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Maternal attachment in the neonatal intensive care unit

Brundage, Janice Kay, Ph.D.

The University of Arizona, 1987

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MATERNAL ATTACHMENT IN THE NEONATAL
INTENSIVE CARE UNIT

by

Janice Kay Brundage

A Dissertation Submitted to the Faculty of the
DEPARTMENT OF COUNSELING AND GUIDANCE
In Partial Fulfillment of the Requirements
For the Degree of
DOCTOR OF PHILOSOPHY
In the Graduate College
THE UNIVERSITY OF ARIZONA

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As members of the Final Examination Committee, we certify that we have read the dissertation prepared by Janice Kay Brundage entitled Maternal Attachment and the Neonatal Intensive Care Unit and recommend that it be accepted as fulfilling the dissertation requirement for the Degree of Doctor of Philosophy.

Final approval and acceptance of this dissertation is contingent upon the candidate's submission of the final copy of the dissertation to the Graduate College.

I hereby certify that I have read this dissertation prepared under my direction and recommend that it be accepted as fulfilling the dissertation requirement.

Dissertation Director

Date
STATEMENT OF AUTHOR

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September, 1987

Tucson, Arizona
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ABSTRACT

The purpose of this study was to describe the phenomenon of maternal attachment as it specifically relates to moderate premature delivery. The study investigated the impact of educational, counseling and therapeutic interventions on mothers who delivered premature infants. Research hypotheses were that mothers who participated in the treatment group would demonstrate significant increases in the independent variables of self esteem, social networking and family function strategies. This study also hypothesized that there would be a significant positive relationship between treatment and the dependent variable of maternal attachment.

The sample consisted of 30 mother-infant dyads between the ages of 15 and 38 years of age. Infants' gestational age ranged from 32 to 36 weeks. Data were gathered using three measures: (1) a demographic profile of the subjects; (2) a questionnaire including the Tennessee Self Concept Scale, Sarason's Life Event Survey, Norbeck's Social Support Questionnaire, Feetham's Family Function Index; and (3) Barnard's Nursing Child Assessment Feeding Scale (NCAFS).

The research study consisted of a field experiment. Fifteen subject were assigned to the experimental and control
group via a modified randomized block procedure. A ques-
tionnaire was issued during infant's hospitalization and at 4 months post infant discharge from the hospital to measure the independent variable. The dependent variable was measured at 1 month, 2-1/2 months and 4 months using the NCAFS. Treatment consisted of a minimum of seven sessions during the infant's hospitalization and discharge to home.

Statistical analyses were conducted in the form of frequency distributions, means, standard deviations, t-tests and correlation scores. Stepwise multiple regression techniques were used for predictor variables. Results indicated that mothers who participated in the treatment group demonstrated significantly improved maternal attachment processes than those mothers who did not receive intervention. The results did not indicate that there was a significant difference between the two groups on self esteem, social support, life events or family function.

Implications for the study were noted. Recommendations for medical and mental health practitioners and future areas of research were discussed.
Psychologists have long been interested in the nature and formative significance of parent-child relationships. Several major theoretical constructs postulate that children's social relationships are shaped by their earliest social experiences (Adler, 1929; Ainsworth, 1973, 1982; S. Freud, 1938, 1940; Piaget, 1953; Schaffer, 1971; Sullivan, 1953). Other investigators have found important links between aspects of the parent-child interaction and the child's future development. To summarize their findings, high quality interactions during the first years of life tend to be positively linked to the child's subsequent cognitive and linguistic competence (Ainsworth, Blehar, Waters, & Wall, 1978; Bee, Barnard, Eyres, Gray, Hammond, Spieta, Snyder, & Clark, 1982; Beckwith & Cohen, 1984; Beckwith, Cohen, Kopp, Parmelee, & Marcy, 1976; Clarke-Stewart, VanderStoep, & Killian, 1979; Coates & Lewis, 1984; Olson, Bates, & Bayles, 1984).

In the early 1960s, medical management of the high-risk neonate evolved dramatically as a result of numerous scientific advancements. Infants who for centuries had been
considered "previable" or the "premature infant" (Cone, 1985, p. 13) were surviving complex medical regimes and growing into adulthood. As more sophisticated data collection resulted from the regionalization of neonatal intensive care units, researchers discovered alarming trends. Low-birth weight infants appeared to manifest biological and psychosocial disabilities in their development (Caputo, Goldstein, & Taub, 1979; Cohen & Beckwith, 1979; Drillien, 1964; Fitzhardinge & Steven, 1972; Wiener, Rider, Oppel, & Harper, 1968). Low birth weight infants have been found to be proportionally overrepresented in families of low socioeconomic status (Sameroff & Chandler, 1975) and in learning disabilities (Sell, Gaines, Gluckman, & Williams, 1985), cases of disharmonious mother-infant interactions (Beckwith, Cohen, Kopp, Parmelee, & Marcy, 1976), parenting disorders (Klein & Stern, 1971; Leifer, Leiderman, Barnett, & Williams, 1972), and child abuse (Klaus & Kennell, 1982; Schmidt & Kempe, 1979).

Inquiry into the causation of these findings increased dramatically. Neonatologists and perinatologists focused on the neonate's developmental progress and ability to interact with their primary caregiver (Als, Lester, & Brazelton, 1979; Brazelton, 1979, 1981). Acknowledging the unique interactive qualities of the parent-child dyad, investigation also focused on the psychological and emotional
reactions of the parents, primarily the mother (Barnard, Hammond, Booth, Bee, Mitchell, & Spieker, 1986). Research discovered that premature delivery precipitated an emotional crisis in the mother. Often she felt guilty for not having carried the fetus to term. Mother's self report also indicated that she lacked confidence in being able to adequately care for her ill child (Brazelton, 1981; Caplan, 1968; Kaplan & Mason, 1960; Minde, Marton, Manning, & Hines, 1980). Studies also indicated parental difficulty in emotionally relating to their premature or ill infants in neonatal intensive care units (Duhamel, Lin, & Skelton, 1974; Prugh, 1953).

Research into the special needs of infants requiring intensive care services have summarized infant temperament and ability of social interaction as follows:

The low-birthweight infant expends so much energy maintaining the homeostasis of blood-flow, respiration, and temperature that little may be left for social interaction. The tendency of the preterm infant's immature nervous system to become overloaded or exhausted is manifest by the prevalence of disruptive, autonomic or motor responses. Furthermore, the infant's unstable control of state allows little if any of the quiet alertness which is the most favorable time for productive social interaction. In summary, the preterm infant tends to be relatively poorly regulated, unpredictable and inaccessible (Nurcombe, Rauh, Achenbach & Howell, 1986, p. 1).

Despite the hazards of illness, if birthweight is not exceptionally low, and provided there is not gross damage to the infant's central nervous system, one of the strongest predictors of later development is the interaction between
parent and child (Beckwith, Cohen, Kopp, Parmelee, & Marcy, 1976). Their findings indicate that health care professionals cannot make accurate predictions regarding an infant's later cognitive and affective development based entirely on known physiological insult. Factors having a positive correlation for developmental status prediction include increased "mutual caregiver-infant gazing at one month" (Beckwith et al., 1976, p. 585) and increased frequencies of "contingent response to their fuss cry" at three months (Beckwith et al., 1976, p. 586). The significant factor appeared to be the reciprocal social transactions, that is, "transactions that occurred contingently to the infant's signals, either simultaneously as in mutual gazing, or successively as in contingency to distress or contingency to nondistress vocalizations" (Beckwith et al., 1976, p. 586). A secondary source of prediction is found in the infant themselves. If the infant can respond visually and auditorily to a primary caretaker by one month of age, the probability for developmental improvement is great (Bee et al., 1982). The implication is that, except in extreme conditions, effective parenting can overcome the biological adversity of premature birth (Barnard, 1987; Barnard et al., 1986; Nurcombe et al., 1986).
Significance of the Problem

Approximately six percent, or 213,000 of the three and a half million infants born in the United State each year are labeled high risk. Advances in clinical perinatology have improved the health status of these infants and their projected chance of survival to approximately ninety-five percent of those infants weighing more than 1,000 grams and over twenty-six weeks in gestational age. Of the births which are indicated as high risk, prematurity (less than 37 weeks gestation) and small for gestational age (less than 2500 grams) make up ninety-five percent of the cases (Cone, 1985).

Aspects of the caretaking environment have been shown to attenuate or intensify effects of perinatal insult (Barnard, et al., 1986). Consequently, the early establishment of satisfactory maternal ties to high risk newborns is of extreme interest to medical and mental health professionals, parents and society as a whole.

Purpose of This Study

The proposed research project is designed to contribute to the advancement of knowledge in clinical/counseling psychology by providing information on the impact of intervention strategies on mothers of high risk infants to enhance perinatal attachment and future parenting techniques. Study of this population may establish and extend the efficacy of
therapeutic intervention to the seriously ill neonate and their family. Information about these issues should help inform parents, medical and mental health professionals of the nature of the psycho-social family struggle that may occur after the birth of an ill child. The delicate balance of the maternal-child dyad will be investigated in hopes of predicting those variables which impact most dramatically on the attachment process.

Statement of the Problem

This research study was designed to evaluate the effects of therapeutic intervention on a group of mothers who have recently delivered an infant into a neonatal intensive care unit. For the purpose of this study, the range of therapeutic interventions will include a multi-faceted approach as outlined in John Mickelson's Rationale for Program Development (Appendix A). The intervention structure will have four main foci or components: curriculum, instruction, milieu, and evaluation. Curriculum will include assessment and promotion of parents' feeling of attachment; facilitation of parental acceptance of prematurity or illness; and acquisition of knowledge and skills to enable parents to eventually assume full-time care of the infant outside of the hospital. Instruction will include parental demonstration of caretaking skills through modeling, rehearsal, reinforcement and self-evaluation. Parents will be encouraged to generate
relevant questions of health care professionals indicating a basic understanding of their infant's health status through modeling and role playing. The psychological milieu will provide the mother emotional support and an opportunity to work on psychological constraints that impede her ability to relate to her child. Evaluation of the study will determine the strengths and weaknesses of intervention design and assist in future empirical research and program development.

Techniques utilized within the context of this therapeutic intervention study cover a broad expanse of theoretical constructs. Social-learning theory (Bandura, 1969), Information-Processing Perspective (Kail & Bisanz, 1982) and Individual Psychology (Adler, 1929, 1931; Christensen & Schramski, 1983; Dinkmeyer, Pew, & Dinkmeyer, 1979) will provide theoretical foundations for the counseling/therapy interventions. This study was designed to answer the following questions:

Problem 1: Do counseling/therapeutic interventions with mothers of premature or ill neonates lead to improved maternal attachment processes?

Problem 2: From a sample of mother-infant dyads of infants receiving services of neonatal intensive care units, do mothers of this population show an impaired self concept or social networking strategy?
Problem 3: Do life events which a mother has experienced in the previous twelve months impact on her coping strategies and perception of herself?

Problem 4: Do counseling/therapeutic interventions have an impact on altering the family's relationship within itself and the broader social unit?

The following hypotheses will be tested:

Hypothesis 1: Mothers who receive counseling/therapeutic intervention will have stronger ties of attachment to their premature infant and will score higher on the Barnard's Nursing Child Assessment Feeding Scale (Appendix B) than those mothers who do not receive treatment.

Hypothesis 2: Mothers who receive intervention will indicate a stronger self-concept and social networking strategy, as evidenced in higher scores on the Tennessee Self Concept Scale (Appendix C) and on the Norbeck Social Support Questionnaire (Appendix D) than those mothers who do not receive treatment.

Hypothesis 3: Mothers who have higher negative change; scores on the Sorensen's Life Event Survey (Appendix E) will have a lower maternal attachment score on the Nursing Child Assessment Feeding Scale.

Hypothesis 4: Mothers who receive intervention will indicate an improved family functioning level as
indicated by the Feetham Family Function Index (Appendix F) than those mothers who do not receive treatment.

Assumptions Underlying This Study
For the purpose of this study, it is assumed that:
1. The constructs investigated are real components of human behavior, and the instruments used to measure them are sufficiently valid and reliable to produce meaningful data.
2. The hospital environment, including the treatment and control intervention, accounts for identical variance among the mother-infant participants.
3. The subjects are competent, able to read at a ninth grade level, and respond truthfully to the questionnaire.

Limitations
This study is limited to mother-infant dyads within the neonatal intensive care units of Arizona Health Science Center and Tucson Medical Center, Tucson, Arizona. All participants must have a basic understanding and knowledge of the English language.

Definition of Terms
The following definition of terms will be utilized for the remainder of the study:
Attachment: A tie or enduring affiliation that exists between a child and one or both of her/his parents that is formed via a series of reciprocal and contingent interactions and which serves to adapt and mediate the relationship.

Bonding: That portion of the parent-child attachment relationship that is primarily unidirectional (parent to infant), rapid (within the first hours or days after birth), and facilitated or optimized by physical contact.

Low-birthweight: An infant who weighs less that 2,500 grams.

Neonatal Intensive Care Unit (NICU): Regional perinatal center or tertiary care unit designed for the treatment of complex medical and surgical conditions of the sick high-risk newborn.

Neonate: A child less than one month of age.

Preterm: An infant less than 259 days or thirty-seven weeks gestational age.

Summary

This research investigation recognizes that the mother-infant interaction system is a mutually adaptive "dance" between partners (Barnard et al, 1986). For this dance to proceed smoothly and for the infant to receive the quantity and quality of stimulation needed for optimum
development, both partners and their dialogue need to have a sufficient repertoire of behaviors to foster communication (Thoman, Acebo, & Becker, 1983). The response of the partners needs to be contingent on one another (Lewis & Coates, 1980) and include a richness of interactive content (Clarke-Stewart, VanderStoep, & Killian, 1979; Cohen & Beckwith, 1979). The specific adaptive patterns between parent and child must change over time (Sameroff & Chandler, 1975). A multifaceted approach of educational and counseling interventions may be useful in reducing the crisis of a premature delivery, and following the medical regime of the neonatal intensive care delivery system.
CHAPTER 2

LITERATURE REVIEW


In addition to these broad construct investigations, there has been a resurgence of research in the last decade critically evaluating the attachment process of the mother-newborn relationship. Klaus and Kennell (1976, 1982), DeChateau and Wilberg (1977), and Brazelton (1981) have engaged in startling research that has created great controversy, a debate which has had a dramatic impact on the humanistic change of hospital policies regarding birth and followup care of the premature and healthy newborn.
The following review of the literature will address three considerations:

1. A review of the theoretical underpinnings of maternal attachment. The primary emphasis will be placed on the three significant approaches that have contributed most heavily to the evolution of attachment theory; psychoanalytic, social learning and an ethologically oriented approach of attachment.

2. A historical review of the relationship between theory and research and how this partnership has shaped the evolution of attachment theory as it is presently viewed.

3. Historical developments during the last several decades that have had a significant impact on the care of the premature and healthy infant. Included in this review will be the research that has contributed to this body of knowledge and implications for intervention strategies.

Theoretical Constructs

A review will be presented of the theoretical underpinning of maternal attachment and its development and evolution through the psychoanalytic, social learning and ethologically oriented psychological models.
Psychoanalytic Theory

In the early 1900s, Sigmund Freud's psychoanalytic theory was greatly influenced by his training in the biological sciences. According to Freud's instinct theory, an instinctual drive has a source and an aim, both of which are genetically determined and therefore have minimal influences from environmental variations. An object, the means through which the aim is achieved, is variable and environmentally adaptable. In 1905 (1953) Freud specified that the child's first love object is the mother's breast, and he inferred that this early suckling relationship would serve as a prototype for all later love relations. Freud characterized the first object relation as "anaclitic" for he viewed the sexual instincts, in this phase of development, as finding their satisfaction through "leaning on" the self-preservation instincts ([1914] 1957, p. 87). The basis for this anaclitic love depended principally upon the nourishment of the infant. Later in 1926 (1959) he observed that the child experiences anxiety when his mother is absent. He identified this as "signal anxiety" and felt that it signals danger to the child that his bodily needs will go unsatisfied ([1926] 1959, pp. 136-138).

It was not until the early 1930s that Freud fully recognized the paramount significance of the infant-mother
attachment. At that time, he stated that the mother's importance is "unique, without parallel, established unalterably for a whole lifetime as the first and strongest love-object and as the prototype of all later love relations" (1938, p. 188). Freud recognized the discrepancy in previous positions, but at the end of his discussion, introduced a new concept.

The phylogenetic foundation has so much the upper hand . . . over accidental experience, that it makes no difference whether a child has really sucked at the breast or has been brought up on the bottle and never enjoyed the tenderness of a mother's care. In both cases, the child's development takes the same path; it may be that in the second case its later longing grows all the greater (1938, pp. 188-189).

Freud's justification for his position, although unquestioning in regard to the significance of the infant-mother relationship "was scattered, inadequate and somewhat contradictory" (Ainsworth, 1969, p. 972). He saw that mother's significance went beyond the infant's bodily needs; however, he never clarified his position of mother as an acquired or secondary drive. Consequently, this discrepancy allowed room for theoretical division in future psychoanalytic theory formation concerned with the origins and development of maternal attachment. The resulting schism produced two separate schools of thought: certain theorists follow Freud's emphasis on the lability of objects and his view that the infant acquires the mother as object through their dependence on her for need-gratification. These
theorists viewed the development of object relations as being extrinsically interfaced with ego development, and thus were dependent on the acquisition of cognitive structures not present at the beginning of life. This group is represented by the ego psychologists. On the other hand, the second group of theorists were adamantly against this position and focused on Freud's reference to a phylogenetic foundation, viewing object relations as primary rather than secondary and acquired. This school of thought is self-designated as object relations theory.

**Ego Psychology.** The ego psychologist, while embracing Freud's theory of psychosexual development, have taken particular note of the development of object relations in the context of the development of ego function. This view was not prominently held by Freud. As in any theoretical perspective, there are some differences from one theorist to another; however, there is a substantive core of agreement among them. The following review is a summary of: Anna Freud (1946, 1954, 1965); Hartmann, Kris, and Loewenstein (1946, 1949); Mahler (1952, 1965); and Spitz (1957, 1965a, 1965b).

The ego psychologists viewed the newborn as an undifferentiated organism—undifferentiated structurally, topographically, and dynamically. Neither id nor ego have emerged from their shared, undifferentiated core, and
separation between conscious, preconscious, and conscious processes are irrelevant. The infant cannot discriminate between sensory input from their own body and sensory input from the external environment. As a result of the lack of discrimination, the infant is described as experiencing everything as part of themself; therefore, all their libidinal energy is contained within. Their experience varies between states of tension (creating unpleasantness) and states of relative quiescence. The infant is unable to distinguish mother from themself, and, accordingly, cannot relate to her as an object. The infant is aware of little else than the ebb and flow of their own tensions. This first stage of newborn life has been referred to by Freud as the "primary narcissistic" period; others have referred to this phenomena as "undifferentiated or "objectless" phase (Hartmann, Kris, & Loewenstein, 1946, p. 19).

The ego psychologists recognize that within a relatively brief time--somewhat less than 12 months--the infant will have transformed profoundly. The infant is able to discriminate between herself/himself, and will be able to actively engage with the external world. The infant appears to progress through three main stages: (1) an undifferentiated or objectless stage, (2) a transitional stage, and (3) a stage of object relations.
Undifferentiated, Narcissistic, or Objectless Stage

This stage is recognized by the majority of ego psychologists as a period of several constitutional givens which are genetically determined and serve as a foundation for more complex processes which will develop later. Even with these givens, the ego psychologists' view of newborns' responses are tied to visceral, autonomic and emotional organization rather than to organizations based on perceptual differentiation of their external world. Anna Freud, more emphatically than her colleagues, tied the origin of object relations to need-gratification, with particular focus on the feeding relationship. The affective experiences of the infant include not only the unpleasure of tension but also the positive pleasure associated with relief from tension. The libidinal cathexis during this early period is connected, not to the mother or even to the breast as object, but "to the blissful experience of satisfaction and relief" (A. Freud, 1954, p. 12).

Benedek (1952) described the following rhythmic course of events as characteristic of the normal mother-infant relationship: arising need, disturbance of sleep, crying, gratification, and again sleep. In this period of extraterine symbiosis, the mother is an integral part of the gratification process. The concept of symbiosis has been
modified by ego psychologists from its original biological meaning of mutual dependence.

Mahler (1965) referred to the symbiotic, parasite-host relationship between fetus and mother in the prenatal period. During the early postnatal period the infant is described as being in a symbiotic envelope. The primary task of the infant is to become differentiated from their mother, to "hatch" rather than to become attached to her.

The Transitional Stage

This is a period between the undifferentiated first phase and the phase in which clear-cut object relations are evident. Ego functions develop during this period, and one can speak of a primitive "body ego". Receptors determining distance become more important, and memory traces are established. The infant is able to make some differentiation between self and non-self, although she/he is still viewed as incapable of cathecting a true object. The infant moves a step from their earlier cathexis of the experience of need-satisfaction, to a cathexis of the food which is the source of pleasure. "The infant in this second stage 'loves' the milk, breast or bottle" (A. Freud 1946, p. 125).

Spitz (1965a) distinguishes the advent of the second state, which he refers to as the stage of the "precursor of the object" or "preobject" (p. 91) by the emergence of the smiling response, which he considers as a species-specific
response to the human face. He feels that the smiling response is a behavioral indicator of an inner shift from an interoceptive, autonomic organization of input to a more differentiated, perceptual organization in which the distance receptors have an increasingly important role.

Other ego psychologists did not see the second stage as being so sharply distinguishable. They placed the shift from narcissism at different times in the development of the infant and generally point to different behavioral indices to mark this transition. Hoffer (1949) considers that thumbsucking indicated ego emergence, generally apparent at twelve to sixteen weeks of age. Anna Freud (1954) and Kris (1951) place special significance on the ability to anticipate the feeding situation and to wait for it. This time was seen as a precursor for the new stage of development.

**True Object Relations**

"The stage of object constancy enables a positive inner image of the object to be maintained, irrespective of either satisfactions or dissatisfaction" (Anna Freud, 1965, p. 65). The infant clearly perceives their mother as a person separate and distinct from themselves. The infant is capable of maintaining their tie to mother, irrespective of their need state, regardless of whether she is currently being gratifying or frustrating, present or absent. When the mother leaves, she is not forgotten.
Anna Freud distinguished the beginning of the stage of object love or true object relations as follows: "When its powers of perception permits the child to form a conception of the person through whose agency it is fed, its 'love' is transferred to the provider of food" (A. Freud, 1946, p. 125).

Spitz marked the advent of this stage as the "libidinal object proper" (1957, p. 82) by the sudden appearance of an anxious response to strangers which he termed as the "eight-month anxiety" (1957, p. 54). He also designated a second phase of development of true object relations as marked with an index related to the child's understanding of their mother's prohibitions. The index consists of negative head shaking, which he viewed as coming about through a process of identification with the mother's control of the infant's behavior.

Object Relations Theory

Object relations theory, originating in the Hungarian school of psychoanalysis, emphatically disputes the concept of primary narcissism and holds that there are object relations, albeit primitive ones, from the very beginning. This school of thought has had a greater impact on theoretical development in Great Britain than in the United States.

Klein (1952) described infants who, as young as three weeks, interrupted their sucking to gaze at the mother's face
or when perhaps two weeks older, responded to the mother's voice and smile with a change of facial expression, indicating that "gratification is as much related to the object which gives the food as to the food itself" (Klein, 1952, p. 239). Even with this observation, her theoretical account of the earliest period of development is very much ruled by the themes of food, orality and the breast. She believed that the infant has an innate striving for the breast: "the newborn infant unconsciously feels that an object of unique goodness exists, from which a maximal gratification could be obtained and that this object is the mother's breast" (Klien, 1952, p. 265).

Winnicott (1960) did not explicitly express the origins of the infant-mother tie: he focused his discussion on the total environmental provision rather than the primary emphasis on orality. Bowlby (1958, 1969), a psychoanalyst in the tradition of object relations theory, not only opposed the view of interpersonal ties as secondary acquisitions resulting from the gratification of primary drives, but encouraged an updating of psychoanalytic instinct theory to address or acknowledge scientific and technical advances in the biological and pediatric field.

**Social Learning Theory**

Social learning theorists proposed that dependency on a primary caretaker results from learning. The infant begins
life with a set of basic drives. It is assumed that the formation of the infant-mother tie can be explained by the same general laws of behavior that serve as a foundation for learning theory.

Unlike propositions about object relations and attachment behavior, social learning theory of dependency and attachment does not describe stages or phases in the development of dependency relations. While recognizing that similarities in experience may result in common patterns of dependency behavior, the emphasis is on the uniqueness that is the consequence of individual experience and learning.

Social learning theorists divide into two schools of thought regarding dependency. The first group, similar to the ego psychologists, view dependency as an acquired or secondary drive. The second group sees dependency as a mere label to be applied to specific kinds of learned behavior.

**Dependency as Acquired Drive**

Those social learning theorist who view dependency as an acquired drive understand the infant's tie to the mother as originating in the infant's initial state of helplessness and total dependence on mother for the gratification of basic physiological needs, for the reduction of primary drives. The crying and other behaviors indicative of the infant's primary drive state are reinforced through the mother's nurturing action. Therefore, this behavior is strengthened
and is more likely to occur again. The stimuli provided by the mother's face and presence becomes signals of gratification to come, and in this way the infant acquires a drive to be close to mother and to seek her attention. Known as the "dependency drive," theory, this view of the origin of dependency is based largely on Hullian behavior theory. Hull (1943) posited that events (rewards and punishments) following a response were the critical elements affecting the subsequent likelihood of the response occurring again. His instrumental conditioning theory was an example of a mathematical-deductive theory which he developed during the early 1940s. Other social learning theorists who followed these basic tenets include Dollard and Miller (1950), Sears (1963), and Sears, Rau, and Albert (1965). Their social learning perspectives have also been heavily influenced by the theories of Freud.

Dollard and Miller (1950) explicitly stated their intent to translate psychoanalytic theory into Hullian terms. Their focus utilized psychoanalytic constructs and applied them to observable behavior. This newly developed set of constructs was intended to stand up to the rigors of empirical tests and analysis. Dollard and Miller's theory could be summarized as follows: the infant's need for nourishment was considered a primary drive, the gratification of which was
rewarding. Through repeated association of this gratification—the caretaker's presence (an example of classical conditioning)—she/he became the focus of a secondary drive, such that the infant came to manifest a desire or drive for interaction with her/him, even in the absence of food. This secondary drive constituted the basis of the relationship between infant and adult.

In the first year of its life the human infant has the cues from its mother associated with the primary reward of feeding on more than 2,000 occasions. Meanwhile the mother and other people are ministering to many other needs. In general there is a correlation between the absence of people and the prolongation of suffering from hunger, cold, pain, and other drives; the appearance of a person is associated with a reinforcing reduction in the drive. Therefore the proper conditions are present for the infant to learn to attach strong reinforcement value to a variety of cues from the nearness of the mother and other adults . . . (It) seems reasonable to advance the hypothesis that the . . . human motives of sociability, dependence, need to receive and show affection, and desire for approval from others are learned (Dollard & Miller, 1950, pp. 91-92).

There is some disagreement about the importance of different primary drives. Whiting (1944), unlike Miller and Dollard, felt that food was more important than other types of reinforcement. He also advocated the role of conflict in dependency relations, suggesting that the conflict existing between two possible outcomes (reward or punishment) energized the infant's response and made the response more intense.
Sears (1963) was at direct odds with Whiting and posited that feeding does not play a greater role in dependency relations than any other primary reinforcer. He suggested that affection was both a primary and secondary reinforcer, advising that through association with eating and caressing, the secondary reinforcers (the mothers's smiling, talking, and patting of the infant) acquired their reinforcement strength.

Linguistic logic suggests that dependence and independence are at opposite points of the same dimension. Walters (Bandura & Walters, 1963) differentiated between task-oriented and person-oriented dependent behavior and later (Walters & Parke, 1964) suggested that many responses instrumental in obtaining social reinforcement gaining approval could readily be classified as "oriented toward achievement." It was generally recognized by several learning theorists that it is not justifiable to assume that help seeking, approval seeking and attention seeking should reflect the same intraorganic underpinnings, as do proximity seeking and contact seeking.

**Dependency as a Behavior**

The present consensus among social learning theorists is that dependency is merely a useful label for certain kinds of learned behavior. This school of thought is concerned neither with dependency as a generalized drive nor with
dependency as a generalized trait. The shift in position parallels the gradual shift of emphasis in learning theory from the Hullian model to the Skinnerian operant conditioning model and on to the integrative model proposed by Bandura's social learning model.

The key concept for the instrumental conditioning group is that the reinforcing stimulus is any stimulus event that follows a response and affects the probability of the event occurring again. Aspects of a reinforcing stimulus would include its rate of emissions, aptitude, or latency of response (Gewitz, 1969).

Bijou and Baer (1965) pointed out the mother's important stimuli for the infant, which allows her to be discriminated from the rest of the environment, are mediated chiefly through distance receptors, although some are tactual receptors.

In effect, the mother is a changing sample of stimuli, some of which are unique to her, but many of which are shared by other people. Thus stimuli from a mother which becomes discriminational for the reinforcement may overlap with stimuli from other people, and the baby's behaviors which have become strengthened to mother's stimulation may be evoked by others who present the same or similar stimuli. Consequently, there are natural bases for both discrimination of the mother from all other people and for generalization from the mother to others (Bijou & Baer 1965, p. 132).

Gewitz emphasized the role of the family in determining which social stimuli acquired reinforcing properties. He felt the individual's family value of social behavior would
determine the appropriate response. Gewitz (1969) also felt that dependency and attachment are acquired by a conditioning of various behavior systems—such as approach, orientation, following, touching, smiling and vocalizing—with respect to a specific person or to a class of persons. The physical and behavioral characteristics become discriminative and reinforcing stimuli that maintain and control the child's behavior. Gewitz emphasized contingency as a condition for reinforcement, thus making very explicit what is implied in other social learning theories. For an environment to be functionally effective for learning and for the control of behavior, it must provide stimuli which can be discriminated by the infant and reinforcers which are contingent upon her/his behavior.

Barnard (1978) developed a model of attachment based on social learning theory. The model characterizes attachment as an interactive process between mother and infant within the framework of the environment (Figure 1, Barnard Child Health Assessment Interaction Model). The interaction between the mother and the infant is influenced by the mother's ability to read the cues of her infant, to alleviate distress, and to provided growth fostering situations. Furthermore, the interaction is also influenced by the infant's ability to give clear cues and to respond to the mother's caregiving. If the infant fails to send clear cues,
Figure 1. Barnard: The Child Health Assessment Interaction Model.
the mother may not be able to interpret the communication and respond appropriately. If the mother does not respond to the infant's cues, the cues will not be reinforced and the behavior will eventually become extinct. Likewise, if the infant does not respond to the mother's cues, mothers' actions will diminish due to lack of reinforcement. This interactive process is contained within the parameters of the animate and inanimate environment.

During the next decade a considerable proportion of behavioral research focused on identifying the age an infant is both competent and sensitive to environmental input and social stimulation (Bower, 1974, 1977; DeCaspar & Fifer, 1980; Spence & DeCasper, 1982).

The Rise and Fall of Secondary Drive Theory

Both the ego psychological (A. Freud, 1965; Hartmann, Kris, & Lowenstein, 1949) and object relations (Isaacs, 1929; Klein, 1952) traditions of thought, like their common mentor Sigmund Freud, acknowledged that infant-adult relationships had their roots in the infant's need for and the caretaker's provision of food. Social learning theory as presented by Dollard and Miller (1950) also suggested that the infant's need for nourishment was considered a primary drive. Theoretical concurrence to this formulation was strengthened because the traditional psychoanalytic and learning theoretical antagonists could agree on the fundamental nature of
certain developmental processes. Consequently, there were no serious questions regarding the validity of the secondary drive theory for several decades.

Animal Research. By the early 1950's, the drive theory of Miller and Dollard came under increasing assault. The primary source of criticism, based on empirical research studies, was directed by experimental psychologist and primatologist Harry Harlow at the University of Wisconsin. In one of the most crucial experiments, Harlow and Zimmermann (1959; Harlow, 1958, 1961) separated infant rhesus macaque monkeys from their mothers and raised them with two surrogate mothers. One surrogate mother was a wire manikin with a bottle in the chest through which the infant was fed exclusively, and the other a terrycloth-covered surrogate that played no role in the infant's feeding. Harlow's animal studies created great controversy in that if the secondary drive theory was correct, it would have predicted a preference for the nourishing wire surrogate mother. In contrast, these series of experiments discovered that the rhesus monkeys preferred the terrycloth surrogate mother in times of fear and used her as the secure base from which they organized their exploratory forays. The infant monkeys fed from the wire manikin; they sought comfort from the cloth covered manikin. Harlow argued that "contact comfort" (1958, p. 677) was an essential element in the formation of social
relationships, whereas involvement in feeding was relatively unimportant.

**Maternal Deprivation Studies.** The early 1950s marked other contradictory examples of the secondary drive theory. World War I and World War II had created a rich experimental environment in which to observe children who were separated from their primary caregivers. Rene Spitz investigated the impact of institutionalization on the developing child and found that at the turn of the century foundling homes or orphanages experienced an incredible death rate. Spitz reported that "the death rates of infants admitted during their first year of life varied from 31.7% to 75% by the end of the second year" (1973, p. 116). In 1945, with the introduction of antibiotics and improved antiseptics techniques, the death rate dropped to ten percent. As the survival rate for the institutionalized child grew, other problems became apparent. This institutionalized population had a higher probability of emotional disturbances, problem behaviors, social-emotional withdrawal, and developmental delay (Spitz, 1973).

The London Homeless Children Study (Freud & Burlingham, 1944), conducted by Anna Freud and Dorothy Burlingham, supported the increasing evidence that children raised without interaction from a primary caretaker had a higher probability of displaying disturbances of developmental
patterns. Unlike the children studied by Spitz, their study concentrated on children who had been separated from their families and who were living in a nursery setting. The results of their research showed that between birth and five months, infants thrived in both the home and nursery setting. In the five to twelve month period, the home infants surpassed the nursery children in both intellectual and emotional development, and showed greater overall response to environmental stimuli. During the period between the first and second year, significant differences between the two groups were noted. The nursery infant (raised without the influence of a primary caretaker) surpassed the home baby in locomotory skills; nonetheless, the nursery babies lagged as much as six months behind their home-reared counterparts in verbal abilities. Emotional differences between the two included higher incidence of aggression and depression in the nursery group. Freud and Burlingham attributed these findings to the nursery infant's lack of a primary attachment figure during a critical time. They concluded that when important "instinctual needs" (1944, p. 27) for early attachment goes unsatisfied and become weakened by institutional life, an impact is made upon later-developing, more complex structured forms of love.
The normal and healthy growth of the human personality depends on the circumstances of the child's first attachments and on the fate of the instinctual forces (sex, aggression, and the derivatives), which find expression in these early and all-important relationships (Freud & Burlingham 1944, p. 100).

Combining the empirical research gathered from Harlow's work with rhesus macaque monkeys and the non-experimental studies of maternal deprivation during the 1920s, 1930s and 1940s, several major tenets were advanced: (1) contact comfort was as important as feeding; (2) the secondary drive interpretation of early relationship formation was inadequate; and (3) the young infant needs to receive care and stimulation from one or a small number of individuals for maximum psychological development. The scientific zeitgeist was ripe for a new approach to attachment theory.

An Etiological Approach to Attachment

Attachment theory was an evolutionary synthesis of several major trends of thought. Important components of attachment theory focused on: the behavioral systems (conceived as having an inner organization and an outward manifestation); an active organism in context to its relationship to the external world; and an organism affected by its introrganismic neurophysiological state.

Advancements in the biological sciences sent repercussions through the study of human behavior. Researchers
increased their attention to the inner structures and subsequent functions of the human mind. One of the first influences felt was from the field of ethology, beginning with Lorenz (1935) and continuing on an expansive front as comparative psychology and ethology (Hinde, 1966) developed. Second, there was renewed interest in evolutionary theory, based partially on ethology and increased interest in studies of nonhuman primates (Harlow, 1958, 1961, 1963). Advances in molecular biology and genetics also contributed to the revitalized interest in evolutionary research. Physiological psychology investigated the activation and termination of behavior from both an neurophysiological and endocrine perspective.

Control systems theory and the information processing model also recognized the importance of the internal structure of the organism. Attention had turned from constructing models of human behavior on the basis of a machine analogy to constructing machines on the model of human cognition and behavior.

John Bowlby. During the early 1950s, John Bowlby, a British psychoanalyst, first received recognition for his work on Maternal Care and Mental Health (1951), a research project commissioned by the World Health Organization. This paper, which was controversial at the time, outlined measures needed to safeguard the emotional health of children
separated from their parents. Bowlby's further research describes, from a psychoanalytic view, how early separation can give rise to conflicts affecting all later love relations (1958, 1969).

**Theory of Component Instinctual Responses**

In 1958, Bowlby developed his first theory on the nature of the mother-infant relationship, which he called the "Theory of Component Instinctual Responses" (p. 350). Dissatisfied with the constructs of psychoanalytic theory, Bowlby's hypothesis incorporated two prevalent types of secondary drive theory regarding attachment behavior: Primary-Object Clinging and Primary-Object Sucking. Bowlby was adamant that this theory was fundamentally different from the role of attachment in relation to the infant's need for food (Secondary Drive Theory). The difference, he noted, was that the secondary drive theory dealt with the ego and super-ego while his theory focused on certain parts of the id and reflected the influence of the emerging field of ethology. Unlike psychoanalytic theory, Bowlby's theoretical constructs were based on actual observations of young children and accounts of their development from their mothers.

Bowlby postulated that the infant begins life with a set of five instinctual responses: sucking, clinging, following, crying, and smiling. Instinctual responses, according to Bowlby, are activated by both psychological and
physiological conditions, including thoughts and wishes (conscious and unconscious) and the organism's hormonal state at a given time. A particular set of external stimuli is also required to activate most instinctual responses, and include a simple set of visual or auditory Gestalts to which the infant's behavioral patterns are innately responsive. Cessation of an instinctive response may be internally or externally mediated. The releasing and terminating mechanisms Bowlby referred to as "social releasers" and "social suppressors" (1958, p. 366).

During this time of theoretical development, Bowlby acknowledged the need for reciprocal responses in the parent-infant relationship (1958, p. 350). These reciprocal responses functioned to ensure the survival of the species. This basic premise served as an evolutionary model which emphasized the importance of natural selection in shaping the behavioral repertoire of any species, eliminating behavioral patterns that do not promote species survival and encouraging behaviors that improve the species success.

**A Control Theory of Attachment Behavior**

In 1969, John Bowlby expanded his earlier proposition regarding the development of the infant-mother relationship. Utilizing constructs from both ethology and control system theory, he developed a model to explain an infant's development of behavioral systems that included both a specific
outcome or "set-goal" (1969, p. 68) and a system for receiving and evaluating feedback. Bowlby believed that it is a predominant tendency of the human organism to seek equilibrium or balance. The use of information and feedback process through the senses (via the environment) enabled the organism gradually to build working models of the environmental objects encountered and to learn to respond to them appropriately.

Bowlby proposed that the five instinctual responses (sucking, clinging, following, crying, smiling) could be characterized in the following manner: (1) they followed a recognizable and predictable pattern in all human infants; (2) are part of a sequence of behavior that follows a predictable course; (3) contribute to the infant's survival; and (4) are present without opportunities to be learned (1969, p.38). These behavioral systems are unsophisticated and occur initially without the input of environmental feedback. Reflex-like and stereotyped, Bowlby referred to these systems as "fixed-action patterns" (1969, p. 66). Instinctual responses were later integrated into a pattern of behavior. This pattern is not inherited; only the potential to develop the behaviors is innate.

Bowlby theorized that in the savannah grasslands in which humans are thought to have emerged, and where their behavior is adapted, it would have been of survival value for
helpless human infants to seek the protective proximity of conspecific adults. As a result of this specie-specific adaptation, the young infant would be equipped with a repertoire of behaviors that promoted attainment and maintenance of proximity. In precocial species, proximity to adults is obtained through the infant's own locomotor efforts; however, in altricial species such as humans, signals assume immense importance. Thus active proximity-promoting and proximity-maintaining behaviors like locomotion, grasping, and clinging are present in human infants only in vestigial form without the strength or complexity needed to ensure either the attainment or maintenance of proximity. Bowlby was able to pinpoint those behaviors which protected humans from the hazards presented in our external world and referred to this condition as the "environment of evolutionary adaptedness" (Bowlby, 1969, p. 58).

The maturation of the human organism, as presented by Bowlby's ethological theory of attachment, brings with it the ability to "goal-correct" (Bowlby, 1969, p. 71); that is to constantly monitor the variance between the organism's performance and the set-goal and to correct performance accordingly.

This control system would function much like a thermostat, which includes sensors that measure the current temperature and compare it with a pre-set standard.
Previously, researchers had focused on discrete attachment behaviors, but by shifting the focus to goal states and efforts to attain them, Bowlby advanced the idea that behaviors with very different morphological characteristics might be interchangeable, since they served similar ends. The emphasis of his theory was on the function of behavior rather than the morphology of a discrete behavior. This represented a major advance in the study of behavioral development.

A goal-corrected system is influenced by several variables relating primarily to learning. When an infant develops in a specific milieu, she/he has a particular set of opportunities for learning. Information received in this environment is integrated with those abilities that are genetically determined, as well as "working models" developed by the objects in the environment (Bowlby, 1969, p. 71). Thus, the infant who desires to be in close proximity to their mother may come to regulate their behavior so that it is designed to establish and maintain physical closeness. Bowlby postulated that occurrence of the five instinctual responses becomes a part of a goal-corrected system and is evident between the ninth and eighteen month of an infant's life (Bowlby, 1969, p. 180).

Attachment behavior, as proposed by Bowlby, develops in four phases (Bowlby, 1968, pp. 266-268). During Phase I,
the child's orientation and signaling behaviors are without
discrimination; that is, one figure is not preferred over
another. This phase begins at birth and lasts for eight to
twelve weeks. Infants emit precursor attachment behaviors
promiscuously: provided that someone satisfies their needs
and responds to their signals, they appear content.
Beginning at about the twelfth week, Phase II involves the
development of a noticeable preference for a particular
attachment figure(s). Auditory stimuli is differentiated at
four weeks and visual stimuli at sixteen. Phase II involves
the development of a preference for a specific attachment
figure(s). This phase lasts approximately six months, at
which point Phase III begins. This state involves the
infant's ability to seek and maintain proximity to the chosen
attachment figure by means of vocalization and locomotion.
Lasting until the end of the second year, this phase also
ushers in the beginnings of both separation and stranger
anxiety (Schaffer & Callender, 1959; Yarrow & Goodwin, 1973).
This anxiety provides further evidence of the child's ability
to differentiate between different stimuli in their environ-
ment. Phase IV is the start of the young child's ability to
form and maintain a goal-corrected partnership. The child at
age two to three years is able to think of their parents as
independent objects with their own plans and behavior. The
child begins to arrange their behavior in order to influence or control theirs.

Bowlby suggests that the infant is most sensitive and ready to develop attachment behavior during the fourth, fifth and sixth months of the first year. If the infant is separated from their primary caregiver either before or during this period of time, she/he may show extreme anxiety and tension and delay in the development of attachment behavior.

Within this control system, Bowlby (1969) implied that at least four hypothetical systems worked together to control the infant's behavior. Later, Bretherton and Ainsworth (1974) formally developed these hypothetical systems. The first was the attachment behavioral system, having as its function the maintenance of a sufficient degree of proximity/contact to attachment figures. The actual degree of proximity/contact sought would depend on the infant's age and capabilities, current endogenous and exogenous circumstances, and the infant's cognitive representations and expectations of the adult based on the history of interaction between the infant and particular adult.

A second behavioral system was the fear/wariness system; its function is the avoidance of or escape from potential dangerous situations. The primary cue of this systems response appears to be the novelty of the stimuli. When this system is activated, it also activates the
attachment behavioral system. If the infant finds that the novel object is not dangerous, the third or exploratory and/or affiliative behavioral system is activated. This system draws the infant into interaction with the novel stimuli, and exploration promotes mastery of the environment. This system also promotes affiliation and the acquisition of social skill with individuals other than the attachment figure, which has value in a complex social system. Exploration and affiliation are inimical to activation of the fear/wariness and attachment behavioral systems so that the four hypothetical systems operate interactively. From the vantage of natural selection, each system functions adaptively and is regulated by the type of control system outlined earlier.

Although these four systems function primarily without direct awareness, the appraisal processes and control systems proposed by Bowlby clearly involve fairly sophisticated cognitive processing—processing at a level beyond the capacities of the newborn infant. It remains unclear when the processes and systems can be considered functional, and what type of developmental changes they go through. Bowlby posited that the four systems appear to integrate by the latter half of the first year. Once this has happened the behavioral systems provide increased flexibility and intercoordination to the infant's behavioral function. This lends
credence to the importance of viewing behavior in functional and organization terms, rather than on a discrete basis (Bowlby, 1969; Sroufe & Waters, 1977).

Attachment Behaviors and Attachment Bonds

Bowlby distinguished between the attachment, which he defined as an enduring affectional tie or bond, specific in its focus, and the attachment behaviors that mediated the formation and maintenance of that bond. Bowlby believed that a specific unbroken bond to a particular person is essential for nonpathological development. He also suggested that a major test of whether an attachment has been formed lies in the assessment of the child's reaction to major separation. If such separation is perceived as permanent, the infant protests the separation vociferously (Bowlby, 1982). This basic tenet was to serve as a catalyst for further research investigating the process of attachment. Studies of short-term separations in laboratory situations (Ainsworth, Blehar, Waters, & Wall, 1978) and in the home environment (Lamb, 1979; Stayton, Ainsworth, & Main, 1973) contributed to the understanding of the behavioral responses often exhibited by young children.

Empirical Studies

The following section contains an historical review of the relationship between theory and research and how this
partnership has shaped the evolution of attachment theory as it is presently viewed.

Animal Research

During the 1960s and 1970s, Harlow (1961, 1963) and his colleagues (Harlow & Harlow, 1965; Harlow & Suomi, 1970) assessed the effects of varied social contact during infancy on later social, learning and reproductive behavior. Research efforts focused on three major factors, which included: rearing in total or partial social isolation (Sackett, 1972); rearing with inanimate surrogate mothers (Harlow & Suomi, 1970); and separating young infants from their mothers or from peers (Mineka & Suomi, 1978). Research on rhesus monkeys showed that withholding physical contact during six or more months of the twelve month infancy period produced deviant adolescent and adult behavior. The degree of deviancy was proportionally more extreme the longer the isolation period and the greater the amount of social and perceptual isolation. The addition of cloth surrogate mothers during the isolation period did little or nothing to counteract postrearing abnormalities. Separation studies disclosed profound immediate effects of losing an attachment object, including agitation, depression, and in a few extreme cases, even death. Other work suggested that separation during infancy could have negative effects persisting into the second and third years of life (Hinde & Spencer-Booth,
1971). The primary conclusion from these research efforts is that early life experiences are important in the development of a wide variety of primate behavior.

It is important to note that research with primates has uncovered variables that appear to have an impact on early separation. The long-term effects of isolation may be influenced by the gender of the primate (Harlow & Harlow, 1965; Sackett, 1972), and the species of primate investigated (Sackett, Holm, Ruppenthal, & Fahrenbruch, 1976). These gender and species differences in response to isolation suggest that important nonenvironmental factors may have an impact in determining risk for developing abnormal behavior. Such factors as differential maturation rates, genetic differences in reactivity, emotionality, tolerance for ambiguity or change, or ability to inhibit maladaptive or inappropriate behavioral responses could also result in differential susceptibility.

Rosenblatt and Lehrman (1963) investigated the effects of mother-infant separation on maternal behavior in laboratory rats. An important aspect of the maternal female is that she will act maternally to pups other than her own young. Under certain conditions alien pups are able to activate her maternal caring behaviors. This phenomena permitted experimentation on eliciting maternal behavior by mothers separated for varying periods of time. Rosenblatt
and Lehrman discovered that in the laboratory rat, separation of mother and infant had a profound influence on the attachment process. The sooner the infant was removed from mother after birth, the more dramatic the impact on the bonding process. Mothers whose pups were not removed until the fifth day postpartum did not respond to foster pups that were given to them to rear; subsequently, all the pups died. Even when the separation was of only two-day duration, one-half of the pups given to mothers died within the first five days. Additionally, lactation was affected, and after a four-day separation from the pups, lactation ceased entirely.

The amount of contact with the pups was investigated by Bridges (1975, 1977). He found that if pups were left with newly delivered mothers for four to six hours after birth, mothers would behave maternally within one day after test pups were introduced. This phenomena occurred even after a twenty-five day separation. Bridges also discovered that contact with only half the litter throughout parturition was also equally effective.

In sheep, too, maternal behavior is affected by early mother-infant separation. Maternal responsiveness appears to wane more rapidly among this specie than rats. Among sheep, Poindron and Le Neindre (1980) discovered that if separation begins at birth and lasts for four hours, 50 percent of the ewes are still willing to accept lambs. When separation
lasts from twelve to twenty-four hours, the percentage of ewes who accept lambs decreases dramatically to 25 percent. In contrast, if a twenty-four hour separation begins two to four days after parturition, all ewes will reaccept their lambs.

Studies of maternal responsiveness in the goat are less definitive than studies in sheep. Research suggests that maternal responsiveness wanes more rapidly after parturition in goats than in sheep (Rosenblatt and Siegel, 1980). Collias (1956) and Klopfer (1971) have found that dams will not accept their own young after kids have been removed at birth for more than two hours. If, however, the mother is allowed five minutes of contact with their kids immediately after parturition, all of the young were reaccepted even if separation extended beyond three hours. Empirical studies indicate that both sheep and goats appear to establish individualized bonds with their young and will not engage in maternal attachment behavior if this bond is broken immediately after birth.

In summary, maternal-infant separation during the first few hours and days of life has a dramatic impact on the maternal bonding process in animal studies. For each species, there appears to be a specific length of separation that this relationship can endure. If separation extends
beyond this sensitive period, the effects on mother behavior during the breeding cycle are often drastic and irreversible.

Human Research

**Strange Situation Paradigm.** Mary Ainsworth was a colleague of Bowlby's and moved his theoretical model into the realm of empirical research on human children. Notably, her scientific efforts investigated children from twelve months of age and older and have served as a cornerstone for much of the subsequent research on human attachment behavior. Although her work is not directly applicable to this present study, one would be remiss in failing to acknowledge her contributions to maternal attachment theory. She developed a technique for assessing the quality and quantity of the attachment process through the use of the strange situation paradigm. This was an important distinction between Ainsworth's work regarding "attachment behaviors" and that presented by her mentor, John Bowlby. Bowlby (1969) had stressed that attachment behaviors mediate the development of the attachment bond. Ainsworth "was interested in the strength and quality of the attachment formed, rather than in the behavior patterns which mediated attachment" (Ainsworth, 1964, p. 52).

It is conceptually important to distinguish between the precursor or mediating attachment behaviors articulated by Bowlby (1969) and the criterial attachment behaviors to
which Ainsworth (1964) referred. The precursor attachment behaviors—crying, sucking, smiling, and grasping—appear adaptively functional in maintaining proximity, and are important in encouraging attachment. By contrast, distinct display of the criterial attachment behaviors is used to infer the existence of an attachment bond. Most of the criterial attachment behaviors described by Bowlby demand more active, goal-corrected behavioral patterning than do the precursor attachment behaviors, and thus they are behaviorally more complex. In addition, as intended by Ainsworth (1964), they reflect the nature of relationships which have already developed.

Ainsworth (1967) reported that specific infants she observed among the Ganda people did not protest brief separations from their mother—for example, when their mothers left the room. However, she was convinced that these infants were indeed attached to their mothers. In an attempt to understand and define this conviction, Ainsworth (1964) described thirteen patterns of interaction which she labeled attachment behaviors. These behaviors were: (1) crying; (2) smiling; (3) vocalizing; (4) visual-motor orientation; (5) crying when the attachment figure leaves; (6) following; (7) scrambling; (8) burying face in lap; (9) exploration from a secure base; (10) clinging; (11) lifting arms in greeting; (12) clapping hands in greeting; and (13) approach through
locomotion. What is distinctive about each of these behaviors is that they occur discriminately in response to the attachment figure.

These criterial attachment indicators were the foundation for developing the strange situation paradigm. The purpose of Ainsworth's research was to examine the manner in which attachment behavior can be triggered at different degrees of intensity by environmental manipulation. The strange situation experiment examined three sets of events: "the child's use of the mother as a secure base from which to explore the environment, the child's responses to a stranger, and the child's responses to separation from her/his mother" (Ainsworth et al., 1978, p. 255). Ainsworth found that behavior in the strange situation is directly correlated with the infant's behavior at home and their established pattern of behavior in interaction with a primary caregiver. A child whose behavior indicates secure attachment via independent behaviors demonstrated in the home is less likely to show extreme fear in the strange situation. Ainsworth also proposed that the patterning of strange-situation behavior is significantly related to social, emotional and cognitive development in the second and third years of life. Children who demonstrated behaviors designated as "securely attached" were found more likely to be at average or above average developmentally.
Ainsworth identified four phases in the development of attachment between mother and child, three of which occur during the first year of life. They are: (1) the initial pre-attachment phase, during which the infant, while attentive to certain specific stimuli, does not differentiate among them; (2) the phase of attachment-in-the-making, when the infant can distinguish between the familiar and unfamiliar; (3) the phase of clear-cut attachment, which is characterized by specific behaviors only directed toward a chosen attachment figure; and (4) the phase of goal-directed partnership, during which the child is less egocentric, and communication and cooperation to achieve set-goals are aspects of the parent-child relationship (Ainsworth et al., 1978, p. 23).

Agenda of Attachment. Brazelton has theorized that the attachment relationship between parents and child does not begin at the moment of birth, but during the pregnancy, (Brazelton, 1981, p. 19). With the first movement of the infant in the womb, the parents begin to think of the fetus as an individual. When a pregnancy is first realized, many expectant mothers and fathers experience a rush of conflicting emotions. Brazelton notes that the pregnancy may be a period of critical reorganization, and may have a strong impact on the psychological health of the parent.
Contrary to early beliefs that the infant was tabula rasa at birth, research has indicated that the neonate has an amazing collection of abilities, all of which lend themselves to the formation of early affectional bonds. Since the "agenda of attachment," as Brazelton describes it, is based on periods of disequilibrium and achievement of balance, he stresses the need for the parents and infant to spend the first four months of the child's life together. During this time, infants become adjusted to and develop a sense of control over their extrauterine existence, while parents develop competence and feelings of self-esteem about their new roles. It is the parent-child interactions themselves that cement the relationship. "In a reciprocal feedback system, the rewards are built in for the parents as well as the infant" (Brazelton & Als, 1978, p. 353).

The Maternal Sensitive Period. Klaus and Kennell (1976) have proposed that there exists a sensitive period immediately after birth during which the human mother is most likely to develop strong affectional bonds with her infant. Initial studies done by Klaus and Kennel in 1972 evaluated a group of 14 mothers who had been given sixteen hours of extra contact with their infant (one hour immediately post delivery and five hours per day for each of the first three days of life). These mothers were compared to a control group of mothers who received a normal routine of newborn care. It
is important to note that hospitals during the early 1970s were much more restrictive in mother-infant interaction policies than current practices. These policies included no immediate contact after birth, and limited visitation during the first three days of life in the nursery. This study found that in a one-month follow-up clinic visit, mothers who had extra contact showed increased frequency of attachment behavior towards their infant. Not only were these behaviors viewed during the examination of the infant but also during a timed feeding situation. All observations were scored in a systematic manner, and the interviews were also standardized. The study did not determine whether the extended contact itself made a difference in maternal interaction or whether the specific time of the contact in the early period after birth (implies a sensitive bonding period) had impacted the mother-infant relationship.

The initial work by Klaus and Kennel has served as a catalyst for additional research in this area. There have been at least seventeen major studies concerning early contact and mother-infant interaction in the last two decades. In summarizing these studies, Klaus separated their focus of investigation into three separate categories: (1) infants and mothers having extra contact in both the first three hours postnatally and the following three days; (2) studies in which early contact occurs on day 1 and day 1 only; and
(3) studies where additional mother-infant contact occurs in the first hour of life only.

Klaus and Kennell further speculated that the traditional separation of mothers and infants at birth following hospital delivery may impair establishment of an optimal mother relationship and later psychologic adjustment. These conditions were thought to result in a number of long-term negative consequences and cover a range of conditions from mother anxiety to child abuse.

Evidence for the existence of a sensitive period and the potentially damaging effect of separation have been drawn from retrospective studies of the epidemiology of parenting failures and from studies of the effects of early contact on breastfeeding and mother-infant interactions.

De Chateau (1979) also studied the effect of extra close physical contact on mothering behavior at 36 hours, three months and one year in a sample of Swedish middle-class primigravidas. He found that at thirty-six hours the early-contact mothers held their infants more than the control group. At a three-month home visit, extended contact mothers held their infants in the "en face" position more often and kissed their infants more frequently than those mothers who had not had early contact. Likewise, their infants were predictably more responsive and alert. At one year, extra
contact mothers were more affectionate than control mothers with their children.

The controversy rages on as to the significance of this early contact. Michael Lamb presented a critical review of the evidence and concluded that "claims regarding the effects of early contact on maternal-infant bonding are not well supported by empirical evidence. Early contact has no enduring effect on maternal attachment, but may sometime have modest short-term effects on some mothers in some circumstances" (Lamb, 1982, p. 767).

Neonatal Intensive Care Units and the Premature Infant

This section will discuss historical developments during the last several decades that have had a significant impact on the care of the premature and healthy infant. Included in this review will be research that has contributed to this body of knowledge, and implications for intervention strategies.

Development of Neonatology

Interest in and special care for the prematurely born infant is a relatively new phenomena in the history of medicine. In the late 19th century, a French obstetrician, Pierre Budin, and Madame Henry, a former midwife, developed "a special department for weaklings" (Budin, 1907) at the Maternite in Paris. Budin greatly influenced the care of the
premature infant. He designed and fostered the use of the first glass-walled incubator and encouraged mothers not only to continue to breastfeed their infants but to become involved in the care of their infants. Budin was especially cognizant of the interrelationship between mothers and premature infants and how this attachment process could be altered due to separation after birth. In his book, The Nursling, he wrote, "Unfortunately . . . a certain number of mothers abandon the babies whose needs they have not had to meet, and in whom they have lost all interest. The life of the little one has been saved, it is true, but at the cost of the mother" (Budin, 1907).

Martin Couney, a student of Pierre Budin, appeared as his representative at the Berlin Exposition of 1896. He presented his newly invented "Kinderbrutanstalt," or "child hatchery," and promoted the great commercial success of this new device. Acknowledging the interest of the lay public in tiny, wizened preterm infants, Couney began to exhibit infants that were given to him by German doctors. His exhibitions were presented on the European continent and in America as late as 1940, when he presented his device at the New York World's Fair. In spite of the commercial flavor of his work, Couney was able to successfully manage more than 5,000 premature infants (Klaus & Kennell, 1982, pp. 151-152). He did not, however, integrate maternal involvement into the
care of the premature infant. It is not surprising to note that Couney found that some mothers did not want their infants back once they had grown to a more normal weight.

As the twentieth century began, France was still the leader in the care and feeding of the premature infant; Great Britain and the United States fell far behind. To illustrate the conditions of premature infant care, a paper published in 1900 inferred that of "the thousands of premature infants born in the United States annually ... most ... are quietly laid away with ... little if any effort being made for their rescue. It is only in the home of the childless or where offspring were greatly desired that any considerable efforts were made to save them" (Ransom, 1900, in Cone, p. 37).

The first unit explicitly designed for the care of the premature infant was opened by Julius Hess at the Michael Reese Hospital in Chicago in 1922. While many of Budin's theories, such as the mother's involvement with the care of her premature infant were being practiced in Europe, no hospitals in the United States encouraged parent participation.

During the 1920s, Arvo Ylppo, a leading Finnish pediatrician was instrumental in providing information regarding the increased physiologic and neurologic functioning levels of the preterm infant. Ylppo's monographs on the
consequence of the social environment on infant development were seen as a new concept within pediatric medicine. By the 1930s, interest about how the fetus and infant coped with the significant alterations and adjustments just before and after birth led a few physicians to continue research where Yllpo had left off. They focused on the physiology of the prematurely born infant. They found that although premature infants are only a few pounds lighter than those born at term, they have a surface area only one-half as large. They surmised the important impact of this body-size to surface-area ratio to respiration, heat loss, and caloric needs.

A series of books and pamphlets on prematurity was published by the Division of Research in Child Development, United States Children's Bureau during the 1930s and 1940s. Among those individuals who influenced the developing field of neonatology was Ethel Dunham, Director of Research in Child Development. Her concern with the problems of the neonate led to federal monitoring of infant mortality rates, and later to funding for neonatal and perinatal research. Another individual who influenced the field was Clement Smith. His book, *The Physiology of the Newborn Infant* (1946) dealt with the physiology issues of the neonate and assisted the medical profession in delineating the newborn infant's capacity to maintain extrauterine homeostasis, and offered guidelines for practical applications.
The early 1940s also witnessed better obstetric care, with organized prenatal care and more gentle manipulations at delivery. The introduction of antibiotic agents, notably penicillin, Gordon Armstrong incubators, omission of oil baths and routine transfusions, increased the viability of the newborn infant. During the late 1940s the isolette incubator was introduced into clinical practice (Cone, 1985).

Organized programs for specialized care of the premature infant were developed in some areas of this country before the 1940s, but as Silverman noted, "proliferation of specialized centers began during the 1940s" (1980, p. 45). Federal aid for construction of hospital facilities began with the passage of the Hill-Burton act in 1946. New construction reached a peak in 1949 with completion of the first 1,000 projects which received this aid. Hill-Burton funds enabled communities to plan construction of expensive "premature centers." The first specialized premature center was opened in Denver at the University of Colorado in 1947. New York City followed quickly thereafter (1948 through 1953) with ten additional centers.

In the 1960s the National Institute of Child Health and Human Development was established to direct and promote research into perinatal biology, maternal health, and the causes of retardation. During this time there was cooperation between the medical practitioner and researcher, with
the common goals of improving the quality of life for the premature infant. Regionalization of neonatal intensive care units and unified reporting advanced research in this area.

As the 1980s emerged, the combination of pediatric and obstetric skills into collaborative teams led to the emergence of clinical perinatology. Artificial barriers delineating obstetric care and pediatric care were broken down. A complete perinatal network, according to Merkatz (1978), must included uniform record keeping and data collection, risk assessment, consultation, maternal and neonatal transport, graded levels of care, professional and public education, and appropriate, comprehensive follow-up of high risk survivors. Stewart, Turcan and Rawlings revealed that "if all the modern techniques, which include early fluid administration and close and detailed monitoring of oxygen, environmental temperature, pH, respiration, and heart rate, are employed in treating the premature infant, he has only a slightly greater chance than a full-term infant of being disabled" (Stewart, Turcan, & Rawlings, 1977, p.97).

Prematurity and the Family System

The last two decades have seen remarkable strides in improving both the survival rate and quality of the survivors of neonatal intensive care units. Questions regarding the impact of a premature birth on the family unit have been investigated. Research has focused on the psychological and
social consequences of this event on mother, father and the extended family system.

Psychological Impact. Maternal and paternal response to the premature delivery of their infant has been investigated in several different fashions. Common emotional reactions of mothers and fathers having infants in intensive care nurseries include guilt, anxiety, emotional crisis, inadequacy and grief.

Prugh (1953) reported that mothers often expressed guilt and anxiety after their infants have been born prematurely. He also discovered that during the first months of the premature infants' life, mother is often forced into a supporting or peripheral position. This diminished status of role function precipitates feelings of anxiety and guilt. Prugh noted that mother may have feelings of guilt after the birth of her infant because she was unable to care for the infant as skillfully as the nurse. Prugh believed that the anxiety was related to the infants' size, maternal feelings about the pregnancy, mothers' degree of confidence about the maternal role, disturbing home conditions, stress, or mothers' own early family relationships (Prugh, 1953, p. 461).

Prugh described father's feeling as being confused and conflicting. He posited that father's conflicting feelings were similar to the mother's feelings regarding the
infant's care. Father's emotionally experience guilt, seeing prematurity as an insult to their masculinity because of the infant's small size and appearance. Fathers may also experience jealousy of the infant because of the mother's close relationship with the infants (Prugh, 1953, p. 463).

The correlation between perceived anxiety during the neonatal intensive care stay of their newborn and later perceptions of the child by parents was studied by Phillipp (1983). This longitudinal research not only evaluated anxiety during the intensive care period but also after discharge. Results of the study indicated that high anxiety during hospitalization did not affect later perceptions of the child. Other findings demonstrated no difference about perceptions of anxiety between mothers and fathers, more anxiety perceived by mothers of smaller babies, and less anxiety among mothers who visited and held their babies early in the hospitalization process.

Parental reaction to the birth of a preterm infant as an acute emotional crisis has been the focus of several studies.

Kaplan and Mason (1960) viewed the reaction of mothers to the birth of a premature infant as an acute reaction to trauma rather than in the context of an ongoing pathological process. Their approach reflects the crisis
theory concepts of Caplan (1960, 1965), for he defines crises as:

Time-limited periods of disequilibrium or behavioral and subjective upsets which are precipitated by an inescapable demand or burden to which the person is temporarily unable to respond adequately. During this period of tension the person grapples with the problem and develops novel resources, both by calling upon internal reserves and making use of the help of others. Those resources are then used to handle the precipitating factor and the person achieves once more a steady state (Kaplan and Mason, 1960, p. 540).

The feelings of shock and disbelief were reported by these mothers. Their reactions appeared to persist because of the brief sight of the infant before it was rushed off to the nursery. The most conspicuous memories were of the small size, "unusual color and unattractive appearance" (Kaplan & Mason, 1960, p. 541). These recollections seemed to add further intensity to the shock and disbelief of the situation.

Kaplan and Mason acknowledged that the reactions to a stressful event as the birth of a premature infant could be influenced by previously existing personality traits. They outlined four psychological tasks that the mother of a premature infant must master to establish a healthy mother-infant relationship. The first task is preparation for the possible loss of the child whose life is at risk. This anticipatory grief involves a withdrawal from the relationship previously established to the child in utero. The second task is the mother's recognition and acknowledgment of
her failure to deliver a normal baby. It is not until after the mother has accomplished the first two tasks that she is expected to resume the process of relating to her infant and recognize their special needs. The third task is that mother must resume the process, which has been interrupted, of relating to her infant. She has previously prepared herself for a loss; however, with the infant's improvement, she must now respond to the change with hope and anticipation. The fourth and final task of mother is to understand how a premature baby differs from a term infant in terms of special needs and growth patterns. She must recognize her child's limitations, and equally important, realize these needs are temporary and will yield in time to normal patterns.

Mason (1963) investigated the quality of early mother-child relationships from information gathered during interviews with mothers of premature infants during the lying-in period. Mason discovered that specific aspects of the mother's coping mechanisms were important in predicting the nature of her subsequent relationship with her child. A good outcome was predicted if mother expressed a fairly high level of anxiety, actively sought information about the condition of her infant, and showed strong maternal feelings for the infant, even in the absence of seeing or holding the child.
Affleck, Howard, and Gershman (1985) studied parental cognitive adaptation to the crisis of intensive care for their newborn. They were interested in investigating mothers' perceptions of control over the infants' recovery and control over prevention of future perinatal problems. These researchers found that many mothers believed they could influence their child's health and development. In response to inquiries about control over future perinatal events, Affleck et al. found a wide variation of response that did not indicate any common agreement.

Solnit and Stark (1961) observed a mourning process occurring in mothers who had given birth to infants who did not meet their expectations for the outcome of the pregnancy. Disappointment, guilt, denial, grief, anxiety, and depression were all feelings expressed in this mourning process. Solnit and Stark stated that an awareness of the mourning process was necessary to "provide therapeutic help to the mother and her child" (1961, p. 536). Benfield, Leib, and Reuter (1976) studied the grief responses of parents whose infant were transferred to regional care centers. Both mothers and fathers demonstrated anticipatory grief. Benfield et al. defined the identified grief as "the reaction felt before the actual loss of a love object" (1976, p. 975). Mothers displayed more grief if they had had positive feelings about
their pregnancy. Fathers displayed more grief if the delivery had been a caesarian section. The feelings the mothers and fathers expressed appeared to reflect an ambivalence between anticipatory love for the infants and anticipatory loss of the infants.

Taylor and Hall (1979) reported that the grief response occurs irrespective of separation. Also, Harper, Sia, Sokal and Sokal (1976) found no reduction of parental anxiety with more frequent visits to the neonatal intensive care units. In contrast, parents' anxiety levels rose as their number of contacts with their infants increased. Thus parents may not be emotionally available to form satisfactory bonds with their at-risk infants during the early postpartum period. It is questionable whether parents can benefit from early and extended contact during a time when they need to work through feelings of depression and sorrow (Ross, 1980).

Herzog (1979) observed over 100 couples who had preterm infants and found that they displayed a complex set of affective reactions including sadness, hopelessness, crying, irritability, thoughts of suicide, and overt anger. Unstructured clinical interviews were conducted concurrently with each set of parents on multiple occasions. The interviews focused on identifying the variables which differentiated mothers who were able to attach to their infants despite an imposed separation due to the infant's health status and
those mothers who were not able to attach to their infants. Important characteristic that were associated with problems of maternal-infant attachment was the mother's affective state and the father's role. Mothers who demonstrated a prolonged postpartum depression pattern had difficulty in feeling that the infant belonged to them. In situations of disordered maternal attachment, two elements of the fathers' role seemed to be influential: (1) the competitiveness with the mother over the care of the infant; and (2) the disengagement or complete withdrawal from the mother and infant.

Parental perception of the child can affect future psychological development. Labeled the "vulnerable child syndrome," this pathological interaction reflects a persistent disguised mourning reaction that evolves in mothers who have had an earlier life-threatening illness of the child (Green & Solnit, 1964). Parental response is frequently one of overprotection, manifested by fears that the infant might stop breathing during the night, concern with the child's weight gain and anxiety about separation from the child. The vulnerable child syndrome is not a common occurrence and is evident in a very small proportion of high-risk infants. It is important to note that parental perception of the child is far more significant than separation in the period immediately after birth.
The birth of an infant requiring care in the neonatal intensive care unit is viewed as an emotional crisis which impinges on the entire family structure. Studies have documented a higher incidence of financial stress, unemployment, divorce, and accidents in families undergoing similar crises (Binger, Albin, & Feuerstein, 1969; Harnovitch, 1964). Owens (1960) has also suggested that the conditions surrounding the premature birth of a child evokes a period of disorganization in the entire family. This period of disorganization preceded the family's efforts to renew their regular schedules and adapt to the new demands required by a premature infant.

Questions arise as to what happens after a child is discharged from the hospital. Research strongly suggests that "mothers of high-risk newborn infants receive considerable guidance in relating to their infants during hospitalization, comparatively little professional assistance is available once the baby is discharge for home" (Ross, 1980, p. 58). The attachment process is a dynamically changing operation which needs continuity and supportive counseling to assist parents in working though ambivalent or negative feelings. Counseling may be most helpful in preparing parents to interact positively with their infant.
Developmental Impact

Low birth weight infants appeared to be at particular risk for later child abuse, neglect, and failure to thrive (Fomufod, Sinkford, & Lovy, 1975; Klaus & Kennell, 1982; Klien & Stern, 1971; Schmidt and Kempe, 1979); and research has described the difficulty of parents in relating to infants in neonatal intensive care units (Duhamel, Lin, & Skelton, 1974; Prugh, 1953). Prospective studies indicate that developmental outcome is correlated to environmental variables rather than to either perinatal or perinatal complications (Barnard, 1975, 1978; Nurcombe, 1986; Wiener Rider, Oppel, & Harper, 1968). Aspects of the caretaking environment have been shown to greatly affect the long-term outcome of the infant's development.

Socio-economic status appears to influence the developmental progress of an infant requiring the services of a neonatal intensive care unit. Sameroff and Chandler (1975) reviewed studies exploring the later effect of perinatal factors and concluded that the socio-economic factor greatly influenced both prenatal and postnatal development. Bakeman and Brown's (1980) three-year data support the conclusion that pre-term infants from a disadvantaged population were more at risk for cognitive deficits than infants from middle-class populations. Their study showed that cognitive ability
was predicted by their status at birth and their mother's education level.

**Interactional Impact**

Previous studies have identified early disturbances in the interactions of premature infants and their mothers. Mothers who visited their infants in hospitals less often were more likely to demonstrate disturbances in mothering (Fanaroff, Kennell, & Klaus, 1972). If these mothers had been separated from their infants for a prolonged period, they regarded others as more competent caregivers (Leidermann, Leifer, Seashore, Barnett, & Grobstein, 1973). Mothers of premature infants displayed less face-to-face contact, less physical contact, and less smiling to their premature infant during the early weeks of their interaction (DiVitto & Goldberg, 1979; Klaus, Kennell, Plumb, & Zuehlke, 1970; Leifer, Leidermann, Barnett, & Williams, 1972). During the first four months, premature infants were less attentive in their interaction (Field, 1977) and less often active on their own (Brown & Bakeman, 1980), while mothers of premature infants were more active than mothers of full-term infants during feedings (Field, 1977) and more likely to be active in the relationship without response from the infant (Brown & Bakeman, 1980). While mothers of high-risk newborn infants receive considerable guidance in relating to their infants during hospitalization, comparatively little professional
assistance is available once the baby is discharged from the hospital. The continuing and changing nature of the attachment process indicates the importance of intervention. Health care professionals must continue to provide follow-up care and emotional support to parents of at-risk infants as a means of assuring positive mother-child relationships with optimal child development (Ross, 1980).

**Intervention Strategies.** Empirical documentation clearly indicates that children who received treatment in neonatal intensive care units are at high risk for biological, social and psychological problems in their developmental progress (Bee et al., 1982; Brazelton, 1981). Search of the literature indicates that intervention programs for low-birthweight infants have been guided by several theoretical models. These programs have five distinct aims: (1) to counterbalance neonatal sensory deprivation, (2) to prevent faulty mother-infant bonding, (3) to provide compensatory experiences during later infancy, (4) to help mother resolve the emotional crisis of premature delivery, and (5) to help parents to be more sensitive and responsive to their infant despite deficiencies in the infant's capacity to elicit care (Nurcombe, Howell, Raugh, Teti, Ruoff, & Brennan, 1984).

The first intervention program is based on the theory of neonatal sensory deprivation. The focus of treatment is extra stimulation. Intervention concentrates on providing
supplemental visual, auditory, tactile or kinesthetic stimulation rather than focusing on the mother-infant interaction. This is accomplished by means of lights, shapes, audiotapes, rocking cribs or massage. Outcome is usually measured in terms of short-term reduction of apnea or crying, and improvement in weight, activity, visual exploration and mental or motor development (Barnard, 1975; Kattwinkel, Nearman, Fanaroff, & Klaus, 1975).

Intervention programs stimulated by the faulty bonding theory point to an impressionable period for mother-infant attachment. This is disrupted if the infant remains too long in intensive care. In contrast to the extra stimulation approach, bonding programs focus on early mother-infant contact, assuming that if normal bonding is not interrupted, favorable mother-infant interaction will follow (De Chateau, 1979; Field, 1977; Kennell, Gordon, & Klaus, 1970; Klaus & Kennell, 1970; Seashore Leifer, Barnett, & Leiderman, 1973). The faulting bonding theory has much intuitive appeal; however, conclusion of empirical studies are "plagued by sampling problems, poor control and brevity of follow up" (Nurcombe, 1984, p. 321).

Compensatory experience programs are basically extensions, downward into the latter part of the first year, of preschool programs for culturally disadvantage children. It is unclear how and when the lower SES environment puts an
infant at a disadvantage, and treatment fluctuates in emphasis between affective interaction and sensory stimulation (Bromwich & Parmelee, 1979; Williams & Scarr, 1971).

Premature delivery has been viewed as a severe life stress (Caplan, 1968; Kaplan & Mason, 1960). Intervention in this area focuses on the resolution of emotional crisis. One study (Minde, Marton, Manning, & Hin-m-s, 1980) of this kind has employed short-term self-help groups with beneficial effects on maternal involvement.

Preterm infants interact differently than their full-term counterparts. It has been clearly demonstrated that many low-birthweight infants have deficiencies in the capacity to elicit and sustain social interaction (Barnard, 1987; Brazelton, 1979). This observation has stimulated two studies (Field, 1977; Nurcombe, 1984) that sought to teach mothers to interact more effectively with their babies.

In summary, maternal education is an important factor in the matrix of components involved in maternal adaptation and psychopathology. It is evident that mothers of lower educational background are more likely to report dissatisfaction in mothering, less satisfactory child-rearing attitudes and more psychological symptoms. These observations suggest that eventually there may be a possibility of identifying women who are at risk for poor adaptation and psychological disturbance. If one can draw a correlation
that these psychosocial factors lead to disturbed mother-infant interaction and poor infant outcome, then it should be possible to design an early intervention program for those mothers who may be high risk. This intervention program must have a multifaceted approach, including education, counseling/therapy, and not only provide services in the neonatal intensive care unit but followup services in the home.
The objective of the study was to examine whether counseling enhances maternal bonding between mothers and premature infants requiring neonatal intensive care services. The investigation focused on therapeutic and educational interventions during the infant's hospitalization and subsequent discharge to their home. A group of mothers having similar perinatal experiences was divided into two groups, one having contact with a therapist and the other receiving no services. This was a prospective, longitudinal study comparing these two groups on the dependent variable of maternal attachment. The independent variable of maternal characteristics, social network, social support and life stressors were analyzed for their effect on the maternal attachment process. Data were gathered from 30 mother-infant dyads at birth, one, two and a half, and four months post discharge from the hospital using interviews, questionnaires and observations. Upon conclusion of the data collection period, comparisons were made between those mothers who have received therapeutic interventions and those mothers who have not received therapeutic interventions. The subjects,
selection of subjects, research on human subjects, assessment instruments, testing procedures, educational and therapeutic procedures, timeline for subject involvement and the data analysis techniques of the study are discussed in this chapter.

**Subjects**

The experimental subjects consisted of 30 mother-infant dyads selected from the neonatal intensive care units of Arizona Health Science Center and Tucson Medical Center, Tucson, Arizona between January 15, 1987 and April 15, 1987. Both facilities were certified as regional perinatal centers or tertiary care units. The above-named Level III nurseries were fully equipped to handle all obstetric or newborn problems and had a full team of neonatologists, perinatologists, pediatric residents, pediatric interns and specially trained nursing personnel. The maternal subjects ranged in age reflecting normal biological parameters of childbearing years. A functional mastery of English was a prerequisite for participation, but English as a second language did not preclude a subject from the study.

The mother-infant dyads of the two neonatal intensive care units were from rural and urban segments of the State's population. Under guidelines set forth by the Arizona Neonatal Transport program, premature infants who were born
in rural areas of southern Arizona were transferred by ground or air travel to Tucson to expedite emergency medical care.

Research has shown that infants requiring special services are not proportionally represented in the socioeco-
nomic status of society as a whole. Mothers who prematurely give birth appear to be represented more frequently in the lower-to-middle socioeconomic levels.

Mother-infant dyads were selected due to the diagnosis of moderate prematurity. The infant's primary care physician was contacted and appraised of the study before any contact of the family occurred. If for any reason the primary care physician or infant's neonatologist assessed that the mother-infant dyad was not appropriate for the study, the family was not approached to participate.

Selection of Subjects

Thirty mother-infant dyads were selected for participation in this study on the basis of the health status of the infant. This study focused on the moderate-risk premature infant as defined by the following broad criteria:

1. 32 through 36 weeks gestational age as determined by Dubowitz scores and/or maternal dates;
2. non-ventilator assistance or minimum ventilator assistance as defined by
   (a) less than 40% oxygen, (b) ventilator rate settings of 20 breaths or less per minute;
3. infants age is three days;
4. no major congenital abnormalities as defined by
(a) significant cardiac disease, (b) genetic conditions of Trisomy 13 and 18 and Downs Syndrome.

Subjects who met the broad health criteria establishing a moderate level of prematurity, and where permission of their primary care physician and neonatologist had been granted were approached to participate in this study. A letter of introduction (Appendix G) indicated the purpose and limitations of the study. Financial incentives were provided to the subjects for participation and amounted to $10.00 per questionnaire and/or observation.

Research on Human Subjects

Guidelines regarding research with human subjects were adhered to in strict accordance of the principles listed in the Ethical Principles in the Conduct of Research with Human Participants (American Psychological Association, 1973) and in the Code of Federal Regulation (Title 45, Subtitle A, Part 46, as currently issued). Special care was taken by the researcher to: (1) avoid causing injurious psychological, physical, or social effects on subjects; (2) inform subjects of the purpose of the study except when withholding information was essential to the investigation; (3) protect the volunteer status of subjects; (4) ensure that the subject's privacy was protected, or that they remained anonymous, in the absence of specific authorization to do otherwise.
In addition to following the professional guidelines set forth by the American Psychological Association, the Human Subjects Review Boards from the University of Arizona (Appendix H), Arizona Health Science Center and Tucson Medical Center (Appendix I) have independently reviewed the proposal for research and determined the merits and safety of the study.

Assessment Instruments--Dependent Measures

This prospective, longitudinal, quasi-experimental study (Campbell & Stanley, 1963) compared two different mother-infant dyad groups on the dependent variable, postpartal maternal attachment. Mother-infant dyads were admitted into the study, and their treatment versus control group status was determined. They were then observed at home at one, two and a half, and four month intervals. These intervals were dated to the child's discharge from hospital.

The Nursing Child Assessment Feeding Scale

The Nursing Child Assessment Feeding Scale (Barnard, 1978) was used to measure maternal attachment. Postpartal maternal attachment was defined as behaviors that: (1) indicated a mother's sensitivity of cues during feeding; (2) indicated mother was providing growth fostering situations for her child socially and intellectually (cognitively) during the feeding; (3) indicated the child's response to
clear cues; (4) indicated the child was responsive to the mother during feeding; and (5) identified mother and child roles and responsibilities in the feeding interaction.

The Nursing Child Assessment Feeding Scale (NCAFS) was an observational tool of both parent and child interaction during the first year of life. It provided a reliable form of assessment of characteristics in six key areas of interaction/adaptation process between parent and child: sensitivity to cues, response to distress, social-emotional growth fostering, cognitive growth fostering, clarity of cues and responsiveness to parent.

The tool gave a total score of maternal-infant behavior. The NCAFS consisted of 76 behavioral items to observe during feeding. The rating scales are binary to assure objectivity. A low score indicates an attachment problem; a high score indicates that attachment between mother and infant is secure.

The scales have been statistically analyzed (Barnard, 1987). Tests for internal consistency were reported using Cronbach's alpha. The alpha for the total parent score was .83 and for the total child score was .73. Test-retest reliability was .75 for the total parent score and .51 for the infant scores over a 12-month period of time.

Videotapes were done on all mother-infant interactions that were scored by the NCAFS scales. Sequences of
behavior were reviewed repeatedly and in slow motion to assure assessment accuracy.

To establish validity and interrater reliability on the Nursing Child Assessment Satellite Training (NCAST) program, this researcher took part in an intensive six-day training session in Seattle, Washington. The NCAST program was developed by Kathryn Barnard from the University of Washington School of Nursing. Although this researcher was primarily interested in the Nursing Child Assessment Feeding Scale (NCAFS), the Home Observation for the Measurement of the Environment (HOME), Nursing Child Assessment Teaching Scale (NCATS), and the Nursing Child Assessment Sleep/Activity Record (NCASA) were also learned. To secure interrater reliability, ten home visits were required with other participants from the training. Reliability was established at the 85% level on the NCAFS and NCATS and 90% level of reliability on the HOME assessment tool. Interrater reliability was personally established during the second week of June, and the NCAST program certified this researcher as reliable and as an NCAST instructor effective June 22, 1987.

The NCAFS was chosen as an instrument to measure the dependent variable because of its repeated use in parent-infant studies. The tool is considered state of the art for measuring infant-mother attachment under the age of one.
Independent Measures

Four independent variables were examined to determine the effect on the attachment process: life stresses; maternal self-concept; interrelationships between family members; and social support network.

Life Experiences Survey

The Life Experiences Survey (LES; Sarason, 1978) is a 57-item self-report measure that allows respondents to indicate events they have experienced during the past year. Items were chosen to represent life changes frequently experienced by individuals in the general population. The format of the LES calls for subjects to rate separately the desirability and impact of events they have experienced. Thus, respondents are asked to indicate those events experienced during the past year as well as (a) whether they viewed the event as being positive or negative, and (b) the perceived impact of the particular event on their life at the time of occurrence. Ratings are on a 7-point scale ranging from extremely negative (-3) to extremely positive (+3). Pearson product-moment correlations were computed to determine the relationship between scores obtained at two testings. The test-retest correlations for the positive change score were .19 and .53 (p < .001). The reliability coefficients for the negative change score were .56 (p < .001) and .88 (p < .001). The coefficients for the total
change score were .63 (p < .001) and .64 (p < .001). Sarason suggested using the negative events score only.

The LES has been used frequently during the last half decade. Currently it is being used as an instrument in a study evaluating the impact of a handicapped child on the maternal attachment process (Capuzzi, 1986). Administration of the scale takes approximately ten to twenty minutes and has been appropriate for individuals who have completed the ninth grade.

Tennessee Self Concept Scale

The Tennessee Self Concept Scale (TSCS) consists of 100 self-description items, of which 90 assess the self-concept and 10 assess self criticism. For each item, the respondent chooses one of five response options labeled from "Completely False" to "Completely True." Items for the scale were written according to a type of two-dimensional facet design involving the following aspects of the self: Identity, Self-satisfaction, Behavior, Physical-self, Moral-ethical self, Personal self, Family self, and Social self. Each of the above categories are divided into statements of self-identity, self-acceptance and behavior. The scale also includes ten items from the MMPI lie scale. The total positive score reflects the overall self-esteem measure and is the score of choice to use. There are no internal consistency studies reported. Fitts (1965) reported test-
retest reliability of .92 for a two-week period for the total positive score. Convergent validity was established by correlating the Tennessee Self Concept Scale with the Butler-Haigh Q-sort (r = .61) and the Taylor Manifest Anxiety Scale (r = .70).

This measurement of self esteem takes approximately ten to twenty minutes to complete. It has been used extensively by a variety of researchers testing diverse subject populations.

Family Function Index.

The Family Function Index (FFI; Feetham & Humenick, 1982) is a twenty-three assessment questionnaire that investigates the following areas of family functioning: Household tasks; Child care; Sexual and marital relations; Interaction with family and friend; Interaction with children; Community involvement; and Sources of emotional support. The questions are answered on a seven-point likert scale.

The format for the FFI survey is based on a technique by Porter (1962) in which the respondent is asked to rate, "what is" and "what should be." The discrepancy between these two ratings, together with the degree of importance the respondent places on each item, contributes to the assessment of family functioning.

Alpha coefficients measuring inter-item reliability of the total scores of each scale were calculated for the
Family Function Index. The alpha for the total score of the "how much is there" items was .66, and was .75 for the "how much should there be" items. The alpha for the discrepancy between "how much is there" and "how much there should be" (a-b) was .81. The alpha for the "how important is this" items was .84. Test-retest reliability was measured, and a coefficient of .85 was achieved. Construct validity was investigated through factor analysis to determine if there was support for the three areas of family functioning: (1) relationships between the family and broader social units; (2) the relationships between the family and subsystems; and (3) the relationships between the family and the individual. These three areas of family functioning were cited by McIntyre (1966) and serve as a foundation of theory from which the Feetham Family Function Index was developed. A varimax rotation was used to analyze the data, and the results were supportive of the McIntyre's categorization of the three areas of family functioning.

The FFI survey can be completed within ten minutes. Porter (1962) reported that persons with less than a high school education may have some difficulty with the format. The survey was first developed to measure family functioning of families with a child with myelodysplasia; however, this survey has also been used under many other conditions, including the birth of a normal child.
The Norbeck Social Support Questionnaire (NSSQ; Norbeck, Lindsey and Carrieri, 1981, 1983) is a self-report questionnaire designed to measure multiple dimensions of social support. Based on Kahn's (1979) definition of social support, the functional components measured are affect, affirmation, and aid. Kahn's concept of convoy (the vehicle through which social support is provided) is measured through three network properties: number in the network, duration of relationships, and frequency of contact with network members. The tool also measures recent losses and the perceived effect of the loss. The NSSQ does not measure satisfaction with the support, conflict, reciprocity, nor density of the social support system. Likewise, the NSSQ does not ask what specific supports have actually been received or given.

Norbeck et al. (1981, 1983) have reported test-retest reliability of .85 and .92 for the functional and structural variables, respectively, at one month and .76 and .73 for the functional and structural variables, respectively, at seven months. The internal consistency was .89 or higher between the two items for each construct. Concurrent validity was moderately high when subject's responses on the NSSQ were compared to the responses on the Cohen and Lazarus Social Support Questionnaire (.31 and .53).
The NSSQ was selected as an instrument because it has been used extensively in hospital or clinical settings. It has also been chosen as a major instrument in a recent study (Capuzzi, 1986) investigating the maternal attachment process with children who are handicapped.

Demographic Variables

Select demographic data were collected on the mother-infant dyad. Literature review of the maternal infant attachment process indicated that these variables can have a significant effect on treatment outcome. The demographic data included mother's age, educational level, marital composition, ordinal position in family of origin and number of offspring. Infant characteristics included gestational age, weight, length of stay birth location and sex of the child. These data were gathered either from information on the maternal chart or by a standard interview schedule by the researcher.

Testing Procedures

Once the selection of mother-infant dyads was completed and their control versus treatment status determined, the researcher collected demographic data from either the mother's medical chart (if she was currently a patient in the hospital), or by a structured questionnaire. To measure the host of predictor variables, a battery of test instruments
was administered. The instruments included: Sarason's Life Experience Survey; Tennessee Self-Concept Scale; Family Functioning Index; and Norbeck Social Support Questionnaire. These measures were repeated at the end of the study to indicate any change in variable measurement.

As a measurement of the dependent variable, the NCAFS was used at 1 month, 2-1/2 months, and at 4 month intervals after the infant had been discharged from the hospital. The one month appointment was arranged to coincide with the infant's corrected, gestational age. The NCAFS required that observations of an infant be corrected for gestational age. For example, if the infant was born three weeks premature, as indicated by the gestational data on the medical chart, the interview would be arranged for the seventh week. All attempts were made to verify the gestational dates of the infant by utilizing Dubowitz scores and/or maternal dates.

**Educational and Therapeutic Procedures**

A multi-faceted approach to the care of the mother and her premature infant was implemented. Following the guidelines for program development by John Mickelson (1981), four main components were followed: curriculum, instruction, milieu, and evaluation.

The researcher provided all mother-infant contact for the initial visit of the study. All mothers who were designated as treatment received therapy and subsequent follow-up
from the researcher. Her training included a masters degree in counseling and six years of direct patient care in an acute hospital facility. Fourteen months of this employment included counseling and social service assignments in the neonatal intensive care nursery at Tucson Medical Center. The researcher followed mothers in the non-treatment group, although the researcher had assistance in videotaping four non-treatment families over a two and a half month period of time.

Education

Information was provided to mothers by the researcher regarding the infant's development and ability to respond to external stimuli. The sessions were used to demonstrate the infant's uniqueness and potential for self regulation and interaction. The sessions discussed the infant's homeostatic system, which included: (1) respiration; (2) skin circulation; (3) automatically mediate movement; (4) facial movement; and (5) visceral activity. Motor systems were explained and included: (1) posturing; (2) tone; and (3) movement. Interaction strategies between mother and infant with regard to the infant's premature neurological status was also suggested (Brazelton, 1979). Parents were encouraged to actively participate in caregiving activities.

The neonatal intensive care unit can be overwhelming to a parent of a premature infant. The therapist also
focused on skill development to promote effective parent–nursery staff communication. Written information was provided to describe and define procedures and medical terminology common in a neonatal intensive care unit.

Psychological Interventions

Psychological factors were paramount in determining the mother's ability to relate to her pre-term infant. From the mother's perspective, a number of problems encumbered their caregiving activities of a preterm baby. The infant was likely to be physically aversive in size and skin color. She/he was barricaded behind an array of sophisticated technical devices and appeared to be in "better hands" with the professionals then with mother. Counseling focused on identifying and alleviating feelings of guilt, doubt and lack of self esteem.

Counseling was seen as a learning process that provided a bridge to solving the tasks of life. Counseling involved communications between the patient and therapist for the purpose of modifying concepts, convictions and attitudes.

The counseling process was divided into four parts: (1) relationship; (2) investigation of dynamics and motives; (3) insight; and (4) reorientation (Adler, 1929; Dinkmeyer, Pew, & Dinkmeyer, 1979). During the relationship phase, the emphasis was upon alignment of the goals of the therapist and the patient, and was based upon mutual trust and respect.
The therapist then explored the current situation and investigated the mother's approach to responsibilities and social relationships. The therapist provided insight into understanding of individual goals and mistaken assumptions that the mother held about life.

After the therapist identified the psychological movement of the mother's hidden reason, the therapist facilitated the mother in becoming aware of why she chose to function in a particular manner. The psychological interpretation emphasized individual goals and purposes. The therapist assisted the mother in identifying aspects of change.

During the reorientation phase, the therapist and the mother assessed the situation. Alternatives in attitude and behavior were sought. The mother became aware of the behavior that was causing the problem(s), and with the therapist's assistance, developed the course of change.

Research Design

The research study consisted of a field experiment assessing the maternal attachment process outcome of the application of a multi-facet treatment program. Subjects selected for project participation were assigned either to the experimental group or the control group via a modified randomized block procedure. These equated groups were measured by the dependent variables at 1 month, 2-1/2 months, and four months of infant's corrected gestational age.
The experimental group received at least three counseling sessions (approximately 60 minutes each) of a comprehensive multi-faceted nature while the infant was hospitalized. After the infant was discharged from the hospital, the therapist contacted the mother (either by phone or by person) at three days, one week, and one month intervals. The treatment control group received the normal services provided by the neonatal intensive care nursing and social service personnel.

**Timeline of Study**

The timeline for the maternal attachment study is designated as follows:

**Step 1**: Neonate is admitted to the neonatal intensive care unit at Tucson Medical Center or Arizona Health Science Center.

**Step 2**: Infant is assessed on dimensions of moderate prematurity, minimum ventilator assistance, no congenital anomalies and general health status.

**Step 3**: The primary physician for the infant is contacted for permission to approach patient's mother.

**Step 4**: Neonatologist is contacted to assess appropriateness of infant's inclusion into the study.

**Step 5**: If both the primary physician and neonatologist agree on family inclusion, mother is contacted and given letter of introduction.
Step 6: Mother agrees or declines participation in the study. She is given the questionnaire and asked to return the questionnaire as soon as possible.

Step 7: When questionnaire is received by researcher, a flip of the coin determines treatment versus control status. Mother is informed at that time of her status in the study.

Step 8: Treatment mothers received three counseling sessions during the infant's hospitalization and follow-up contact at three days, seven days and one month intervals after discharge. Individual needs were assessed, and if additional contact was warranted, therapy was provided on an as-needed basis.

Step 9: All mother-infant dyads were observed in their home at one month, two and a half months, and four months post discharge. The NCAFS assessed maternal-child interactions. Mothers were also asked to complete the identical questionnaire that was issued at the beginning of the study.

Analysis of Data

An analyses of the maternal characteristics, paternal characteristics, infant description and family profile for the total group was reported in the form of frequency distributions, means and standard deviation scores. Next, t-tests
were employed to determine if there were any statistical differences between the two groups on the variables. Results from Test A were compared with results from Test B to determine treatment effect.

Parametric techniques in the form of t-tests and intercorrelation comparisons were conducted to determine the status of the four hypotheses of the study.

A multiple regression analysis was used to investigate the relationship between the dependent measure of maternal attachment and the predictor variables of self esteem, life events, family functioning, and social network. An intercorrelation matrix was computed with all variables.

A commonality analysis (Kerlinger & Pedhazur, 1973) was performed on the data to determine the unique contribution of each group of variables. This was done by calculating the contribution of each group of predictor variables to the dependent variable of maternal attachment. Maternal attachment was further divided into the six scales of sensitivity to cues, response to distress, socio-emotional growth fostering skills, cognitive development, infant's clarity of cues, and infant's responsiveness.
CHAPTER 4

RESULTS

The purpose of this study was to describe the phenomenon of maternal attachment as it specifically relates to moderate premature delivery. The study was an exploratory effort to investigate the impact of educational, counseling and therapeutic interventions on mothers who delivered premature infants. Information was gathered with a demographic profile of the subjects, standard questionnaires in the hospital and home, and an observational tool in the home. The findings which emerged from the methods and procedures described in Chapter 3 are presented in this chapter. To enrich the meaningfulness of interpretation and inference from this data, there are three major sections in this chapter: descriptive results, analyses of the study hypotheses, and analyses of the predictor variables of maternal attachment. First, initial analyses were made of all maternal characteristics, paternal characteristics, infant descriptions and family profile for the total group and between Group I (Control) and Group II (Treatment) in the form of frequency distributions, means and standard deviation scores. Second, t-tests were employed to determine if there were any
significant differences between the two groups on the scores of several variables. Third, parametric techniques in the form of t-tests and correlations were employed with the data in order to answer the hypotheses. The predictor variables of maternal attachment were computed by stepwise multiple regression techniques.

The significance level for the study was set at the .05 level, although results approaching that level (.05 to .10) were also discussed as a trend. A note of caution in data interpretation must be advanced due to the number of variables that were compared between the two groups. Caution must also be extended to instrument interpretation because of the small number of subjects in the two groups and the attrition factor of Group I. There is the possibility that some variables that were significantly different at the .05 level were the result of chance rather than treatment effect.

**Descriptive Results**

**Maternal Characteristics**

The variables of maternal age, educational level, marital status, ordinal position within their family of origin, number of brothers and sisters, self concept, life events, social support, and family function were analyzed to give a description of the maternal characteristics.

**Demographics.** A total of 30 subjects was admitted into the study: 15 mothers who received no treatment (Group
I) and 15 mothers who received educational and therapeutic interventions (Group II). The age of the mothers ranged from 15 to 38 years, with an average age of 25.63 years. The maternal age of Group I ranged from 15 to 35 years of age, with a mean of 25.67 years, and the Group II maternal age ranged from 17 to 38 years, with a mean age of 25.60 years. There was no significant difference between the two groups (t = 0.03, 28df, p = .978). The educational level for the sample ranged from 9 to 20 years of schooling, with a mean of 13.4 years. The mothers in Group I reported a mean of 13.27 years, with a range of 9 to 20 years, and the mothers in Group II reported a mean of 13.53 years, with a range of 10 to 20 years of educational training. Table 1 gives the comparative demographic data for maternal characteristics of age and education and indicates the mean value for Group I and Group II.

Seventeen mothers (56.7%) in the total sample were married, twelve (40%) were never married, and one (3.3%) was separated and subsequently divorced. Group I mothers reported 53.4% were married, and 60% of the mothers in Group II indicated they were married at the time of the infant's birth. Reviewing marital histories, 15 mothers (50%) reported being unmarried five months prior to the birth of their infant. They were equally distributed between Group I and Group II. The ethnicity of the mothers was recorded.
Table 1. Maternal characteristics: Mean demographic data on age and education.

<table>
<thead>
<tr>
<th></th>
<th>Total (N = 30)</th>
<th>Group I (N = 15)</th>
<th>Group II (N = 15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>25.63</td>
<td>25.67</td>
<td>25.60</td>
</tr>
<tr>
<td>Education</td>
<td>13.40</td>
<td>13.27</td>
<td>13.53</td>
</tr>
</tbody>
</table>

Table 2. Maternal characteristics: Demographic data on ethnicity and marital status.

<table>
<thead>
<tr>
<th></th>
<th>Total (N = 30)</th>
<th>Group I (N = 15)</th>
<th>Group II (N = 15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>20 66.7</td>
<td>9 60.0</td>
<td>11 73.4</td>
</tr>
<tr>
<td>Black</td>
<td>5 16.7</td>
<td>2 13.2</td>
<td>3 20.0</td>
</tr>
<tr>
<td>Hispanic</td>
<td>5 16.7</td>
<td>4 26.8</td>
<td>1 6.6</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>14 43.3</td>
<td>7 43.3</td>
<td>6 40.0</td>
</tr>
<tr>
<td>Married</td>
<td>16 56.7</td>
<td>8 56.7</td>
<td>9 60.0</td>
</tr>
</tbody>
</table>
The majority of the mothers was Caucasian (66.7%). There were five Black (16.7%) and five Hispanic (16.7%) mothers in the total sample. Maternal characteristics on ethnicity and marital status are reported in Table 2.

Twenty-eight mothers reported their ordinal position in their family of origin. The categories that were established were oldest, only, middle, youngest, second of two, oldest female, and youngest only. Table 3 reflects the frequencies of the total group on ordinal position within their family of origin. It is interesting to note that 13 mothers (46.4%) reported that they were middle children in their family of origin. The next highest frequencies were five mothers (17.9%) who reported oldest positions and five mothers (17.9%) who reported holding the youngest position in their families. Mothers reported that the number of siblings in their family of origin ranged from one sibling to twelve siblings. The mothers in the total sample averaged 3.90 siblings per family (SD = 3.06). Male and female siblings were equally distributed between Group I and Group II families of origin.

**Self-Concept.** The mother's self concept was measured using the Tennessee Self Concept Scale at the time of the infant's birth and then again at four months post discharge of the infant from the hospital. Table 4 reflects the comparisons between Test A and Test B and between Group I and
Table 3. Maternal characteristics of ordinal position (N = 28).

<table>
<thead>
<tr>
<th>Ordinal Position</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oldest</td>
<td>5</td>
<td>17.9</td>
</tr>
<tr>
<td>Only</td>
<td>1</td>
<td>3.6</td>
</tr>
<tr>
<td>Middle</td>
<td>13</td>
<td>46.4</td>
</tr>
<tr>
<td>Youngest</td>
<td>5</td>
<td>17.9</td>
</tr>
<tr>
<td>Second of 2</td>
<td>1</td>
<td>3.6</td>
</tr>
<tr>
<td>Oldest female</td>
<td>3</td>
<td>10.7</td>
</tr>
<tr>
<td>Youngest only</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
Table 4. Tennessee Self Concept Scale: Means, standard deviations, and t-test results.

<table>
<thead>
<tr>
<th>Test</th>
<th>Total (N = 30)</th>
<th>Group I (N = 15)</th>
<th>Group II (N = 15)</th>
<th>t-test Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>387.20</td>
<td>400.44</td>
<td>382.87</td>
<td>0.70</td>
</tr>
<tr>
<td>SD</td>
<td>33.40</td>
<td>34.47</td>
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* p = .10

**p = .05
Group II. The TSCS was administered to 30 subjects: 15 mothers in Group I and 15 mothers in Group II during the infant's hospitalization (Test A). The total positive self concept scores ranged from 332 to 455, with a mean of 387.20 (SD = 33.40) for the total sample. Group I had a mean score of 400.44 (SD = 34.47) for the first instrument application, and Group II had a mean score of 382.87 (SD = 33.33). There were no significant differences between Group I and Group II at the first measurement period (t = 0.70, 28df, p =.487).

At the four-month interval after discharge, the TSCS was completed by 24 subjects: 9 mothers in Group I and 15 mothers in Group II (Test B). The total positive self concept scores ranged from 332 to 458, with an average mean of 385.79 (SD = 33.56) for the total group. Group I recorded a mean score of 398.44 (SD = 44.42), and Group II recorded a mean score of 378.20 (SD = 23.63). No significance difference was noted between the two groups on the total self concept scores (t = 1.47, 22df, p = .157). When a comparison was conducted between the first instrument application and the second instrument application, there were no significant differences in the variable self concept scores (t = .85, 23df, p =.41). There was a very significant correlation between pre and post test on the total TSCS (r = .80, 23df, p = .0001).
A comparison was made within each group by reviewing the subscales of physical-self, moral-ethical self, personal self, family self, social self, and self criticism of the Tennessee Self Concept Scale. Table 5 provides the means, standard deviations and t-test values between the total score and the six subscales on Test A and Test B. Group I showed no significant change on the six subscales scoring the variable of self concept. Group II recorded a significant change between the first instrument application of physical self and the four-month post discharge measurement. The mean of the first subscale for physical self was 65.27 (SD = 8.41), and the second subscale mean was 60.73 (SD = 8.79). This decrease in physical self subscale was significantly different from the first instrument application (t = 2.10, 14df, p = .05) for Group II (Treatment).

Life Events. Sarason's Life Experiences Survey (LES) was given during the infant's hospitalization and at four months post discharge of the infant from the hospital. The data were used to determine if there were significant differences in the amount of stress experienced by the two groups.

The LES was administered to 30 subjects during the infant's hospitalization: 15 mothers in Group I, and 15 mothers in Group II. Group I recorded a mean score of 391.53 (SD = 34.05), and Group II reported a mean score of 382.87
Table 5. Tennessee Self Concept Subscales: Means, standard deviations, and t-test results.

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<tr>
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<th>Total (N = 30)</th>
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* p = .10

**p = .05
The difference on the Sarason's Life Experiences Survey between Group I and Group II was not significant ($t = .70, 28\text{df}, p = .49$).

The LES was administered to 23 subjects four months post discharge of the infant from the hospital. Nine mothers were in Group I, and 15 mothers were in Group II. The mean score for Group I was $398.44$ ($SD = 44.43$), and for Group II the mean score was $378.20$ ($SD = 23.62$). The separate variance estimate was not significantly different for the two groups ($t = 1.26, 11\text{df}, p = .23$). Table 6 compares the statistical data between Group I and Group II, Test A and Test B, between the subscales of Sarason's Life Experiences Survey. Statistical analysis for the total positive score for Group I was $18.42$ ($SD = 9.64$) and Group II was $21.33$ ($SD = 13.47$). There was not a significant difference between Group I and Group II on the total positive score ($t = -.99, 23\text{df}, p = .334$). Additionally, the total negative score for Group I, ($M = -15.95, SD = 23.61$) and Group II ($M = -14.33, SD = 18.51$) was not significant ($t = -.28, 23\text{df}, p = .784$).

Social Support. The Norbeck Social Support Questionnaire (NSSQ) was given to the mother during the infant's hospitalization and at four months post discharge from the hospital. Table 7 reflects the means, standard deviations and $t$-test results for the NSSQ. The data were used to determine if there were any significant differences in the

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<th>Total (N = 30)</th>
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<th>Group II (N = 15)</th>
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<th>Group II (N = 15)</th>
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Table 6--Continued

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* p = .10

**p = .05
Table 7. Norbeck Social Support Questionnaire: Means, standard deviations, and t-test results.

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* p = .10
**p = .05
social network between the two groups and whether the social
network changed over time.

The NSSQ was administered to 30 subjects during the
infant's hospitalization: 15 mothers in Group I, and 15
mothers in Group II. The mean score for total function,
which included affect, affirmation and aid, was 3.86 (SD =
1.02). Group I reported a mean of 4.00 (SD = .714), and
Group II reported a mean of 3.74 (SD = 1.24) for total
functional support. There was not a statistical difference
between the two groups (t = .70, 28df, p = .489).

Subscales on the NSSQ were investigated to determine
variance among the groups. The total number listed in the
subjects support system was 12.63 for the sample. Group I
reported a mean of 12.67 (SD = 5.19), and Group II reported a
mean of 12.60 (SD = 6.35) for individuals listed in their
support system. The reported range within the total network
variable was 3 to 22 people. The average network was
composed of the partner, five relatives, three friends, and
three other persons. There were no significant differences
in network size (t = .03, 28df, p = .975) or of the mean
number of persons listed by source. The subscales of the
NSSQ were statistically analyzed to determine significant
differences between Group I and Group II. Affect, affirma-
tion, aid, total function, frequency contact, duration and
loss were all computed to determine differences between Group
I and Group II. The nine subscales were not significantly different between the Control and Treatment group.

Four months after the infants were discharged from the hospital, the NSSQ was administered again. Twenty-four mothers were tested, nine in Group I and fifteen in Group II. The mean score for total function of Test B was 3.90 (SD = .73). Group I reported a mean of 3.87 (SD = .79), and Group II reported a mean of 3.92 (SD = .74). There were no significant differences between the Control and Treatment group (t = -.16, 23df, p = .867).

The NSSQ contained eight subscales measuring the following variables: number in the list, affect, affirmation, aid, total function, frequency of contact, duration, and loss. Comparisons were made contrasting the eight subscales between Group I and Group II. The mean score for the total number on the list for Test B was 11.13 (SD = 6.10). Group I reported a mean score of 12.67 (SD = 6.12), and Group II had a mean score of 10.20 (SD = 6.10). There were no significant differences between Group I and Group II on Test B (t = .96, 22df, p = .348). Mothers reported a range of 3 to 19 people on their list. The average network listed a partner, five family members, three friends, and two other persons. Group II network size decreased from Test A to Test B; however, results were not statistically significant (t = 1.59, 14df, p = .134). There were no significant
differences between Group I and Group II on the test applications. Comparisons were also made between Test A and Test B within the group. The subscale of frequency of contact showed a statistical trend between Test A and Test B of Group II. The frequency of contact mean of 12.78 (SD = 6.07) was reported for Test A, and the frequency of contact mean of 9.71 (SD = 6.02) was reported for Test B. A statistical trend was noted in a decreased frequency of contact for Group I between test applications (t = -.29, 13df, p = .093).

There were no other subscales of the NSSQ that were significantly different within the group for Test A and Test B instrument application.

**Family Functioning.** A mother's perception of her relationship between family and individual (Factor I), family and subsystem (Factor II), and family and broader social unit (Factor III) were compared using the Family Function Index (FFI). Table 8 presents the factorial analysis of the discrepancy scores on the FFI and indicates the relationship between the questions on the survey and the factor of highest association. Table 9 statistically describes the mean, standard deviation and t-test results of Test A and Test B of the FFI.

Comparisons were made to determine differences between Group I and Group II and between Test A and Test B. The mean for the total score of Test A was 3.43 (SD = 9.83).
Table 8. Factor analysis of discrepancy scores on Feetham Family Function Survey.*

<table>
<thead>
<tr>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfaction with marriage (26)**</td>
<td>Emotional support from friends and relatives (21, 22)</td>
<td>Time you are ill (17)</td>
</tr>
<tr>
<td>Discussion of concerns and problems with spouse (4)</td>
<td>Talk with friends and relatives (1, 2)</td>
<td>Time spouse misses work (20)</td>
</tr>
<tr>
<td>Emotional support from spouse (23)</td>
<td>Help from relatives (8)</td>
<td>Problem with children (12)</td>
</tr>
<tr>
<td>Time spent with spouse (3)</td>
<td>Help from friends (10)</td>
<td>Time other children miss school (15)</td>
</tr>
<tr>
<td>Satisfaction with sexual relations (27)</td>
<td>Time with neighbors (5)</td>
<td></td>
</tr>
<tr>
<td>Disagreements with spouse (16)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time with children (13)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Help from spouse (7)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Factor 1 = Relationship between family and individual
Factor 2 = Relationship between family and subsystem
Factor 3 = Relationship between family and broader social units

* Items not loading highly on any factor:
1. Time in leisure recreational activities
2. Time with health professionals
3. Time missing housework

** Number of the question on survey

<table>
<thead>
<tr>
<th>Test</th>
<th>Total (N = 30)</th>
<th>Group I (N = 15)</th>
<th>Group II (N = 15)</th>
<th>t-test Result</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Mean</td>
<td>Mean</td>
<td></td>
</tr>
<tr>
<td>Factor I</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>4.97</td>
<td>4.53</td>
<td>5.40</td>
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</tr>
<tr>
<td>SD</td>
<td>7.32</td>
<td>5.97</td>
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</tr>
<tr>
<td>Factor II</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>1.83</td>
<td>2.20</td>
<td>1.47</td>
<td>0.47</td>
</tr>
<tr>
<td>SD</td>
<td>4.19</td>
<td>3.12</td>
<td>5.13</td>
<td></td>
</tr>
<tr>
<td>Factor III</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>-2.13</td>
<td>-2.40</td>
<td>-1.87</td>
<td>-0.46</td>
</tr>
<tr>
<td>SD</td>
<td>3.15</td>
<td>3.89</td>
<td>2.29</td>
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</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>3.43</td>
<td>2.47</td>
<td>4.40</td>
<td>-0.53</td>
</tr>
<tr>
<td>SD</td>
<td>9.83</td>
<td>9.37</td>
<td>10.50</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test B</th>
<th>Total (N = 24)</th>
<th>Group I (N = 9)</th>
<th>Group II (N = 15)</th>
<th>t-test Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor I</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>4.71</td>
<td>5.33</td>
<td>4.33</td>
<td>0.60</td>
</tr>
<tr>
<td>SD</td>
<td>3.74</td>
<td>4.24</td>
<td>3.50</td>
<td></td>
</tr>
<tr>
<td>Factor II</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>2.92</td>
<td>1.67</td>
<td>3.67</td>
<td>-1.02</td>
</tr>
<tr>
<td>SD</td>
<td>4.60</td>
<td>4.72</td>
<td>4.51</td>
<td></td>
</tr>
</tbody>
</table>
Table 9--Continued

<table>
<thead>
<tr>
<th>Test B</th>
<th>Total (N = 24)</th>
<th>Group I (N = 9)</th>
<th>Group II (N = 15)</th>
<th>t-test Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor III</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>-1.42</td>
<td>-.67</td>
<td>-1.87</td>
<td>1.48</td>
</tr>
<tr>
<td>SD</td>
<td>2.12</td>
<td>1.66</td>
<td>2.29</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>5.38</td>
<td>5.00</td>
<td>5.60</td>
<td>-0.15</td>
</tr>
<tr>
<td>SD</td>
<td>9.23</td>
<td>10.28</td>
<td>8.91</td>
<td></td>
</tr>
</tbody>
</table>

* p = .10

**p = .05
Group I reported a total mean of 2.47 (SD = 9.37), and Group II reported a mean of 4.40 (SD = 10.40). Test A did not show a significant difference between Group I and Group II (t = -0.53, 23df, p = .60). Test B was conducted four months after the infant was discharged from the hospital. The total mean for Test B was 5.38 (SD = 9.23). Group I reported a mean of 5.00 (SD = 10.28), and Group II reported a mean of 5.60 (SD = 8.91). The difference between Group I and Group II in Test B was not significant (t = -0.15, 22df, p = .881).

Test A was compared with Test B to determine the significance of the relationship of pre and post tests. The mean variable for Test A was 2.83 (SD = 10.47), and for Test B the mean was 5.36 (SD = 9.23). A t-test regarding the relationship indicated that there were no statistical significance between the two groups (t = -0.81, 23df, p = .425). Correlation factors were also computed and indicated a very low correlation between Test A and Test B (r = -0.22, p = .403). Further statistical analysis focused on the differences between Factor I, Factor II and Factor III. There were no significance statistical results reported at the factor level.

Paternal Characteristics

Twenty-seven fathers in the total sample were recorded on the infant's birth record. The age of the fathers ranged from 17 to 43 years, with an average age of 28.7
years. The mean age of the fathers in Group I was 29.58 years and for Group II was 27.67 years. Group II fathers were slightly younger than Group I fathers. The educational level for the sample ranged from 10 to 20 years, with a mean of 14.2 years. The mean educational level of the fathers in Group I was 15.25 years, and in Group II was 13.27 years of formal schooling. Group I was contrasted to Group II on father's educational level and found a significant trend towards higher education in Group I (Control) at the .10 level ($t = 2.02, 25\text{df}, p = .055$). Table 10 contrasts the difference between Group I and Group II on paternal characteristics.

Infant Descriptions

The 35 infants in the study were all diagnosed with moderate prematurity. Their gestational age ranged from 32 to 36 weeks, with an average age of 33.5 weeks. There were 18 infants in Group I and 17 infants in Group II. The infants varied in birth weight between 1530 grams and 3175 grams, with the mean average of 2049 grams. Group I and Group II did not differ significantly regarding gestational age ($t = .28, 33\text{df}, p = .781$) and total birth weight ($t = -1.01, 33\text{df}, p = .323$). All infants required hospitalization that ranged from 5 to 40 days length of stay (LOS). The mean length of stay was 18.9 days for the total sample. Group I recorded a mean LOS of 20.2 days, and Group II recorded a
Table 10. Paternal characteristics: Mean demographic data on age and education.

<table>
<thead>
<tr>
<th></th>
<th>Total (N = 27)</th>
<th>Group I (N = 13)</th>
<th>Group II (N = 14)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>28.70</td>
<td>29.58</td>
<td>27.67</td>
</tr>
<tr>
<td>Education</td>
<td>14.20</td>
<td>15.25</td>
<td>13.27</td>
</tr>
</tbody>
</table>

Table 11. Infant characteristics: Mean demographic data on age, weight and LOS.

<table>
<thead>
<tr>
<th></th>
<th>Total (N = 30)</th>
<th>Group I (N = 18)</th>
<th>Group II (N = 17)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gestational age</td>
<td>33.5</td>
<td>33.6</td>
<td>33.4</td>
</tr>
<tr>
<td>Grams</td>
<td>2049</td>
<td>1983</td>
<td>2115</td>
</tr>
<tr>
<td>LOS</td>
<td>18.9</td>
<td>20.2</td>
<td>17.53</td>
</tr>
</tbody>
</table>
mean of 17.53 days for LOS. Infants in Group I had slightly longer days of hospitalization; however, the data was not statistically significant between the two groups (t = .76, 33df, p = .455). Table 11 provides comparative data on infant characteristics of gestational age, weight and LOS.

Twenty-five occurrences of birthing (83.3%) were single deliveries, and five occurrences (16.7%) were multiple births of twins. Twenty-four birth occurrences (80%) were vaginal, and six birth occurrences (20%) were cesarean section deliveries. The location of delivery was recorded; 20 birth occurrences (66.7%) were delivered at Tucson Medical Center, and ten birth occurrences (33.3%) were located at Arizona Health Science Center. Twenty-one mothers (70%) reported private insurance, and nine mothers (30%) reported that they had no insurance coverage. A summarization of the infant characteristics of birth, hospital location and insurance between Group I and Group II is found in Table 12.

Family Profile

**Structure.** Fifteen mothers (50%) reported that the delivery of the infant was their first viable child. Of that group, one mother reported a previous delivery of a 25-week infant who had died shortly after birth. The 15 (50%) reporting additional children in the family unit ranged between 1 and 4 children, with a mean average of 1.26 children.
Table 12. Infant characteristics: Demographic data on birth, location and insurance.

<table>
<thead>
<tr>
<th></th>
<th>Total (N = 30)</th>
<th>Group I (N = 15)</th>
<th>Group II (N = 15)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freq.</td>
<td>%</td>
<td>Freq.</td>
</tr>
<tr>
<td><strong>Birth</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>25</td>
<td>83.3</td>
<td>12</td>
</tr>
<tr>
<td>Twin</td>
<td>5</td>
<td>16.7</td>
<td>3</td>
</tr>
<tr>
<td><strong>Delivery</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vaginal</td>
<td>24</td>
<td>80.0</td>
<td>12</td>
</tr>
<tr>
<td>Caesarian</td>
<td>6</td>
<td>20.0</td>
<td>3</td>
</tr>
<tr>
<td><strong>Location</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TMC</td>
<td>20</td>
<td>66.7</td>
<td>9</td>
</tr>
<tr>
<td>UMC</td>
<td>10</td>
<td>33.3</td>
<td>6</td>
</tr>
<tr>
<td><strong>Insurance</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td>21</td>
<td>70.0</td>
<td>10</td>
</tr>
<tr>
<td>None</td>
<td>9</td>
<td>30.0</td>
<td>5</td>
</tr>
</tbody>
</table>
Income. The mean family income for the total group was approximately $23,000. Table 13 illustrates the income levels of the study and reports the frequencies and percents of representation for the total sample. Six mothers had incomes of less than $4,999.00 annually; one mother had an income of more than $55,000 per year.

Twenty-five mothers were from the metropolitan Tucson area. Three mothers were from Sierra Vista, one mother was from Arizona City and one mother was from Wilcox, Arizona. Transitory patterns of the total sample group were evaluated. Twenty mothers (66.6%) reported moving during the six months of the study. Five mothers moved outside of their communities, four mothers moved outside the state. Of the five subjects who did not complete the study, four moved without a forwarding address. No additional information could be obtained to assist in the location of these subjects, and they were eliminated from the study.

In summary, the descriptive results indicate that there were no significant differences between the mothers who were in the Group I (Control) and those mothers who were in Group II (Treatment) in terms of the mother's age, educational level, marital status, ordinal position within their family of origin, number of brothers and sisters, self concept, life events, social network, and family function. There were no significant differences in the background of
Table 13. Family profile: Income level (N = 28).

<table>
<thead>
<tr>
<th>Income</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4,999</td>
<td>6</td>
<td>21.5</td>
</tr>
<tr>
<td>5,000-9,999</td>
<td>5</td>
<td>17.9</td>
</tr>
<tr>
<td>10,000-14,999</td>
<td>3</td>
<td>10.7</td>
</tr>
<tr>
<td>15,000-19,999</td>
<td>2</td>
<td>7.1</td>
</tr>
<tr>
<td>20,000-24,999</td>
<td>2</td>
<td>7.1</td>
</tr>
<tr>
<td>25,000-29,999</td>
<td>2</td>
<td>7.1</td>
</tr>
<tr>
<td>30,000-34,999</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>35,000-39,999</td>
<td>3</td>
<td>10.7</td>
</tr>
<tr>
<td>40,000-44,999</td>
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<td>3.6</td>
</tr>
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<td>45,000-49,999</td>
<td>3</td>
<td>10.7</td>
</tr>
<tr>
<td>50,000-54,999</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>55,000+</td>
<td>1</td>
<td>3.6</td>
</tr>
</tbody>
</table>
the fathers for age and only slight differences with regard to their educational level. Infant descriptions were not significantly different as related to gestational age, birth weight, and type of delivery. Family profile did not differ significantly in structure or income between subjects in Group I and Group II.

Analysis of the Problems and Hypotheses

This section introduces the analysis of the data associated with the problems and hypotheses posited by the present study. The analyses includes the results obtained through use of parametric statistical procedures: specifically, paired t-tests, correlation, and multiple regression. Four problems were identified in the study, and four hypotheses were associated with each of these problems. As with the descriptive findings, there were many variables that were measured between the two groups. Additionally, several hypotheses required the use of multiple correlations between variables to substantiate the results.

Problem 1

The first problem posited by the present study is, "Does counseling/therapeutic interventions with mothers of premature or ill neonates lead to improved maternal attachment processes?" The NCAFS was used to measure the dependent variable of maternal attachment. The NCAFS was separated
into six key areas of interaction/adaptation processes between mother and infant: sensitivity to cues, response to distress, socio-emotional growth fostering, cognitive growth fostering, infant’s clarity of cues and responsiveness to parent.

Hypothesis 1

"Mothers who receive counseling/therapeutic intervention will have stronger ties of attachment to their premature infant and will score higher on the Barnard's Nursing Child Assessment Feeding Scale than those mothers who do not receive treatment." To answer this question, the results of the NCAFS for the mother-infant dyads for Group I were compared with the NCAFS results for Group II. Observational measurements of the NCAFS were taken at one month, two and a half months and four months post discharge of the infant from the neonatal intensive care unit. Comparisons were made not only between Group I and Group II, but within each group at the three different feeding intervals to follow the development of the attachment process.

The 15 mothers in Group II received a multi-dimensional treatment program during their infant's hospitalization and follow-up for four months after the infant was discharged. Mothers received an average of 11.53 sessions of counseling and/or education, with a range of 7 to 16 sessions per subject. Three counseling sessions per mother were
conducted, when possible, before the infant was discharged from the hospital. Contact was initiated by the therapist at 3 days, 7 days, 14 days, 21 days and 28 days after discharge. If the mother indicated a need for additional contact, the therapist continued intervention up to and including the fourth month after the infant was released from the hospital. The counseling needs of the mothers were tremendously varied. Financial and child care provisions were universal conflicts for all of the mothers within the study. Ninety percent of the mothers reported a struggle in adjusting to their new role of motherhood and their self imposed expectations of that role. Ninety percent of the mothers reported a grieving response to the birth of their premature infant. Sixty percent of the mothers worked outside the home and expressed interpersonal conflict regarding their return to work. Fifty percent of the mothers reported a decrease in communications with their spouse or significant other. The majority of these mothers reported an increase in conflict with their significant other due to the responsibility and delegation of child care. Six infants' health status required apnea monitors in the home. Three mothers moved outside of their communities, and two of these three mothers moved outside of the state. Two mothers expressed concerns regarding chemical dependency issues of their spouse/significant other. One mother was separated from her husband of 12 years and was
divorced. One mother was briefly jailed during the treatment program. One mother gave birth to a set of twins during her last month of medical school. All the mothers in Group II reported special needs during the hospitalization of their infant and for four months after their premature infants were allowed to go home.

The attachment behaviors of the mothers in Group I (Control) and Group II (Treatment) were compared at the one-month interval after the infant was discharged from the hospital (Table 14). Twenty-six mothers were rated by the NCAFS observational tool: 11 in Group I, and 15 in Group II. Group I had a mean score of 58.09 (SD = 10.79), and Group II had a mean score of 57.47 (SD = 9.75). The variance between the two groups were not significant (t = .15, 24df, p = .879). Additionally, there were no significant differences on the six subscales of the NCAFS scale between Group I and Group II.

At two and a half months, 26 mothers were observed: 11 in Group I, and 15 in Group II. No significant results were reported between the total mean score of Group I (M = 59.27, SD = 11.57) and Group II (M = 60.13, SD = 4.87). The six subscales were not significantly different between the Control group and the Treatment group. Table 15 describes the statistical analyses for the NCAFS at the two and a half month interval.
Table 14. Means, standard deviations, and t-test results for the NCAFS at one month.

<table>
<thead>
<tr>
<th>Scales</th>
<th>Total (N = 26)</th>
<th>Group I (N = 11)</th>
<th>Group II (N = 15)</th>
<th>t-test Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>13.23</td>
<td>12.91</td>
<td>13.47</td>
<td>-0.51</td>
</tr>
<tr>
<td>SD</td>
<td>2.73</td>
<td>3.36</td>
<td>2.26</td>
<td></td>
</tr>
<tr>
<td>Response to Distress</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>10.08</td>
<td>10.27</td>
<td>9.93</td>
<td>0.67</td>
</tr>
<tr>
<td>SD</td>
<td>1.26</td>
<td>0.90</td>
<td>1.48</td>
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<tr>
<td>Socioemotional</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>11.54</td>
<td>11.55</td>
<td>11.53</td>
<td>0.01</td>
</tr>
<tr>
<td>SD</td>
<td>2.06</td>
<td>1.86</td>
<td>2.26</td>
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</tr>
<tr>
<td>Cognitive</td>
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<td></td>
</tr>
<tr>
<td>Mean</td>
<td>6.08</td>
<td>6.09</td>
<td>6.07</td>
<td>0.03</td>
</tr>
<tr>
<td>SD</td>
<td>2.04</td>
<td>2.21</td>
<td>1.98</td>
<td></td>
</tr>
<tr>
<td>Clarity of Cues</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>9.58</td>
<td>10.09</td>
<td>9.20</td>
<td>0.82</td>
</tr>
<tr>
<td>SD</td>
<td>2.73</td>
<td>3.02</td>
<td>2.54</td>
<td></td>
</tr>
<tr>
<td>Responsiveness</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>7.23</td>
<td>7.18</td>
<td>7.27</td>
<td>-0.10</td>
</tr>
<tr>
<td>SD</td>
<td>2.18</td>
<td>2.48</td>
<td>2.02</td>
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</tr>
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<td>Total (N = 26)</td>
<td>Group I (N = 11)</td>
<td>Group II (N = 15)</td>
<td>t-test Result</td>
</tr>
<tr>
<td>--------</td>
<td>---------------</td>
<td>------------------</td>
<td>-------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Total</td>
<td></td>
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</tr>
<tr>
<td>Mean</td>
<td>57.73</td>
<td>58.09</td>
<td>57.47</td>
<td>0.15</td>
</tr>
<tr>
<td>SD</td>
<td>9.99</td>
<td>10.79</td>
<td>9.75</td>
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</tbody>
</table>

* p < .10

** p < .05
Table 15. Means, standard deviations, and t-test results for the NCAFS at two and a half months.

<table>
<thead>
<tr>
<th>Scales</th>
<th>Total (N = 26)</th>
<th>Group I (N = 11)</th>
<th>Group II (N = 15)</th>
<th>t-test Result</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sensitivity</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Mean</td>
<td>13.31</td>
<td>13.09</td>
<td>13.47</td>
<td>-0.45</td>
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<tr>
<td>SD</td>
<td>2.07</td>
<td>2.95</td>
<td>1.19</td>
<td></td>
</tr>
<tr>
<td><strong>Response to Distress</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>10.31</td>
<td>10.45</td>
<td>10.20</td>
<td>0.60</td>
</tr>
<tr>
<td>SD</td>
<td>1.05</td>
<td>.68</td>
<td>1.27</td>
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<tr>
<td><strong>Socioemotional</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Mean</td>
<td>11.58</td>
<td>11.18</td>
<td>11.87</td>
<td>-0.84</td>
</tr>
<tr>
<td>SD</td>
<td>2.04</td>
<td>2.75</td>
<td>1.35</td>
<td></td>
</tr>
<tr>
<td><strong>Cognitive</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>6.54</td>
<td>6.27</td>
<td>6.73</td>
<td>-0.67</td>
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<tr>
<td>SD</td>
<td>1.70</td>
<td>2.28</td>
<td>1.16</td>
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</tr>
<tr>
<td><strong>Clarity of Cues</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>10.65</td>
<td>11.09</td>
<td>10.33</td>
<td>0.76</td>
</tr>
<tr>
<td>SD</td>
<td>2.48</td>
<td>2.73</td>
<td>2.32</td>
<td></td>
</tr>
<tr>
<td><strong>Responsiveness</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>7.38</td>
<td>7.18</td>
<td>7.53</td>
<td>-0.48</td>
</tr>
<tr>
<td>SD</td>
<td>1.81</td>
<td>2.22</td>
<td>1.51</td>
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</tr>
</tbody>
</table>
Table 15--Continued

<table>
<thead>
<tr>
<th>Scales</th>
<th>Total (N = 26)</th>
<th>Group I (N = 11)</th>
<th>Group II (N = 15)</th>
<th>t-test Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>59.77</td>
<td>59.27</td>
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</tr>
<tr>
<td>SD</td>
<td>8.18</td>
<td>11.57</td>
<td>4.87</td>
<td></td>
</tr>
</tbody>
</table>

* p < .10

** p < .05
The third feeding scale measurement, taken at four months, revealed evidence to indicate that there were significant differences between Group I and Group II. Twenty-three subjects were measured: 10 in Group I, and 13 in Group II. Table 16 reflects the statistical comparison between Group I and Group II on the NCAFS total and subscale score. The total mean score for Group I was 59.60 (SD = 5.85) and for Group II was 64.77 (SD = 2.89) and was highly significant at the .01 level (t = -2.79, 21df, p = .011). Reviewing the individual subscales, four of the six key areas indicated trends or significant findings. There were significant trends towards the Treatment group in the maternal subscale of sensitivity to cues and response to distress. In the sensitivity to cues, Group I recorded a mean score of 12.00, and Group II reported a mean score of 13.46. There were significant differences at the trend level (t = -1.58, 21df, p = .10). In the response to distress category, the mean for Group I was 9.50 (SD = 1.50), and the mean for Group II was 10.23 (SD = .60) and indicated a positive trend in the data towards the Treatment group (t = -1.60, 21df, p = .10). Two subscales were significantly different at the .05 level. The socio-emotional subscale compared Group I (M = 11.40, SD = 1.65) with Group II (M = 12.69, SD = .95) and found significant differences in the estimates of variance between the two groups (t = -2.37, 21df, p = .03) at the .05 level.
Table 16. Means, standard deviations, and t-test results for the NCAFS at four months.

<table>
<thead>
<tr>
<th>Scales</th>
<th>Total (N = 23)</th>
<th>Group I (N = 10)</th>
<th>Group II (N = 13)</th>
<th>t-test Result</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sensitivity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Means</td>
<td>12.83</td>
<td>12.00</td>
<td>13.46</td>
<td>-1.58*</td>
</tr>
<tr>
<td>SD</td>
<td>2.27</td>
<td>2.87</td>
<td>1.51</td>
<td></td>
</tr>
<tr>
<td><strong>Response to Distress</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Means</td>
<td>9.91</td>
<td>9.50</td>
<td>10.23</td>
<td>-1.60*</td>
</tr>
<tr>
<td>SD</td>
<td>1.12</td>
<td>1.50</td>
<td>.60</td>
<td></td>
</tr>
<tr>
<td><strong>Socioemotional</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Means</td>
<td>12.13</td>
<td>11.40</td>
<td>12.69</td>
<td>-2.37**</td>
</tr>
<tr>
<td>SD</td>
<td>1.42</td>
<td>1.65</td>
<td>.95</td>
<td></td>
</tr>
<tr>
<td><strong>Cognitive</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Means</td>
<td>7.65</td>
<td>7.60</td>
<td>7.69</td>
<td>-0.28</td>
</tr>
<tr>
<td>SD</td>
<td>.78</td>
<td>.70</td>
<td>.85</td>
<td></td>
</tr>
<tr>
<td><strong>Clarity of Cues</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Means</td>
<td>12.39</td>
<td>11.50</td>
<td>13.08</td>
<td>-2.03**</td>
</tr>
<tr>
<td>SD</td>
<td>1.97</td>
<td>2.27</td>
<td>1.44</td>
<td></td>
</tr>
<tr>
<td><strong>Responsiveness</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Means</td>
<td>7.61</td>
<td>7.50</td>
<td>7.62</td>
<td>-0.03</td>
</tr>
<tr>
<td>SD</td>
<td>1.37</td>
<td>1.84</td>
<td>.96</td>
<td></td>
</tr>
<tr>
<td>Scales</td>
<td>Total (N = 23)</td>
<td>Group I (N = 10)</td>
<td>Group II (N = 13)</td>
<td>t-test Result</td>
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<tr>
<td>--------</td>
<td>---------------</td>
<td>-----------------</td>
<td>------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>62.52</td>
<td>59.60</td>
<td>64.77</td>
<td>-2.50***</td>
</tr>
<tr>
<td>SD</td>
<td>5.04</td>
<td>5.85</td>
<td>2.89</td>
<td></td>
</tr>
</tbody>
</table>

* p < .10
** p < .05
*** p < .01
The infant scale for clarity of cues of Group I reported a mean of 11.50 (SD = 2.27) and a Group II mean of 13.08 (SD = 1.44), and were significantly different between the Treatment and Control groups (t = -2.03, 21df, p = .05).

In summary, when contrasting Group I (Control) to Group II (Treatment), there were significant differences between the two groups at the four-month interval. The total NCAFS scores were significantly different at the .01 level of analysis. Four of the six subscales varied substantially. The two subscales of sensitivity to cues and response to distress were significant at the .10 level, and the socio-emotional growth fostering skills and clarity of cues categories were significant at the .05 level.

In conclusion, the data supports Hypothesis 1 that mothers who received counseling intervention have stronger ties of attachment to their premature infant, as indicated on the Barnard's NCAFS. Observational measurements that were taken at one month and two and a half months after the infant's discharge from the hospital were not significantly different between Group I and Group II. The fourth month results, however, were significantly different when the performance of Group I and Group II were reported on the NCAFS. The mothers in Group II (Treatment) had significantly higher scores in four of the six subscales on the NCAFS than mothers in Group I (Control).
Problem 2

The second problem posited by the present study is, "From a sample of mother-infant dyads of infants receiving services of neonatal intensive care units, do mothers of this population show an impaired self concept or social networking strategy?" The Tennessee Self Concept Scale (TSCS) was used to measure the independent variable of self-concept, and the Norbeck Social Support Questionnaire (NSSQ) was used to measure the subject's networking strategy.

Hypothesis 2

"Mothers who receive intervention will indicate a stronger self-concept and social networking strategy as evidence in higher scores on the TSCS and on the NSSQ, than those mothers who do not receive treatment." In order to answer this question, the results of the TSCS (Table 5) and the NSSQ (Table 7) for the mothers of Group I (Control) and Group II were compared. Test A instrument measurements were used as a baseline for self concept and social networking strategy. Test B determined if the two groups were significantly different as a result of the treatment effect. An intercorrelational matrix was developed to contrast the correlations between the total Tennessee Self Concept Scale and the Norbeck Social Support Questionnaire.

Test A of the TSCS was given during the infant's hospitalization. The total mean score was 387.20. Group I
had a mean score of 400.44, and Group II had a mean score of 382.87. There were no significant differences between Group I and Group II at the baseline measurement period \( (t = 0.70, 28\text{df}, p = .487) \).

Test B of the TSCS was administered four months after the infant was discharged from the hospital. The total TSCS mean was 385.79. Group I recorded a mean score of 398.44, and Group II reported a mean score of 378.20 for total self concept. A statistical analyses of the variance between Group I and Group II was not significant \( (t = 1.47, 22\text{df}, p = .157) \).

Test A was compared with Test B, and there were no significant differences in the variable of self concept scores \( (t = .85, 23\text{df}, p = .0001) \).

The results of the NSSQ in Test A were used as a baseline measurement for networking strategies. Test A had a total mean function score of 3.86. The mean scores of Group I \( (M = 3.74) \) and of Group II \( (M = 3.74) \) were not statistically different \( (t = .70, 28\text{df}, p = .489) \).

The total mean function score for Test B of affect, affirmation, and aid was 3.90. Group I reported a mean of 3.87, and Group II reported a mean of 3.92. There were no significant differences between the Control and Treatment group \( (t = -.16, 23\text{df}, p = .867) \).
A comparison was made between Test A and Test B on the total function scale. Test A had a total function mean of 3.86 (SD = 1.01), and Test B had a mean score of 3.90 (SD = .73). The difference between Test A and Test B were not significant ($t = .17, 23$df, $p = .867$).

In conclusion, the results of the TSCS and the NSSQ were inconclusive regarding treatment effect. There were no statistical differences between Test A and Test B application and between Group I and Group II.

Two intercorrelation matrices were computed with the major variables for the total TSCS and the NSSQ. Table 17 reflects the intercorrelations between the total TSCS and the NSSQ factors. With regard to Test A, a high positive correlation was observed between the frequency of contact and the factor focusing on the total network (FREQCON1-6, $r = .97$, $p < .001$). Two positive correlations with a moderate trend were observed for the duration of the support system and the total network (DUR1-4, $r = .46$, $p < .01$) and for the factor measuring total functioning and total TSCS factors (TLFUNCT1-6, $r = .46$, $p < .01$).

Test B indicated a high positive correlation between frequency of contact and total network (FREQCON2-4, $r = .99$, $p < .001$). Marked significant correlations additionally existed between total function and frequency of contact.
Table 17. Intercorrelations between the total Tennessee Self Concept Scale and the Norbeck Social Support Questionnaire.

<table>
<thead>
<tr>
<th>Correlations:</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Test A</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TLFUNCT1</td>
<td>.05</td>
<td>.35</td>
<td>.08</td>
<td>.18</td>
<td>.46*</td>
</tr>
<tr>
<td>FREQCON1</td>
<td></td>
<td>.28</td>
<td>.97**</td>
<td>.13</td>
<td>.33</td>
</tr>
<tr>
<td>DUR1</td>
<td></td>
<td>.46*</td>
<td>-.26</td>
<td>.28</td>
<td></td>
</tr>
<tr>
<td>TLNETWK1</td>
<td></td>
<td>.03</td>
<td></td>
<td>.34</td>
<td></td>
</tr>
<tr>
<td>TLOSS1</td>
<td></td>
<td>.16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TENNTOT1</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>N of cases: 29</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-tailed Signif:</td>
<td>* -.01</td>
<td>** -.001</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Correlations:</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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</thead>
<tbody>
<tr>
<td><strong>Test B</strong></td>
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</tr>
<tr>
<td>TLFUNCT2</td>
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<td>.14</td>
<td>-.54*</td>
<td>-.02</td>
<td>.15</td>
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<tr>
<td>FREQCON2</td>
<td>.16</td>
<td>.99**</td>
<td>-.23</td>
<td>.12</td>
<td></td>
</tr>
<tr>
<td>DUR2</td>
<td>.25</td>
<td>.27</td>
<td>.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TLNETWK2</td>
<td></td>
<td>-.19</td>
<td>.14</td>
<td></td>
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</tr>
<tr>
<td>TLOSS2</td>
<td></td>
<td></td>
<td>-.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TENNTOT2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N of cases: 22</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>1-tailed Signif:</td>
<td>* -.01</td>
<td>** -.001</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
(TLFUNCT2-2, $r = .56, p < .01$) and total function, and total network (TLFUNCT2-4, $r = .53, p < .01$).

The association between frequency of contact and total network were significant. As the degree of frequency of contact increased, the association of total network factors also increased in the predicted direction.

In conclusion, the data does not support Hypothesis 2, that mothers who receive intervention will indicate a stronger self-concept and social networking strategy as evidence in higher scores on the TSCS and the NSSQ than mothers who do not receive treatment. There were no statistically significant differences between the Control and Treatment groups on Test A or on Test B.

Problem 3

The third problem presented by the study is, "Do life events which a mother has experienced in the previous twelve months impact on her coping strategies and perception of herself?" LES was used to determine the total, positive and negative scores for mothers in Group I and Group II.

Hypothesis 3

"Mothers who have higher negative change scores on the Sarason's Life Event Survey will have a lower maternal attachment score on the Barnard Nursing Child Assessment
Feeding Scale." The results of the mother's negative scores on the LES were contrasted with the results of the NCAFS.

A correlation matrix was created (Table 18) to measure the association between maternal attachment at one month, two and a half month, and four month intervals and the LES negative change factors. There were no significant correlations between maternal attachment factors and negative change factors. The only significant finding was a high correlation between the NCAFS measurement at one month and the NCAFS measurement at two and a half months (r = .75, p > .001).

In summary, the data do not support Hypothesis 3 that states, mothers who have higher negative change scores on the LES will have a lower maternal attachment score on the NCAFS.

Problem 4

The fourth problem issued by this study investigated, "Does counseling/therapeutic intervention have an impact on altering the family's relationship within itself and the broader social unit. The Family Function Index (FFI) was used to determine if therapy altered the family system of mothers who had premature infants.

Hypothesis 4

"Mothers who receive intervention will indicate an improved family functioning level as indicated by the Family
Table 18. Intercorrelations between the NCAFS and one, two and a half, and four month intervals and the LES negative change scores.

<table>
<thead>
<tr>
<th>Correlations:</th>
<th>2</th>
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<th>4</th>
<th>5</th>
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</thead>
<tbody>
<tr>
<td>NCAFS 1</td>
<td>.75**</td>
<td>.24</td>
<td>.20</td>
<td>.16</td>
</tr>
<tr>
<td>NCAFS 2</td>
<td>.41</td>
<td>.18</td>
<td>.14</td>
<td></td>
</tr>
<tr>
<td>NCAFS 3</td>
<td></td>
<td>.12</td>
<td>.08</td>
<td></td>
</tr>
<tr>
<td>SORNEG1</td>
<td></td>
<td></td>
<td></td>
<td>.09</td>
</tr>
<tr>
<td>SORNEG2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N of cases:</td>
<td>22</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-tailed signif:</td>
<td>* -.01</td>
<td>** -.001</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Function Index than those mothers who do not receive treatment. In order to answer this question, the results of the total score for the FFI were computed between Test A and Test B and between Group I and Group II. Table 8 provides a summary of the statistical analysis of the FFI.

A baseline measurement of family function was recorded by Test A. The total mean score of Test A was 3.43. Group I reported a mean score of 2.47, and Group II reported a mean score of 4.40. Test A did not show a significant difference between Group I and Group II ($t = -0.53$, $23df$, $P = 0.60$).

Four months after treatment, family function was again assessed. Test B had a total mean score of 5.38: Group I reported a mean score of 5.00, and Group II reported a mean score of 5.60. The difference between Group I and Group II in Test B was not significant ($t = 0.15$, $22df$, $P = 0.881$).

Test A was compared with Test B to investigate the significance of the relationship between pre and post tests. The mean variable for Test A was 2.83, and the mean for Test B was 5.36. There was no statistical significance between the two groups ($t = 0.81$, $23df$, $P = 0.425$) on family functioning.

The FFI is divided into three areas of sensitivity: Factor I measures relationship between family and individual,
Factor II measures relationship between family and subsystem, and Factor III measures relationship between family and broader social units. To determine the degree of variance, a comparison was made between Test A and Test B on the three subscales (t-tests). No subscales were significantly varied.

In conclusion, the data do not support Hypothesis 4, that mothers who receive intervention indicate an improved family functioning level by improved scores on the FFI. There were no significant differences between Group I (Control) and Group II (Treatment) on Test A or on Test B.

**Predictor Variables on Maternal Attachment**

Stepwise multiple regression equations were computed for predicting maternal attachment gains on the Nursing Child Assessment Feeding Scale with a multitude of independent variables. Variables including mother's age, educational level, marital status, ordinal position, self concept, life events, social network, family function, paternal age and educational level, infant's age, weight, and type of delivery were analyzed to determine the association of these variables on predicting maternal attachment. The NCAFS were divided into six subscales: the four maternal subscales of sensitivity to cues, response to distress, socio-emotional growth fostering skill, and cognitive development. The two infant subscales of clarity of cues and responsiveness to parent were also computed. Table 19 reflects a multiple stepwise
### Table 19. Stepwise regression summary table of the study variable on maternal attachment.

<table>
<thead>
<tr>
<th>NCAFS Subscales</th>
<th>Loss Total (NSSQ)</th>
<th>Multiple R</th>
<th>R Squared</th>
<th>F-Value</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sensitivity to Cues</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternal Age</td>
<td>.10</td>
<td>.48</td>
<td>19.78</td>
<td>p&lt;.002**</td>
<td></td>
</tr>
<tr>
<td><strong>Response to Distress</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loss Total Number</td>
<td>.66</td>
<td>.43</td>
<td>16.15</td>
<td>p&lt;.006**</td>
<td></td>
</tr>
<tr>
<td>(NSSQ)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Score (LES)</td>
<td>.81</td>
<td>.66</td>
<td>19.34</td>
<td>p&lt;.0000****</td>
<td></td>
</tr>
<tr>
<td><strong>Socio-Emotional Growth</strong></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Loss Number 1</td>
<td>.72</td>
<td>.52</td>
<td>22.32</td>
<td>p&lt;.0001****</td>
<td></td>
</tr>
<tr>
<td>Duration (NSSQ)</td>
<td>.80</td>
<td>.64</td>
<td>17.40</td>
<td>p&lt;.0000****</td>
<td></td>
</tr>
<tr>
<td><strong>Cognitive</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternal Age</td>
<td>.68</td>
<td>.47</td>
<td>18.39</td>
<td>p&lt;.0003***</td>
<td></td>
</tr>
<tr>
<td><strong>Clarity of Cues</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternal Age</td>
<td>.45</td>
<td>.20</td>
<td>5.36</td>
<td>p&lt;.0308*</td>
<td></td>
</tr>
<tr>
<td><strong>Infant's Responsiveness</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Father's Education</td>
<td>.43</td>
<td>.19</td>
<td>4.83</td>
<td>p&lt;.0391*</td>
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</tr>
<tr>
<td>Moral Ethical Self (TSCS)</td>
<td>.60</td>
<td>.36</td>
<td>5.70</td>
<td>p&lt;.0110**</td>
<td></td>
</tr>
</tbody>
</table>

* p < .10
** p < .01
*** p < .001
****p < .0001
regression summary table, and indicates the factors that are the best predictor variable for each of the six subscales. Each subscale was computed by a stepwise multiple regression equation to compute the best predictor. The single best predictor of maternal attachment and sensitivity to cues was the independent variable of maternal age ($R = .70$, $F = 19.70$, $p = .01$). The response to distress category in the maternal attachment processes was predicted by a subscale in the NSSQ, that of loss of numbers within the network ($R = .66$, $F = 16.15$, $p < .006$). A second step-wise multiple regression predictor variable to the response to distress category was the LES negative score (1) factor. This second variable contributed significantly to the prediction of response to distress and was significant at the $R = .81$, $F = 19.34$, $p < .0000$ level. The third subscale of socio-emotional growth fostering skills was affected by two predictor variables. Loss of number in the network (1) ($R = .72$, $F = 22.34$, $p < .0001$) was the first step wise multiple regression computation. The second computation indicated that duration of the contact was an important predictor variable ($R = .80$, $F = 17.40$, $p < .00001$) for socio-emotional growth fostering skills development. The single best predictor variable for the NCAFS subscale of cognitive skill was maternal age ($R = .68$, $F = 18.39$, $p < .0003$). Regarding the infant's clarity of cues, mother's age was the strongest predictor of this
maternal attachment subscale ($R = .45, F = 5.36, p = .308$). The factor which measured the infant's responsiveness was most strongly associated with father's educational level ($R = .43, F = 4.84, p < .0391$). The second step on the multiple regression computation indicated the moral-ethical self subscale of the TSCS as the strongest predictor for the infant's responsiveness ($R = .60, F = 5.70, p < .0110$).

In conclusion, the best predictor variables for the maternal attachment scales were as follows: maternal age and sensitivity of cues; loss number in the network and LES negative scores with response to distress; loss number of the network and duration of relationships within the network with socio-emotional growth fostering skills; maternal age and cognitive development; maternal age and infant's clarity of cues; father's education and moral-ethical self subscale on the TSCS with infant's responsiveness subscale.

**Summary**

This chapter presented the quantitative results for the study, including the descriptive results of the major variables and the analytic results of the study questions and hypotheses. When Group I was contrasted with Group II there were significant differences between the two groups at the four month interval regarding maternal attachment. There were no significant differences between Group I and Group II on self concept, perception of life events, social support or
family function. The strongest predictor for the maternal attachment subscales were as follows: maternal age for sensitivity to cues; loss of number in the network and LES negative scores with response to distress; loss number of network and the duration of the relationship within the network with socio-emotional growth fostering; maternal age and cognitive development; maternal age and infant's clarity of cues; and fathers education and moral-ethical self subscale with the infant's responsiveness subscale.
This chapter presents a discussion of the results as they relate to the study problem, the hypotheses, and the existing body of research. The chapter begins with a review of the study's purpose, problems, hypotheses, and findings. The results are then discussed in terms of the major study variables. The chapter concludes with a deliberation of the strengths and limitations of the study, implications for policy and clinical practice, and suggestions for additional research.

Introduction

The purpose of this study was to investigate the impact of intervention strategies on mothers of high-risk premature infants and the long-range effect on the maternal attachment processes. The four variables of self concept, stress, social support and family function were also examined to determine their relationship to the dynamic process of maternal attachment. This information was essential to establish and extend the efficacy of therapeutic intervention programs to the seriously ill neonate and their family. Information regarding these issues serve the function of
informing parents, medical and mental health professionals of the nature of the psycho-social family struggle that occurs after the birth of an ill child.

There was a number of studies investigating the various intervention strategies on the mother-infant dyad of a critically ill or premature child. The majority of intervention strategies were divided into five distinct program goals: (1) neonatal sensory stimulation, (2) prevention of faulty mother-infant bonding, (3) provision of compensatory experiences during later infancy, (4) assistance to mothers to resolve the emotional crisis of premature delivery, and (5) increased parent's sensitivity and responsiveness to their infant, despite deficiencies in their infant's capacity to elicit care. The approach of this study was a multi-faceted intervention program and included a collection of program goals from the five strategies. The intervention study focused on the educational, counseling and therapeutic needs of the mother during her infant's hospitalization and discharge home. Additionally, discrete variables of self-concept, social network, family function and stress were measured at two time intervals to measure change in these maternal characteristics over time.

The design for the present study was a prospective, longitudinal, quasi-experimental design that compared two different mother-infant dyad groups on the dependent variable
of postpartum maternal attachment. Measurements of the dependent variable were made at one, two and a half, and four month time intervals after the infant's discharge from the hospital. The independent variables of maternal self-concept, life stress, social support, network and interrelationships between family members were analyzed to indicate their impact on the attachment process.

Four study problems were advanced regarding the maternal attachment process of mothers in Group I (Control) and Group II (Treatment) to determine the effect of the intervention program. Table 20 summarizes the study problems, the related hypotheses and whether the hypotheses were supported or rejected.

Discussion of Major Study Variable

A comparison was made between mothers who had premature infants and received therapy and education, and mothers who did not receive therapy and education. Observational measurements were taken at three time periods to establish treatment impact on their maternal attachment processes. The study additionally investigated the relationship between self-concept, life events, social support, and family function within the dynamic process of maternal attachment.
Table 20. Summary of study problems, hypotheses and whether hypotheses were supported or rejected.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Hypothesis</th>
<th>Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Do counseling/therapeutic interventions with mothers of premature or ill neonates improve maternal attachment processes.</td>
<td>Mothers who receive counseling/therapeutic interventions will have stronger ties of attachment to their premature infant and will score higher on the NCAFS than those mothers who do not receive treatment.</td>
<td>Yes*</td>
</tr>
<tr>
<td>2. From a sample of mother-infant dyads of mothers receiving services of neonatal intensive care units, do mothers of this population show an impaired self concept or social networking strategy.</td>
<td>Mothers who receive intervention will indicate a stronger self-concept and social networking strategy as evidenced in higher scores on the TSCS and on the NSSQ than those mothers who do not receive treatment.</td>
<td>No</td>
</tr>
<tr>
<td>3. Do life events which a mother has experienced in the previous twelve months impact on her coping strategies and perception of her self.</td>
<td>Mothers who have higher negative scores of the LES will have lower maternal attachment on the NCAFS.</td>
<td>No</td>
</tr>
<tr>
<td>4. Do counseling/therapeutic interventions have an impact on altering the families relationship within itself and the broader social unit.</td>
<td>Mothers who receive intervention will indicate an improved family functioning level as indicated by the FFI than those mothers who do not receive treatment.</td>
<td>No</td>
</tr>
</tbody>
</table>
Hypothesis 1: Maternal Attachment

It was hypothesized that mothers who received counseling/therapeutic interventions would have stronger ties of attachment to their premature infant as indicated in higher scores on the NCAFS.

Findings. The hypothesis was supported at the four-month interval. Women who received a multi-faceted treatment program during their infant's hospitalization and the first five months of life scored significantly higher on four out of the six subscales on the NCAFS. The two subscales of sensitivity of cues and response to distress were significant at the trend level (.10). The socio-emotional growth fostering and clarity of cue subscales were significant at the .05 statistically significant level.

Alternative Explanations and Interpretations. Maternal attachment is a dynamic process which changes over time. Theoretically, maternal attachment is viewed as an interactive process between mother and infant within the framework of the environment (Barnard, 1978).

Finding no significant differences at the one and two and a half month interval could have been affected by the neurologically depressed state of the premature infant (Nurcombe et al., 1986). The interaction between the mother and infant is influenced by the mother's ability to read the cues of her infant, to alleviate distress, and to provide
growth-fostering situations. Furthermore, the interaction is also influenced by the infant's ability to give clear cues and to respond to the mother's caregiving. If the infant fails to send clear cues, the mother is not able to interpret the cues. Thoman et al. (1983) states that the infant needs to be responsive, readable and predictable. During the first four months, premature infants were less attentive in their interaction (Field 1977) and less often active on their own (Brown & Bakeman 1980), while mothers of premature infants were more active than mothers of full-term infants during feedings (Field 1977) and more likely to be active in the relationship without response from the infant (Brown & Bakeman, 1980). The change of NCAFS scores between one month, two and a half month and four month measurements could reflect the natural maturation process of the increased responsiveness of the infant.

Infant maturation would not account for the statistically significant results between Group I and Group II at the four month interval. Infants in Group I and infants in Group II did not differ significantly in gestational age, weight or hospital length of stay. Statistically significant results of the NCAFS subscales are due to the treatment effect of the study.
Hypothesis 2: Self Concept and Social Support

It was hypothesized that mothers who received intervention would indicate a stronger self-concept and social networking strategy, as evidenced in higher scores on the TSCS and on the NSSQ than those mothers who did not receive treatment.

Findings. The hypothesis was rejected. Mothers who received treatment did not have statistically higher scores on the TSCS and on the NSSQ than those mothers who were in the control group. On the TSCS, Group II reported a significantly depressed score on the physical self subscale between Test A and Test B. On the NSSQ, Group II mothers reported negative significant changes on their total networking list and loss of significant persons for support. On the NSSQ, post test analysis indicated a high positive correlation between frequency of contact and total network (r = .99, p < .001). Marked significant correlations additionally existed between total function and frequency of contact (r = .56, p < .01) and total function and total network (r = .53, p < .01), although findings were statistically insignificant between Group I and Group II.

Alternate Explanations and Interpretations. On the TSCS and the NSSQ of Test B there were a total of 24 mothers reporting, 9 in Group I and 15 in Group II. Group I had an attrition rate of approximately 40%. The six subjects who
did not complete the study were all under the age of 19 and all were unmarried. Five of the six mothers had moved during the period of the study. Statistical differences may have emerged from the post test if the six subjects had been included. The results of their questionnaire may have decreased the mean score of Group I and Group II on the TSCS and the NSSQ significantly.

A significant discrepancy occurred in Group II on the physical self subscale of the TSCS between Test A and Test B. A possible explanation for this inverse reporting is that women who have just had a premature infant have concerns about other things than their physical appearance. Maternal reactions to the birth of a premature infant is an acute emotional crisis (Affleck, Howard & Gershman, 1985; Kaplan & Mason, 1960). Mothers often report a mourning process (Solnit & Stark, 1961), and the demonstration of anticipatory grief (Benfield et al., 1976). Mothers are aware that their physical self is going through a number of hormonal, fluid and weight changes during the second or third day postpartum. Mothers are directed towards their infant's health status rather than their physical self. At four months the emotional crisis of a premature delivery has passed, and the reality of physical self is there. The four month score may indicate mother's discouragement on her physical change. The subject attrition from Group I could account for the
nonsignificant findings between Test A and Test B on physical self within Group I.

A discrepancy also occurred on Test B for Group II in a decreased score on their total networking list and an increased score on loss of significant persons. The transitory patterns of Group II were evaluated. Three mothers moved outside of their communities and two mothers moved outside the state. The relocation of the family would dramatically decrease their social network system and would add to the significance of the number of individuals lost.

The lack of statistical support for the social networking system may also be attributed to the transitory patterns of this sample. Sixty-six percent of the mothers reported moving during the five months of the study. A move would not only affect total function of the support system but would also have an impact on frequency of contact and total network size.

Hypotheses 3: Stress and Maternal Attachment

It was hypothesized that mothers who have higher negative change scores on the LES would have lower maternal attachment scores on the NCAFS.

Findings. There were no significant correlations between maternal attachment factors and negative change factors. The only significant finding was a high correlation
between the NCAFS measurement at one month and the NCAFS measurement at two and a half months ($r = .75$, $p < .001$).

Alternate Explanations and Interpretations. There are several possible explanations for why the means of the LES were not significantly different. First, both groups of mothers had experienced the stress of a high-risk delivery, indicating less likelihood that differences between groups on the LES scores would be found. Secondly, the LES may not be sensitive to the stressors experienced by mothers having a premature infant. Studies have documented a higher incidence of financial stress, unemployment, divorce and accidents in families experiencing similar crisis (Binger et al., 1969; Harnovitch, 1964). Stressors pertinent to the study sample include dealing with the health care system, tremendous financial commitments, and the transfer of complex medical routines to the home (Brazelton, 1981).

Thirdly, the lack of significant difference also may be due to the small sample size. Subject attrition may explain the statistically insignificant findings in the LES negative scores and their association with maternal attachment.

Hypothesis 4: Family Function

It was hypothesized that mothers who received intervention would indicate an improved family functioning
level as indicated on the FFI than those mothers who did not receive treatment.

Findings. The hypothesis was rejected. Mothers who received treatment did not score significantly higher on the FFI than mothers who were in the control group. There were no significant differences between Group I (Control) and Group II (Treatment) on Test A or on Test B.

Alternate Explanations and Interpretations. The results of this study did not support previous research findings that indicated families of a premature infant experience a period of disorganization (Owens, 1960) and altered system of family function (Feetham & Humenick, 1982).

A possible explanation for the statistically insignificant findings between the Treatment group and Control group on family functioning may be that it is too soon to identify changes within the family system. Significant system change may take longer than three months to develop and measure.

Strengths and Limitations of the Study

The results of this study need to be considered in reference to the strengths and limitations of the design. Several strengths in research design were noted for the study. One strength of the design included random sampling of the mothers who volunteered to participate. The data were collected using both quantitative and qualitative methods
with instruments that had been used before with similar subject samples. The data were collected longitudinally over an average of five months.

An additional strength of the study was that a review of the literature did not identify other studies that examined the effects of a multi-faceted treatment program with mothers who had moderately premature infants. Many of the studies in the literature focused on the extremely premature infant, under 30 weeks gestational age and 1500 grams. There is an information void regarding the effects of premature delivery and maternal attachment in the 32 to 36 week gestational age infant range.

The study investigated the four independent variables of stress, life events, social support, family function and the relationship of these independent variables to maternal attachment. The previous studies investigating maternal attachment have measured one or two variables at one time period only. The effects of having a premature infant on maternal attachment and the maternal characteristics that affect the process have not been investigated over a period of time.

The limitations of the design include threats to internal validity, construct validity and external validity issues.
Internal Validity. Internal validity draws false positive or false negative conclusions about causal hypotheses. Although the discussion on internal validity is primarily focused in terms of threats taken singly, a note of caution is extended that multiple internal validity threats can operate in a cumulative or countervailing fashion. The internal validity threats that were presented in the study include history, maturation, instrumentation, selection and mortality. The maternal attachment process may have been affected by the historical conditions surrounding the mother or the natural maturation process of the mother's new role of motherhood. Instrumentation may have posed a threat to internal validity in that the NCAFS were an observational instrument that may have changed due to the increased experience of the human observer between the first, second and third testing intervals. Threats of self-selection of subjects by their willingness to participate in this study limits the generalizability of the selection results. The largest threat to internal validity of this study was that of mortality and the attrition of subjects in Group I. Valiant attempts were made to retain subject participation; however, due to the transitory patterns of the general sample and the lack of forwarding addresses for four of the five subjects in Group I, subjects were lost from the study. One mother
elected to drop from the study, stating that her significant other did not want an observer in their home.

**Construct Validity.** Threats to construct validity include evaluation apprehension and experimenter expectancies. Mothers who were observed feeding their infant in the home may have been apprehensive about being evaluated by a person whom they perceived as an expert in infant development or psychological services. An additional threat to construct validity is an experimenter's expectancies that can bias the data obtained by tainting the control and treatment outcomes on observational tools.

**External Validity.** Threats to external validity reflect the problem of generalization of the results across various types of persons, setting, and time. In essence, it is very difficult to determine tests of statistical interaction effects. The primary threats to external validity was the interaction of selection and treatment and the interaction of setting and treatment. Mothers who give birth to premature infants appear atypical of the total birthing population, and those mothers who were willing to participate in the study may be atypical of the population of mothers giving birth to premature infants.

Mothers who participated in the study were all approached during their infants hospitalization. Two hospitals were involved in the study, one hospital a large university
teaching facility and the other a primarily private medical facility. Mothers may have had different responses in willingness to participate due to the location and philosophy of the birth place institution.

**Implications for Policy and Clinical Practice**

The results of this research have several implications for policies and clinical practice that are appropriate to families who have a premature infant in the neonatal intensive care unit. The first implication is for policies that provide for immediate intervention programs after the birth of a premature infant. A multi-faceted program needs to begin at birth for the mother-infant dyad. Treatment should extend through the first six months of the infant's development. The intervention strategy must include therapy, education and referral to community resources for the mother and her family system. The continuity of seeing one individual in the hospital and home is essential. Feedback from the mothers in this study indicates that having one person with whom they can interact provided emotional and psychological support and assisted in the alleviation of stress. Currently, there are programs that assist mothers while the infant is hospitalized; however, follow-up visits at home are delegated to the public health nurse. Mothers seldom have the opportunity to meet with the public health nurse before
their infants are discharged from the hospital. Hospital personnel seldom conduct home visits.

The largest stress and social network disruption occurs after the infant is discharge to home; then the mother has the full responsibility of caring for her infant. This period of time extending from discharge to at least six months postpartum is when policies are needed to develop programs to provide comprehensive services to the mother. The one or two visits from the public health nurse are inadequate to meet the needs of the mother-infant dyad. If funding was allocated towards prevention of dysfunctional maternal attachment and the myriad of associated problems, less funding would later be needed to deal with the outcomes of dysfunctional maternal attachment (i.e., child abuse, learning disabilities, non-organic failure to thrive).

Another implication for clinical practice is that professionals working with mothers who have had premature infants need to be educated as to the behavioral and neurological responses of the premature infant. The professional also needs to be educated to the typical patterns of attachment between a mother-premature infant dyad and the anticipated problems with the interaction/adaptation styles between these two partners. The health care professionals, in turn, could prepare mothers for what behavioral responses
to anticipate, and ways to minimize the distress in their infants.

With regard to aid and support, services need to be developed that can provide assistance and relief to the mother. These services need to be affordable, or policies need to be established that would require insurance companies to reimburse for such assistance. The financial burden placed on the care of these premature infants exacerbates the stress of the family unit. A few insurance policies are providing this type of coverage; however, costs are frequently prohibitive, and services are few in number, especially in rural areas.

**Recommendations for Future Research**

The results of this study suggest a need for research in several areas. One recommendation would be to replicate this study with a larger sample of mothers with premature infants to determine if similar results occur. In addition, a larger sample would allow for the use of more sophisticated analysis techniques and would alleviate several of the threats of internal validity of the study.

A second recommendation is to gather similar data on high-risk women before they deliver and determine if there is a difference between those mothers who deliver prematurely and those mothers who carry their infant to term. A
longitudinal study of both maternal groups may provide interesting comparative data between the two groups.

A third recommendation is to replicate this study and extend the duration of the investigation to several years. This would provide valuable information on the course of maternal attachment during the first two years of the premature infant's life. Additional information could also be collected to determine change in family function over time.

A fourth recommendation of this study is to improve instrumentation measuring maternal attachment. The NCAFS observational tool may be limited in the components of attachment that are measured. The scale is appropriate during the first year of an infant's life. The NCAFS have been validated with a primarily middle-class, caucasian sample; however, there are concerns about the validity of the instrument with lower socio-economic samples or with minority families. Additional investigation and development of a maternal attachment instrument would provide important advances in mother-infant research.

Summary

This chapter presented a discussion of the results as they related to the study problem and hypotheses, the major study variables, and the existing body of research. The results of this study indicate that mothers who received a
comprehensive intervention program were positively influenced with their attachment processes with their premature infants. Although the maternal attachment behaviors between Group I and Group II were not significantly different at the one month and two and a half month testing interval, the fourth month showed significant differences between the Control and Treatment group. Group II (Treatment) mothers exhibited improved sensitivity to cues and response to distress. Mother and infants in Group II differed significantly from Group I in their improved socio-emotional growth fostering skills and the infant's clarity of cues.

The results of this study indicate that mothers who have received a comprehensive treatment program do not differ from mothers who have not received intervention in regards to self-concept, stress, social networking strategies, and family function. Maternal characteristics assessed during the infant's hospitalization and again at four months post infant discharge from the hospital did not show any positive significant changes between Group I and Group II. Group II mothers, however, did report negative significant changes in their perception of physical self, number of individuals on their networking list, and loss of significant persons for support.

There were limitations to this study, particularly in the areas of self-selection of sample, small sample size and
the mortality of subjects. Group I (Control) was especially affected by attrition of subjects. The strength of the study improved on past research attempts by intervention in both the hospital and home setting and longitudinal, prospective data collection.

The results suggest implications for policy and clinical practice. Early intervention programs to facilitate mother-infant interaction and adaptation are critical in the facilitation of the attachment process. Further research is needed to replicate this study and to explore further intervention strategies with mothers giving birth to infants in the neonatal intensive care units.
APPENDIX A

JOHN MICKELSON'S RATIONALE FOR PROGRAM DEVELOPMENT
John Mickelson's Rationale for Program Development


The "Rationale for Program Development" as prepared by Mickelson has four main foci or components: curriculum, instruction, milieu, and evaluation.

**CURRICULUM**

Goal 1.0: To promote parents' feelings of attachment toward their newborn.

Goal 2.0 to facilitate parental acceptance of temporary or permanent impairments suffered by the infant as a result of prematurity, illness, or congenital anomaly.

Goal 3.0 for parents to acquire knowledge and skills to enable their eventual assumption of full-time care of the infant outside of the hospital.

Content knowledge will include:

Information regarding physiological and neurological conditions requiring intensive care, the apparatus and tests used to maintain or assess neonatal health in the intensive care nursery, the special and normal caretaking functions appropriate to the needs of the premature or sick baby, and the various emotional feelings experienced by families in response to the birth of a special care infant.

Content-methodologies will include:

Techniques for touching, stimulating, and handling sick and premature newborns, procedures for breast and bottle feeding and the performance of other caretaking functions, skills for effective parent-nursery staff communications, and skills for recognizing and responding appropriately to post-discharge problems.
INSTRUCTION

Derived from the goals, the instructional objectives for the program will include:

1. parents' demonstrations of caretaking skills necessary to the needs of their infant (such as feeding, diapering, and fondling),

2. parental indications of attachment to their baby via expressions of their eagerness to see/know about the infant and his condition (as through visits, telephone calls and eventual preparations for the baby's homecoming,

3. parents' ability to ask relevant questions of health care personnel indicative of their understanding of the infant's condition.

Instructional subject matter information and skills taught to parents in the hospital setting include:

1. unique aspects of the individual infant's condition and clinical treatment,

2. scope of the parent's role in caretaking,

3. limits of the baby's ability to participate in parent-child interaction, and

4. techniques for understanding and coping with their emotional reactions to the infant's condition.

Additional aspects of subject matter include:

1. names and responsibilities of members of the nursery staff,

2. rules and policies governing the intensive care nursery.

Subject matter is highly individualized in accordance with the special needs of each parent-infant dyad. The subject matter is derived from the stated content-knowledge and supports the goals of the curriculum.
Instructional strategies:

Consist of specific procedures utilized by those designated to provide instruction in order that parents assimilate and use knowledge provided via the subject matter and achieve instructional objectives. Examples of instructional strategies include:

1. demonstrations by nursery staff of caretaking and infant stimulation procedures to enable the parent to learn and adopt these techniques,

2. various presentations depicting parental responses to the birth of a premature or sick baby and clinical care provided for various birth conditions to assist parents in the recognition that their responses to their infant's condition are normal, while familiarizing them with the nursery setting and equipment,

3. use of counselors to share personal experiences and help develop coping strategies to deal with common parental emotional responses,

4. learning situations during which parents practice and acquire caretaking skills and the use of infant stimulation techniques, and

5. written information describing nursery policies provided in the form of parent handbooks to enable parents to be aware of rules and be more comfortable in the nursery setting.

Instructional strategies selected are constrained by the following:

1. parents are in the midst of what is often a life-or-death crisis and because of emotional stress can easily be overwhelmed by too large an amount of information given too soon.

2. some parents may be using hospital staff as scapegoats for their infant's condition and may resist attempts to teach them new skills.

3. each infant's condition and each parent's response to it are unique. Therefore, particular strategies appropriate for use with one parent-infant dyad may be totally inappropriate for another.
MILIEU

The psychological milieu must provide the parents emotional support in settings in which parents feel comfortable while observing and practicing caretaking techniques, discussing feelings, and asking questions regarding both the infant's condition and clinical care practices. Instruction in a one-to-one situation at cribside in the intensive care nursery or in a parents room set aside for such purposes. Group meetings may also be appropriate.

EVALUATION

A wide variety of evaluative measures are necessary to ascertain whether curricular goals and instructional objectives are met.

1. Parent willingness to participate in individual instructional or counseling meetings will serve as a signifier of parental understanding of the stress and special needs associated with their child's birth.

2. Nursery and /or support program personnel will utilize observation to assess the development of caretaking skills and the growth of attachment as illustrated by parental visits, telephone calls, and caretaking behavior.

3. Use of one of the instruments for measuring the quality of attachment in a parent interview.

Home visits, records of emergency room visits or readmissions to the hospital, post-discharge questionnaires completed by parents, and health histories of children kept by the high-risk clinic and child care program will also provide additional information about attachment.
APPENDIX B

NURSING CHILD ASSESSMENT FEEDING SCALE
<table>
<thead>
<tr>
<th>Item</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>51. Child maintains smooth and coordinated movements during feeding.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>52. Child shows a change in level of motor activity within 5 seconds of being handled or repositioned by parent.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>53. Child shows potential disengagement cues within 5 seconds after parent moves closer than 7 to 8 inches from child's face.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>54. Child does not turn away or avert gaze from parent during first half of feeding.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Child's Comments:**

---

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APPENDIX C

TENNESSEE SELF CONCEPT SCALE
TENNESSEE SELF CONCEPT SCALE (TSCS)

ABOUT YOURSELF

INSTRUCTIONS

On the top line of the separate answer sheet, fill in your name and the other information except for the time information in the last three boxes. You will fill these boxes later. Write only on the answer sheet. Do not put any marks in this booklet.

The statements in this booklet are to help you describe yourself as you see yourself. Please respond to them as if you were describing yourself to yourself. Do not omit any item. Read each statement carefully, then select one of the five responses listed below. On your answer sheet, put a circle around the response you chose. If you want to change an answer after you have circled it, do not erase it but put an X mark through the response and then circle the response you want.

When you are ready to start, find the box on your answer sheet marked time started and record the time. When you are finished, record the time finished in the box on your answer sheet marked time finished.

As you start, be sure that your answer sheet and this booklet are linked up evenly so that the item numbers match each other.

Remember, put a circle around the response number you have chosen for each statement.

<table>
<thead>
<tr>
<th>Completely False</th>
<th>Mostly False</th>
<th>Partly False and</th>
<th>Mostly True</th>
<th>Completely True</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

You will find these response numbers repeated at the top of each page to help you remember them.
<table>
<thead>
<tr>
<th>Question</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I have a healthy body</td>
<td></td>
</tr>
<tr>
<td>2. I am an attractive person</td>
<td></td>
</tr>
<tr>
<td>3. I consider myself a sloppy person</td>
<td></td>
</tr>
<tr>
<td>4. I am a decent sort of person</td>
<td></td>
</tr>
<tr>
<td>5. I am an honest person</td>
<td></td>
</tr>
<tr>
<td>6. I am a bad person</td>
<td></td>
</tr>
<tr>
<td>7. I am a cheerful person</td>
<td></td>
</tr>
<tr>
<td>8. I am a calm and easygoing person</td>
<td></td>
</tr>
<tr>
<td>9. I am a nobody</td>
<td></td>
</tr>
<tr>
<td>10. I have a family that would always help me in any</td>
<td></td>
</tr>
<tr>
<td>kind of trouble</td>
<td></td>
</tr>
<tr>
<td>11. I am a member of a happy family</td>
<td></td>
</tr>
<tr>
<td>12. My friends have no confidence in me</td>
<td></td>
</tr>
<tr>
<td>13. I am a friendly person</td>
<td></td>
</tr>
<tr>
<td>14. I am popular with men</td>
<td></td>
</tr>
<tr>
<td>15. I am not interested in what other people do</td>
<td></td>
</tr>
<tr>
<td>16. I do not always tell the truth</td>
<td></td>
</tr>
<tr>
<td>17. I get angry sometimes</td>
<td></td>
</tr>
<tr>
<td>18. I like to look nice and neat all the time</td>
<td></td>
</tr>
<tr>
<td>19. I am full of aches and pains</td>
<td></td>
</tr>
<tr>
<td>20. I am a sick person</td>
<td></td>
</tr>
<tr>
<td>21. I am a religious person</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Completely False</td>
</tr>
<tr>
<td>---</td>
<td>------------------</td>
</tr>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>22. I am a moral failure</td>
<td></td>
</tr>
<tr>
<td>23. I am a morally weak person</td>
<td></td>
</tr>
<tr>
<td>24. I have a lot of self-control</td>
<td></td>
</tr>
<tr>
<td>25. I am a hateful person</td>
<td></td>
</tr>
<tr>
<td>26. I am losing my mind</td>
<td></td>
</tr>
<tr>
<td>27. I am an important person to my friends and family</td>
<td></td>
</tr>
<tr>
<td>28. I am not loved by my family</td>
<td></td>
</tr>
<tr>
<td>29. I feel that my family doesn't trust me</td>
<td></td>
</tr>
<tr>
<td>30. I am popular with women</td>
<td></td>
</tr>
<tr>
<td>31. I am mad at the whole world</td>
<td></td>
</tr>
<tr>
<td>32. I am hard to be friendly with</td>
<td></td>
</tr>
<tr>
<td>33. Once in a while I think of things too bad to talk about</td>
<td></td>
</tr>
<tr>
<td>34. Sometimes, when I am not feeling well, I am cross</td>
<td></td>
</tr>
<tr>
<td>35. I am neither too fat nor too thin</td>
<td></td>
</tr>
<tr>
<td>36. I like my looks just the way they are</td>
<td></td>
</tr>
<tr>
<td>37. I would like to change some parts of my body</td>
<td></td>
</tr>
<tr>
<td>38. I am satisfied with my moral behavior</td>
<td></td>
</tr>
<tr>
<td>39. I am satisfied with my relationship to God</td>
<td></td>
</tr>
</tbody>
</table>
### Scale of Response:

- **Completely False**
- **Mostly False**
- **Partly False and Partly True**
- **Mostly True**
- **Completely True**

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>40. I ought to go to church more</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>41. I am satisfied to be just what I am</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>42. I am just as nice as I should be</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>43. I despise myself</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>44. I am satisfied with my family relationships</td>
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<tr>
<td>45. I understand my family relationships</td>
<td></td>
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<td></td>
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<tr>
<td>46. I should trust my family more</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>47. I am as sociable as I want to be</td>
<td></td>
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</tr>
<tr>
<td>48. I try to please others, but don't overdo it</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>49. I am no good at all from a social standpoint</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>50. I do not like everyone I know</td>
<td></td>
<td></td>
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<tr>
<td>51. Once in a while, I laugh at a dirty joke</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>52. I am neither too tall nor too short</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>53. I don't feel as well as I should</td>
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<tr>
<td>54. I should have more sex appeal</td>
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<tr>
<td>55. I am as religious as I want to be</td>
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<td></td>
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<tr>
<td>56. I wish I could be more trustworthy</td>
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<td></td>
</tr>
<tr>
<td>57. I shouldn't tell so many lies</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>58. I am as smart as I want to be</td>
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<tr>
<td>59. I am not the person I would like to be</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>60. I wish I didn't give up as easily as I do</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completely False</td>
<td>Mostly False</td>
<td>Partly False and Partly True</td>
<td>Mostly True</td>
<td>Completely True</td>
<td></td>
</tr>
<tr>
<td>------------------</td>
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</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

61. I treat my parents as well as I should (Use past tense if parents are not living) ...

62. I am too sensitive to things my family says ...

63. I should love my family more ...

64. I am satisfied with the way I treat other people ...

65. I should be more polite to others ...

66. I ought to get along better with other people ...

67. I gossip a little at times ...

68. At times I feel like swearing ...

69. I take good care of myself physically ...

70. I try to be careful about my appearance ...

71. I often act like I am "all thumbs" ...

72. I am true to my religion in my everyday life ...

73. I try to change when I know I'm doing things that are wrong ...

74. I sometimes do very bad things ...

75. I can always take care of myself in any situation ...
Completely False | Mostly False | Partly False and Partly True | Mostly True | Completely True
---|---|---|---|---
1 | 2 | 3 | 4 | 5

76. I take the blame for things without getting mad ......................... ___
77. I do things without thinking about them first ............................... ___
78. I try to play fair with my friends and family ............................... ___
79. I take a real interest in my family ............................................ ___
80. I give in to my parents (Use past tense if parents are not living) .................. ___
81. I try to understand the other fellow's point of view ....................... ___
82. I get along well with other people ............................................. ___
83. I do not forgive others easily ................................................... ___
84. I would rather win than lose in a game ....................................... ___
85. I feel good most of the time ..................................................... ___
86. I do poorly in sports and games ............................................... ___
87. I am a poor sleeper ............................................................... ___
88. I do what is right most of the time .......................................... ___
89. I sometimes use unfair means to get ahead .................................. ___
90. I have trouble doing the things that are right .............................. ___
91. I solve my problems quite easily .............................................. ___
92. I change my mind a lot ............................................................ ___
<table>
<thead>
<tr>
<th>Completely False</th>
<th>Mostly False</th>
<th>Partly False and Partly True</th>
<th>Mostly True</th>
<th>Completely True</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

93. I try to run away from my problems ...........................................

94. I do my share of work at home ....................................................

95. I quarrel with my family ............................................................

96. I do not act like my family thinks I should ....................................

97. I see good points in all the people I meet ....................................

98. I do not feel at ease with other people ........................................

99. I find it hard to talk with strangers ...........................................

100. Once in a while I put off until tomorrow what I ought to do today ....
APPENDIX D

NORBECK SOCIAL SUPPORT QUESTIONNAIRE
NORBECK'S SOCIAL SUPPORT QUESTIONNAIRE

Please list each significant person in your life on the right. Consider all the persons who provide personal support for you or who are important to you.

Use only first names or initials, and then indicate the relationship, as in the following example:

Example:

<table>
<thead>
<tr>
<th>First Name or Initials</th>
<th>Sex/Relationship</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
</tr>
<tr>
<td>5.</td>
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<tr>
<td>etc.</td>
<td></td>
</tr>
</tbody>
</table>

Use the following list to help you think of the people important to you, and list as many people as apply in your case.

- spouse or partner
- health care providers
- counselor or therapist
- minister/priest/rabbi
- neighbors
- family members or relatives
- friends
- work or school associates
- other

You do not have to use all 22 spaces. Use as many spaces as you have important persons in your life.
<table>
<thead>
<tr>
<th>First Name or Initials</th>
<th>Relationship</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ___________________</td>
<td>1. ___________________</td>
</tr>
<tr>
<td>2. ___________________</td>
<td>2. ___________________</td>
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<td>3. ___________________</td>
<td>3. ___________________</td>
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<td>21. ___________________</td>
<td>21. ___________________</td>
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<tr>
<td>22. ___________________</td>
<td>22. ___________________</td>
</tr>
</tbody>
</table>
For each person you listed, please answer the following questions by writing in the number that applies.

1 = not at all  2 = a little  3 = moderately  
4 = quite a bit  5 = a great deal

**Question 1:** How much does this person make you feel liked or admired?

1. 
2. 
3. 
4. 
5. 
6. 
7. 
8. 
9. 
10. 
11. 
12. 
13. 
14. 
15. 
16. 
17. 
18. 
19. 
20. 
21. 
22. 

**Question 2:** How much does this person make you feel respected or loved?

1. 
2. 
3. 
4. 
5. 
6. 
7. 
8. 
9. 
10. 
11. 
12. 
13. 
14. 
15. 
16. 
17. 
18. 
19. 
20. 
21. 
22.
191

1 = not at all    2 = a little    3 = moderately
4 = quite a bit   5 = a great deal

Question 3: How much can you confide agree in this person?

1. ___________________
2. ___________________
3. ___________________
4. ___________________
5. ___________________
6. ___________________
7. ___________________
8. ___________________
9. ___________________
10.____________________
11.____________________
12.____________________
13.____________________
14.____________________
15.____________________
16.____________________
17.____________________
18.____________________
19.____________________
20.____________________
21.____________________
22.____________________

Question 4: How much does this person with or support your actions or thoughts?

1. ___________________
2. ___________________
3. ___________________
4. ___________________
5. ___________________
6. ___________________
7. ___________________
8. ___________________
9. ___________________
10.____________________
11.____________________
12.____________________
13.____________________
14.____________________
15.____________________
16.____________________
17.____________________
18.____________________
19.____________________
20.____________________
21.____________________
22.____________________
1 = not at all  2 = a little  3 = moderately  4 = quite a bit  5 = a great deal

Question 5:
If you needed to borrow $10, a ride to the doctor, or some other immediate help, how much could this person usually help?
1. ______________________________
2. ______________________________
3. ______________________________
4. ______________________________
5. ______________________________
6. ______________________________
7. ______________________________
8. ______________________________
9. ______________________________
10. ______________________________
11. ______________________________
12. ______________________________
13. ______________________________
14. ______________________________
15. ______________________________
16. ______________________________
17. ______________________________
18. ______________________________
19. ______________________________
20. ______________________________
21. ______________________________
22. ______________________________

Question 6:
If you were confined to bed for several weeks, how much could this person help you?
1. ______________________________
2. ______________________________
3. ______________________________
4. ______________________________
5. ______________________________
6. ______________________________
7. ______________________________
8. ______________________________
9. ______________________________
10. ______________________________
Question 7: How long have you known this person?
1 = less than 6 months
2 = 6 to 12 months
3 = 1 to 2 years
4 = 2 to 5 years
5 = more than 5 years
1. ________________
2. ________________
3. ________________
4. ________________
5. ________________
6. ________________
7. ________________
8. ________________
9. ________________
10. ________________
11. ________________
12. ________________
13. ________________
14. ________________
15. ________________
16. ________________
17. ________________
18. ________________
19. ________________
20. ________________
21. ________________
22. ________________

Question 8: How frequently do you usually have contact with this person? (Phone calls, visits, letters)
5 = daily
4 = weekly
3 = monthly
2 = a few times a year
1 = once a year or less
1. ________________
2. ________________
3. ________________
4. ________________
5. ________________
6. ________________
7. ________________
8. ________________
9. ________________
10. ________________
11. ________________
12. ________________
13. ________________
14. ________________
15. ________________
16. ________________
17. ________________
18. ________________
19. ________________
20. ________________
21. ________________
22. ________________
9. During the past year, have you lost any important relationships due to moving, a job change, divorce or separation, death, or some other reason?

_______ 0. No
_______ 1. Yes

IF YES:

9a. Please indicate the number of persons from each category who are no longer available to you.

_______ spouse or partner [58]
_______ family members or relatives [59-60]
_______ friends [61-62]
_______ work or school associates [63-64]
_______ neighbors [65-66]
_______ health care providers [67]
_______ counselor or therapist [68]
_______ minister/priest/rabbi [69]
_______ other (specify) _______________________ [70]

9b. Overall, how much of your support was provided by these people who are no longer available to you?

_______ 0. none at all
_______ 1. a little
_______ 2. a moderate amount
_______ 3. quite a bit
_______ 4. a great deal
APPENDIX E

SARASON'S LIFE EVENT SURVEY
SARASON'S LIFE EVENT SURVEY

DIRECTIONS: Listed below are a number of events which sometimes bring about change in the lives of those who experience them and which necessitate social readjustment. Please check those events which you have experienced in the recent past and indicate the time period during which you have experienced each event. Be sure that all check marks are directly across from the items they correspond to.

Also, for each item checked below, please indicate the extent to which you viewed the event as having either a positive or negative impact on your life at the time the event occurred. That is, indicate the type and extent of impact that the event had. A rating of -3 would indicate an extremely negative impact. A rating of 0 suggests no impact either positive or negative. A rating of +3 would indicate an extremely positive impact.

<table>
<thead>
<tr>
<th>NEGATIVE</th>
<th>POSITIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremely -3</td>
<td>Extremely +3</td>
</tr>
<tr>
<td>Moderately -2</td>
<td>Moderately +2</td>
</tr>
<tr>
<td>Somewhat -1</td>
<td>Somewhat -1</td>
</tr>
</tbody>
</table>

NO - 0
### NEGATIVE

<table>
<thead>
<tr>
<th>Extremely</th>
<th>Moderately</th>
<th>Somewhat</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>-2</td>
<td>-1</td>
<td>-0</td>
</tr>
</tbody>
</table>

### POSITIVE

<table>
<thead>
<tr>
<th>Extremely</th>
<th>Moderately</th>
<th>Somewhat</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>+3</td>
<td>+2</td>
<td>-1</td>
<td></td>
</tr>
</tbody>
</table>

## Section 1

1. Marriage
   -3 -2 -1 0 +1 +2 +3

2. Detention in jail or comparable institution
   -3 -2 -1 0 +1 +2 +3

3. Death of spouse
   -3 -2 -1 0 +1 +2 +3

4. Major change in sleeping habits (much more or much less sleep)
   -3 -2 -1 0 +1 +2 +3

5. Death of close family member:
   a. mother: -3 -2 -1 0 +1 +2 +3
   b. father: -3 -2 -1 0 +1 +2 +3
   c. brother: -3 -2 -1 0 +1 +2 +3
   d. sister: -3 -2 -1 0 +1 +2 +3
   e. grandmother: -3 -2 -1 0 +1 +2 +3
   f. grandfather: -3 -2 -1 0 +1 +2 +3
   g. other (specify): -3 -2 -1 0 +1 +2 +3

6. Major change in eating habits (much more or much less food intake)
   -3 -2 -1 0 +1 +2 +3

7. Foreclosure on mortgage or loan
   -3 -2 -1 0 +1 +2 +3

8. Death of a close friend
   -3 -2 -1 0 +1 +2 +3

9. Outstanding personal achievement
   -3 -2 -1 0 +1 +2 +3
<table>
<thead>
<tr>
<th>Negative Score</th>
<th>Positive Score</th>
</tr>
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<tbody>
<tr>
<td>Extremely -3</td>
<td>Extremely +3</td>
</tr>
<tr>
<td>Moderately -2</td>
<td>Moderately +2</td>
</tr>
<tr>
<td>Somewhat -1</td>
<td>Somewhat -1</td>
</tr>
</tbody>
</table>

10. Minor law violations (traffic tickets, disturbing the peace, etc.)

11. Male:
   Wife/girlfriend's pregnancy

12. Female: Pregnancy

13. Changed work situation
   (different work responsibility, major change in working conditions, working hours, etc.)

14. New job

15. Serious illness or injury of close family member:
   a. father
   b. mother
   c. sister
   d. brother
   e. grandfather
   f. grandmother
   g. spouse
   h. other (specify)

16. Sexual difficulties

17. Trouble with employer (in danger of losing job, being suspended, demoted, etc.)

18. Trouble with in-laws
<table>
<thead>
<tr>
<th>Number</th>
<th>Event Description</th>
<th>NEGATIVE</th>
<th></th>
<th>POSITIVE</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Extremely</td>
<td>Moderately</td>
<td>Somewhat</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td>19.</td>
<td>Major change in financial status (a lot better off or a lot worse off)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-3 -2 -1 0 +1 +2 +3</td>
<td></td>
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</tr>
<tr>
<td>20.</td>
<td>Major change in closeness of family members (increased or decreased closeness)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-3 -2 -1 0 +1 +2 +3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21.</td>
<td>Gaining a new family member (through birth, adoption, family member moving in, etc.)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>-3 -2 -1 0 +1 +2 +3</td>
<td></td>
<td></td>
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<tr>
<td>22.</td>
<td>Change of residence</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>-3 -2 -1 0 +1 +2 +3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23.</td>
<td>Marital separation from mate (due to conflict)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-3 -2 -1 0 +1 +2 +3</td>
<td></td>
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<tr>
<td>24.</td>
<td>Major change in church activities (increased or decreased attendance)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>-3 -2 -1 0 +1 +2 +3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25.</td>
<td>Marital reconciliation with mate</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>-3 -2 -1 0 +1 +2 +3</td>
<td></td>
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<tr>
<td>26.</td>
<td>Major change in number of arguments with spouse (a lot more or a lot less arguments)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>-3 -2 -1 0 +1 +2 +3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27.</td>
<td>Married male: Change in wife's work outside the home (beginning work, ceasing work, changing to a new job, etc.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-3 -2 -1 0 +1 +2 +3</td>
<td></td>
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<tr>
<td>28.</td>
<td>Married female: Change in husband's work (loss of job, beginning new job, retirement, etc.)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>-3 -2 -1 0 +1 +2 +3</td>
<td></td>
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<tr>
<td>29.</td>
<td>Major change in usual type and/or amount of recreation</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>-3 -2 -1 0 +1 +2 +3</td>
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</tr>
<tr>
<td>30.</td>
<td>Borrowing more than $10,000 (buying home, business, etc.)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>-3 -2 -1 0 +1 +2 +3</td>
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<td></td>
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<tr>
<td>NEGATIVE</td>
<td>POSITIVE</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Extremely -3</td>
<td>Extremely +3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderately -2</td>
<td>Moderately +2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Somewhat -1</td>
<td>Somewhat +1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NO -0</td>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Event</th>
<th>Rating Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>31. Borrowing less than $10,000 (buying car, TV, getting school loan, etc.)</td>
<td>-3 -2 -1 0 +1 +2 +3</td>
</tr>
<tr>
<td>32. Being fired from job</td>
<td>-3 -2 -1 0 +1 +2 +3</td>
</tr>
<tr>
<td>33. Male: Wife/girlfriend having abortion</td>
<td>-3 -2 -1 0 +1 +2 +3</td>
</tr>
<tr>
<td>34. Female: Having abortion</td>
<td>-3 -2 -1 0 +1 +2 +3</td>
</tr>
<tr>
<td>35. Major personal illness or injury</td>
<td>-3 -2 -1 0 +1 +2 +3</td>
</tr>
<tr>
<td>36. Major change in social activities, e.g., parties, movies, visiting (increased or decreased participation)</td>
<td>-3 -2 -1 0 +1 +2 +3</td>
</tr>
<tr>
<td>37. Major change in living conditions of family (building new home, remodeling, deterioration of home, neighborhood, etc.)</td>
<td>-3 -2 -1 0 +1 +2 +3</td>
</tr>
<tr>
<td>38. Divorce</td>
<td>-3 -2 -1 0 +1 +2 +3</td>
</tr>
<tr>
<td>39. Serious injury or illness of close friend</td>
<td>-3 -2 -1 0 +1 +2 +3</td>
</tr>
<tr>
<td>40. Retirement from work</td>
<td>-3 -2 -1 0 +1 +2 +3</td>
</tr>
<tr>
<td>41. Son or daughter leaving home (due to marriage, college, etc.)</td>
<td>-3 -2 -1 0 +1 +2 +3</td>
</tr>
<tr>
<td>42. Ending of formal schooling</td>
<td>-3 -2 -1 0 +1 +2 +3</td>
</tr>
<tr>
<td>43. Separation from spouse (due to work, travel, etc.)</td>
<td>-3 -2 -1 0 +1 +2 +3</td>
</tr>
<tr>
<td>44. Engagement</td>
<td>-3 -2 -1 0 +1 +2 +3</td>
</tr>
<tr>
<td>45. Breaking up with boyfriend/girlfriend</td>
<td>-3 -2 -1 0 +1 +2 +3</td>
</tr>
<tr>
<td>NEGATIVE</td>
<td>POSITIVE</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>----------------------------------------------</td>
</tr>
<tr>
<td>Extremely -3</td>
<td>Extremely +3</td>
</tr>
<tr>
<td>Moderately -2</td>
<td>Moderately +2</td>
</tr>
<tr>
<td>Somewhat -1</td>
<td>Somewhat -1</td>
</tr>
<tr>
<td>NO -0</td>
<td></td>
</tr>
</tbody>
</table>

31. Borrowing less than $10,000 (buying car, TV, getting school loan, etc.)  
   
| -3 | -2 | -1 | 0  | +1 | +2 | +3 |
32. Being fired from job                     
   | -3 | -2 | -1 | 0  | +1 | +2 | +3 |
33. Male: Wife/girlfriend having abortion    
   | -3 | -2 | -1 | 0  | +1 | +2 | +3 |
34. Female: Having abortion                  
   | -3 | -2 | -1 | 0  | +1 | +2 | +3 |
35. Major personal illness or injury          
   | -3 | -2 | -1 | 0  | +1 | +2 | +3 |
36. Major change in social activities, e.g., parties, movies, visiting (increased or decreased participation)  
   | -3 | -2 | -1 | 0  | +1 | +2 | +3 |
37. Major change in living conditions of family (building new home, remodeling, deterioration of home, neighborhood, etc.)  
   | -3 | -2 | -1 | 0  | +1 | +2 | +3 |
38. Divorce                                   
   | -3 | -2 | -1 | 0  | +1 | +2 | +3 |
39. Serious injury or illness of close friend  
   | -3 | -2 | -1 | 0  | +1 | +2 | +3 |
40. Retirement from work                      
   | -3 | -2 | -1 | 0  | +1 | +2 | +3 |
41. Son or daughter leaving home (due to marriage, college, etc.)  
   | -3 | -2 | -1 | 0  | +1 | +2 | +3 |
42. Ending of formal schooling                
   | -3 | -2 | -1 | 0  | +1 | +2 | +3 |
43. Separation from spouse (due to work, travel, etc.)  
   | -3 | -2 | -1 | 0  | +1 | +2 | +3 |
44. Engagement                               
   | -3 | -2 | -1 | 0  | +1 | +2 | +3 |
45. Breaking up with boyfriend/girlfriend     
   | -3 | -2 | -1 | 0  | +1 | +2 | +3 |
### NEGATIVE

<table>
<thead>
<tr>
<th>Rating</th>
<th>Example Event</th>
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<tbody>
<tr>
<td>Extremely -3</td>
<td>Leaving home for the first time</td>
</tr>
<tr>
<td>Moderately -2</td>
<td>Reconciliation with boyfriend/girlfriend</td>
</tr>
<tr>
<td>Somewhat -1</td>
<td>Other recent experiences which have had an impact on your life. List and rate.</td>
</tr>
</tbody>
</table>

### POSITIVE

<table>
<thead>
<tr>
<th>Rating</th>
<th>Example Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremely +3</td>
<td>Beginning a new school experience at a higher academic level (college, graduate school professional school, etc.)</td>
</tr>
<tr>
<td>Moderately +2</td>
<td>Changing to a new school at same academic level (undergraduate, graduate, etc.)</td>
</tr>
<tr>
<td>Somewhat -1</td>
<td>Being dismissed from dormitory or other residence</td>
</tr>
</tbody>
</table>

Section 2: Student Only

<table>
<thead>
<tr>
<th>Event</th>
<th>Rating</th>
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<tbody>
<tr>
<td>51. Beginning a new school experience at a higher academic level (college, graduate school professional school, etc.)</td>
<td>-3 -2 -1 0 +1 +2 +3</td>
</tr>
<tr>
<td>52. Changing to a new school at same academic level (undergraduate, graduate, etc.)</td>
<td>-3 -2 -1 0 +1 +2 +3</td>
</tr>
<tr>
<td>53. Academic probation</td>
<td>-3 -2 -1 0 +1 +2 +3</td>
</tr>
<tr>
<td>54. Being dismissed from dormitory or other residence</td>
<td>-3 -2 -1 0 +1 +2 +3</td>
</tr>
<tr>
<td>55. Failing an important exam</td>
<td>-3 -2 -1 0 +1 +2 +3</td>
</tr>
<tr>
<td>56. Changing a major</td>
<td>-3 -2 -1 0 +1 +2 +3</td>
</tr>
<tr>
<td>57. Failing a course</td>
<td>-3 -2 -1 0 +1 +2 +3</td>
</tr>
<tr>
<td>58. Dropping a course</td>
<td>-3 -2 -1 0 +1 +2 +3</td>
</tr>
<tr>
<td>59. Joining a fraternity/sorority</td>
<td>-3 -2 -1 0 +1 +2 +3</td>
</tr>
<tr>
<td>60. Financial problems concerning school (in danger of not having sufficient money to continue)</td>
<td>-3 -2 -1 0 +1 +2 +3</td>
</tr>
</tbody>
</table>
APPENDIX F

FEETHAM FAMILY FUNCTION INDEX
FEETHAM FAMILY FUNCTION INDEX

FAMILY FUNCTIONING SURVEY

For each of the following statements, there are three questions: How much is there now? How much should there be? How important is this to you? Please answer all three questions by circling the number which represents how you feel now about the family function in each statement. The term spouse refers to your husband or wife or the person who acts as your husband or wife.

Please try to answer all items.

1. The amount of discussion with your friends regarding your concerns and problems.

   (15) a. How much is there now?
   Little   Much
   1  2  3  4  5  6  7

   (16) b. How much should there be?
   Little   Much
   1  2  3  4  5  6  7

   (17) c. How important is this to you?
   Little   Much
   1  2  3  4  5  6  7

2. The amount of discussion with your relatives regarding your concerns and problems (do not include your spouse).

   (18) a. How much is there now?
   Little   Much
   1  2  3  4  5  6  7

   (19) b. How much should there be?
   Little   Much
   1  2  3  4  5  6  7

   (20) c. How important is this to you?
   Little   Much
   1  2  3  4  5  6  7

3. The amount of time you spend alone with your spouse.

   (21) a. How much is there now?
   Little   Much
   1  2  3  4  5  6  7
4. The amount of discussion of your concerns and problems with your *spouse*.

(24) a. How much is there now?
\[
\begin{array}{cccccc}
\text{Little} & \text{2} & \text{3} & \text{4} & \text{5} & \text{6} & \text{7} \\
\text{Much} \\
\end{array}
\]

(25) b. How much should there be?
\[
\begin{array}{cccccc}
\text{Little} & \text{3} & \text{3} & \text{4} & \text{5} & \text{6} & \text{7} \\
\text{Much} \\
\end{array}
\]

(26) c. How important is this to you?
\[
\begin{array}{cccccc}
\text{Little} & \text{2} & \text{3} & \text{4} & \text{5} & \text{6} & \text{7} \\
\text{Much} \\
\end{array}
\]

5. The amount of time you spend with *neighbors*.

(27) a. How much is there now?
\[
\begin{array}{cccccc}
\text{Little} & \text{2} & \text{3} & \text{4} & \text{5} & \text{6} & \text{7} \\
\text{Much} \\
\end{array}
\]

(28) b. How much should there be?
\[
\begin{array}{cccccc}
\text{Little} & \text{2} & \text{3} & \text{4} & \text{5} & \text{6} & \text{7} \\
\text{Much} \\
\end{array}
\]

(29) c. How important is this to you?
\[
\begin{array}{cccccc}
\text{Little} & \text{2} & \text{3} & \text{4} & \text{5} & \text{6} & \text{7} \\
\text{Much} \\
\end{array}
\]

6. The amount of time you spend in *leisure/recreational activities*.

(30) a. How much is there now?
\[
\begin{array}{cccccc}
\text{Little} & \text{2} & \text{3} & \text{4} & \text{5} & \text{6} & \text{7} \\
\text{Much} \\
\end{array}
\]

(31) b. How much should there be?
\[
\begin{array}{cccccc}
\text{Little} & \text{2} & \text{3} & \text{4} & \text{5} & \text{6} & \text{7} \\
\text{Much} \\
\end{array}
\]
c. How important is this to you?
Little  Much
1  2  3  4  5  6  7

7. The amount of help from your spouse with family tasks such as care of children, house repairs, household chores, etc.

a. How much is there now?
Little  Much
1  2  3  4  5  6  7

b. How much should there be?
Little  Much
1  2  3  4  5  6  7

c. How important is this to you?
Little  Much
1  2  3  4  5  6  7

8. The amount of help from relatives with family tasks such as care of children, house repairs, household chores, etc. (do not include spouse).

a. How much is there now?
Little  Much
1  2  3  4  5  6  7

b. How much should there be?
Little  Much
1  2  3  4  5  6  7

c. How important is this to you?
Little  Much
1  2  3  4  5  6  7

9. The amount of time with health professionals (doctors, nurses, social workers, etc.).

a. How much is there now?
Little  Much
1  2  3  4  5  6  7

b. How much should there be?
Little  Much
1  2  3  4  5  6  7

c. How important is this to you?
Little  Much
1  2  3  4  5  6  7
10. The amount of help from your friends with family tasks such as care of children, house repairs, household chores, etc.

(42) a. How much is there now?
   Little  Much
   1 2 3 4 5 6 7

(43) b. How much should there be?
   Little  Much
   1 2 3 4 5 6 7

(44) c. How important is this to you?
   Little  Much
   1 2 3 4 5 6 7

11. If you don't have a child, check here _____

   (45) and omit questions 12, 13, 14, and 15.

12. The number of problems with your child(ren).

(46) a. How much is there now?
   Little  Much
   1 2 3 4 5 6 7

(47) b. How much should there be?
   Little  Much
   1 2 3 4 5 6 7

(48) c. How important is this to you?
   Little  Much
   1 2 3 4 5 6 7

13. The amount of time you spend with your child(ren).

(49) a. How much is there now?
   Little  Much
   1 2 3 4 5 6 7

(50) b. How much should there be?
   Little  Much
   1 2 3 4 5 6 7

(51) c. How important is this to you?
   Little  Much
   1 2 3 4 5 6 7

14. If you do not a child in school, check here _____ and omit question 15. (52)
15. The amount of time your child(ren) miss school.
   (53) a. How much is there now?
       Little  Much
       1  2  3  4  5  6  7
   (54) b. How much should there be?
       Little  Much
       1  2  3  4  5  6  7
   (55) c. How important is this to you?
       Little  Much
       1  2  3  4  5  6  7

16. The number of disagreements with your spouse.
   (56) a. How much is there now?
       Little  Much
       1  2  3  4  5  6  7
   (57) b. How much should there be?
       Little  Much
       1  2  3  4  5  6  7
   (58) c. How important is this to you?
       Little  Much
       1  2  3  4  5  6  7

17. The amount of time you are ill.
   (59) a. How much is there now?
       Little  Much
       1  2  3  4  5  6  7
   (60) b. How much should there be?
       Little  Much
       1  2  3  4  5  6  7
   (61) c. How important is this to you?
       Little  Much
       1  2  3  4  5  6  7

18. The amount of time you spend doing housework (cooking, cleaning, washing, yardwork, etc.)
   (62) a. How much is there now?
       Little  Much
       1  2  3  4  5  6  7
19. The amount of time you miss work (including housework).

(63) b. How much should there be?
   Little  Much
   1  2  3  4  5  6  7

(64) c. How important is this to you?
   Little  Much
   1  2  3  4  5  6  7

20. The amount of time your spouse misses work (including housework).

(65) a. How much is there now?
   Little  Much
   1  2  3  4  5  6  7

(66) b. How much should there be?
   Little  Much
   1  2  3  4  5  6  7

(67) c. How important is this to you?
   Little  Much
   1  2  3  4  5  6  7

21. The amount of emotional support from friends.

(68) a. How much is there now?
   Little  Much
   1  2  3  4  5  6  7

(69) b. How much should there be?
   Little  Much
   1  2  3  4  5  6  7

(70) c. How important is this to you?
   Little  Much
   1  2  3  4  5  6  7

(71) a. How much is there now?
   Little  Much
   1  2  3  4  5  6  7

(72) b. How much should there be?
   Little  Much
   1  2  3  4  5  6  7

(73) c. How important is this to you?
   Little  Much
   1  2  3  4  5  6  7
22. The amount of emotional support from relatives.

(74) a. How much is there now?
   Little       Much
   1 2 3 4 5 6 7

(75) b. How much should there be?
   Little       Much
   1 2 3 4 5 6 7

(76) c. How important is this to you?
   Little       Much
   1 2 3 4 5 6 7

23. The amount of emotional support from your spouse.

(77) a. How much is there now?
   Little       Much
   1 2 3 4 5 6 7

(78) b. How much should there be?
   Little       Much
   1 2 3 4 5 6 7

(79) c. How important is this to you?
   Little       Much
   1 2 3 4 5 6 7

24. The amount of time your work routine is disrupted (including housework).

(15) a. How much is there now?
   Little       Much
   1 2 3 4 5 6 7

(16) b. How much should there be?
   Little       Much
   1 2 3 4 5 6 7

(17) c. How important is this to you?
   Little       Much
   1 2 3 4 5 6 7

25. The amount of time your spouse's work routine is disrupted (including housework).

(18) a. How much is there now?
   Little       Much
   1 2 3 4 5 6 7
(19) b. How much should there be?
    Little     Much
    1 2 3 4 5 6 7

(20) c. How important is this to you?
    Little     Much
    1 2 3 4 5 6 7

26. The amount of satisfaction with your marriage.

(21) a. How much is there now?
    Little     Much
    1 2 3 4 5 6 7

(22) b. How much should there be?
    Little     Much
    1 2 3 4 5 6 7

(23) c. How important is this to you?
    Little     Much
    1 2 3 4 5 6 7

27. The amount of satisfaction with the sexual relations with your spouse.

(24) a. How much is there now?
    Little     Much
    1 2 3 4 5 6 7

(25) b. How much should there be?
    Little     Much
    1 2 3 4 5 6 7

(26) c. How important is this to you?
    Little     Much
    1 2 3 4 5 6 7

28. What is most difficult for you now?

29. What is most helpful for you now?
APPENDIX G

LETTER OF INTRODUCTION
MATERNAL ATTACHMENT STUDY

Mother's Consent Form

We are studying how the special relationship between a mother and her baby develops. We would like to learn if a mother's feeling for her baby are affected by the mother having contact with a counselor.

We are also interested in any recent life experiences that have occurred in the past year and whether they have had a positive or negative effect on mother's life. Finally, we want to know how much support mother's family and friends have provided.

Mothers who participate in this study will be randomly assigned to either the group that has contact with the counselor or the group that does not have contact with the counselor. Mothers in the counselor group will receive training from the counselor on understanding their baby's behavior, understanding their own emotional ups and downs, parenting skills and techniques to help with coping with life stresses.

During the time the baby is in the intensive care nursery, the counselor will have at least three counseling sessions with the mother. One session will assist the mother in learning to recognize and understand the baby's behavioral cues and one session will deal with feelings or parenting questions. The counselor will also be available to mothers when their baby leaves the hospital. Regular contact (either by phone or in person) will occur at three days, one week and one month after the baby is discharged from the hospital. If additional contact with the counselor is desired, mothers will be able to make these arrangements on an as needed basis.

We will be using questionnaires while the baby is in the hospital to gather information about life experiences, how mother feels about herself, and family support. The questionnaires will be given to you when the baby is approxi-
mately two weeks away from discharge. These questionnaires will also be given to you at four months after the baby has been discharged from the hospital and will indicated the conclusion of this study.

The questionnaire should take about 40-50 minutes for you to complete. It is necessary that you complete the entire questionnaire at one sitting. The completed questionnaires will be picked up by a research assistant. This information will be completely confidential and your name will not be written on the questionnaires.

We would also like to observe you and your new baby a few times during her/his first few months. We would like to observe the infant at one month, 2 1/2 months and 4 months of age. Each observation will take approximately 15-30 minutes. These observations will take place in your home. We prefer to have these observations in the rooms where you normally take care of the child, not in the fanciest or most clean room for the observer. All of the observations will be videotaped and will be filmed by a female research assistant.

The videotapes will be of you performing caretaking task, such as feeding or playing with your baby. The equipment we will be using is portable home video equipment. No bright lights are necessary and we want to have as little of an impact on your home as possible.

Since we are also interested in the medical care both you and your baby receive, we will need to have access to both of your medical records.

All information will be kept completely confidential and only your study number will appear on the questionnaires and observations. The information from your questionnaire as well as the information from the questionnaires of other mothers participating in the project will be entered into a computer for analysis. Your individual responses will not be reviewed.

Participation in this study involves no risk to you or your baby. You will be sent the results of the study when all data has been analyzed. You will receive $10.00 each time the questionnaires and observations are completed (one week prior to discharge from the hospital, one month after discharge, 2 1/2 months, 4 months) for a total of $40.00.
You can choose at any time and for any reason to discontinue your participation in this study.

If you have any questions, you can call Dr. Betty Newlon or Janice Brundage at 621-3218.

Thanks for your help!

I have read the above "Subject's Consent". The nature, demands, risks and benefits of the project have been explained to me. I understand that I may ask questions and that I am free to withdraw from the project at any time without incurring ill will (or affecting medical care of myself or my baby). I also understand that this consent form will be filed in an area designated by the Human Subjects Committee with access restricted to the principal investigator or authorized representatives of the particular department. A copy of this consent form will be given to me.

_________________________________________  ________________________
Subject's Signature                        Date

I have carefully explained to the subject the nature of the above project. I hereby certify that to the best of my knowledge the subject signing this consent form understands clearly the nature, demands, benefits and risks involved in participating in this study. A medical problem, language or educational barrier has not precluded a clear understanding of her involvement in this project.

_________________________________________  ________________________
Investigator's Signature                   Date
APPENDIX H

HUMAN SUBJECTS APPROVAL
(UNIVERSITY OF ARIZONA)
The proposal submitted by Betty J. Newlon
entitled "The effects of counseling on the parental attachment of mothers..."
has been approved by the Human Subjects Committee of the School
of Family and Consumer Resources.

The committee has found there to be no risk to the subjects involved.

Chair,
School of Family and Consumer Resources
Human Subjects Committee
5/16/86
APPENDIX I

HUMAN SUBJECTS APPROVAL
(TUCSON MEDICAL CENTER)
March 9, 1987

Janice Kay Brundage  
c/o Guadalupe Olivas, R.N., Ph.D.  
Tucson Medical Center

Re: Therapeutic Intervention Strategies: Implications for Maternal Attachment in the Neonatal ICU

Dear Janice:

This is to advise you that the above research study was approved by the Human Research Committee on 2-3-87 and subsequently by the Medical Executive Committee on 2-23-87. You may now proceed with your research.

Review by the Human Research Committee has been set at six months. A copy of our Guidelines for Continuing Review and our membership roster are enclosed.

Should you have any questions, please contact me at extension 5332.

Sincerely,

Ronald P. Spark, M.D.  
Chairman  
TMC Human Research Committee

RPS/ki

Enc. (2)
REFERENCES


Code of Federal Regulations, Title 45, Subtitle A, Part 46. as taken from ethical principles in the conduct of research with human participants, Washington, D.C., American Psychological Association, Inc. 1973


