on 309 children.

Based on the DDST, 20% of the children were at risk for developmental delay when assessed and based on their adjusted gestational age. Statistical significance ($p \leq$ .035) was demonstrated when compared with 42% in the first year study (Medoff-Cooper & Schraeder, 1982).

To determine if there were changes in the quality of the childrearing environment in families of children who were of VLBW infants, the six subscale scores from the HOME Inventory were correlated with the same six subscale scores in the second year study. Significant correlations were found between both groups of scores. Thus, the quality of the childrearing environment remained stable for years 1 and 2.

The TTQ cluster distribution was not significantly different from the standardized population. Individual temperament scales of the TTQ were analyzed with t-tests. No relationship between behavioral style and the VLBW infant seems to exist. The difficult behavior style characteristic of the VLBW infant in the first year was mediated by time. During the second year, the percentage of difficult children ranged from 38% to 10% (p < .03, sign test, n = 5).

Correlation coefficients were obtained between the HOME Inventory scores and the TTQ scale. Of the five TTQ dimensions which are interactionally influenced (rhythmicity, approach, adaptability, intensity, and mood), none were found to be statistically significant.

In a 1986 study conducted by Medoff-Cooper, the behavioral style of 41 VLBW infants was assessed at 6 and 12 months of adjusted gestational age. Nine were identified as easy and 13 were identified as difficult. The study consisted of VLBW infants ranging in birthweight from 720 to 1,500 grams, with a mean time in the NICU of 54.8 days. The mean time on mechanical ventilation was 9.05 days. To assess behavioral style, two different measures were employed: the Revised Infant Temperament Scale (Carey & McDevitt, 1978) at 6 months, and at 12 months the Toddler Temperament Scale (Fullard, McDevitt, & Carey, 1984). The quality of the home environment was assessed using the HOME Inventory. Stepwise linear regression analysis was performed on each of the nine dimensions of the infant behavioral style and nine dimensions of toddler behavioral style. Birthweight, degree of intraventricular hemorrhage, days on mechanical ventilation, days in the NICU, and scores on the HOME Inventory subscales were found to be predictor variables. All were found to be predictors of infant behavioral style at 6 months, with the exception of degree of intraventricular hemorrhage, which was found to be significant only at the 12-month assessment. Explained variance for the nine dimensions ranged from .11 to .34, which suggested that each dimension was influenced by differing combinations of social, environmental, medical, and biological factors. Social environmental variables as seen on the HOME Inventory subscales appeared to be the

most important for the greatest majority of infant behavioral style dimensions. On the nine dimensions of infant behavioral style (Carey & McDevitt), activity, rhythmicity, approach, adaptability, intensity, mood, persistence, distractibility, and threshold, the following predictors were found at 6 months: (a) opportunity for variety in daily stimulation and organization of the physical environment, rhythmicity; (b) avoidance of restriction, adaptability; (c) emotional and verbal responsivity of the mother, intensity; (d) maternal involvement with the child, mood; and (e) provision for appropriate play materials, threshold.

Five of the nine dimensions of infant behavioral style comprise the cluster groups of easy/difficult. These five dimensions are: rhythmicity, approach, adaptability, intensity, and mood and are interactionally influenced. Based on the Medoff-Cooper (1986) study, the only predictor variables at 6 months for these five dimensions were the HOME Inventory subscale scores. Therefore, birthweight in VLBW infants, days on mechanical ventilation, and days in the NICU did not predict a behavioral style of easy or difficult.

The study conclusions were VLBW infants manifest different behavioral style characteristics from full-term infants. At 6 months, behavioral style cluster distribution supported previous findings, more difficult infants, and fewer easier infants than expected in the general population. Medoff-Cooper (1986) also concluded

that the responsive parent-child interactions are essential for developing VLBW infants. This research additionally emphasized that as early as 6 months of age, the infant's behavioral style and maternal responsiveness interact to influence the participant's behavior. This research has provided the foundation for examining the VLBW infant's behavioral style on family unit interactions.

Summary

Research on VLBW infants has focused almost exclusively on the negative outcomes or problems experienced by these infants. Evidence is accumulating that strongly suggests that these problems may be linked with infants exhibiting a behavioral style termed difficult. Consistent with family systems theory is the belief that family unit may be affected by the infant's behavioral style. The behavioral style of the VLBW infant is frequently perceived as difficult by the mother. This perception may exist based on previous experiences by the mother with other children, especially if the other children were full-term infants. Interaction patterns within the family unit must be explored, particularly when the second child is a VLBW infant under 1 year of age and has a full-term infant sibling. An examination of the family from a dynamic approach is necessary of the possible effects of the VLBW infant's behavior style on other family unit members.

A paucity of studies exists when examining the family unit from a healthy family systems approach. The McCain

(1990) study of healthy family systems is the only study to specifically include VLBW infants within the family unit. Research in families with VLBW infants is needed to assist in the development of intervention to progress toward a model of health. At present, such a model is unavailable. To concede, however, that some VLBW infants do not manifest a behavioral style of difficulty and HOME Inventory scores can remain stable over time, is to recognize that family health dimensions may be present within the family unit, and positive VLBW infant outcomes can be attained.

Because VLBW infants are physiologically immature and have been placed in the NICU is to suggest that interaction patterns of VLBW infants may be different and consequently the model of family health for family units of VLBW infants when compared with full-term infants may be different. Therefore, conclusions based on family units with full-term infants may not be generalized to family units of VLBW infants.

CHAPTER III

Methodology

An ex post facto descriptive design was selected to examine infant behavioral style and its relationship to family unit health with two groups of infants. The first group consisted of a family unit where one member was a VLBW infant of 6 to 8 months of adjusted age. The second group consisted of a family unit where one member was a full-term infant of 6 to 8 months of age. Both groups were matched with similar attribute variables. These attribute variables included socioeconomic status as determined by the Hollingshead Four Factor Index of Social Status (Hollingshead, 1975), and the marital status or maternal position of the infant's mother within the family unit. Also explored were differences between the groups on two variables, family unit health and infant behavioral styles.

Thomas et al.'s (1963) behavioral style dimensions of rhythmicity, approach, adaptability, intensity, and mood were clustered into two groups, yielding a behavioral style of either easy or difficult after the raw scores for each dimension was obtained. Family unit health, the dependent variable, included six bipolar dimensions: (a) individuation versus enmeshment, (b) clear communication versus unclear or distorted communication, (c) stability

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versus disorganization, (d) flexibility versus rigidity, (e) mutuality versus isolation, and (f) role reciprocity versus role conflict.

Instrumentation

To measure the concepts of Barnhill's (1979) theory of healthy family dynamics, Lasky et al. (1985), in developing a 62-item, 6-point Likert scale instrument to operationally define the quality of family dynamics, used eight bipolar dimensions of functioning. Instrument development was based on five assumptions:

1. Individuals act and react.

2. Family responses evolve from individual action.

3. Families and individuals are influenced by external factors.

4. Nursing's methodology is appropriate for intervention in events that are potentially stressful to the family.

5. Nurses are equipped to facilitate changes in family communication patterns (Lasky et al., 1985).

The Lasky et al. (1985) instrument was selected for this study for a variety of reasons. The focus of the instrument is on multiple family dimensions, it avoids child bias, and it provides a comprehensive view of the family. The instrument also can be used at any stage of family life, is easily administered, and is written on a third-grade educational level (Tomlinson et al., 1990).

The instrument contains positively and negatively phrased statements with statements being generated for six

of the eight bipolar dimensions. The last two bipolar dimensions, clear versus unclear or distorted perception and clear versus diffuse or breached generational boundaries, were deleted from the Lasky et al. (1985) instrument. The decision was made because of difficulty in conceiving items reflecting these concepts and because the authors believed these categories did not reflect the instrument development criteria (Lasky et al.).

Content validity was established by seeking expert opinion on each item and by having the experts sort the items into one of the six remaining dimensions of Barnhill's (1979) theory. The panel of experts included nurses, family therapists, educators knowledgeable in family dynamics, graduate nursing students, and families.

A second phase in establishing content validity consisted of administering the questionnaire to normal families including two adults and at least one child over the age of 12 years. Subjects defined themselves as normal and identified no major economic, social, or health stressors influencing their family unit. Items were deleted or revised if 40% of the subjects found the item unclear and/or 90% of the subjects selected an extreme response. Following item deletion or revision, retesting was performed with no item being unclear to 40% or more of the families. Ten items, however, were placed in more than one category and, therefore, eliminated (Lasky et al., 1985). Concurrent validity also was established following the 10 deletions (Fitzgerald, Speer, & Trevor, 1988).

Reliability coefficients also were determined. Initial reliability coefficients were obtained by administering the Lasky et al. (1985) questionnaire to three groups: 116 college faculty, 364 parent subjects who had experienced the birth of a high risk newborn, and 144 couples in which one member had a chronic illness. Data obtained from the high risk family group and the normal college group were combined and Varimax Rotation factor analysis performed for additional analysis of the six dimensions of family unit health. Factor analysis was undertaken to determine if a statistical pattern of relationships underlying the data resembled the theoretical pattern inherent in the six dimensions that guided the development of items in each dimension. Eigenvalues and the percentage of variance for the six factors were obtained. Reliability coefficients from various studies are presented in Appendix A.

The Lasky et al. (1985) instrument consists of 62 items with the following items per subscale: individuation versus enmeshment, 13; clear communication versus unclear or distorted communication, 10; stability versus disorganization, 9; flexibility versus rigidity, 11; mutuality versus isolation, 10; and role reciprocity versus role conflict, 9. Respondents are asked to strongly agree, (1); agree, (2); agree more than disagree, (3); disagree more than agree, (4); disagree, (5); or strongly disagree, (6). Each dimension is an individual subscale and is scored separately. Reverse order scoring is present for

some items within each subscale. The lower the scores are on the individual subscale, the healthier is the family unit.

The VLBW and full-term infant's behavioral style at 6 to 8 months adjusted age was assessed using the Revised Infant Temperament Questionnaire (RITQ) (Carey & McDevitt, 1978). The RITQ was standardized on 203 full-term infants between the ages of 4 and 8 months. The infants included 104 males and 99 females with the predominance of the infants consisting of infants from middle to upper socioeconomic levels. The age distribution of the 203 infants was as follows: 4 to 5 months, 44; 5 to 6 months, 49, 6 to 7 months, 55; and 7 to 8 months, 55.

The standardized revision included 112 items and were subjected to correlational analysis with other items in their assigned dimensions (Carey & McDevitt, 1978). Seventeen items were deleted because of correlational coefficients that did not exceed .30. A total of 95 items was retained. These 95 items measure nine characteristics of behavioral style: activity, rhythmicity, approach, adaptability, intensity, mood, persistence, distractibility, and threshold.

The means and standardization for the nine dimensions as established by Carey and McDevitt (1978) are as follows: activity mean $(\overline{X})$ = 4.4, standard deviation (SD) = 0.56; rhythmicity, $(\overline{X})$ = 2.36, SD = 68; approach, $(\overline{X})$ = 2.27, SD = 0.78; adaptability, $(\overline{X})$ = 1.02, SD = 0.57; intensity, $(\overline{X})$ = 3.42, SD = 0.71; mood, $(\overline{X})$ = 2.81, SD = 0.68;

persistence, $(\bar{X})$ = 3.03, SD = 0.82; distractibility, $(\bar{X})$ = 2.23, SD = 0.60; and threshold, $(\bar{X})$ = 3.79, SD = 0.76.

The sample was subdivided into the following clinical diagnostic cluster groups: difficult, 19; slow to warm up, 12; intermediate high (difficult), 23; intermediate low (easy), 63; and easy, 86. Internal consistency of intercorrelation of the items within any category ranged from .49 to .71 with a median value of .57. The internal consistency for the entire instrument was .83. The test-retest reliability ranged from .66 to .81, with a median value of .75. A .86 test-retest reliability was attained for the instrument. Behaviors assessed by the RITQ include sleep, feeding, soiling, wetting, diapering, dressing, bathing, and responses to new people and new environments (Medoff-Cooper, 1986).

In this study, only the dimensions pertaining to the cluster groups of easy and difficult were used, thus reducing the 95 items to 54 items. The intermediate cluster groups were excluded. The five interactionally influenced behavioral style dimensions that comprise the cluster groups of easy and difficult are: rhythmicity, approach, adaptability, intensity, and mood. The number of items per dimension are as follows: rhythmicity, 12; approach, 11; adaptability, 11; intensity, 10; and mood, 10. The internal consistency and test-retest reliability coefficients as established by Brackbill et al., (1990) for each dimension are presented respectively: rhythmicity,

.65, .75; approach, .71, .77; adaptability, .57, .74; intensity, .56, .66; and mood, .53, .81.

The cluster group of easy/difficult are designated as: regularity of biological functioning, the extent to which an infant approaches or withdraws from new situations, adaptability to change of routine, intensity or energy levels of responses of all types, mood, positive or negative, and the extent to which the infant's behavior is pleasant or unpleasant (Brackbill et al., 1990).

The easy/difficult cluster designation is derived from established means and standard deviations (Carey & McDevitt, 1978) on full-term infants from middle to upper-middle income families. Infants defined as easy are those meeting the following criteria: scores greater than the mean in no more than two of the five interactionally influenced behavioral style dimensions, and neither greater than one standard deviation. Difficult infants are those infants with four or five scores greater than the mean in the five behavioral style dimensions cited above. The intensity dimension of behavioral style must be one of the four to five scores and two scores must be greater than one standard deviation above the mean.

Socioeconomic data were collected and used as one of the matching attribute variables for the two groups. Socioeconomic status was assessed using the Hollingshead Four Factor Index of Social Status. The occupation and education of the infant's mother and her husband were determined. Occupation was placed on a scale from 1 to 9.

A score of 1 indicated the least skilled occupation, and a score of 9 indicated the most skilled occupation. The scale is multiplied by a constant of 5 and an occupational score is obtained. Education is also placed on a scale from 1 to 7; 7 is the highest educational score. This score is multiplied by a constant of 3. Individual scores can be obtained for occupation and education. Occupation and educational scores are summed for the mother and her husband to attain a family unit score. The summation scores are subsequently divided by 2, thereby creating five levels of socioeconomic status (Hollingshead, 1975). If the infant's mother is living with a friend or parent, the socioeconomic status was based on the infant's mother's occupation and education.

Data on additional family member characteristics were collected. These data included the gestational ages of the VLBW and full-term infant at the time of birth, the length of time the adult partner had been a member of the family unit, intensive care nursery length of stay for the VLBW infant, infant birthweight, length of time the infants have been family unit members, and the marital status of the mother as determined by maternal position within the family unit.

<u>Sample</u>

Mothers who have had VLBW infants with birthweights of 1,500 grams or less in the NICU at either a university hospital or a private hospital in the southeastern portion of the United States were recruited for the study. Mothers

of full-term infants of 6 to 8 months of age also were recruited for participation in the study. Mothers recruited for the study were women who met the following criteria: members of a family unit, delivered two children with the first child as the healthy product of a full-term pregnancy, and both children must be currently residing with the mother. To ensure further uniformity in sampling, the two children residing with the mother could not be products of twin gestation.

Procedure

The first phase of data collection was to identify the VLBW infants. Two southeastern United States hospitals with intensive care nurseries were contacted. The Chairman of the Obstetrics and Gynecology Department at one hospital provided the researcher with a computer generated list of mothers who delivered infants weighing 1,500 grams or less, the date of the infant's birth, along with the mother's obstetrical status. A similar computerized list was not available from the private hospital. A manual search was therefore conducted by the researcher on infant data from the developmental follow-up clinic on all infants in the intensive care nursery 1 year prior to record review to the present time of record review. Birthweight and maternal obstetrical status were determined from the infant's record. Approximately 400 infant records were reviewed. Eight subjects met the study criteria. Once the infants were identified, secretaries from both hospitals contacted the infant's mother to determine their willingness to

participate in the study. If they were willing to participate, the researcher contacted the mother and arrangements were made to meet with them at various clinics or in their homes when the VLBW infants were at an adjusted age of 6 to 8 months. Families were deleted if the first child died or was not living with the mother, the infant was a twin gestation product, or if a family unit was not identified.

The second phase was to locate and interview the full-term infant family unit. Three clinic sites were utilized: the Women, Infant, and Child Clinic (WIC), a hospital clinic, and a private pediatrician's office. Two days per week, the researcher would visit the clinics and recruit mothers prior to the infant's routine examination or the securing of the WIC vouchers. Since willingness to answer the researcher's questions constituted consent, a letter of written consent was not obtained.

Section 1 of the questionnaires (Appendix B) begins by identifying whether the mother is a member of a family unit. The definition of the family is provided at the beginning of Section 1. The mother must have only two children, and the VLBW infant must be the second child and presently between 6 and 8 months of adjusted age. Full-term infants must also be between 6 and 8 months of age. Characteristics of the VLBW infant were obtained and included birthweight, birth order, gestational age at the time of birth, and length of time the infant spent in the hospital immediately following birth. For the VLBW

infants, the researcher obtained many of these characteristics from the infant's record or from the computerized list prior to the researcher's interview.

Socioeconomic status was determined (Hollingshead, 1975), once the study inclusion criteria were met. A description of the job held by the mother and significant adult family members was obtained. A description was obtained so that jobs could be appropriately placed into the Hollingshead's categories.

The marital status of the mother was obtained at the completion of Section 1. The researcher posed this question only if, during the course of the interview, the marital status had not been determined. Marital status was reported as maternal position within the family unit. A score of 1 equalled marriage, a score of 2 as living with a friend, and a score of 3 as living with a mother or father. The interview progressed to Section 2 following the completion of Section 1.

In the event that the mother met the study criteria, the researcher then progressed to Section 2. This section was comprised of statements found on the Lasky et al. (1985) instrument. Following the completion of Section 2, the researcher progressed to Section 3 which consisted of statements related to the infant's behavioral style from the revised Carey and McDevitt (1978) instrument of infant behavioral style of infants aged 4 to 8 months. The interviews with the mothers were conducted during the time the VLBW and full-term infants were being examined by

health care professionals in the clinic or in the mother's home. The projected time for completing the questionnaire consisting of three sections was approximately 20 to 30 minutes. A code number was placed in the top right-hand corner of the questionnaire and on a separate sheet of paper the code number and corresponding subject's name was listed in the event that at a later date the subject desired to be dropped from study participation (see Appendix C). Data collection was continued until 15 VLBW and 22 full-term infants' mothers had been interviewed and the family units were matched by Socioeconomic status, and maternal position within the family unit. Power analysis provided the method for determining a suitable sample size. The method was employed to increase the likelihood of achieving statistically significant results (Polit & Hungler, 1990). The researcher established alpha, gamma, and power $(1-\beta)$ that comprise the three factors of power analysis. An alpha value of .05 was established to reduce the occurrence of Type I errors or wrongly accepting a true null hypothesis. Gamma or the population effect size is the second factor to be established using power analysis. Gamma measures the strength between the independent and dependent variables. In the absence of prior studies to establish the effect, an effect of .8, as established by Cohen (197), was used. The third factor of power analysis is power. Power of $1-\beta$, is the probability of rejecting the null hypothesis. A value of .6 was selected, producing a 40% risk of committing a Type II error or wrongly

accepting a false null hypothesis. Using the established table from Polit and Hungler, 15 subjects per group were needed. Raw scores were obtained for all three sections of the questionnaire.

Data Analysis

The analysis of data was achieved by using five forms of statistical tests: descriptive statistics, correlation coefficients, the t-test, analysis of covariance, and Cronbach alpha coefficients. The t-test was used to test differences between the two group means posed in the first research question. Each of the six bipolar dimensions of the family dynamics was analyzed independently. Level of statistical significant was set at the .05 level.

Limitations

Identified and listed were the limitations proposed for this study.

1. Family dynamics were not established prior to the VLBW and full-term infant's birth.

2. Revised infant temperament questionnaire (RITQ) has not been standardized for VLBW infants.

3. Self-reports by the mother within the family unit may not be a true reflection of the family dynamics.

4. Poor discriminant validity exists with the revised infant temperament questionnaire (RITQ) (Goldsmith, Rieser-Danner, & Briggs, 1991).

5. Small sample size limits the generalizability of the study results.

6.   Revised infant temperament questionnaire (RITQ)
was standardized on middle to upper middle class families.

CHAPTER IV

Findings

Description of the Sample

The sample for this study consisted of 15 family units with VLBW infants and 22 family units with full-term infants. Infants within both family units were second born children, following a first birth of a healthy full-term infant. The second child was between 6 and 8 months of age at the time of the interview. Family demographic variables included: maternal education, maternal occupation, adult partner's education and occupation, length of time the family had lived as a family, intensive care nursery length of study for the VLBW infants, infant birthweights, the length of time the infant had lived in the family, maternal position within the family, and the socioeconomic status of the family unit. Socioeconomic status was derived from the educational and occupational levels of individual adult family unit members. The family demographic data are presented in Table 1. Statistically significant differences existed between the two family units on two demographic variables, maternal occupation (t = 2.152, p = 0.038) and infant birthweights (t = -15.89, p = .000). Because statistically significant differences were obtained with two variables, maternal occupation and infant

Table 1

Characteristics of VLBW and Full-Term Infant Families

Variable	VLBW Infant Family N = 15 Mean	SD	Full-Term Family N = 22 Mean	SD	Statistical Results t	p
Maternal Education	4.13	1.300	4.140	1.040	-.008	.994
Maternal Occupation	2.47	2.360	1.280	.940	2.152	*0.038
Adult Partner Education	4.20	1.520	4.000	1.070	.470	.641
Adult Partner Occupation	3.20	2.780	2.460	1.790	.993	.327
Length of Time Adults Had Been a Family Unit (months)	97.26	97.780	126.050	118.430	-.777	.442
ICN Length of Stay for VLBW Infant (months)	2.33	1.290				
Birthweight (Grams)	1047.87	296.320	3262.080	476.770	-15.890	*.000
Length of Time Infant in Family Unit (months)	7.13	1.470	6.910	.826	.594	.557
Maternal Position Within Family Unit	2.00	.845	1.820	.853	.6399	.527
Socioeconomic Status of Family Unit	25.73	13.76	20.659	6.910	1.483	.147

*Statistically significant

birthweight, two separate analyses of covariance were performed with each variable as a covariate on each of the six dimensions of family dynamics. Analysis of covariance revealed that after controlling for occupation, differences within one family dynamics dimension, individuation versus enmeshment (F = 5.484, p = .025), existed. Marital status or the maternal position within the family unit was independently analyzed to attain a better explanation of the effect of marital status on family dynamics. The results are presented in Table 2.

Table 2

Maternal Position Within the Family Unit
on Family Dynamics (N = 37)

Dimension	Spouse N = 15	Friend N = 11	Child N = 11
Individuation - Enmeshment	33.33	31.73	27.27
Clear Communication - Unclear Communication	26.13	29.46	28.51
Stability - Disorganization	21.60	25.27	26.10
Flexibility - Rigidity	32.34	35.27	37.59
Mutuality - Isolation	18.73	22.35	20.27
Role Reciprocity - Role Conflict	24.93	27.64	28.00

Note. The lower the score, the better the dynamics

Presentation of Findings

The purpose of this study was to determine if differences in family unit health existed between family units with VLBW infants when compared with family units of full-term infants. Two research questions were posed to determine first if differences in behavioral styles existed between the two family units and secondly to determine if a relationship existed between behavioral styles and family dynamics.

Family Dynamics

The family dynamics of each family unit was analyzed by each of the six dimensions: (a) individuation versus enmeshment, (b) clear communication versus unclear or distorted communication, (c) stability versus disorganization, (d) flexibility versus rigidity, (e) mutuality versus isolation, and (f) role reciprocity versus role conflict. Descriptive data on each of the six dimensions are presented in Table 3. The independent t-test was used to determine if differences in the mean scores between the two family units existed within each of the six dimensions. No statistically significant differences were found on any of the six dimensions: (a) individuation versus enmeshment (t = 0.136, p = 0.893, (b) clear communication versus unclear or distorted communication (t = 0.434, p = 0.667), (c) stability versus disorganization (t = 0.116, p = 0.908), (d) flexibility versus rigidity (t = 0.406, p = 0.687), (e) mutuality versus isolation (t = 1.50, p = 0.143), and (f) role

Table 3

Family Dynamics

Dimension	VLBW Infant Family N = 15		Full-Term Family N = 22		Statistical Results	
	Mean	SD	Mean	SD	t	p
Individuation - Enmeshment	31.20	5.11	30.96	5.57	0.136	0.893
Clear Communication - Unclear Communication	28.51	8.50	27.36	7.45	0.434	0.667
Stability - Disorganization	24.21	8.85	23.91	6.73	0.116	0.908
Flexibility - Rigidity	35.28	7.19	34.43	5.46	0.406	0.687
Mutuality - Isolation	22.06	7.15	19.05	5.08	1.500	0.143
Role Reciprocity - Role Conflict	27.20	9.32	26.27	7.15	0.342	0.734

Note. Lower the score, the better the dynamics

reciprocity versus role conflict (t = 0.342, p = .734). In the absence of statistical significance, the scores for both family units were combined and Cronbach alpha coefficients for internal consistency calculated for each of the six dimensions. The results are summarized in Table 4.

Table 4

<u>Family Dynamics Combined Scores for Families</u>
<u>with VLBW and Full-Term Infants (N = 37)</u>

Dimension	Mean	SD	Cronbach Alpha Coefficients
Individuation – Enmeshment	31.05	5.32	.33
Clear Communication – Unclear or Distorted Communication	27.83	7.80	.74
Stability – Disorganization	24.03	7.54	.70
Flexibility – Rigidity	34.78	6.14	.51
Mutuality – Isolation	20.27	6.09	.73
Role Reciprocity – Role Conflict	26.65	7.99	.75

<u>Behavioral Styles</u>

The five behavioral style dimensions that defined the factor easy/difficult, were each independently analyzed by family unit. The easy/difficult dimensions of behavioral style include: (a) rhythmicity, (b) approach, (c)

adaptability, (d) intensity, and (e) mood. Independent t-test analysis between the two family units on each dimension of behavioral style revealed nonsignificant statistical results: (a) rhythmicity (t = 0.967, p = 0.340), (b) approach (t = -1.69, p = 0.10), (c) adaptability (t = -1.99, p = 0.55), (d) intensity (t = 0.144, p = .886), and (e) mood (t = -1.02, p = 0.316). The findings are summarized in Table 5. The mean scores between the two family units on each of the five dimensions of behavioral style were combined, Cronbach alpha coefficients determined, and mean scores on each dimension compared with the established standards (Carey & McDevitt, 1978). The data are presented and summarized in Table 6.

Correlation Coefficients

To determine if relationships existed between the dimensions of infant behavioral style on the six dimensions of family dynamics, the Pearson Product-Moment correlation coefficient was employed using the combined scores from both family units. Statistically significant correlates were: approach with stability versus disorganization (r = 0.377, p = 0.022), approach with role reciprocity versus role conflict (r = 0.466, p = 0.004), adaptability with stability versus disorganization (r = 0.328, p = 0.048), and mood with role reciprocity versus role conflict (r = 0.403, p = 0.013). Combined family unit demographic data were also correlated using the Pearson Product-Moment correlation coefficient. Statistically significant correlation coefficients for family unit demographics and

Table 5

Behavioral Styles

Dimension	VLBW Infant Family N = 15		Full-Term Family N = 22		Statistical Results	
	Mean	SD	Mean	SD	$\underline{t}$	$\underline{p}$
Rhythmicity	3.38	.98	3.09	.81	.967	.340
Approach	2.61	.94	3.11	.85	-1.690	.100
Adaptability	2.71	.76	3.15	.60	-1.990	.055
Intensity	3.43	.58	3.40	.66	.144	.886
Mood	2.87	.76	3.14	.84	-1.020	.316

Table 6

Combined and Standardized Behavioral Style Scores

Dimension	VLBW & Full-Term Infant Combined Behavioral Style Scores (N = 37)			Standardized Behavioral Style Scores (Carey & McDevitt, 1978)		
	Mean	SD	Cronbach Alpha Coefficients	Mean	SD	Internal Consistency
Rhythmicity	3.21	.88	.73	2.36	.69	.69
Approach	2.91	.91	.77	2.27	.78	.71
Adaptability	2.97	.69	.50	2.02	.59	.57
Intensity	3.41	.62	.33	3.42	.71	.56
Mood	3.03	.81	.63	2.81	.697	.53

behavioral style on the six dimensions of family dynamics are presented in Appendix D.

Also determined was the correlation coefficients between each of the six family dynamics dimensions, the five dimensions of behavioral style and family unit demographic data. The results are presented respectively in Figure 2 and Appendices E and F. Additionally, the socioeconomic status of the family unit was correlated with the five dimensions of behavioral style. Two dimensions were found to be statistically significant: adaptability (r = -0.379, p = 0.021) and rhythmicity (r = -0.444, p = .006). Correlation coefficients of VLBW infant family units were also computed. The findings are summarized in Appendix G.
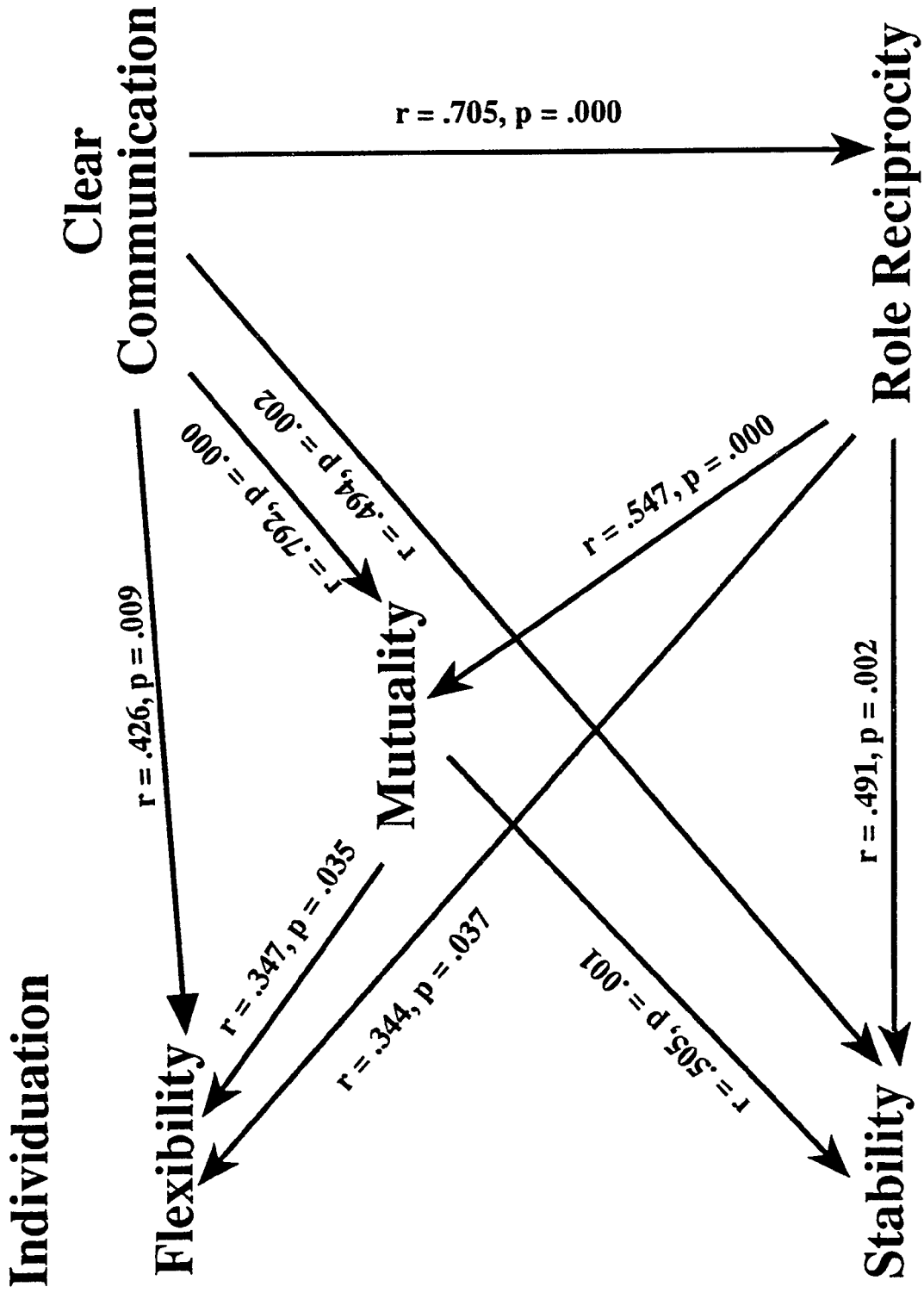
Figure 2. Family Dynamics Correlation Coefficients

CHAPTER V

Discussion, Conclusions, and Recommendations

Discussion

The data from the two family units investigated failed
to produce statistically significant differences on any of
the six dimensions of family dynamics. However, in the
absence of statistically significant mean scores on any of
the six dimensions, the results did reveal family units
with full-term infants to be healthier on all six
dimensions of family dynamics. Maternal occupation was
found to be statistically significant in the dimension of
individuation versus enmeshment, but since maternal
occupation was a component of socioeconomic status, no
further analysis of this variable was performed.
Statistically significant differences between the two
family units on socioeconomic status was not attained.

Statistical significance also was not attained on any
of the five behavioral style dimensions when the two groups
of VLBW and full-term infants were examined independently.
When the two groups of infant scores were combined and
compared with the established standard scores, differences
were found on all five behavioral style dimensions. Family
dynamics correlates were identified with a larger
percentage of the variance in scores remaining unexplained.

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Correlations between the six dimensions, the five behavioral style dimensions, and demographic data were determined.

Conceptual Framework

The six dimensions of family dynamics are interrelated with an interlocking mutually causal system. Significantly high correlation coefficients between the six dimensions were determined and were illustrated in Figure 2. Health in one dimension, for example, clear communication versus unclear communication, correlated as highly significant (r = -0.705, p = 0.000) with the dimension of role reciprocity versus role conflict. Nine statistically significant correlation coefficients were determined for the six dimensions of family dynamics further supporting the interlocking nature of the framework. By improving one dimension of family dynamics, improvement in other dimensions can be attained. Mutuality versus isolation, as one dimensions of family dynamics, remains a central factor to the emotional closeness and cohesiveness of the family unit, correlated significantly with four dimensions: (a) clear communication versus unclear communication (r = 0.792, p = 0.000), (b) stability versus disorganization (r = 0.505, p = 0.001), (c) flexibility versus rigidity (r = 0.347, p = 0.035), and (d) role reciprocity versus role conflict (r = 0.547, p = 0.000).

Family unit demographic variables were also correlated with the six dimensions of family dynamics in addition to the five interactionally influenced dimensions of infant

behavioral style. Of the variables correlated, none
correlated significantly with the dimension of mutuality
versus isolation. From this finding, therefore, variables
which could affect healthy family unit interactions and
promote emotional closeness or intimacy within the family
unit, were not identified in this study. The dimension of
individuation versus enmeshment correlated with maternal
position within the family (r = -0.470, p = 0.003),
suggesting that individuation is higher with mothers who
occupy a child position within the family unit. Therefore,
when the mother of the infant occupies a child position
within the family unit, healthy interactions are created
within the family unit that promote individuation or
feelings of independence. Also found to be statistically
significant was family unit socioeconomic status with
stability versus disorganization (r = -0.399, p = .015).

Significant negative correlation coefficients were
determined on four dimensions of family dynamics, with the
demographic variable of the adult partner's occupation.
They are: clear communication versus unclear communication
(r = -0.415, p = 0.011), stability versus disorganization
(r = -0.357, p = 0.030), flexibility versus rigidity (r =
-0.413, p = 0.011), and role reciprocity versus role
conflict (r = -0.345, p = 0.037). As the adult partner's
occupational level increases, healthy interactions are
created, thus defining family unit health within the
previously cited four dimensions. The dimensions of
stability versus disorganization was significantly

correlated with two demographic variables, maternal education ($\underline{r}$ = -0.533, $\underline{p}$ = 0.001) and adult partner's occupation ($\underline{r}$ = -0.357, $\underline{p}$ = 0.030), in addition to two infant behavioral style dimensions, approach ($\underline{r}$ = 0.377, $\underline{p}$ = 0.022) and adaptability ($\underline{r}$ = 0.328, $\underline{p}$ = 0.048). Family unit stability is attained when the mother is better educated and when the infant manifests behavioral style dimensions that are approachable and adaptable.

Barnhill's (1979) fourth dimension of family dynamics, flexibility versus rigidity, significantly correlated with two demographic variables, maternal position in the family unit ($\underline{r}$ = 0.362, $\underline{p}$ = 0.028) and one previously mentioned variable, adult partner's occupation ($\underline{r}$ = -0.413, $\underline{p}$ = 0.011). Greater family unit flexibility is achieved when the mother is married.

Role reciprocity versus role conflict, Barnhill's (1979) sixth dimension, correlated significantly with one demographic variable, adult partner's occupation ($\underline{r}$ = -0.345, $\underline{p}$ = 0.037) as cited previously and two behavioral style dimensions, approach ($\underline{r}$ = 0.466, $\underline{p}$ = 0.004) and mood ($\underline{r}$ = 0.403, $\underline{p}$ = 0.013). Role reciprocity versus role conflict is achieved when the infant is approachable and had a positive mood. Of the variables cited, all have served as variables for the creation of interactions which define family unit health.

The behavioral style of the infant is a continuous variable and the statistically significant correlation supported the interrelatedness of the five dimensions under

investigation: rhythmicity, approach, adaptability, intensity, and mood. These correlations are: adaptability and approach (r = 0.657, p = 0.000), mood and approach (r = 0.607, p = 0.000), and mood and adaptability (r = 0.455, p = 0.005). When the five dimensions were examined independently by family unit, those with VLBW and full-term infants, statistically significant differences were not attained. The reported lack of discriminant validity on the RITQ may have attributed to the interrelatedness between the five dimensions and to the lack of differences in behavioral style when the two family units were compared. Differences in mean scores did exist, however, on all five dimensions of behavioral style. VLBW infants were more approachable, adaptable, and experienced a positive mood when compared with full-term infants. VLBW infants were also found to be more arrhythmic and intense in comparison to full-term infants in this study. Combined behavioral style scores were also different from the Carey and McDevitt (1978) standards and the decision was, therefore, made not to classify infants in this study as either easy or difficult.

Review of Research

The findings from this study supported previous findings when Barnhill's (1979) framework provided the basis for examining family dynamics. Tomlinson et al. (1990) also found that marriage created interactions which supported family unit health, but only on two dimensions: individuation versus enmeshment and mutuality versus

isolation. In the present study, marriage correlated with one dimension: flexibility versus rigidity. Unsupported was McCain's (1990) finding that length of neonatal hospitalization correlated with role reciprocity versus role conflict. The McCain study revealed nonsignificant statistical results on any of the six dimensions of family dynamics with economic adequacy. Flexibility versus rigidity, stability versus disorganization, and clear communication versus unclear communication, all were significant relationships with socioeconomic status in the Brackbill et al. (1990) study. In this study, the variable socioeconomic status, correlated significantly with one dimension of family dynamics: stability versus disorganization.

The study extended some of the Medoff-Cooper and Schraeder (1982) findings. With VLBW infants of approximately the same age subjects in the Medoff-Cooper and Schraeder study, RITQ dimensions score also were not markedly different when VLBW infant scores in the study were compared with the standardized scores. Like the Medoff-Cooper and Schraeder study, the difficult/easy distribution was different. Of the five dimensions of rhythmicity, approach, adaptability, intensity , and mood, the Medoff-Cooper and Schraeder study had significant relationships on several subscales of the HOME Inventory. These three behavioral style dimensions that correlated with the HOME Inventory were: approach, intensity, and mood. The present study also had significant relationships

on three of the behavioral style dimensions: approach, adaptability, and mood. The family units' socioeconomic status was also found to correlate significantly on two behavioral style dimensions: adaptability and rhythmicity.

In Medoff-Cooper's (1986) study of 41 VLBW infants, birthweight, degree of ventricular hemorrhage, and days in the HOME Inventory subscales were subjected to linear regression analysis on the nine dimensions of infant behavior style dimensions examined in the present study: rhythmicity, adaptability, intensity, and mood. The remaining variables were not significant predictors on the five dimensions of behavioral style. In the present study of 15 VLBW infants at 6 to 8 months of adjusted age, birthweight significantly correlated with two dimensions of behavioral style: approach ($r = 0.633$, $p = 0.011$) and mood ($r = 0.590$, $p = 0.021$). Length in the NICU and the length of time the VLBW infant had been in the family unit was not found to be statistically significant on any of the five behavioral style dimensions. However, additional correlates with the five behavioral style dimensions were maternal education on adaptability ($r = -0.622$, $p = 0.013$) and approach ($r = -0.528$, $p = 0.043$). Adult partner occupation also correlated significantly with rhythmicity ($r = -0.594$, $p = 0.019$).

Design

The lack of statistically significant differences between the two family units on the six dimensions of family dynamics can be attributed to several factors

related to design, subjects, and setting. The first factor
is that of a small sample size, 15 family units with VLBW
infants and 22 family units with full-term infants. A 40%
risk of committing a type II error and accepting a false
null hypothesis exists when a sample of 15 subjects per
group is present (Polit & Hungler, 1990).

Another possible explanation for the lack of
statistically significant differences between the two
family units was the method employed to recruit mothers.
The mothers of the infants consisted as a sample of
convenience with the mother being requested to participate.
Mothers who manifested some dimension of psychopathology,
for example disorganization, frequently refused to
participate in this study and often did not maintain
consistent follow-up care with their infants. Therefore,
some dimensions of family unit health were already present
when the mother agreed to participate.

Statistically significant differences between VLBW and
full-term infant behavioral style dimensions also can be
attributed to the small sample size and the RITQ's reported
lack of discriminant validity. From this study, four
assumptions were proposed and all were supported by this
study. The first assumption was supported by the presence
of intensive care nursery stay which was not present with
the full-term infant. Assumption two, that addressed
family unit composition on family dynamics, was not found
statistically significant, but the mean scores in the six
dimensions between the two family units did reveal

full-term infant family units to be healthier. Statistical support was achieved in the identification of variables affecting family dynamics, assumption three. From this study, assumption four was supported by the number of mothers who were unemployed and remaining at home with their infants.

Conclusions

The following conclusions were drawn from this study:

1. VLBW infant and full-term infant family units were statistically matched on socioeconomic status and maternal position within the family unit.

2. Statistically significant differences between VLBW and full-term infant family units did not exist on any of the six dimensions of family dynamics.

3. Statistically significant differences between VLBW and full-term infants did not exist on any of the five interactional dimensions of infant behavioral style.

4. Statistically significant correlations existed for five of the six dimensions of family dynamics: maternal position in the family with individuation versus enmeshment; adult partner occupation with clear versus unclear communication; maternal education, adult partner occupation, maternal position in the family unit, socioeconomic status, approach, and adaptability with stability versus rigidity; adult partner occupation with flexibility versus rigidity; and adult partner occupation, approach, and mood with role reciprocity versus role conflict.

5. No statistically significant correlations were found for the family dynamics dimension of mutuality versus isolation and demographic variables.

6. The healthy family systems framework consisting of six dimensions of family dynamics is an interlocking mutually causal system.

7. The five dimensions of infant behavioral style are interrelated.

Recommendations

Three recommendations were proposed for further research. They include:

1. Compare two family units as described in this study with a sample size which can assist in achieving statistical significance. Based on the mean scores of a larger sample size is recommended for each of the six dimensions of family dynamics.

2. Conduct a correlational study to identify variables that correlate with family unit mutuality versus isolation.

3. Subject the RITQ to factor analysis to improve the psychometric qualities of the instrument.

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Appendix A

Cronbach Alpha Coefficients

Family Dynamics Measure (FDM) Mean Scores
and Standard Deviations

United States Studies

FDM DIMENSIONS	1983 Moore N=64 Mo/Fa pairs (FL-Hi Risk infants) (SD)	1984 White-Lasky N=89 families (FL-Hi Risk infants) (SD)	1984 White, Moore, Lasky N=153 (FL-Hi Risk infants) (SD)	1985 Stechmiller N=21 (FL-Cardiac rehab.) (SD)	1985 Rodebush N=44 (Nat'l-Ventilator Dependent Children) (SD)	1986 Whitley N=30 (FL-Dual Career RN) (SD)	1986 King, Yocom N=124 (IL-Alcohol Abusing spouse) (SD)
Individuation-Enmeshment	33.26(6.7)	33.35(7.0)	33.56(6.0)	32.11(4.0)	31.20(5.9)	29.10(4.0)	35.19(7.2)
Mutuality-Isolation	19.44(6.4)	20.83(6.4)	0.24(6.5)	21.05(5.5)	21.80(6.7)	17.36(5.4)	26.27(9.0)
Flexibility-Rigidity	35.44(5.5)	34.06(4.9)	13.80(5.2)	33.95(4.5)	32.34(5.2)	29.82(5.3)	35.97(5.5)
Stability-Disorganization	21.38(6.1)	24.63(6.7)	23.13(6.7)	20.84(3.0)	22.49(6.8)	17.90(4.9)	27.74(7.0)
Clear Communication-Distorted Communication	20.06(8.2)	27.43(8.2)	26.86(8.2)	24.68(7.2)	25.90(7.2)	21.65(7.0)	30.64(7.5)
Role Reciprocity-Role Conflict	24.52(8.5)	23.80(6.5)	24.11(7.3)	18.10(3.1)	23.32(6.5)	25.73(6.5)	28.48(8.3)
FDM Total	158.61(28.7)	163.21(28.8)	161.21(28.7)	150.0(19.7)	160.19(25.3)	140.93(23.9)	184.27(29.7)

3 = a combination of 1 and 2

THE LOWER THE SCORE THE BETTER THE FAMILY DYNAMICS

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Family Dynamics Measure (FDM) Mean Scores
and Standard Deviations

United States Studies

FDM Dimensions	1986 Marshall Ogden Williams (17 Families) FL frail Elderly N=41 (SD)	1986 Gunter N=45 (FL-Cancer Patients) Before dx	(SD)	After dx	(SD)	1986* Tomlinson, White, Wilson N=160 (T1) 3rd Trimester (FL) (SD)	1986 McCain preterm infants 2-3 years of age Ohio N=82 (55 families) (SD)	1987 Smith FL N=39 Children with cancer	1987* Brackbill, White Wilson, Calahone FL N=92 (Infants 8-9 mos T2)
Individuation-Enmeshment	33.61(5.2)	36.00(5.2)		35.91(5.1)		33.60(6.0)	31.80(5.8)	33.97(6.4)	33.37(5.6)
Mutuality-Isolation	23.40(6.7)	22.53(4.1)		22.64(4.4)		19.80(7.8)	22.20(8.2)	20.31(7.4)	18.39(6.1)
Flexibility-Rigidity	33.40(5.4)	34.17(4.9)		34.17(5.2)		33.80(4.8)	34.50(5.0)	33.00(5.8)	33.47(4.8)
Stability-Disorganization	21.00(4.5)	22.64(5.1)		22.75(5.1)		23.93(7.3)	23.30(5.0)	25.85(7.8)	22.65(6.5)
Clear Communication-Distorted Communication	23.80(4.4)	26.55(5.8)		26.93(6.5)		23.83(8.5)	26.90(7.9)	26.85(9.6)	24.79(7.5)
Role-Reciprocity-Role Conflict	22.61(5.4)	21.51(3.9)		21.82(3.8)		24.60(7.6)	25.80(7.6)	26.33(7.5)	24.80(7.1)
FDM Total	157.52(21.3)	163.42		164.24		161.59(32.86)	**	**	157.11(28.42)

*Brackbill study is time 2 of the Tomlinson study
**FDM total not computed

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Family Dynamics Measure (FDM) Mean Scores and Standard Deviations

United States Studies

FDM Dimensions	1988 Brimeyer Contraceptors/Pregnant Adolescents FL (N=60)		1988 Brimeyer Contraceptors Pregnant Adolescents Combination Means FL (N=60) (SD)	1988 Chura N=30 (FL pregnant) Adolescent Students (SD)	1988 Paul N=40 Intertile Primiparous Couples, 20 husbands (FL) (SD)	1988 Podosky N=98 Chronically Ill Children Including controls N=38 (SD)	1989 Ennis N=33 Mo. or Fa. Home Parenteral Nutrition Children (National) (SD)
	Contraceptors N=30 (SD)	Pregnant N=30 (SD)					
Individuation-Emeshment	31.03(6.2)	32.77(5.7)	32.90(5.9)	30.38(5.2)	34.55(6.6)	31.26(6.2)	33.58(5.8)
Mutuality-Isolation	20.33(7.9)	25.07(7.4)	25.65(7.6)	22.97(7.4)	18.63(4.9)	21.35(9.1)	22.40(8.5)
Flexibility-Rigidity	36.10(5.5)	35.73(4.5)	35.91(4.9)	36.40(5.7)	34.78(4.8)	33.29(5.9)	34.59(6.4)
Stability-Disorganization	26.73(5.9)	29.97(6.8)	28.35(6.5)	30.10(8.3)	18.40(5.2)	23.09(7.3)	24.09(6.8)
Clear Communication-Distorted Communication	32.90(8.6)	32.60(9.3)	32.75(8.9)	30.67(8.3)	25.63(6.5)	26.08(8.5)	26.60(8.3)
Role Reciprocity-Role Conflict	28.07(9.1)	26.27(8.2)	27.16(8.6)	26.03(6.7)	23.60(6.3)	29.68(7.9)	27.71(8.3)
FDM Total	183.07(27.3)	182.73(27.4)	182.73(27.4)	176.93(29.3)	**	165.01(32.79)	**

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**FDM total not computed

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Family Dynamics Measure (FDM) Mean Scores and Standard Deviations

FDM Dimensions	1990 White, Wilson Cobb, Greene, Curry FL Rural T1 N=130 (3rd Trimester)	United States Studies 1991 White, Wilson Greene, Curry, Gammage FL Rural T2 N= (Infants 8-9 mos.)	1991 Boggs N=71 NC Normal and high risk infants (infants 12 mos.)
Individuation-Enmeshment	33.33(6.78)		30.14(6.1)
Mutuality-Isolation	18.95(7.200)		19.81(8.1)
Flexibility-Rigidity	33.53(5.79)		30.52(4.3)
Stability-Disorganization	22.30(6.74)		22.03(6.5)
Clear Communication-Distorted Communication	24.04(7.58)		24.61(7.2)
Role Reciprocity-Role Conflict	23.15(7.5)		26.47(7.1)
FDM Total	* *		* *

THE LOWER THE SCORE THE BETTER THE FAMILY DYNAMICS

Family Dynamics measure (FDM) item Reliabilities
-Cronbach alpha Coefficients*-

United States Studies

FDM Dimesnions	1983[1] Moore	1984[2] White-Lasky	1984[3] White, Moore, Lasky	1985 Stechmiller	1985 Rodebush	1986 Whitley	1986 King, Yocom	1986 Marshall
Individuation-Enmeshment	.63	.56	.58	**	.46	.44	.49	.31
Mutuality-Isolation	.63	.75	.66	**	.78	.82	.80	.75
Flexibility-Rigidity	.56	.30	.42	**	.49	.70	.38	.48
Stability-Disorganization	.75	.67	.81	**	.75	.80	.62	.55
Clear Communication-Distorted Communication	.85	.77	.81	**	.79	.85	.73	.36
Role Reciprocity-Role Conflict	.86	.68	.78	**	.87	.85	.75	.55
FDM Total	.77	.81	.81	**	.87	**	.86	.82

3 = a combination of 1 and 2
* = computed by using SD of each of th e62 items and each of the 6 associated bipolar dimension SD
**FDM total reliabilities not computed

Family Dynamics measure (FDM) Item Reliabilities
-Cronbach Alpha Coefficients

United States Studies

FDM Dimensions	1986 Gunter N=45 (FL Cancer Patients) Before dx	After dx	1986* Tomlinson White, Wilson N=160 3rd Trimester (FL)	1986 McCain N=62 55 Families Children from 2-3 Years	1987 Smith FL N=39 Children with cancer	1987 Brackbill, White Wilson, Calahone FL N=92 (infants 8-9 mos; T2)	1988 Brimeyer Contraceptors\ Pregnant Adolescents FL (N=60)	1988 Chmura N=30 FL Pregnant Adolescent Students)
Individuation-Enmeshment	.41	.39	.48	.51	.53	.52	.43	.38
Mutuality-Isolation	.68	.70	.87	.88	.86	.87	.82	.77
Flexibility-Rigidity	.42	.49	.51	.53	.63	.55	.33	.53
Stability-Disorganization	.66	.65	.77	.59	.79	.83	.68	.80
Clear Communication-Distorted Communication	.70	.78	.83	.82	.85	.85	.82	.77
Role Reciprocity-Role Conflict	.44	.37	.81	.82	.81	.82	.83	.67
FDM Total	.33	.66	**	**	**	.90	.86	.88

*Brackbill study is time 2 of the Tomlinson study
**FDM reliabilities not computed

Family Dynamics Measure (FDM) Item Reliabilities
-Cronbach Alpha Coefficients

United States Studies

FDM Dimensions	1988 Paul N=40 Infertile Primiparous Couples, 20 Wives, 10	1988 Prodosky N=98 Chronically ill children Including Conrols (n=38) (FL)	1989 Ennis N=33 Mo or Fa Home Parenteral Nutrition Children (National)	1980 Cobb, Greene, Curry FL Rural T2 N=130	1991 White, Wilson Green, Curry, FL Rural T2 N= (3rd Trimester)	1991 White, Wilson Gammage N= (Infants 8-9 mos)	1991 Boggs N=71 (NC) Normal and High Risk Infants
Individuation-Enmeshment	.61	.55	.33				.49
Mutuality-Isolation	.74	.89	.88				.88
Flexibility-Rigidity	.48	.66	.70				.22
Stability-Disorganization	.80	.80	.71				.73
Clear Communication-Distorted Communication	.77	.86	.82				.81
Role Reciprocity-Role Conflict	.76	.84	.80				.76
FDM Total	.**	.**	.**				.**

*Brackbill study is time 2 of the Tomlinson study
**FDM reliabilities not computed

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University of Florida

Family Dynamics Measure (FDM) Item Reliabilities
-Cronbach Alpha Coefficients

United States Studies

FDM Dimensions	1987 White, Tomasdottir Wilson Iceland N=73 (T1r) (3rd Trimester (Pregnancy)	1987 Tomasdottir, White Wilson, Agustsdottin Iceland (N=50) (12R) (Infants 8-9 mos)	1987 Tomasdottir, White Wilson, Gildersleeve Iceland (R) (N=9 Families) (Infants 8-9 mos)	1988 White, Tomasdottir Wilson, Kirstjansdottin Iceland (T1A)	1988 White Tomasdottir Wilson, Kirstjansdottin N**
Individuation-Enmeshment	.61	.58	**		
Mutuality-Isolation	.71	.79	**		
Flexibility-Rigidity	.50	.62	**		
Stability-Disorganization	.74	.74	**		
Clear Communication-Distorted Communication	.77	.82	**		
Role Reciprocity-Role Conflict	.77	.80	**		
FDM Total	.**	**	**		

*Brackbill study is time 2 of the Tomlinson study
**FDM reliabilities not computed

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Family Dynamics Measure (FDM) Item Reliabilities
-Cronbach Alpha Coefficients

United States Studies

FDM Dimensions	1990 Paunonen, White, Wilson, Pakulinen Finland F=136 (Fin T!)	1990 Hall, Wulff, White Hansen, Wilson Denmark N=160) Den T1	1991 Tilt, Estonia (Est. T1) M=160 (3rd Tri. peg).	1991 Elander, Persson White, Wilson (Swe T1) N=160
Individuation-Enmeshment	.39	.72	.53	
Mutuality-Isolation	.84	.69	.66	
Flexibility-Rigidity	.60	.30	.36	
Stability-Disorganization	.63	.55	.47	
Clear Communication-Distorted Communication	.60	.64	.58	
Role Reciprocity-Role Conflict	.85	.44	.42	
FDM Total	.**	.**	.**	

*Brackbill study is time 2 of the Tomlinson study
**FDM reliabilities not computed

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Appendix B

Family Demographics Questionnaire

Section 1

FAMILY UNIT DEMOGRAPHIC DATA

Are you the mother of the baby you have with you today?
_____ Yes
_____ No

Is this your first or second baby?
_____ Yes
_____ No

Was your first baby a healthy full-term baby?
_____ Yes
_____ No

Very Low Birthweight Infant Qualifications

a. How old is your baby? _____
b. How preterm or premature was your baby at birth?____
c. Subtract the baby's age from weeks of prematurity to obtain an
   adjusted age _____ (must be between 6 to 8 months)

Full-term Infant Qualification

a. How old is your baby? _____
   (must be between 6-8 months)
b. Was this baby a healthy full-term infant?

This questionnaire asks questions about your present family. For this
study, a family is defined as a group of two or more adults who have a
commitment to each other and live together. Often these people are related by
blood or marriage, but they may also be people who care about each other and who
live together, such as friends.

Using this definition, do you live in a family?
_____ Yes
_____ No

1. Group 1 = VLBW infant   2 = Full-term infant   1._____

2. How many years of education have you had?   2._____
   1 = Through 6th grade
   2 = 7th - 9th grade
   3 = 10th - 11th grade
   4 = 12th grade
   5 = 1 year vocational or college
   6 = College or university graduate
   7 = Graduate degree or post graduate

3. What is your job? ____   3. _____
   Describe your duties:

   The occupational score is derived from the Holinghead Four
   Factor Index of Social Status and is follows:

   1 = Farm laborers/manual service workers
   2 = Unskilled workers
   3 = Machine operators and semi-skilled workers
   4 = Small business owners, general workers, craftsmen
   5 = Clerical and sales workers, small farm and business owners
   6 = Technicians, semi-professionals, small business
   7 = Small business owners, maangers, minor professionals
   8 = Administrators, lesser professionals and proprietors of medium-sized
       businesses
   9 = Higher executives, proprietors of large businesses, and major
       professionals

4. How many years of education has your adult
   partner had?   4. _____
   1 = Through 6th grade
   2 = 7th - 9th grade
   3 = 10th - 11th grade
   4 = 12th grade
   5 = 1 year vocational or college
   6 = College or university graduate
   7 = Graduate degree or post graduate

5. What is the job of your adult partner?   5. _____

   Describe their duties:

   The occupational score is derived from the Holinghead Four
   Factor Index of Social Status and is follows:

   1 = Farm laborers/manual service workers
   2 = Unskilled workers
   3 = Machine operators and semi-skilled workers
   4 = Small business owners, general workers, craftsmen
   5 = Clerical and sales workers, small farm and business owners
   6 = Technicians, semi-professionals, small business
   7 = Small business owners, maangers, minor professionals
   8 = Administrators, lesser professionals and proprietors of medium-sized
       businesses
   9 = Higher executives, proprietors of large businesses, and major
       professionals

6. How long has your adult partner been   6. _____
   part of your family unit?
   _____ (months)

7. How long was your baby in the intensive
    care nursery? _____ (months)

7. _____

8. How much did your baby weigh at birth?
    _____ grams

8. _____

9. How long has your baby been in your family
    unit? _____ (months)

9. _____

10. What is your position in the family?
    1 = Spouse
    2 = Friend
    3 = Child

10. _____

Section II

FAMILY DYNAMICS MEASURE**

Directions: When you answer the following questions, please recall a family is defined as a group of two or more people who have a commitment to each other and live together. Please read each question and decide whether you strongly agree, agree, agree more than disagree, disagree more than agree, disagree, or strongly disagree. For example, if you strongly agree that in your family, when you feel blue someone comforts you (question 1), you should circle 1 (strongly agree). If you disagree, you should circle 5 (disagree). There are no right or wrong answers. If you are unsure, please make a guess.

In my family:	Strongly Agree	Agree	Agree More Than Disagree	Disagree More Than Agree	Disagree	Strongly Disagree	
1. When I feel blue, someone comforts me.	1	2	3	4	5	6	____(11
2. I agree with the way tasks are divided.	1	2	3	4	5	6	____(12
3. Someone knows how to get ahold of me when I'm not home.	1	2	3	4	5	6	____(13
4. I think the real issues don't get talked about.	1	2	3	4	5	6	____(14
5. I carry more than my share of the tasks to be done.	1	2	3	4	5	6	____(15
6. I am expected to like the same food as everyone else.	1	2	3	4	5	6	____(16
7. I am satisfied with how the work gets done.	1	2	3	4	5	6	____(17
8. Once a decision is made its hard to change.	1	2	3	4	5	6	____(18
9. Some people say one thing and mean another.	1	2	3	4	5	6	____(18
10. I look for new ways to do things.	1	2	3	4	5	6	____(20

In my family:	Strongly Agree	Agree	Agree More Than Disagree	Disagree More Than Agree	Disagree	Strongly Disagree	
11. I solve most problems on my own.	1	2	3	4	5	6	____(21
12. Others offer to help me with my tasks.	1	2	3	4	5	6	____(22
13. I feel a sense of togetherness.	1	2	3	4	5	6	____(23
14. I have things that belong only to me.	1	2	3	4	5	6	____(24
15. I want people to do things my way.	1	2	3	4	5	6	____(25
16. Everything falls apart when there's trouble.	1	2	3	4	5	6	____(26
17. I know how to reach members at any time.	1	2	3	4	5	6	____(27
18. No one cares about me.	1	2	3	4	5	6	____(28
19. I let others know what I want.	1	2	3	4	5	6	____(29
20. I get a fair share of the chores.	1	2	3	4	5	6	____(30
21. I think talking gets me nowhere.	1	2	3	4	5	6	____(31
22. I have to remind others to do their chores.	1	2	3	4	5	6	____(32
23. I can't count on how family money will be spent.	1	2	3	4	5	6	____(33
24. I think the important things are talked about.	1	2	3	4	5	6	____(34
25. I stick to my daily routines.	1	2	3	4	5	6	____(35

In my family:	Strongly Agree	Agree	Agree More Than Disagree	Disagree More Than Agree	Disagree	Strongly Disagree	
26. It's hard to say what I mean.	1	2	3	4	5	6	____(36
27. I don't get enough help with work at home.	1	2	3	4	5	6	____(37
28. There is someone who cares about me.	1	2	3	4	5	6	____(38
29. I keep feelings to myself.	1	2	3	4	5	6	____(39
30. I think there is always something going wrong.	1	2	3	4	5	6	____(40
31. I get stuck with the bad jobs.	1	2	3	4	5	6	____(41
32. I don't know what to expect from one day to the next.	1	2	3	4	5	6	____(42
33. I let someone else make up my mind.	1	2	3	4	5	6	____(43
34. I am a "loner."	1	2	3	4	5	6	____(44
35. I feel a sense of closeness.	1	2	3	4	5	6	____(45
36. I feel left out.	1	2	3	4	5	6	____(46
37. When there is a misunderstanding I talk it over until it is clear.	1	2	3	4	5	6	____(47
38. I know we can make it when things go wrong.	1	2	3	4	5	6	____(48
39. I feel a sense of warmth.	1	2	3	4	5	6	____(49
40. I do not feel close to anyone.	1	2	3	4	5	6	____(50

In my family:	Strongly Agree	Agree	Agree More Than Disagree	Disagree More Than Agree	Disagree	Strongly Disagree	
41. I make decisions for myself.	1	2	3	4	5	6	____(51
42. I don't like the work I have to do.	1	2	3	4	5	6	____(52
43. I am allowed to have my own opinions.	1	2	3	4	5	6	____(53
44. When I speak, some-one listens to what I say.	1	2	3	4	5	6	____(54
45. I ask when I don't know what others mean.	1	2	3	4	5	6	____(55
46. I don't do things unless someone agrees.	1	2	3	4	5	6	____(56
47. Talking about my problems confuses things more.	1	2	3	4	5	6	____(57
48. I avoid talking about problems.	1	2	3	4	5	6	____(58
49. It's hard to change the rules.	1	2	3	4	5	6	____(59
50. I stand up for myself.	1	2	3	4	5	6	____(60
51. I think we are all alike.	1	2	3	4	5	6	____(61
52. I know what to expect from one day to another.	1	2	3	4	5	6	____(62
53. I know what to expect from other members.	1	2	3	4	5	6	____(63
54. I seldom change my daily routines.	1	2	3	4	5	6	____(64
55. The correct way to do things is important.	1	2	3	4	5	6	____(65

In my family:	Strongly Agree	Agree	Agree More Than Disagree	Disagree More Than Agree	Disagree	Strongly Disagree	
56. It's important to hold the same beliefs.	1	2	3	4	5	6	____(66
57. I have a place to call my own.	1	2	3	4	5	6	____(67
58. Each of us can do the same job in different ways.	1	2	3	4	5	6	____(68
59. It's okay to bring friends home.	1	2	3	4	5	6	____(69
60. The rules are not bent for me.	1	2	3	4	5	6	____(70
61. I think things out by myself.	1	2	3	4	5	6	____(71
62. Activities can be changed.	1	2	3	4	5	6	____(72

Section III

The purpose of this section of the questionnaire is to determine the general pattern of your infant's reactions to his/her environment.

The questionnaire consists of several pages of statements about your infant. Please circle the number indicating the frequency with which you think the statement is true for your infant. Although some of the statements seem to be similar, they are not the same and should be rated independently. If any item cannot be answered or does not apply to your infant, just draw a line through it. If your infant has changed with respect to any of the areas covered, use the response that best describes the recently established pattern. There are no good and bad or right and wrong answers, only descriptions of what your infant does. When you have completed the questionnaire, which will take about 25-30 minutes, you may make any additional comments at the end.

Because this research examines specifically infant disposition as a component of infant temperament, the number to the right of the question number in parenthesis is the question number on the original temperament questionnaire.

Using the following scale, please circle the number that indicates how often the infant's recent and current behavior has been like that described by each item.

	Almost Never	Rarely	Variable usually does not	Variable usually does	Frequently	Almost always
1. (1) The infant eats about the same amount of solid food (within 1 oz.) from day to day.	1	2	3	4	5	6 __(73
2. (2) The infant is fussy on waking up and going to sleep (frowns, cries).	1	2	3	4	5	6 __(74
3. (5) The infant accepts right away any change in place or position of feeding or person giving it.	1	2	3	4	5	6 __(75
4. (6) The infant accepts nail cutting without protest.	1	2	3	4	5	6 __(76
5. (9) The infant accepts his/her bath any time of the day without resisting it.	1	2	3	4	5	6 __(77
6. (10) The infant takes feedings quietly with mild expression of likes and dislikes.	1	2	3	4	5	6 __(78
7. (13) The infant wants and takes milk feedings at about the same times (within one hour) from day to day.	1	2	3	4	5	6 __(79

			Almost Never	Rarely	Varible usually does not	Varible usually does	Frequently	Almost Always
8.	(14)	The infant is shy (turns away or clings to mother) on meeting another child for the first time.	1	2	3	4	5	6__(80
9.	(18)	The infant vigorously resist additional food or milk when full (spits out, clamps mouth closed, bats at spoon, etc.)	1	2	3	4	5	6__(81
10.	(19)	The infant resists changes in feeding schedule (1 hour or more) even after two tries.	1	2	3	4	5	6__(82
11.	(20)	The infant's bowel movements come at different times from day to day (over one hour difference).	1	2	3	4	5	6__(83
12.	(23)	The infant makes happy sounds (coos, smiles, laughs) when being diapered or dressed.	1	2	3	4	5	6__(84
13.	(24)	The infant accepts new foods right away, swallowing them promptly.	1	2	3	4	5	6__(85
14.	(26)	The infant reacts mildly (just blinks or startles briefly) to bright light such as flash bulb or letting sunlight in by pulling up shade.	1	2	3	4	5	6__(86
15.	(27)	The infant is pleasant (smiles, laughs) when first arriving in unfamiliar places (friend's house, store).	1	2	3	4	5	6__(87
16.	(28)	The infant gets sleepy at about the same time each evening within 1/2 hour).	1	2	3	4	5	6__(88
17.	(29)	The infant accepts regular procedures (hair brushing, face, washing, etc.) at any time without protest.	1	2	3	4	5	6__(89

		Almost Never	Rarely	Variable usually does not	Variable usually does	Frequently	Almost always
18. (31)	The infant's initial reaction to a new baby sitter is rejection, crying, clinging to mother, etc.)	1	2	3	4	5	6__(90
19. (34)	The infant objects to being bathed in a different place or by a different person even after 2 or 3 tries.	1	2	3	4	5	6__(91
20. (35)	The amount of milk the infant takes at feedings is quite unpredictable (over 2 oz. difference) from feeding to feeding.	1	2	3	4	5	6__(92
21. (36)	For the first few minutes in a place or situation (new store or home), the infant is fretful.	1	2	3	4	5	6__(93
22. (38)	The infant reacts strongly to foods, whether positively (smacks lips, laughs, squeals) or negatively (cries).	1	2	3	4	5	6__(94
23. (39)	The infant is pleasant (coos, smiles, etc.) during procedures like hair brushing or face washing.	1	2	3	4	5	6__(95
24. (42)	The infant greets a new toy with a loud voice and much expression of feeling (whether positive or negative).	1	2	3	4	5	6__(96
25. (45)	The infant's initial reaction at home to approach by strangers is acceptance.	1	2	3	4	5	6__(97
26. (46)	The infant wants daytime naps at differing times (over 1 hour difference) from day to day.	1	2	3	4	5	6__(98
27. (48)	The infant cries when left to play alone.	1	2	3	4	5	6__(99
28. (49)	The infant adjusts within 10 min. to new surroundings (home, store, play area).	1	2	3	4	5	6__(100

		Almost Never	Rarely	Variable usually does not	Variable usually does	Frequently	Almost always
29. (50)	The infant's daytime naps are about the same length from day to day (under one half hour difference).	1	2	3	4	5	6__(101
30. (54)	The infant displays much feeling vigorous laugh or cry) during diapering or dressing.	1	2	3	4	5	6__(102
31. (56)	The infant adjusts easily and sleeps well within 1 or 2 days with changes of time or place.	1	2	3	4	5	6__(103
32. (60)	The infant wants and takes solid food feedings at about the same time (within 1 hour) from day to day.	1	2	3	4	5	6__(104
33. (61)	The infant is content (smiles, coos) during interruptions of milk or solid feeding.	1	2	3	4	5	6__(105
34. (62)	The infant accepts with a few minutes a change in place of bath or person giving it.	1	2	3	4	5	6__(106
35. (63)	The infant cries for less than one minute when given an injection.	1	2	3	4	5	6__(107
36. (65)	The infant continues to react to a loud noise (hammering, barking dog, etc.) heard several times in the same day.	1	2	3	4	5	6__(108
37. (66)	The infant's initial reaction is withdrawal (turns head, spits out) when consistency, flavor or temperature of solid food is changed.	1	2	3	4	5	6__(109
38. (67)	The infant's time of waking in the morning varies greatly (by 1 hour or more) from day to day.	1	2	3	4	5	6__(110
39. (70)	The infant reacts strongly to strangers: laughing or crying.	1	2	3	4	5	6__(111

			Almost Never	Rarely	Variable usually does not	Variable usually does	Frequently	Almost Always	
40.	(73)	The infant's period of greatest physical activity comes at same time of day.	1	2	3	4	5	6__(112	
41.	(74)	The infant appears bothered (cries, squirms) when first put down in a different sleeping place.	1	2	3	4	5	6__(113	
42.	(75)	The infant reacts mildly to meeting familiar people (quiet smiles or no response).	1	2	3	4	5	6__(114	
43.	(76)	The infant is fussy or moody throughout a cold or an intestinal virus.	1	2	3	4	5	6__(115	
44.	(77)	The infant wants an extra feeding at a different time each day (over one hour difference).	1	2	3	4	5	6__(116	
45.	(78)	The infant is still wary or frightened of strangers after 15 minutes.	1	2	3	4	5	6__(117	
46.	(81)	The infant remains pleasant or calm with minor injuries (bumps, pinches).	1	2	3	4	5	6__(118	
47.	(82)	The infant's initial reaction to seeing doctor is acceptance (smiles, coos).	1	2	3	4	5	6__(119	
48.	(84)	The infant plays quietly and calmly with toys (little vocalization or other noise).	1	2	3	4	5	6__(120	
49.	(85)	The infant's fussy period occurs at about the same time of day (morning, afternoon, or evening).	1	2	3	4	5	6__(121	
50.	(89)	The infant is calm in the bath. Like or dislike is mildly expressed (smiles or frowns).	1	2	3	4	5	6__(122	

		Almost Never	Rarely	Variable usually does not	Variable usually does	Frequently	Almost always
51. (90)	The infant requires intro- duction of a new food on 3 more occasions before he/ she will accept (swallow) it.	1	2	3	4	5	6__(123
52. (91)	The infant's first reaction to any new procedure (first haircut, new medicine, etc.) is objection.	1	2	3	4	5	6__(124
53. (93)	The infant is fussy or cries during the physical examination by the doctor.	1	2	3	4	5	6__(125
54. (94)	The infant accepts changes in solid food feedings (type, amount, timing) within 1 or 2 tries.	1	2	3	4	5	6__(126

Subject Number _____

Appendix C

Code Sheet

Code Sheet

Clinic	Date	Code Number	Mother's Name
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Appendix D

Correlation Matrix Family Demographics
Behavioral Style with Family Unit Health

Correlation Matrix Family Demographics - Behavioral Style with Family Unit Health

	Individuation-Enmeshment	Clear Communication-Unclear Communication	Stability-Disorganization	Flexibility-Rigidity	Mutuality-Isolation	Role Reciprocity-Role Conflict
Maternal Education			r = -.533 p = .001			
Maternal Occupation						
Adult Partner Education						
Adult Partner Occupation		r = -.415 p = .011	r = -.375 p = .030	r = -.413 p = .011		r = -.345 p = .037
Length of time as a family unit						
ICN Length of Stay						
Birthweight						
Length of time Infant in family unit						
Maternal Position in the family unit	r = -.470 p = .003		r = .362 p = .028			
Socioeconomic Status			r = -.399 p = .014			
Rhythmicity						
Approach			r = .377 p = .022			r = .466 p = .004
Adaptability			r = .328 p = .028			
Intensity						
Mood						r = .403 p = .013

Appendix E

Behavioral Style Correlation Matrix for Combined VLBW and Full-Term Infants

Behavioral Style Correlation Matrix for Combined VLBW and Full Term Infants

	Rhythmicity	Approach	Adaptability	Intensity	Mood
Rhythmicity	1.0				
Approach		1.0			
Adaptability		r=.657 p=.000	1.0		
Intensity				1.0	
Mood		r=.607 p=.000	r=.455 p=.005		1.0

Appendix F

Correlation Matrix for Demographic Data

Correlation Matrix for Demographic Data

	Family Membership	Maternal Education	Maternal Occupation	Adult Partner Education	Adult Partner Occupation	Length of time the family unit has been a unit (months)	ICN length of stay (months)	Birth-weights (grams)	Length of time infant has been unit (months)	Maternal position within the family	Socio-economic status of the family
Family Membership 1 = VLBW infant 2 = Full-term infant	1.0										
Maternal Education		1.0									
Maternal Occupation	r=-.342 p=.038	r=.369 p=.025	1.0								
Adult Partner Education		r=.558 p=.000		1.0							
Adult Partner Occupation		r=.439 p=.007	r=.355 p=.031	r=.53 p=.001	1.0						
Length of time the family unit has been a unit (months)						1.0					
ICN length of stay (months)							1.0				
Birthweights (grams)	r=.937 p=.000						r=-.804 p=.000	1.0			
Length of time infant has been in the family unit (months)					r=.493 p=.002				1.0		
Maternal position within the family	r=.626 p=.000		r=-.341 p=.039	r=-.412 p=.011	r=-.500 p=.002	r=.626 p=.000				1.0	
Socioeconomic Status of the family		r=.659 p=.000	r=.723 p=.000	r=.677 p=.000	r=.859 p=.000				r=.405 p=.013	r=-0.538 p=.001	1.0

Appendix G

Correlation Coefficients for VLBW Infant Families

Correlation Coefficients for VLBW Infant Families

	Rhythmicity	Approach	Adaptability	Intensity	Mood
Maternal Education		r = -0.528 p = .0.043	r=-0.622 p=.013		
Maternal Occupation					
Adult Partner Education					
Adult Partner Occupation	r=-0.594 p=0.019				
Length of time the family unit has been a unit (months)					
ICN Length of Stay (months)					
Birthweights (grams)		r=0.633 p=0.011			r=0.590 p=0.021
Length of time Infant has been in family unit (months)					
Maternal Position in the family unit					
Socioeconomic Status of the family					

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___Eight Months of Adjusted Age on Family Unit Health___

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