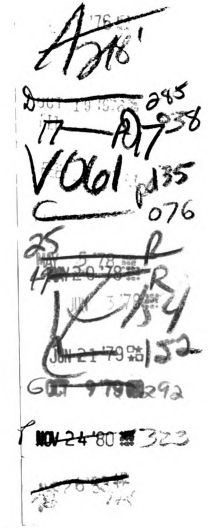

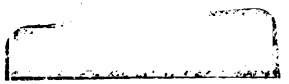

ABSTRACT

EARLY PREDICTION OF PARENTING POTENTIAL

By

Ann Leard Wilson

The significance of predictors of Parenting Potential, defined as mother-infant interaction that is functional in facilitating positive child growth and development, was studied with 40 primiparous mothers and their newborns. Maternal attachment is considered as central to the quality of mother-infant interaction and is assessed in this study by measures of maternal responsiveness.

The process of seeking permission and cooperation from the medical community to conduct this study was a major part of the research project. A detailed description is provided of the process followed for securing hospital, physician, and patient permission and cooperation.

An interactional approach was used to examine the nature of the mother-infant relationship. Both the mother and the infant were considered to be active participants in the parenting dyad. The variables used as predictors of Parenting Potential included background information gathered from questionnaires administered during the mothers' last trimester of pregnancy and observational

assessments of maternal and neonatal behavior made immediately following delivery and during the period of postpartum hospitalization.

The background data gathered during the last trimester of pregnancy included information about demographic factors, stress encountered during pregnancy, planning and management of pregnancy and hospital care, and personal resources for childrearing. The total scores from the Survey on Bringing Up Children were used as measures of concern regarding the latter variable. A delivery room observation scale was developed to assess maternal responsiveness during the first ten minutes following birth. Maternal responsiveness during a feeding was also assessed approximately three days following delivery by a feeding observation scale. The Brazelton Neonatal Behavioral Assessment Scale was administered to assess each newborn's behavior.

The significance of the variables used as predictors of Parenting Potential was evaluated by measures of maternal responsiveness assessed on a repeated feeding observation made four weeks following delivery. Also at this time mother-infant adjustment was assessed by a postpartum research inventory, the Neonatal Perception Inventory and an openended interview.

A stepwise multiple regression statistical method was employed as the major strategy of data analysis. The results indicate that maternal responsiveness in the delivery room significantly predicts maternal responsiveness during a hospital feeding

($R^2$ = .22 $p$ < .01). Age as a continuous variable and the choice to have a rooming-in arrangement in the hospital are both significant predictors of maternal responsiveness as it is assessed four weeks following delivery. Together, these two variables account for .51 of the variance in this dependent variable ($p$ < .01).

Age, the most significant predictor, is discussed in terms of emotional and social stability. The greater predictive significance of age when combined with rooming-in is discussed as a function of the sensitive period hypothesis which suggests that maternal attachment is related to the amount of contact time a mother and newborn have together during the first hours and days following birth.

The research findings which indicate an attenuation during the first postpartum month of the predictive significance of the responsiveness in the mother's behavior observed in the hospital can be explained by the separation which the mothers and infants encountered at birth. This suggestion is supported by the finding that mothers assessed as most responsive four weeks following birth were older and chose the hospital option of rooming-in. These mothers may have a predisposition for seeking the optimal contact they had with their newborns during their first postpartum days, and this additional contact time may affect the degree of their responsiveness four weeks following delivery.

It is suggested that further research with a large random sample is required to establish the predictive significance and the

feasibility of the routine use of a delivery room observation scale. An investigation of the meaning of prenatal assessments of a mother's predisposition for contact with her newborn would also provide information useful to the early assessment of Parenting Potential.

For the delivery of comprehensive health care, the research findings indicate that the use of the broad perspective provided by the concept of Parenting Potential is useful for assessing early indicators of the quality of the parenting relationship. A delivery room observation scale could provide a means of making assessments of early mother-infant interaction which can be used by hospital staff to provide more sensitive individualized care for their patients. Those who care for new mothers are encouraged to consider the support they give to their patients as enhancing the potential of future parenting relationships.

# EARLY PREDICTION OF PARENTING POTENTIAL

By

Ann Leard Wilson

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Family Ecology

1975

TO MY FAMILY

## ACKNOWLEDGMENTS

I am tempted to only acknowledge "motherhood without which this study would have been impossible." Obviously this is true, but far more than the process of mothers birthing and parenting babies was entailed in the development of this study. It has been my contact with the many people who generously shared their time and efforts which has made this dissertation a personally enriching experience.

I want to express my most sincere gratitude to the members of my committee who have guided me through my graduate program. Their special interest in this dissertation added to my own enthusiasm for undertaking some of the more strenuous demands of such a study.

Dr. Robert Boger, the chairman of my program committee, has shared my excitement in developing through my graduate work an integrative focus on family ecology. He has been of much assistance to me as I have attempted to coordinate my interests with an academic program.

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with young children. His wise suggestions and novel ideas have added much to the unique quality of this study. Dr. Helfer has also introduced me to people and experiences which have given special meaning to my graduate work. I feel very fortunate in having had this opportunity to learn from him.

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The College of Human Ecology has given me the latitude to explore my interests in the area of infancy and early parent-child relations. The breadth of exposure to university faculty and community programs that I have enjoyed has provided a rich opportunity for learning and has stimulated the formulation and initiation of this research project.

The faculty members in the Department of Human Development, College of Human Medicine, have been most helpful in the preliminary work and logistical planning essential for this dissertation. My special thanks go to Dr. Thomas Helmrath who assisted me throughout much of this planning and introduced me to many of the physicians and nurses whose cooperation was necessary for conducting the study. I also appreciate Dr. David Kallen's support throughout the development of my emerging interest in this area of research.

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Megan Ewald, who was born one year ago, has added a special meaning to this study. Her birth and development over this past year has given me a realistic view of how the warmth of human attachments nourishes the wonder of human growth. I thank Megan's parents for their friendship over my years as a graduate student.

In the end it was the 40 mothers who permitted me to observe them and their babies at one of the most exhilarating moments of their lives together who did make this study a possibility. For me

nothing could have been more fascinating to observe than the joyous moments of these families at the time the miracle of conception became a reality with the birth of a baby. I feel humble in having had this opportunity to study a process so deep a part of each of our lives.

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# CHAPTER I

## INTRODUCTION

The rich potential of human life becomes a startling reality with the birth of a newborn infant. At birth the intricate process of human growth has already begun and will continue in a context which will affect the child's emerging development. From conception human growth occurs in an interpersonal context which provides for the emerging relationship between a mother and child. How the relatedness of these two individuals begins to be expressed in behavior will nurture the process of growth and the realization of the child's human potential.

This study examines how mothers and infants begin to interact with one another. Their style of interaction contributes to the quality of a mother's bonds of emotional attachment with her newborn which are intrinsic to her capacity to give nurturant care. Responsive behavior has been used as an important indicator of a mother's attachment to her newborn (Klaus & Kennell, 1970b), and an infant's visual exploratory behavior, important to developmental processes has been shown to be influenced by the degree of maternal responsiveness (Rubenstein, 1967). Maternal responsiveness is thus used in this study as a measure of attachment behavior, and mother-infant interaction is considered as a reciprocal process in the emergence of human bonding.

Parenting Potential is the term employed in this study to identify parent-child interaction that is functional in facilitating positive child growth and devlopment. Maternal attachment, considered to be central to the parenting relationship, represents a mother's capacity for caregiving and can be used to predict the Parenting Potential of the relationship.

Behavior is a function of the context in which it is observed and reflects life experience and the environmental situation. Making this assumption about behavior necessitates that these factors be accounted for in this study. Information about the mother's background and the planning and management of the pregnancy and hospital care is used to understand better the meaning of the responsive behavior observed. Newborn behavioral individuality is also assessed and considered as affecting the nature of the mother's responsiveness which reflects the degree of her maternal attachment.

The comprehensive research question to be explored in this study is:

> Can Parenting Potential, identified by the variance in scores of maternal responsiveness and assessments of mother-infant adjustment made four weeks following delivery, be predicted from background information and maternal and neonatal behavioral observations made at the time of delivery and postpartum hospitalization?

Early maternal and neonatal behaviors may provide the first clues about future parenting style and the potential for the parenting relationship. When initial indicators of bonding are weak and an infant's behavior is not reinforcing to positive maternal behaviors, there may be a risk involved in the parenting relationship.

The use of a broad focus to determine potential parenting problems enables preventive intervention prior to the development of parent-child relationships which may not facilitate the process of positive child growth and development.

Parenting Potential can be evaluated using a variety of factors as indicators of the quality of the evolving relationship. The focus on early attachment behavior, central in this study, was chosen because of its accessibility to observational evaluation. The overt demonstration of the formation of emotional bonds can be readily observed under the fairly standard procedures followed in giving routine care to obstetric patients.

With a wholistic perspective on the process of birth, the interpersonal context of initial maternal behavior can be examined. Modern medical practices which protect the lives of mothers and newborns have limited the liberty with which mothers may express responsive behavior toward their newborn infants. Close observations of early maternal behavior may provide insight into the importance of maternal responsiveness and how this interaction can be facilitated in a setting safe for both mothers and their newborns. With this perspective on the process of birth, the early care a mother and newborn receive may be understood to play a role in enhancing the potential of a parenting relationship. Early maternal behavior may have important implications for future parent-child relations and the child's total development.

## Purpose of the Study

The purpose of this study is to evaluate the use of assessments as predictors of the potential quality of a relationship between a parent and child. The predictive significance of these assessments will be established through an evaluation of mother-infant interaction four weeks following delivery.

The process used to obtain the cooperation of both the community physicians and the hospital staff instrumental in conducting this study is an additional dimension of the research. Although gaining the support of essential institutions and individuals is a critical part of all research with human subjects, involvement in the health care system is especially difficult for a nonmedical professional. How this cooperation was sought and secured is an important aspect of this study.

Explanation of the process of securing permission and cooperation for conducting this study may be useful in opening doors of obstetric and newborn services of hospitals for future research studies and intervention programs. Provisions for educational input to the hospital staff and community physicians are included as part of the preliminary procedures essential for conducting this kind of study. This is an important facet of the study and one that will attempt to increase awareness of the unique role these professionals can play in supporting the development of positive mother-infant relationships. An effort will be made to help medical professionals understand how the emotional climate of the care

they provide to patients can affect the way a mother will establish an on-going relationship with her newborn.

In summary, the purpose of the study is two-fold. Emphasis is placed upon both the actual analysis of the data collected and the process of conducting the research. The design of the research represents a new direction in examining the parent-child relationship and evaluates a means of making early assessments of the quality of early mother-infant interaction with a broad perspective on the parenting relationship. The focus of attention is upon more than the identification of children who are likely to suffer from severe developmental disorders. The study attempts to investigate both empirically and procedurally the feasibility of predicting from observations of early maternal and neonatal behavior the potential of a parenting relationship. Measures of maternal responsiveness are used in assessing maternal attachment which is considered to be central in the emerging parenting relationship. Eventually such measures may be useful in designing programs which can provide supportive services for families with young children.

## Conceptual Framework

An interactional approach to the study of the mother-infant relationship is utilized in this research. This approach conceptualizes both mothers and infants as active individuals, each contributing to the nature of their on-going relationship. Using this approach, the mothers' and the infants' behavior is viewed as

representing a dynamic dyadic system in which is manifest the nature of the reciprocity of both individual's interaction with each other.

The interactional conceptualization of the mother-infant relationship is operationalized in this study with a focus on gross behaviors that can be easily observed and assessed. Not all the data to be collected in this study represent the nature of the contingent behaviors of a mother and infant as they respond to each other at one point in time. However, the cross-sectional sampling of behavioral observations utilized in the research design provides information about the unique nature of an individual mother's and infant's capacities to respond to each other.

As the focus of this investigation is upon examining overt maternal and neonatal behavior, the interactional approach provides a useful perspective for making the appropriate observations. To provide a more comprehensive understanding of the attachment process and the ensuing mother-infant adjustment, an ecological perspective is used to assess how a mother's past experiences and present situation also affect the behavior observed. These factors are assessed during a woman's last trimester of pregnancy, and assessments of the mother's and newborn's behavior are made during hospital observations. The predictive significance of both the background variables and behavior observed in the hospital is evaluated with repeated observations and self-report assessments of mother-infant adjustment made during a home visit four weeks following delivery. These three points in time at which these data are collected are designated as Time 1 ($T_1$), Time 2 ($T_2$), and Time 3 ($T_3$).

Figure 1 illustrates the dynamic interfaces of variables which affect the maternal and neonatal behaviors identified as the focus of the investigation. These observed behaviors are in turn conceived as mediating the quality of the future parenting relationship. Adaptation between mother and infant which is not positive is considered as having potential pathological consequences for the child's future behavior and development.

## Assumptions

The following assumptions will be made in examining the early interaction of maternal and newborn behaviors:

1. The period of human infancy is the critical period for the establishment of human bonds of attachment which will mediate the nature of the parenting relationship and the child's overall development.

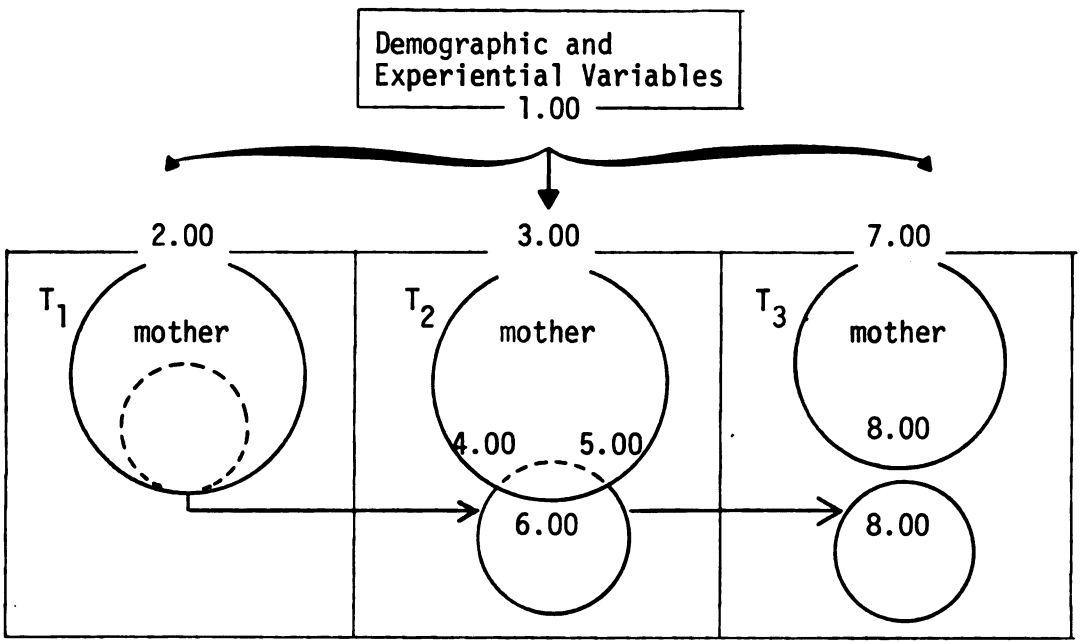
2. All behavior occurs in interaction. The mother-infant relationship involves a dyadic system in which both mother and infant contribute to the nature of their mutual interaction.

3. Overt behavioral indicators of maternal attachment are first observed in a mother's responsiveness to her newborn in the delivery room. This behavior represents the outcome of nine months of anticipation and the maternal investment in giving birth.

4. The factors immediately preceding delivery influence this maternal behavior e.g., length of labor, degree of pain, type of anesthesia, difficulty of delivery. How these factors influence maternal behavior is unknown.

5. An observation of mother-infant interaction during a feeding is a representative sample of the quality of the parenting relationship.

6. The biological nature of a woman's function in giving birth has necessitated the primary emphasis on her initial behavior in this study.




gray area = observed behaviors

The variables and behaviors as they appear in Figure 1 are:

1.00 Demographic and experiential factors
2.00 Management of pregnancy and hospital care
3.00 Labor and delivery
4.00 Maternal behavior in the delivery room
5.00 Maternal behavior during a hospital feeding
6.00 Neonatal behavioral and physical characteristics
7.00 Mother-infant adjustment four weeks following delivery
8.00 Feeding behaviors four weeks following delivery

Figure 1.--Conceptual Schema of Research Design

## Definitions

Mother: The individual who gives birth to a child.

Caregiver: The individual who gives nurturant care to a dependent infant or child.

Parenting: The active engagement of roles a caregiver and dependent infant assume in relation to each other.

Mother-Infant Interaction: The reciprocal behavior manifest in the parenting relationship that reflects both the mother's and the infant's individual style of responsiveness to each other.

Maternal Responsiveness: The intentional focus of behavior on an infant which is either initiated by the mother or elicited by the infant.

Maternal Attachment: The extent to which a mother feels that her infant occupies an essential position in her life as measured by the degree of maternal responsiveness.

Parenting Potential: Mother-infant interaction that is functional in facilitating positive child growth and development.

Predictors of Parenting Potential: The following variables are factors which influence a mother's capacity for parenting:

1.00 Demographic and experiential factors

- 1.01 age
- 1.02 income
- 1.03 education
- 1.04 marital status and length of marriage
- 1.05 personal resources for child rearing
- 1.06 stress encountered during pregnancy

2.00 Management of pregnancy and hospital care

- 2.01 planning of pregnancy
- 2.02 choice of hospital care for infant
- 2.03 prenatal education

3.00 Labor and delivery

- 3.01 length of labor
- 3.02 father's responsiveness in the delivery room

4.00 Maternal behavior in the delivery room

- 4.01 total score of maternal responsiveness in the delivery room

5.00 Maternal behavior during a hospital feeding

- 5.01 total score of maternal responsiveness during a hospital feeding.
- 5.02 ratio of time mother spends looking at infant to total time of feeding
- 5.03 breast or bottle feeding

6.00 Neonatal behavior and physical characteristics

- 6.01 newborn interactive processes
- 6.02 newborn motoric processes
- 6.03 newborn organizational processes of state control
- 6.04 newborn organizational processes of physiological response to stress
- 6.05 physical appearance of newborn
- 6.06 discrepancy between actual and desired sex of newborn

Indicators of Parenting Potential: The quality of the parenting relationship is assessed by the variance of scores in the following variables:

7.00 Mother-infant adjustment assessed four weeks following delivery

- 7.01 maternal perception of newborn behavior
- 7.02 attitudes toward caregiving
- 7.03 maternal self-report of physical health
- 7.04 feelings of maternal attachment reported by mother
- 7.05 mother-infant adaptation to parenting relationship
- 7.06 maternal recall of first contact with newborn
- 7.07 maternal recall of difficulty of labor and delivery

8.00 Feeding behaviors four weeks following delivery

- 8.01 total score of maternal responsiveness during feeding four weeks following delivery
- 8.02 infant responsiveness during feeding
- 8.03 ratio of time mother spends looking at infant to total time of feeding
- 8.04 breast or bottle feeding

## Importance of the Study

Over the years there has been much interest among clinicians and researchers in understanding how an infant begins to form attachments to his parents. Recently, attachment has begun to be studied in terms of how parents develop emotional bonds with their children. The medical attention received by the problems of child abuse and neglect and the developmental disorders of children whose critical condition at birth required that they be separated from their parents has contributed to this new approach to the study of attachment. Bonding failure is now viewed by many as functional in the etiology of many forms of emotional and physical pathology seen in children. An examination of the attachment process from the parents' perspective provides a point of view that is useful in examining the earliest of parenting behaviors.

As an attempt to document through standard observations in the delivery room and during a first feeding the initial spontaneous responses of mothers to their newborns, this study will provide information that will contribute to the understanding of the attachment process. These observations combined with the prenatal questionnaires and the neonatal assessments provide information useful

in evaluating how a mother's background and responsiveness and her newborn's behavioral capacity will contribute to the quality of their parenting relationship. Such an evaluation represents an attempt to enlarge the focus of the delivery process to include a programmed assessment of maternal and neonatal behavior that can be used to identify how appropriate supportive assistance can be provided for young families. Through a sensitive means of early assessment and immediate intervention, families can receive reinforcement for their positive behavior or preventative assistance before problems become manifest in the parent-child relationship which may begin to affect the child's behavior and development.

The cooperation of the medical community needed to conduct this study requires an involvement in research which utilizes a broad perspective for examining the well being of obstetric patients. This is important as a means of orienting the attention of those who care for new mothers and their newborns to the importance of early mother-infant interaction and its significance for the potential parenting relationship.

# CHAPTER II

# REVIEW OF THE LITERATURE

## Attachment Behavior

The phenomenon of attachment is a fundamental developmental process which emerges during the first year of a child's life. The role that human attachment plays in facilitating emotional growth and well-being has been thoroughly described in the classic studies of maternal deprivation. The work of Provence and Lipton (1962), Freud and Burlingham (1943), Spitz (1946), and Bowlby (1966) have described the psychopathological consequences that institutional rearing can have on the development of young children. These authors have suggested that only consistent experiences over time can lead to an infant's establishment of an internal mental representation of the person who gives him care. Such a mental image fosters a young child's sense of relatedness in maintaining an interactive relationship with the caregiver and a feeling of security in being able to leave the caregiver to explore the near environment. Situations which do not encourage an infant's attachment to adult caregivers deprive the individual of a capability in forming the human bonds necessary for maintaining meaningful interpersonal relationships.

Attachment provides the nurturance for physical and emotional growth. Fraiberg (1967) has explained that in the absence

of human ties, a conscience cannot be formed and qualities of self-observation and self-criticism fail to develop. She noted that the feeling of distance from others that is experienced by an unattached individual is accompanied by an emotional range impoverished of joy, guilt and remorse.

Cognitive studies contribute information that is helpful in understanding the emerging processes of attention, perception, learning and retention which mediate how a child attaches to his caregivers. Influenced by the Piagetian concept of object conservation, studies emphasize how an infant's ability to conceive of his mother as a permanent figure is related to the quality of his attachment to her. Bell (1970), through observations of infants in a contrived situation, found that infants who respond to a separation from their mothers with signs of attachment but without upset, ambivalence or defensiveness have more accelerated conceptions of person permanence as opposed to inanimate object permanence. In interviewing the mothers regarding their play with and interest in their infants, a positive relationship was revealed between sensitive and devoted mothering attitudes and practices and the infants' concept of person permanence. These practices and attitudes can be understood as affecting the quality of the early relationship between a mother and her infant.

Before cognitive mechanisms can actively operate to facilitate selective social behavior, an infant must first experience a fundamental attraction to other humans. How an infant differentiates a human individual as a unique object in the environment is

contingent upon both his innate sensory capabilities and the stimulus qualities of those with whom he interacts. It is increasingly acknowledged that infants are born well endowed with a capacity for processing sensory visual stimulation, e.g., the ability to focus their vision on objects and to follow slowly moving targets. Interestingly, newborns are best able to focus on objects eight inches away from their faces or about the distance of the mother's face during a feeding.

The auditory system at birth is also well developed with a high degree of functional complexity. The neonate can make differential responses to stimuli which vary in pitch, intensity, and duration. Newborns are also born equipped with sensitivities to skin pressure and touch. A newborn's tactile sensitivity varies according to body part stimulated, the area around the mouth being the most sensitive to touch. Smell and taste sensitivities have also been demonstrated in newborns. Infants are also able to make proprioceptive discriminations appropriately adjusting their bodies in response to shift in posture.

How does a human caregiver function as an attractive and preferred stimulus object for the newborn's selective attention? Rheingold (1961) noted that humans have built into them a number of features that make them the focus of an infant's attention. She has claimed that the human's constant movement which emits a great deal of highly varied stimulation that can appeal to a number of the infant's different sense modalities simultaneously makes the

person an appealing focus of attention. That the human is also responsive to the infant's own behavior in a continuous and reciprocal pattern of interaction is of importance in stimulating the selective attention of the newborn.

Kagan and Lewis (1965) showed that the human face alone possesses characteristics such as contrast, movement and three dimensionality which are especially likely to catch an infant's attention. Similarily, Fantz (1963) demonstrated the salience of the human face as a stimulus object for newborns. His studies have shown that neonates only two to six days old pay more attention to a disc with human features painted on it than to any other stimuli of similar shape and size.

Newborns also demonstrate selective attention to human auditory stimulation. Hutt, Lenard, Bernuth, and Muntjewerff (1968) showed that infants are more likely to respond positively to sounds having some characteristics of the human voice at a younger age than they can demonstrate responsiveness to faces.

Given sensory ability and stimulus objects, cognitive mechanisms begin to function as an infant between the ages of 4 and 8 months learns to distinguish different individuals and to recognize his mother as his familiar caregiver. Emotional bonds are forthcoming as the child selectively seeks proximity with those with whom he shares an attachment.

Bowlby (1958), a psychoanalyst with a biological perspective, maintains a dynamic point of view on attachment. He describes

the attachment process as an interaction between innate behaviors of the infant such as crying, sucking, smiling, clinging and following and the parental responses which they elicit. Such a conceptualization underscores the role each partner plays in the creation of the human bond emerging between parent and child.

The early years of a child's life are thus the vital ones for the development of attachments between caregivers and their children. The availability of caregivers willing and able to provide an emotionally responsive climate for growth will affect the child's capacity for attachment and subsequent emotional and physical development. Attachment as an emotional investment in caregiving needs to be evident in parents' early responsive behavior towards their child if an environment for nurturing children's capacity for attachment to their caregivers is to be created.

Quickening has been identified as a turning point during pregnancy when a woman begins to develop stronger feelings of attachment to her child. It is at this time when a psychological readjustment also appears to take place that the pregnant women begins to develop a more realistic relationship with her yet unborn child (Bibring, 1959).

The growth of a mother's attachment to her child can thus be traced prenatally to a woman's feelings toward her unborn child. Data from a study of the mourning response of mothers to the death of a newborn infant have suggested that a substantial degree of affectional bonding precedes a woman's tactile contact

with her infant (Kennell, Slyter, & Klaus, 1970). Evidence from this study also have indicated that mothers who are pleased to be pregnant and those who had tactile contact with their infants before their death experienced a longer and perhaps more intense period of mourning than those mothers who did not report such feelings or experience early tactile contact. These findings lend support to the notion that the emergence of a woman's feelings of attachment begins prior to birth and are intensified with initial physical contact with the newborn.

## Animal Attachment Studies

Various animal studies provide information helpful in conceptualizing the natural variables facilitating immediate maternal bonding. Ethological studies have noted that when goats, sheep, or cows are separated from their newborns for the first four days after birth, these animals show a failure to care for their young when they are reunited. However, after a separation of a mother and her newborn on the fifth day after delivery, there is no apparent disruption in the mothering behavior (Hersher, Moore, & Richmond, 1958). These findings indicate the importance of the timing of the first contact between the mother and her newborn following birth.

Another study involving half wild kaffir buck which had been rendered unconscious during birth with chloroform and ether showed that these mother animals refused to accept their newborns when they regained consciousness. Morais (cited in Newton & Newton, 1962) reported that when the buck were rendered unconscious

immediately after birth and before they were allowed to view their young, acceptance was immediate with the return of consciousness. This study indicates that the procedural management of the delivery and the timing of contact are important variables mediating the acceptance of the young. Chimpanzees also exhibit behavior which displays the importance of the management of delivery for future maternal behavior. It has been noted that when giving birth in captivity the mother is likely to be afraid of her newborn and will not allow it to cling to her coat (Lawick-Goodall, 1971).

The amount of contact permitted between a mother and her newborn appears also to be an important mediating factor involved in future attachment. In a study of rhesus monkeys, the amount of visual and auditory contact permitted between a mother and newborn was manipulated, and it was demonstrated that mothers deprived of full contact with their newborns showed a marked decrease in the amount of time and care they gave to their offspring (Harlow & Harlow, 1965).

Previous experience has been shown to affect the course of maternal behavior. Scott (cited in Brody, 1966) has shown that ewes who were artificially fed as lambs are able to nurse their own offspring but otherwise ignore their own lambs. Orphan rhesus monkeys who lack experience with their own species are frequently ineffective and brutal mothers (Harlow, Harlow, & Hanson, 1966). Rat studies provide similar findings. Female rats, when reared so that they are unable to lick their own abdomens and posterior bodies, give

minimal tactile stimulation to their young. These same rats, when prevented from carrying objects, have shown an inability to make nests and retrieve their young (Schneirla, 1951).

The behavior and appearance of an infant animal have also been noted to affect his mother's caregiving. As a rhesus monkey develops more independent behavior, he reinforces his mother's caregiving behavior less, and she begins to alter her nurturant behavior towards him (Harlow & Harlow, 1965). It has been noted that when the infant langur's typical coat, size, vocalizations and awkward movements disappear, maternal behavior also ceases (Jay, 1963).

These ethological reports highlight variables which affect maternal attachment manifest in caregiving behaviors. Findings from animal studies provide information helpful in making critical assessments of how human maternal behavior emerges. Animal studies, however, have the liberty of manipulating experiential and environmental variables to clarify hypotheses concerning how maternal behavior can be experimentally affected. Although ethical considerations forbid the kind of behavioral experimentation conducted in examining animal maternal behavior, laboratory and naturalistic observational studies have provided information concerning human behavioral mechanisms which function to facilitate the caregiving relationship. It has been possible to conduct in hospital settings some experimental research with human mothers and their newborns. Contemporary hospital management of maternity care

has created practices which limit how mothers can initiate contact with their newborns. Experiments can be conducted by liberalizing these practices, without harmful medical consequences, to investigate how maternal behavior may be affected by the environmental constraints imposed by routine hospital care. Both the naturalistic and experimental investigations have provided intriguing insight into the study of human attachment behavior, and these findings will be reviewed.

## Human Attachment Studies

Studies with human mothers and their newborns reveal that a pattern of behavior exists in how a mother first initiates contact with her infant. Klaus and Kennell (1970a) examined tactile interaction through a quantitative analysis of photographs taken of mothers during their first ten minutes of interaction with their infants. Their data provide evidence of an orderly progression of what they identify as species specific behavior. A mother begins contact with her infant by applying finger tip touch on the infant's extremities before she begins to have palm contact with the infant's trunk. The data gathered indicate that 52% of the first three minutes of initial contact is spent in finger tip interaction with the newborn on his extremities and 28% of the time is spent in palm contact on the trunk. During the last three minutes of the contact time, 26% of the time was spent in finger tip interaction on the extremities while 62% of the time was spent in palm contact on the trunk. Interestingly, this same pattern of behavior

has been observed with a mother's first interactions with her premature infant; the rate of acceleration from finger tip touching to palmar contact occurring more slowly.

In attempting to establish a feeling of relatedness, gaze interaction between a mother and her newborn is noted throughout the literature as an important function for subsequent parenthood. Moss and Robson (1968) have stated that to be looked at is tantamont to being acknowledged and to be acknowledged is a prerequisite for both social interchange and the establishment of more permanent attachments. These researchers found that a pregnant woman's expression of interest in her yet unborn child is related positively to the amount of face to face gazing between her and her infant assessed when the infant is 1 and 3 months old.

Eye contact mediates a substantial part of the nonverbal transactions that transpire between a mother and infant (Robson, 1967). During the first contact a mother has with her newborn an intense interest in eye to eye contact has been noted. With an understanding of the importance eye contact plays in eliciting attachment, it is of interest that visual fixation and visual following are the only naturalistic neonatal reflexes which do not drop out over time. The newborn's ability to visually fixate upon an object and to follow a moving target is a relatively advanced behavior compared to overall maturation at the time of birth. Rheingold (1961) has gone so far as to say that visual and not physical contact is the basis for sociability.

Robson (1972) stated that "with gaze as the conductor of social orchestration, speech and the smiling response play a constant counterpoint" (p. 308). Observations of mother-infant pairs indicate that speech and smiling help modulate the potentially arousing and disrupting effects of visual contact. Language is intimately linked to reciprocal gazing, and it is noted that mothers and infants vocalize to one another mainly during gaze interchanges.

Maternal responsiveness to newborn vocal signals has also been demonstrated. The newborn's cry or distress signal can be distinguished by its three different patterns. Newborns have a hunger cry progressing from an arhythmical low intensity cry to a louder rhythmical form. They also have an angry cry having a somewhat similar form but with a different sequence of component parts, and a pain cry with a sudden onset, a pause and then a series of gasping cries. Wolff (1969), through spectographic analysis of crying episodes, has been able to identify these three patterns and has found that mothers can fairly easily distinguish the different patterns so as to respond appropriately to their distressed infants. Formby (1967) has demonstrated that mothers are also able to discriminate the individual cry of their own infants from the cries of strange newborns.

Noting these patterns of neonatal and maternal behavior which facilitate the attachment of a mother and child to each other, revealing studies have been conducted to investigate the

effects of manipulating the quality of a mother's initial interaction with her newborn. In their most recent study the Case Western research group divided 28 primiparous mothers into two treatment groups having different amounts of contact time with their newborns (Klaus, Jerauld, Kreger, McAlpine, Steffa, & Kennell, 1972). One group received the usual hospital treatment and was allowed the standard amount of physical contact time with their newborns. The second group received sixteen additional hours of contact time. The mothers' backgrounds and infants' characteristics were similar.

Three separate assessments of the mothers and their infants were made on two different occasions, once one month following delivery and once one year after the child's birth. These assessments included a standardized interview, an observation of maternal performance during a pediatric examination of the infant and a filmed study of the mother feeding her infant. Results from this study show that one month following delivery the extended contact group was more reluctant to leave their infants with baby-sitters and stood and watched their infants more closely during a physical examination than did mothers in the control group. The extended contact group also showed greater soothing, eye to eye contact and fondling during the feedings. Results from the one year follow-up revealed similar differences between these two groups in response to the questions about baby-sitters and in behavior observed during the physical examination.

The findings from the Klaus et al. (1972) research which shows that contact time may play a role in mediating the quality of parental attachment influenced the development of a tentative hypothesis that there may be immediately following delivery a "maternal sensitive period" (p. 463). The separation of a mother from her infant at birth is viewed as possibly impairing the formation of the vital human bond of attachment.

Several studies have been conducted to investigate the effects of manipulating the amount and quality of contact time a mother is permitted to have with her pre-term infant. In one study, Leifer, Leiderman, Barnett, and Williams (1972) have shown that mothers of full term infants who experience periodic full contact with their newborns during their first two to three days of hospitalization smiled at their infants and held them closer to their bodies than did the mothers of premature infants who had been separated from their newborns following delivery. This significant difference was noted during standard observations made 30 to 40 days following birth.

Another study (Klaus & Kennell, 1970b) used an analysis of time lapse photographs of mother-infant interaction during a feeding to compare the behavior of one group of mothers who, because of their newborn's medical condition, had been separated from their infants for 20 days with a group of mothers who were permitted physical contact within the first five days of life. The data from this study collected one month after hospital discharge

indicate that compared to the early contact group the late contact mothers burped their babies less frequently, changed their positions less, held their infants with less proximal contact and were generally less skillful in feeding their infants than the mothers who had experienced early contact with their newborns.

The credibility of the notion of a maternal sensitive period is most clearly evident in examining the development of children who experience a separation from parental contact for a prolonged period of time following birth. Through retrospective studies of populations of pre-term or high risk infants, it has been noted that these infants who had less contact with their parents following birth have a higher tendency toward developmental disorders later in childhood than do full term infants. In spite of an absence of relevant organic pathology, such severe developmental disorders as failure to thrive and child abuse have been recognized as being associated with early mother-infant separation during the neonatal period (Shaheen, Alexander, Trus, Kowsky, & Barbero, 1968; Klein & Stern, 1971).

The studies reviewed provide information about how the initial timing of maternal contact may affect parenting behaviors and the development of attachment. These findings are relevant in understanding how hospital care may be more farsighted in its provision for the management of a mother's early contact with her newborn. An acknowledgment of the disturbances in parent-child interaction that have been most clearly identified with the population of families who have encountered early separation from

their newborns because of their critical condition should make it apparent that more sensitive care needs to be given to these special patients. Human maternal attachment, however, is a complex process which defies simplistic explanations. Leifer et al. (1972) has indicated that eliciting and maintaining maternal attachment involves a "confluence of factors not all equally influential at any one point or over time" (p. 1217). Attachment is as much a function of maternal variables representing historical, situational and biological factors as it is influenced by the newborns' behavioral individuality.

## Parenting Potential

Attachment has thus been described as a dynamic process involving many factors which over time mediate the future of a mother's interaction patterns with her infant. Mother-infant interaction is also viewed as a subsequently dynamic behavior. The interaction itself has been described as a fit between mother and infant (Escalona, 1968), an interactive mesh (Brazelton, 1961), intricate ballet (Spitz, 1965) and as an interactive spiral (Ainsworth & Bell, 1969). Each of these descriptions emphasizes that it is through the behavioral interaction that takes place between a mother and her infant that a relationship develops to become either harmonic or dissonant. Parenting Potential is considered as mother-infant interaction that is functional in facilitating positive child growth and development. It is when the relationship fails to be harmonic that it can be considered

at risk for future parenting problems which may lead to developmental disorders in the child.

To prevent dissonance in the relationship from becoming destructive, an early detection of a parenting relationship can facilitate supportive preventive intervention. The identification of patterns of variables creating vulnerability to dissonance and dysfunctional interaction is necessary. The early behaviors manifest in a mother's first attempts to relate to her infant may provide revealing information concerning her investment and willingness to give nurturant care to her newborn. The newborn's behavioral repertoire will, of course, affect a mother's early caregiving behavior. This first intersection of behaviors provides a part of the foundation for the relationship which will develop between an individual mother and her newborn. To assess the potential for the parenting relationship, it is necessary to examine how a mother and infant will contribute to their mutual interaction.

With attachment as a focus for the fundamental bonding process, the quality of the parenting relationship is viewed to a large extent as contingent upon the subjective emotional tie between a parent and newborn. How feelings of attachment develop and how they affect the future relationship involve the use of a broad perspective for examining the salient influences which function to determine the nature of the behavior observed between parent and child.

An examination of both organic and psychosocial factors as they are related to the behavior of infants and mothers is necessary to assess the potential of the parenting relationship. An examination of both the present situation of the mother as well as her personal past experience of being mothered is also important. Organic and psychosocial factors are often related to each other as they pertain to the well being of the mother and infant and they interact with each other in terms of the mother-infant relationship. Fluid boundaries are drawn in examining how these factors influence parenting.

Traditionally, studies have investigated neonatal and maternal behavior and characteristics from a clinical perspective and have focused upon factors which may have pathological consequences for the mother's behavior and the child's development. The following review will discuss these research findings which contribute to an understanding of how variables related to a mother's background and pregnancy and a newborn's individual behavior may be related to the risk of the future quality of the parenting relationship. This dissertation applies these findings in the selection of the variables used as predictors of Parenting Potential.

## Maternal Contribution to Parenting Risk

The term risk when applied to an obstetric patient usually refers to the possibility of a woman's developing a complication in pregnancy and/or delivering an infant with manifest disabilities. The relationship between these complications and the risk of the

potential parenting relationship will first be explored. The discussion will begin with a view of the prenatal environment which a pregnant woman provides for her yet unborn child.

Interpretations of any study of prenatal influences upon fetal outcome suffer from an inability to show causal relationships. The nonexperimental nature of this kind of human research necessitates that correlational findings be evaluated comparatively with findings from other studies. Joffe (1969) highlighted this particular handicap of prenatal research in noting the inability to separate the contribution of genetic variables and postnatal environmental factors from the prenatal influences which research efforts try to identify. Genetic differences by themselves may dispose children to characteristic behavioral disorders. As it is not the aim of this review to distinguish causal links but rather to identify possible determinants of potential parenting problems, correlational evidence is sufficient for indicating the likelihood of emerging problems.

Historically and culturally, folklore has made references to the prenatal influences which affect a pregnant woman and the developing fetus. Until recent scientific investigation of the prenatal environment, these old tales have been considered as irrelevant magic unassociated with the realities of perinatal development. Recent studies have investigated how external emotional and physical factors can affect the prenatal environment and can be related to the nature of the child's physiological and psychological make-up and the subsequent mother-infant relationship. The mother's attitude toward her pregnancy and impending parenthood have also been found to be related to her interaction with her newborn.

## Organic Indicators of Parenting Risk

Medical findings increasingly indicate that the prenatal environment is related to the risk encountered by the fetus and newborn. Pasamanick and Knobloch (1961) use the term "reproductive casualty" (p. 7) to refer to how prenatal insult can lead to the risk of bearing a child with a disability. In developing a Maternal and Child Health Index for use in prenatal clinics, Nesbitt and Aubry (1969) have used these variables in assessing risk: age, marital status, parity, past obstetric performance, medical-obstetric ills, reproductive tract abnormalities, nutrition, psychological state and socioeconomic status.

It has been noted by these physicians that past obstetric performance is a strong indicator of risk, as history of a prior fetal death or delivery of a low birthweight infant doubles a woman's chances of a recurring fetal loss. The medical-obstetric ills that have been shown to be important indicators of high risk pregnancies are diabetes, chronic hypertension, endocrine disorders, and fetal maternal blood group incompatabilities. Pregnancy in very young (under 18) and older women (over 35) is also associated with perinatal loss.

The difficulty of quantifying the risk related to race, marital status, psychological state and socioeconomic status make these factors difficult to assess in relation to their relative influence on perinatal outcome. Their interrelationships will be discussed later.

Nutritional status is also a part of this complex of variables and has known effects on the developing fetus and its later development as a growing infant. A most startling finding in regard to this prenatal influence was reported by Winick (1969). He has claimed that when the mother's protein intake is below a critical level during pregnancy that 50% of the potential DNA content of the brain and other vital organs may never be replicated in a developing fetus. Exposure during pregnancy to the external influences of drugs, radiation, and cigarette smoking have also been indicated as influences on intrauterine development of the embryo and fetus (Montague, 1962).

Research findings from a prenatal clinic in Syracuse indicate that two-thirds of the women considered as high risk obstetric patients can be identified early in pregnancy (Aubry & Pennington, 1973). It is most interesting that those involved in this clinic claimed that it is clear that the risk factors for perinatal outcome are virtually the same as those for maternal outcome. The findings indicate that only 20% to 30% of the mothers with no problems during pregnancy are likely to have newborns which require special care following birth. How the special care that infants born with disabilities require can contribute to the potential risk of the relationship will be considered.

## Psychosocial Indicators of Parenting Risk

The human is the only species which has the distinction of rearing its children beyond the procreative cycle. Noting this,

Benedek (1970) has indicated that the motherly quality of a woman is not a simple response to hormonal stimulation brought about by pregnancy and the ensuing necessity to care for the young. For the human, two resources contribute to the quality of a woman's mothering behavior. Both physiological factors influencing the birth process and lactation and also the expression of an individual woman's personality which has developed under environmental influences can modify a woman's ability to give care to a dependent child.

Benedek (1970) described parenting behavior as a function of the human mental apparatus which receives its direction from the mother's "empathic reaction" (p. 158) to a child's needs. The empathic reaction evolves from a woman's ability to modify drive patterns through an integration of memory traces into personality organizations and ego functions. The manifestation of this process can be evaluated in a woman's adaptation to caring for her newborn.

In a comprehensive longitudinal examination of maternal adaptation, it was demonstrated that the quality of a woman's adaptation to motherhood could be predicted by her adaptation to pregnancy (Shereshefsky, Liebenberg, & Lockman, 1973). In this study it was shown that the personality characteristics of nurturance and ego strength and the woman's capacity to visualize herself as a mother were indicative of a positive adaptive response to pregnancy and subsequent parenthood. As a concurrent measure of adaptation, it was found that a woman's accomodation to her infant and her acceptance of the maternal role is highly related to the quality of the woman's relationship with her husband during this time.

The positive relationship noted in the Shereshefsky et al. (1973) study between pregnancy adaptation and maternal adaptation provides information helpful for understanding how prediction of Parenting Potential can be made. The trend noted as existing across time can be identified as an indication of how maternal adaptation functions from the time of conception to the child's early infancy. Parenting Potential is certainly related to how a woman adjusts to the physiological and psychological changes inherent in the process of pregnancy and caregiving. The following review will cover factors related to a woman's psychosocial background that may contribute to the potential risk of a parenting relationship.

Emotional Factors and Psychosomatic Reactions to Pregnancy.--Obstetric complications have been investigated in relation to maternal emotional and attitudinal variables. Habitual abortion, prolonged labor, toxemia, hyperemesis (excessive vomiting), and premature delivery have all been studied in light of how the psychological state may dispose women to these somatic conditions. As mentioned before, methodological problems often cloud specific relationships as most frequently data are collected only after the pregnancy has begun. Under such conditions it is impossible to determine the temporal ordering of psychological stress and physiological consequences. Existing data specify there are relationships between the psychological state and somatic conditions; however, the direction of the effects of these variables is unknown.

Habitual aborters, women having a history of three or more consecutive spontaneous abortions, have been found to have traits of

dependency, compliance, and sacrificial attitudes related to child bearing. These women have been shown to benefit from psychotherapy in later being able to deliver a full term infant (Weil & Tupper, 1960). Prolonged labor and delivery room complications have also been reported to be associated with maternal anxiety during pregnancy (Davids & DeVault, 1962). McDonald, Gynther, and Christakos (1963) have explored this relationship between anxiety and obstetric complications using 86 women of lower socioeconomic status. They found that four personality factors from the Minnesota Multiphasic Personality Inventory (MMPI) distinguished the two groups differing in anxiety and obstetric complications. The group with more complications showed less ego strength, more ergic tension, less self-sentiment and more guilt proneness.

McDonald (1968) reported that toxemia, defined as excessive edema, significant proteinuria and hypertension, has been attributed to emotional disturbance by several different investigations. Using semistructured interviews the relationship between vomiting and attitudes toward children was studied in 100 primiparous mothers by Chertok, Mondzain, and Bonnaud (1963). These investigators found a positive relationship between vomiting and ambivalent maternal attitudes toward having children. Using both interviews and Rorschachs, Harvey and Sherfey (1954) related anxiety levels with vomiting. They found vomiters as being characterized by frigidity, pervasive immaturity and as making a consistent association of gastrointestinal dysfunction with sexual disorders.

In examining the psychogenic etiology of permature births Blau, Sluff, Easton, Welkowitz, Springarm, and Cohen (1963) did a retrospective study matching 30 women who delivered prematurely in the absence of accountable medical factors with 30 women who delivered full term infants. These investigators used age, race, socioeconomic status, education, and parity as the basis for their matching. The premature group showed distinctive clinical and statistical differences including more negative attitudes to the pregnancy, greater emotional immaturity, more body narcissism, and less adequate resolution of the familial Oedipal problems.

Taking a more heuristic approach in examining expressed attitudes and feelings of pregnant women as they are related to physical complications of pregnancy, Heinstein (1967) made the general statement that the stress of pregnancy accentuates somatic difficulties that are already present prior to the pregnancy. Clifford (1962) reported similar findings using 50 unwed and 50 married multiparous and 50 primiparous women.

Heinstein (1967) found that pregnant women with positive attitudes and feelings about pregnancy also have fewer physical complaints and fears. A cluster of attitudes and feelings indicative of general moodiness, depression, and overdependence was significantly associated with physical complications. Women who rejected being pregnant showed greater anxiety, depressions, dependencies, unhappiness in their marriages and attitudes reflecting sexual maladjustment. Together with these rejecting attitudes were

feelings of alienation and uselessness all being associated with gastro-intestinal disorders late in pregnancy.

Research findings have indicated that social stability also influences adjustment during pregnancy (Davids & Rosengren, 1962). Women who are dissatisfied with their social status and are otherwise socially unstable have been noted to be less happy to be pregnant, more anxious and generally emotionally maladjusted.

In his review of the role emotional factors play in obstetric complications, McDonald (1968) reported that there is consistent evidence that women who experience any of the variety of obstetric complications have higher anxiety levels and use fewer repressive type defenses than women who have normal pregnancies and deliveries. He conceptualized these findings as indicating that stress in the form of unresolved conflicts about pregnancy causes anxiety which results in adaptive attempts to cope with the stress. He asserted that with prolonged anxiety adaptive attempts fail and autonomic nervous system activation occurs with complications in the physiological functions of a system showing maximal activation.

Although there appears to be a strong trend in these research findings supporting the notion that maternal anxiety is related to obstetric complications during pregnancy and delivery, Aubry and Pennington (1973) were not able to gather enough evidence from their clinic population to show that emotional factors should be given consideration in evaluating medical risk in their population of patients. They found, however, that maternal age, race,

marital status, parity, and nutrition are fairly good predictors of potential risk to the neonate.

Support for these findings can be given by the research findings made by Grimm and Venet (1966). This research involved 105 normal pregnant women who were followed through their entire maternity cycle. Although these findings indicated that there is some degree of relationship between early emotional and attitudinal characteristics and emotional adjustment later in the maternity cycle, there was no relationship found between these characteristics and the physical condition of either the mother or her child. The complexity of unraveling the interrelationships makes it difficult to interpret any of the findings in terms of specific factoral relationships.

Whether or not these emotional factors are related to the physical outcome of the pregnancy, they reveal maternal characteristics that may become manifest in organic complications during pregnancy. Since these complications have a psychogenic etiology, they may be considered as risk factors which may effect the potential of the future interaction between a mother and her infant. Support for this view can be found in research which assumes a broader span of time and which investigates prenatal factors as they are related to neonatal and infantile behavior. These studies, which are reviewed next, explore the bridge between pregnancy and the mother-infant relationship. Evidence of how a maternal evironment can constitute intrauterine influences that may become manifest in an infant's behavior will be explored.

Emotional Factors, Intrauterine Environment, and Neonatal Behavior.--In viewing life on a continuum it becomes necessary to consider intrauterine experience as the first encounter a developing human organism engages in with its environment. Fetal life, as manifest in movement detected by a mother, has been shown to be related to motor, adaptive, and total scores of infants' later scores on the Gesell scales administered at twelve, twenty-four, and thirty-six weeks (Walters, 1965). This study dealt only with a physically detectable correlation between pre and postnatal variables but does indicate a link in development across the perinatal time span.

Sontag (1941) originated research investigating the significance of fetal environmental differences. His work has shown that fetal hyperactivity observed in the prenatal period is often associated with the mother's emotional stress and tends to continue postnatally with irritability, crying, food intolerance, and loose stools. More recently Ottinger and Simmons (1964), in a study investigating the behavior of human neonates and prenatal anxiety, found that scores on an anxiety scale, administered in each trimester of pregnancy, were related to amounts of neonatal crying electronically recorded during the first four days of life after birth. In another survey of 100 mothers and their infants, relationships were observed to exist between emotional difficulties of the mother during pregnancy and a general syndrome in the infant's behavior of restlessness, fussiness, excessive crying, irritability, sleepiness,

vomiting, and loose stools (Turner, 1956). Turner concluded that prenatal stress might affect the reactivity of the fetal nervous system and alter the infant's whole pattern of behavior.

Ferreira (1960) also found evidence of how environmental factors can influence the prenatal development of the fetus. He indicated that mothers and newborn infants with deviant behavior as evaluated by trained nurse-observers on the basis of the infants' crying, amount of sleep, degree of irritability, bowel movements, and feeding had negative maternal attitudes prior to the infants' delivery. These negative attitudes were assessed by the mothers' high scores on a scale of fear of harming the baby and on a rejection of pregnancy scale.

Other studies have investigated the relationships between prenatal anxiety and later child rearing attitudes. Davids, Holden, and Gray (1963) found that women who had been highly anxious during pregnancy had less desirable parental attitudes as indicated on the hostility and control scales on the Parent Attitude Research Inventory (PARI). They also found that the children who were being reared by women who were highly anxious during pregnancy did less well on the Bayley Infant Mental scale at eight months of age than did infants reared by mothers who had exhibited little anxiety during pregnancy.

Doty (1967) in her study of the relationships among attitudes in pregnancy and other maternal characteristics found that these attitudes vary as a function of social class membership and

previous pregnancies. She found that lower class women, especially multiparae, admit more emotional disturbance and express greater rejections of pregnancy and maternal role taking than do other groups. Interestingly, these negative attitudes in pregnancy were correlated with the number of infant problems among all groups except the lower class.

These findings could reflect actual differences in the infants' behavior or could reflect that lower class mothers are less attentive or more repressive in regard to their infants' behavior. Doty's work (1967) confirmed the findings made by Davids et al. (1963) suggesting that attitudes during pregnancy can predict child rearing attitudes. Her work showed that negative attitudes toward child rearing were reflected on the hostility, fostering of dependency, fear of harming the baby, avoidance of communication, and dependency of mother scales on the PARI administered during pregnancy.

The studies which bridge pregnancy and neonatal behavior indicate that an infants' behavior which does not reinforce maternal attachment can be related to maternal anxiety or negative attitudes toward child rearing during pregnancy. Thus, irritable behavior in difficult infants can be related to maternal psychological state during pregnancy. The same factors related to the psychogenic nature of somatic difficulties of the mother during pregnancy have also been attributed to the behavior patterns of the newborn. It can thus be seen how Parenting Potential is associated with both the infant's and the mother's behavior.

Identification of these maternal characteristics associated with potential problems could facilitate appropriate intervention that could ameliorate the somatic conditions of both the mother and the infant and lessen the likelihood of a risk for the potential relationship.

Status of Family Relationships, Experiential Background, and Adjustment to Parenting.--To complete this investigation of the maternal side of the parenting relationship, the situational and experiential factors that are a part of the mother's background and present life circumstances will be discussed as possible indicators of Parenting Potential. Rapopart (1963) described the birth of a child as a critical transition in the normal expectable development of the family life cycle. She identified four characteristics which are unique to this event: (a) it is a point of no return, (b) it has novel components for people experiencing it, (c) it can provoke acute disequilibrium in individual and family systems, and (d) the mode in which this normal crisis is handled is important to future outcomes of family relationships.

In assuming that the birth of a child, especially a first child, most likely leads to some disruption in all families, it can be understood how stressful situations which already exist in a family can compound the normal period of adjustment. This stress can, of course, be reflected in the nature of the infant's development as it is mediated by the mother during her pregnancy and throughout the perinatal period.

Along with normal strain on a family that accompanies the birth of an infant, another assumption can be made regarding child bearing. With the availability of effective contraceptives and the acceptance of abortion as a legitimate means of terminating pregnancy, it can be assumed that childbearing is a consequence of motivated human action (Flapan, 1969). It is important to bear in mind these two facts in evaluating how situational and experiential factors can effect Parenting Potential.

Klaus and Kennell (1970b) listed steps involved in a mother's development of attachment to her newborn. These steps are planning the pregnancy, confirmation of the pregnancy, accepting pregnancy, fetal movement, accepting the fetus as an individual, birth, seeing the baby, touching the baby, and caretaking. Pregnancy is a maturation process itself involving different developmental stages. These authors cited Caplan's (1960) proposition that a woman's ability to accept pregnancy and to perceive of the fetus as a separate individual are indicators of her accomplishment of two important adaptive tasks of pregnancy which are also a part of the attachment process.

In recognizing the importance of the prenatal period for the attachment process and its influence upon the child's future development. Cohen (1966) identified the kinds of stress situations which can be dysfunctional in the adaptive process that is a part of pregnancy. These stress inducing situations can also be considered as attributing to the potential for parenting problems. Moving to a new geographical area, marital infidelity, death of a close friend or relative, previous abortions or loss of previous children can all

contribute to the retardation of developing feelings of attachment to the unborn infant. Any one of these or other situational variables that heighten this normally stressful period increases the likelihood of parenting disorders that can facilitate developmental difficulties for the infant. Isolation from support of family or other individuals intensifies the strain of any one of these stress inducing situations.

An assessment of a mother's background must also include more than her immediate situation as it relates to her capacity for child rearing. It is important to examine her experiential background to know how she, herself, was nurtured as a young child and how this might influence her motivation for bearing a child. The absence of a mothering imprint which develops with the childhood experience of receiving nurturant care is considered as a strong indicator for potential parenting problems and especially for child abuse. This experiential deficit is also manifest in an inability to trust and in unrealistic expectations of child behavior (Kempe & Helfer, 1972).

These experiential factors are especially relevant in light of the assumption that was made by Flapan (1969) that child bearing is a function of motivated behavior. Studies have shown a tenuous relationship between unwanted pregnancies and poor personal and school adjustment of children so conceived (Pohlman, 1967). Today, however, the more important question to be explored is what are parents' motives in conceiving children. It has been noted by those

who have worked with abusive parents that these individuals' motivations for parenthood reflected a desire to have an infant who will give them the nurturance they failed to receive as developing children. When this unrealistic expectation is not met, crisis situations can precipitate into abusive patterns of interaction between parent and child.

## The Infant's Contribution to Parenting Risk

Parmelee and Haber (1973) have defined the "risk infant" (p. 376) as any newborn or young infant who has a high probability of manifesting in childhood sensory or motor deficits and/or mental handicaps. The objective of these researchers was to identify the risk infant to enable the most beneficial medical and educational intervention. Brazelton (1973a) views early assessment of the risk for developmental disorders as essential in intervening to prevent a compounding of problems which can occur when an environment cannot adjust appropriately to an infant. Inappropriate parenting can easily lead to this compounding.

### Organic and Psychosocial Indicators of Parenting Risk

There has been a growing realization that factors related to pregnancy and delivery can be crucial determinants of deviant child development. The term reproductive wastage was first used to indicate how prenatal events can lead to either lethal or sublethal consequences for the newborn. The lethal manifestations were considered as abortions, stillbirths, and neonatal deaths, while

sublethal components of prenatal insult were considered to include cerebral palsy and other disabilities. In 1961 Pasamanick and Knoblock (1961) revised this notion with the term reproductive casualty that describes the harmful events that take place during pregnancy and delivery which result in damage to the fetus or newborn.

The formulation of these concepts has provided the schema of a continuum for examining a newborn with consideration given to its prenatal development. It was these researchers' proposition that, depending upon the degree and location of the prenatal damage, disabilities ranging in severity from cerebral palsy and epilepsy to different types of learning and behavioral disorders resulted from minor degrees of prenatal damage which lowered an infant's threshold to stress. Pasamanick and Knoblock (1966) also associated abnormalities with certain life experiences and identified socioeconomic status as being functional in determining the nature of fetal outcome.

Wolff (1967) has asserted that the continuum of reproductive casualty has facilitated an understanding of childhood disorders as being related to each other. He has also noted that birth injury, constitutional vulnerability, social deprivation, and emotional trauma all make significant contributions to psychiatric morbidity.

Chess (1970) has contributed to Wolff's interpretation of the continuum of reproductive casualty. She has also proposed that, along with the physiological disorders which make it difficult for a child to cope with the demands of his sociocultural environment, a child's temperament is an indicator of his potential for

developing behavior disorders. She has defined temperament as a child's behavioral style or the manner in which the child characteristically reacts to individuals and situations. The vulnerability associated with traits of temperaments, she has asserted, should be considered in evaluating a child's risk of encountering developmental disorders.

Chess's work has differentiated specific attributes in infants during their first five weeks of life and has identified patterns of temperament which are likely to make a child vulnerable to damaging interaction with the environment. These traits that constitute vulnerability to stress are the infant's activity level, rhythmicity, pattern of approach and withdrawal, adaptability, quality of mood, intensity of reaction, threshold of responsiveness, distractibility, attention span, and persistence. Using these traits as descriptive measures, Chess has developed clusters of behaviors to identify individual children as either "easy children," "difficult children," or "slow to warm up children" (pp. 127-129). According to her schema the easy children are positive in mood, highly regular, readily adaptable, low or mild in intensity of their reactions and usually affirmative in their approach to new situations. In contrast, difficult children, who are at the greatest risk of developing behavior disorders, are irregular in biological functions, have predominantly negative responses to new stimuli, are slow to adapt to environmental change and have a high frequency of negative mood expressions and intense reactions. The slow to warm

up children are characterized by a combination of negative through mildly intense initial responses to new situations and by gradual adaptation after repreated contact with the stimulus.

Drilleen (1964) indicated from her work with longitudinal studies of premature infants whose birth weights were three pounds or less, that overactivity and restlessness were common behavior problems of these children who survive into childhood. Pasamanick, Rogers, and Lilienfield (1956) also indicated that the behavior disorders of childhood of overactivity, restlessness, and distractibility can be causally related to perinatal factors involved in the pregnancy and in the birth of the infant. Ucko (1965) in his study of the relationship between asphyxia at birth and later behavior of children indicated that the temperamental traits of unusual sensitivity and overreactivity to stimuli may be associated with neonatal asphyxia.

Each of these noted characteristics associated with obstetric complications or prematurity would be classified by Chess as a trait of a difficult child. It was her contention that with recognition of this behavioral style it is possible to devise strategies of dealing with the child and of adapting his environment to reduce the child's chances of developing a behavioral disorder percipitated by his contribution to the parenting relationship. Parental behaviors also need adaptation to prevent creating unnecessary stress for the child or the parent.

Psychophysiological research has contributed information useful in understanding the discrete variables which function to

dispose an individual infant to having a characteristic temperament. Individual differences in a variety of behavioral dimensions have been identified in infants. These differences in behavior have differential effects on how a mother will interact with her newborn.

Korner (1974) reviewed research regarding specific behavioral variables salient in affecting the caregiving an infant receives. As noted previously, the quality of an infant's visual gaze behavior has a major effect on eliciting maternal feelings of attachment. Korner, in citing her own research (1970) has shown that reliable individual differences exist in how frequently newborns display spontaneous alert visual behaviors. In another study she conducted with Thoman (Korner & Thoman, 1972), she has reported that newborns readily respond with alertness to different types of maternal ministrations. Korner concluded that variation in the neonate's sensory responsiveness should feed into the child's level of arousal and subsequently qualitatively affect the mother-infant relationship.

In the same review, Korner (1974) drew attention to the fact that not only does the infant's general arousal and, particularly, irritability have an effect on the caregiver, but also the infant's relative soothability plays a role in affecting the mother-infant relationship. She noted that a mother's capability to sooth her infant is of central importance in her emerging feelings of effectiveness and competence as a mother. In the study conducted with Thoman (Korner & Thoman, 1972) Korner found that infants differed significantly from each other in how soothable they are and how much they cry after completion of soothing intervention.

It has been widely acknowledged in the developmental literature that there are differences in how parents respond to male and female infants. In a conclusive statement regarding these differences, Lewis (1972) noted that boys in general receive more proximal holding contact with their caregivers and girls receive more distal visual and auditory stimulation from their parents. To understand how the newborn contributes to the caregiving received, studies have begun to detect sex differences that are apparent in newborn behavior that may exert a subtle influence on caregiving.

From her survey of the developmental literature, Korner (1974) tentatively asserted that female newborns appear to be more receptive to certain types of stimuli and are orally more sensitized than male newborns. She also noted that females are in no way less active or expressive than males. Korner reported that there is suggestive evidence that male newborns may be endowed from birth with greater physical strength and muscular vigor.

Clarifying how individual infants vary in these ways shows how flexible a mother must be to adapt to the individual characteristics of her newborn's behavior. Robson and Moss (1970) illustrated how a mother's subjective feelings of attachment can diminish when caregiving fails to sooth appropriately an infant's irritable crying and other demands. Acknowledging the variability in infant state behavior, levels of arousal and sex related behavior, the caregiver's essential function can be understood as assisting an infant to regulate his sensory input and motor repsonses. To coordinate caregiving

efforts with infant behavior is delicate work which requires a sensitivity to the individual traits of the infant. The infant can certainly be understood to be an active participant in making this a smooth or difficult task for a parent to undertake.

Brazelton (1973a) has recognized the variable ability that individual newborns have in being able to compensate their behavior and development in disorganized depriving environments. He has reported that neonatal problems are compounded early in life with inappropriate interaction with a physical and social environment. To predict a newborn's contribution to the likelihood of what Brazelton has called "failure in the environment interaction" (p. 361), he has expressed a need for sophisticated methods of assessing newborn behavioral characteristics.

Findings from a predictive study on infants and their families conducted by Escalona (1973) support Brazelton's concern about the confounding that the interaction between a neonate and his environment can have on a child's development. These researchers have found that although in general infant behavioral characteristics are not maintained over time, certain children carry into the preschool years pathological behavioral attributes that were noted when the children were 16 weeks old. In light of these findings, Escalona asserted that when development and adaptation proceed stressfully and not entirely successfully certain early patterns of behavior are more likely to remain intact and continue in unaltered form at later ages.

In his review of neonate assessment procedures, Brazelton (1973a) has suggested that indicators of the effects of intrauterine experience should be examined to detect their role in neonatal development. Assessment of the neonate's immaturity or dysmaturity are of important predictive value in suggesting long term intrauterine deprivation which can affect the cellular development of the fetus. A clinical assessment of the placenta and cord blood at birth is another indicator of risk for the newborn, for it may reflect intrauterine nutritional deprivation and reduced potential for the infant.

In assessing neurological functioning of the newborn, Brazelton (1973a) has claimed that the depth of depression and disorganization after birth and the curve of recovery may be the best indicators of central nervous system compromise and may be valuable in predicting infants at risk for developmental difficulty. He indicated that complex integrated behaviors such as level of arousal and total body tone, rather than discrete tendon or skin reflexes, are better evidence of insults to the neonate's brain caused by intrauterine, labor or delivery difficulties. Brazelton's Neonatal Behavioral Assessment Scale (1973b) evaluates both the infant's use of state to maintain control of reactions to environmental and internal stimuli and the infant's response to various kinds of stimulation.

Use of such an instrument can lead to a predictive means of identifying an infant's behavioral disposition before a newborn ever leaves the hospital. Preventive intervention can then be planned and

parents can be informed of the temperamental tendencies of their individual infants. Parents can then be helped to care appropriately for their infants, decreasing the likelihood of emerging behavioral problems. Without such help these difficult newborns have an increased potential of becoming involved in a non-positive parent-child interaction that can lead to developmental pathology.

The importance of making early assessments of infantile development was also stressed by Greenberg (1970). He has asserted that the appearance of unusual behavior in infants indicates faulty development, vulnerability to stress and the greater probability for later development of abnormalities in cognitive, sensorimotor, social, and emotional functions. In his work he has assumed that abnormal development in infants who are not handicapped by neurological disorders is a consequence of inadequate care and stimulation. The mother's behavior in relation to her infant he claims to be a derivative of her personality traits. This conception fails to consider the bilateral nature of the relationship but does indicate the interaction of the mother and the infant in the parenting relationship. Even in the absence of neurological disorders behavioral differences do exist between infants which can mediate the type of relationship which emerges between an infant and parent. The likelihood of this constitutional nature of the infant's behavior becoming involved in a compounding cycle as indicated by Brazelton was overlooked by Greenberg.

Not only is a mother's behavior in relation to her infant's individuality important, but her perception of her infant has also

been noted to be related to the newborn's developmental outcome. The complex of a mother's perception of her infant's behavior and the newborn's developmental outcome has been highlighted in a longitudinal study conducted by Broussard and Hartner (1970). These authors developed an instrument designed to measure a primipara's perception of her newborn's behavior as compared to an average infant's behavior. Crying, spitting, feeding, elimination, sleeping, and predictability were the criteria used in the evaluation made by the mothers one month after their infant's delivery. One hundred twenty full term first born infants were used as subjects and were divided on the basis of their mothers' evaluation into a high and a low risk group for possible emotional and developmental disorders.

When these subjects were four and a half years old they were evaluated by two child psychologists for the need of therapeutic intervention. A statistically significant association was evident between the mothers' evaluation and its prediction of their infants' behavioral outcome as judged by a professional. These findings have been interpreted by the authors in two ways. The results may indicate that unique personality characteristics or innate genetic characteristics representing a true picture of the infant can be detected very early in a newborn's behavior by its mother. The other interpretation given explains the predictive relationship as representing a self-fulfilling prophecy in that maternal expectations may become manifest in the child's development. In either case, maternal perceptions can be considered an

important variable related to the infant's future development. These noted perceptions could be used as an indication of the potential parenting relationship.

This review has covered both physical and temperamental characteristics of newborns which have been associated with the perinatal environment. These factors, viewed on a continuum relative to the nature of the perinatal insult or to individual behavioral characteristics, dispose an infant to the vulnerability of becoming a partner in a parenting interaction that does not facilitate positive growth of development. In his study of maternal attachment Klaus (Note 1) has developed the axiom, "You can't love a dish rag." This in sum depicts the role an infant plays in creating a risk situation out of parenting interaction. The "dish rag" infant or baby whose responses are incongruent with maternal overtures fails to release positive maternal attachment or to reinforce nurturant care. The reciprocity between mother and infant has been shown to be in part contingent upon the infant's behavior.

## Summary and Conclusions

Escalona in her classic work Roots of Individuality (1968) first drew attention to the interaction between sensitivities of individual infants to different sensory modalities and characteristic stimulation patterns of individual mothers. This focus on the interaction of maternal and infant variables is central in this review which attempts to describe the ways in which patterns of experience for individual infants and the behavior styles which evolve from

them are the product of the response of both partners in the relationship.

The findings reported in this review all indicate that from conception interrelationships exist among maternal attitudes, emotionality during pregnancy, child rearing styles, socioeconomic status, obstetric complications, and infant behavior. A chronological progression has been followed in examining these factors as they are related to the potential of the parenting relationship. The review began with a description of factors which dispose a woman to a high risk pregnancy. Maternal attitudes and emotionality during pregnancy are related to obstetric complications, child rearing attitudes, and to behavior patterns of the newborn infant. Intrauterine environmental factors were then discussed as they relate to both the mother and the infant. A mother's situational circumstances and experiential background of having received nurturant care were also considered as they play a role in parenting behavior. Neonatal outcome and the infant's physical and environmental characteristics were next reviewed. All these factors must be considered in evaluating Parenting Potential.

In considering the potential of a parenting relationship the interaction of these possible variables has been explored. Long term follow up studies of infants placed in categories on the basis of hypoxia, asphyxia, or prematurity, without regard to other perinatal or neonatal events, have not been successful in defining the degree of risk to an infant's future development (Parmelee & Haber, 1973). The concept of Parenting Potential can, however, facilitate

the broader perspective necessary for examining the variety of pre and postnatal variables operating in this interaction.

A major study conducted by Werner, Simonian, Bierman, and French (1967) on the cumulative effects of perinatal complications and deprived environment on the physical, intellectual, and social development of preschool children provides support for a comprehensive approach to the assessment of child development. Smith, Flick, Ferriss,and Sellman (1972), in identifying the apparent multidetermined nature of developmental outcome, have also concluded that a multivariate approach is necessary to determine the predictive accuracy of factors believed to be related to developmental outcome.

The research design proposed by Davids (1968) provides an appropriate framework for examining Parenting Potential in light of the multideterminant nature of the factors identified by others as important indicators of developmental outcome. He suggested that if mothers were studied prior to childbirth, and then if the mothers and their children were studied at subsequent times in formative stages, it would be possible to discover the bilateral effects of a child's temperament and behavior and the mother's attitudes and behavior on the child. Such an approach could provide definitive information that would more clearly specify indicators of the potential risk of a parenting relationship.

Aubry and Pennington (1973) stated that the common goal of modern obstetrics and pediatrics is to maximize the quality of fetal, newborn and infant life in such a manner as to give every individual conceived the greatest optimal physical, mental, and

emotional development. To maximize this human potential, this review highlights the need for a perspective on development as more than a function of biological ontogeny.

Pregnancy must be approached with delicate attention paid to the intimate interactions between a dependent organism and the environment which will provide for its emerging capacities. The nurturance and stimulation which parenting provides come from generic feelings of parental attachment to the newborn child. These feelings of parental attachment become manifest in the earliest interactions between a mother and her newborn and influence the quality of their relationship and the child's attainment of his human potential.

# CHAPTER III

# METHODOLOGY

## Research Design

The time frame illustrated in Figure 2 was employed for the data collection in this study.

| $T_1$ | $T_2$ | $T_3$ |
|---|---|---|
| 3rd Trimester of Pregnancy | Hospital | 4 Weeks Postpartum |

Figure 2.--Time Frame of Data Collection.

This is a descriptive study which used a prospective repeated measures design. At each point in time during the data collection different measures were made of maternal and/or neonatal variables assumed to affect or reflect maternal attachment and the process of mother-infant adjustment. The data collected during the third trimester of pregnancy ($T_1$) permit an analysis of the extent to which demographic, experiential, and stress factors during pregnancy and the planning and management of pregnancy itself predict behavioral indications of attachment and the future mother-infant adjustment.

The data collected during the time of the mother's and the infant's hospitalization ($T_2$) provide assessments of the overt manifestations of the mothers' responsiveness to their newborns and evaluations of the newborns' behavioral characteristics. These data are then used to predict mother-infant adjustment four weeks following birth ($T_3$) assessed by responses to psychological inventories and observations of mother-infant interaction.[1] These measures permit an analysis of the predictive validity of the measures made during pregnancy and the immediate postpartum period.

## Measurement

Presented in Table 1 is information about the measures employed in this research. A description of the type of data collected and the instruments used are listed according to the time frame of this study and the number by which the research variables are identified. A complete listing of the variables by their numbers appears on pages 9-11.

## Hypotheses and Methodological Questions

To answer the comprehensive research question concerning the early prediction of Parenting Potential, the folloiwng hypotheses and methodological questions were posed:

### Hypotheses

Ho 1: There are no relationships between the background variables (1.01-2.03) and a woman's maternal responsiveness to her newborn in the delivery room (4.01).

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[1]Originally the $T_3$ data was to be collected six weeks following delivery. This plan was changed because of time limitations and a reconsideration of issues presented in the child development literature.

TABLE 1.--Measurement Description.

| Time | Variable No. | Type of Data | Instrument |
|---|---|---|---|
| | | Predictors of Parenting Potential | |
| $T_1$ | 1.01-1.06 | demographic information and personal resources for child rearing | Survey on Bringing Up Children (Helfer and Schneider, 1975). |
| | 1.07 | stress encountered during pregnancy | Social Readjustment Scale (Holmes and Rahe, 1967). |
| | 2.01-2.03 | management of pregnancy and hospital care | questionnaire. |
| $T_2$ | 3.01-3.02 | factors related to labor and delivery | Delivery Room Ob. Scale and hospital chart. |
| | 4.01 | maternal responsiveness in delivery room | Delivery Room Ob. Scale |
| | 5.01 | maternal responsiveness during a feeding | Feeding Ob. Scale. (Osofsky and Danzger, 1974). |
| | 5.02 | ratio of time mother spends looking at baby to total feeding time | observational method (Klaus and Kennell, 1970b). |
| | 5.03 | breast or bottle feeding | check list |
| | 6.01-6.06 | neonatal behavioral and physical characteristics | Neonatal Behavioral Assessment Scale (Brazelton, 1973b). |
| | | Indicators of Parenting Potential | |
| $T_3$ | 7.01 | maternal perception of newborn behavior | Neonatal Perception Inventory (Broussard and Hartner, 1971). |

TABLE 1.--Continued.

| Time | Variable No. | Type of Data | Instrument |
|---|---|---|---|
| | 7.02 | attitudes toward caregiving | Postpartum Research Inventory (Schaefer and Manheimer, Note 2). |
| | 7.03 | maternal self-report of physical health | same as above |
| | 7.04 | mother-infant adaptation to parenting relationship | open ended interview (Kennedy, 1969). |
| | 7.05 | feelings of attachment reported by mother | open ended interview (Robson and Moss, 1970). |
| | 7.06-7.07 | maternal recall of first contact with newborn and difficulty of labor and delivery | interview questions |
| | 8.01 | maternal responsiveness during a feeding | Feeding Ob. Scale (Osofsky and Danzger, 1974). |
| | 8.02 | baby responsiveness during a feeding | same as above |
| | 8.03 | ratio of time mother spends looking at baby to total time of feeding | observational method (Klaus and Kennell, 1970b). |
| | 8.04 | breast or bottle feeding | check list |

Ho 1a: Factors related to labor and delivery (3.01-3.02) do not affect the above relationship.

Ho 2: There are no relationships between the background variables (1.01-2.03) and a woman's maternal responsiveness to her newborn during a hospital feeding (5.01).

Ho 2a: Neonatal behavioral and physical characteristics (6.01-6.06) and maternal responsiveness in the delivery room (4.01) do not affect the above relationship.

Ho 3: There are no relationships between a woman's maternal responsiveness to her newborn in the delivery room (4.01) and her responsiveness to her newborn during a hospital feeding (5.01).

Ho 4: There are no relationships between the background variables (1.01-2.03) and a newborn's behavioral characteristics (6.01-6.04).

Ho 5: There are no relationships between neonatal behavioral and physical characteristics (6.01-6.06) and maternal responsiveness during a feeding four weeks following delivery (8.01).

Ho 5a: Maternal responsiveness in the delivery room (4.01) and during a hospital feeding (5.01) do not affect the above relationship.

Ho 6: There are no relationships between background variables (1.01-2.03) and maternal responsiveness during a feeding four weeks following delivery.

Ho 6a: Neonatal behavioral and physical characteristics (6.01-6.06) and maternal responsiveness in the delivery room (4.01) and during a hospital feeding (5.01) do not affect the relationship.

Ho 7: There are no relationships between background variables (1.01-2.03), neonatal characteristics (6.01-6.60), and maternal responsiveness in the delivery room (4.01) and during a hospital feeding (5.01) and mother-infant adjustment assessed four weeks following delivery (7.01-7.03).

Ho 8: There is no relationship between breast or bottle feeding and the total score of maternal responsiveness on the Feeding Observation Scale.

## Methodological Questions

Question 1: What is the internal consistency reliability of the Delivery Room Observation Scale?

Question 2: What is the internal consistency reliability of the Feeding Observation Scale?

Question 3: Is there a relationship between the Looking Ratio (time mother spends looking at baby to total time of feeding) and the total score of maternal responsiveness on the Feeding Observation Scale?

## Instruments

The following are descriptions of the instruments administered to the subjects. A source list of where information about the instruments or copies of them may be obtained is presented in Appendix A.

### Instruments Administered at Time 1

#### Survey on Bringing Up Children

As an attempt to identify parents who have the potential to abuse their children, a predictive child rearing questionnaire was developed by Schneider, Helfer, and Pollock (1972). The instrument has been revised, and the Survey on Bringing Up Children (Helfer & Schneider, 1975) has a broader purpose to identify families who might have unusual rearing tendencies and not just the capability of being abusive. Preliminary studies using 500 women's responses to the questionnaire indicate that the instrument in its present form is capable of identifying women who otherwise have been identifed as having high risk parenting skills.

The questionnaire in its present form is a 50 item self-administering instrument made up of statements which are answered on a 7-point Likert Scale ranging from strongly agree to strongly disagree. The instrument includes a total score indicating the degree of concern about the respondent's personal resources for child rearing. This total concern score includes the following clusters: relationships with parents, unsatisfactory relationships, satisfactory relationships, expectations of children, life expectations, management of crises, and problems with mate.

The clusters included in the scale have been identified as separate and stable categories by factor analytic studies. These clusters were almost identically predicted from observations of the psychodynamics of families who have abused their children. The authors suggest that to date the face validity that was built into the questionnaire appears to be substantiated by the clusters that developed from the factor analyses. Although these data do indicate that the questionnaire is capable of separating groups of women who are high or low risk in their capabilities of rearing children, the instrument has not been fully validated nor has its reliability been completely assessed.

In this dissertation the total score from the survey was used in the data analysis as a measure of concern about the womens' personal resources for childrearing. This score is the combined score from each of the individual clusters composing the instrument.

As a part of this instrument the subjects were asked to provide demographic information and information concerning their

personal history and the management and planning for their pregnancy and hospital care. These data were used to provide the background information in the data analysis. A list of these supplemental questions appears in Appendix B.

## Social Readjustment Rating Scale

The Social Readjustment Rating Scale (Holmes & Rahe, 1967) is based on the assumption that a cluster of social events which require change in ongoing life adjustment is significantly associated with the time of the onset of illness. The occurrence and clustering of social or life events have been demonstrated to have etiologic significance as a necessary, but not sufficient, cause of illness (Rahe, Meyer, Smith, Kjaer, & Holmes, 1964). The emphasis of this scale is on the assessment of the adaptive change required by life events. The adaptation required by the change is considered in terms of the nature of the kind of adaptive stress it represents rather than the psychological meaning or the emotional or social desirability of the life event.

An individual's total score on the scale, used in the data analysis of this dissertation represents a quantitative weighting of the relative magnitude of each of the events encountered during the specified period of time. The rating was established by requesting 394 subjects to rate 43 life events in terms of the relative degree of readjustment each would require in order to accommodate to the new situation regardless of its desirability. Except for a .82 coefficient of correlation for the white and the black groups

among the sample, there was a consensus of above .90 concerning the relative perceived order and magnitude of the means of the events that were rated. Religion, race, sex, and marital status were considered as variables affecting the individual ratings of the life events.

This instrument is included in the dissertation as a measure of the amount of stress encountered by the subjects during pregnancy. The readjustment required by the birth of the first child is considered as a major one and may be affected by the amount of stress already encountered during the prenatal period of time.

## Instruments Administered at Time 2

### Delivery Room Observation Scale (Appendix C)

The Delivery Room Observation Scale was developed by the investigator to be used for this dissertation. The goal of developing an instrument like the Apgar Scale[2] for making assessments of the responsiveness of a mother to her newborn guided the development of this scale.

Two sources of reference were used to create this instrument. A two-year predictive study conducted at the National Center for the Prevention and Treatment of Child Abuse and Neglect provided the primary stimulus for developing the Scale (Gray, Cutler, & Dean,

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[2]A 10-point rating scale used as a routine medical assessment of a newborn's physiological functioning one and five minutes following birth (Apgar, 1953).

Note 3). This study included clinical assessments of women's responses to their newborns immediately following birth in the delivery room. Using video tapes made of 200 patients' behavior in the delivery room and pre- and postnatal interviews and questionnaire responses, the women were identified as having high or low risk parenting capabilities. The following responses were identified at the end of the assessment period as being important indicators of risk exhibited in maternal behavior observed in the delivery room.

1. Totally passive reactions

    a. no active interest in the baby
    b. refusal to see or hold the baby when given the opportunity
    c. focus of orientation of interaction on self

2. Expression of definite hostility

    a. toward father, who put her "through all this"
    b. toward baby with inappropriate verbalizations
    c. with remarks about baby's sex or physical appearance

The second source of reference for the development of the scale came from Rising's work (1974). Rising has drawn attention to what she calls the "fourth stage of labor," (p. 870) or the first hour or two after delivery, which she identified as the time of "family integration" (p. 870). Rising stresses the importance of the nurse's role during this time and has included in her writing several questions helpful in guiding a nurse's observations to identify families having difficulty integrating as a new unit. Without data to support her clinical impressions, she urges those who have the opportunity to observe women after delivery to orient their attention to making these observations:

1. Do either or both parents reach for or look at the newborn or do they look away or even physically retreat?

2. Do the couples' first comments reflect positive identification or do they indicate disappointment with the sex, or extreme relief that the delivery is over?

3. Do the husband and wife focus on themselves or their discomfort, or do they look to each other or the baby?

4. Do the couple ask to see or hold the baby? Do they comment on specific characteristics or seem to have positive associations with the baby?

5. Do the couple have a name picked out, or what do they call the child soon after birth?

6. What is the feeling of the couple's communication with each other and the newborn?

To define specific variables that could be easily assessed by an observer for this dissertation, seven video tapes were made by the investigator of the responses of mothers and fathers to their newborns immediately following birth. The patients in the group practice being used as a sample population were approached and asked if they would agree to be video taped. These women were in the preliminary stages of labor when approached and all agreed. The video tapes were reviewed by the investigator with a group of consultants including a psychiatrist, clinical psychologists, social workers, pediatricians, neonatologists, nurses, a social science methodologist and several mothers. Several discrete verbal and nonverbal behaviors were identified, and for several identified behaviors a quantitative and qualitative rating scale was developed to make the observations.

Due to the procedural routine followed in the delivery room it was decided that just the first 10 minutes following the infant's full exposure to the mother (usually prior to cutting the cord) would be used as the rating period. These first 10 minutes were chosen because during this period of time a fairly standard routine is followed in the delivery room. Also occasionally after delivery patients are medicated and the first 10 minutes after birth provide a time before the effects of the drugs administered affect behavioral functioning. In each observation made the women were judged as being cognitivily alert prior to and immediately following the delivery.

Inter-rater reliability was established with the observation scale at .95 on three different trials with the investigator and one nurse and at .95 on two trials with the investigator and a second nurse. On several occasions, follow-up checks between nurses and the investigator indicated inter-rater reliability scores of between .90 and 100.

The items the scale developed and implemented include assessments of the following maternal behaviors:

1. Response to baby's sex
2. Immediate attempt to reach baby
3. Visual tracking of baby
4. Questions asked regarding physical status of baby
5. Comments made about baby
6. Distal looking at baby--quality
7. Distal looking at baby--quantity
8. Proximal touching of baby
9. Talking to baby
10. Use of pronouns
11. Use of baby's name
12. Focus of attention
13. General tone of affectual response

If the father was present in the delivery room, an assessment was also made of his responsive behavior to the mother and newborn. Each of the 13 scale items is rated on a 4-point scale measuring the degree of responsiveness which the mother (and father, if present) expresses in her behavior to her newborn. In this dissertation the total score of the individual scores from each scale item was used as a measure of maternal responsiveness in the delivery room. The father's score was separately coded and analyzed.

## Brazelton Neonatal Assessment Scale

The Brazelton Scale (Brazelton, 1973b) is a behavioral assessment that was developed to score a newborn's interactive behavior. The overall focus of the exam is on assessing the infant's available responses to his environment. This provides an indirect measure of the infant's potential effect on those who care for him. Several basic neurological tests are also included in the assessment as scale items.

The scale includes 27 behavioral items, each of which is scored on a 9-point scale and 20 elicited neurological responses which are scored on a 3-point scale. For most of the scale, the midpoint represents the expected norm. The mean score is related to the expected behavior of an average seven-plus pound full-term (40 week gestation) normal Caucasian infant who received Apgar scores of not less than seven at one minute and eight at five minutes with no clinical evidence of abnormal intrauterine experience

and whose mother had not received more than 100 mg of sedative drugs prior to delivery. The assessment is made on the infant's third day of life midway between feedings.

The Brazelton Scale is scored by the infant's best, not his average performance. All attempts are made to facilitate this performance. The infant's state of consciousness is considered as an important variable in this exam. Reactions to stimuli are interpreted within the context of the infant's state at the time of the administration of each assessment on the scale. The assessment of the pattern of states or levels of consciousness, as well as the movement of the pattern of states from one state to another, is central to the assessment and is considered to be an important functional characteristic of the infant in the neonatal period. The evaluation of the state-related behaviors is considered to be perhaps the best predictor of the infant's receptivity and ability to respond to stimuli in a cognitive sense. Six levels of states ranging from deep sleep to intense crying are identified and noted throughout the course of the exam.

The investigator administered the exam to each of the infant subjects. She was trained to give the exam at the Child Development Unit at Boston Children's Hospital where she established inter-rater reliability above the .90 required by the training program.

To develop a profile of an individual infant's behavior on the 27 behavior and 20 neurological scales, a system has been developed to cluster items on dimensional scales so that a minimum

number of variables can be used in a summary score (Adamson, Tronick, Als, & Brazelton, Note 4). These dimensional scores can also be used to compare outcomes among infants. The four conceptual dimensions used were selected to summarize the basic processes which underlie an infant's behaviors as observed and scored using the examination. They are:

I. Interactive processes: The infant's capacity to respond to social or potentially social stimuli, especially during the alert state, is assessed by the scale items which evaluate the infant's ability to orient, to cuddle, and to be consoled.

II. Motor processes: The infant's ability to maintain adequate tone, to control motor behavior and to perform integrated motor actions is evaluated by the scale items which include assessments of motor tone, activity, hand-to-mouth, defensive reactions, motor maturity, pull-to-sit, and reflexes.

III. Organizational processes: State Control: The infant's ability to organize his states and to shut out disturbing stimuli when asleep (habituation) are assessed using the scale items which evaluate rapidity of build up, peak of excitement, irritability, self-quieting and state lability.

IV. Organizational processes: Physiological Response to Stress: The infant's reaction to stress is assessed using the items which assess tremulousness, startles, and skin color lability.

Three typologies or scores are used for the first three dimensions. For dimension IV a dichotomy of "yes" or "no" is used. The typology labelled "3" or "no" characterizes exceptionally good performance. This rating system was used in this dissertation in the analysis of the data collected on the infants.

Feeding Observation Scale

There are two component parts to the feeding scale that was used in this dissertation. The first part of the scale measures the ratio of time a mother spends looking at her infant to the total time of the feeding. This measure is similar to the one used by Klaus and Kennell (1970b) in their studies of maternal attachment.

The second part of the scale includes an assessment of maternal responsiveness observed during the feeding. The scale used for this part of the observation was developed by Osofsky and Danzger (1974) to evaluate the relationship between neonatal style and the early mother-infant relationship.

The observations were made by two trained research assistants who had obtained .90 inter-rater reliability. This rating was established by having the two observers independently rate with the investigator a sample of five mother-infant pairs. After reliability was established, observations were made by one of the observers with periodic checks by a second observer. The observers were unaware of the subjects' scores on the Delivery Room Observation Scale or the newborns' Brazelton evalutation.

Both breast and bottle feeding mothers were included in this sample. An attempt was made to administer the observations on the mothers' third day in the hospital or as close to this time as possible. The observations were always made after the mothers had fed their infants at least four times so that both mother and baby would feel reasonably comfortable in the situation. The feeding

observation scale included discrete measures to assess the following maternal behaviors:

1. Attentiveness and general sensitivity to the infant's state and sucking behavior
2. Quality and frequency of auditory stimulation
3. Quality and frequency of visual stimulation (eye contact)
4. Head and facial movements
5. Quality and quantity of tactile stimulation
6. Position in which infant is held

Each of the scale items is rated on a 6-point scale. The total score of all ratings was used in this dissertation as a measure of maternal responsiveness during a feeding.

## Instruments Administered at Time 3

### Neonatal Perception and Bother Inventory

The Neonatal Perception Inventory is based on the assumption that the way a mother relates to her child is modified by her perception of his appearance and behavior (Broussard & Hartner, 1971). This instrument also assumes that the American emphasis on superiority would be reflected in a mother's expectation that her healthy full-term first born infant would be better than average. Broussard devised the Neonatal Perception Inventory using the mother's concept of the average baby as an anchor for comparison of her own infant's behavior. The behavioral items used for assessing the comparison of a mother's perception of her baby and the average baby are crying, spitting, feeding, elimination, sleeping, and

predictability. These items were selected on the basis of Broussard's past clinical experience with the concerns new mothers express about their newborns.

The inventory was first administered to 318 primiparae on two different occasions. The first administration of the inventory (Time I) was conducted in the women's first or second postpartum day and was again administered (Time II) when the infants were approximately 1 month old. To assess the mother's threshold for annoyance a Bother Inventory was also developed to assess the degree to which a mother is bothered by her infant's behavior in regard to the same six behavioral items. The data were analyzed in terms of the relationship between maternal attitudes and the child's future development.

The data collected by Broussard and Hartner to assess their instrument's validity suggest a relationship between a mother's perception of her newborn at birth and at 1 month and the child's behavior independently rated four and a half years following his birth. The infants perceived by their mothers as not as good as the average baby at 4 weeks were assigned to a high risk category while the infants perceived as better than average were assigned to a low risk category. A $x^2$ test for association was done to determine the relationship of the probability of risk rating of the child established at 1 month of age and the need for intervention assessed four and a half years later by psychiatric evaluations. A statistically significant association was evident between prediction and

outcome, with more infants in the high risk group judged as needing therapeutic intervention than those in the low risk group.

Although the mother's perception of her infant as measured by the perception inventories on the first or second postpartum day did not show predictive validity at the four and a half year follow-up assessment, the Time I perceptions have been shown to be predictive of later evaluations made of these children at 11 years of age Broussard, Note 5). These data support the validity of the Neonatal Perception Inventory as a sensitive assessment of maternal perception.

In this dissertation the discrepancy between the "average baby" score and the "your baby" score was coded as a continuous variable. This score was used in the data analysis rather than the categorical rating of risk.

Schaefer Postpartum Research Inventory

This inventory was developed to assess individual differences in mothers' reponses to the problems of postnatal care for their infants (Schaefer & Manheimer, Note 2). The 20 concepts of psychological responses in this inventory came from a review of the literature and interview responses with pediatricians, nurses and mothers concerning problems of the postpartum period. Three to five items are used on the questionnaire to measure each concept. The inventory was first administered at an army general hospital outpatient clinic where women were asked to complete the inventory while waiting for their six-week postpartum medical examination.

The results of the internal consistency reliabilities on the scales indicate that only 10 of the 20 scales are reliable above .50 for both multiparae and primiparae. Intercorrelations of seven relatively reliable scales reveal two major patterns of psychological response. The first pattern included extrapunitiveness, negative aspects of childrearing, irritability and depression. The second pattern included fear or concern for the baby, need for reassurance and intrapunitiveness.

The seven scales with the highest internal consistency reliability scores were selected to be used in this investigation. These scales and their respective reliability coefficients are:

| | | |
|---|---|---|
| 1. | Irritability | .61 |
| 2. | Fear or concern for baby | .74 |
| 3. | Negative aspect of childrearing | .70 |
| 4. | Intrapunitiveness | .79 |
| 5. | Ignoring | .70 |
| 6. | Need for reassurance | .65 |
| 7. | Depression | .64 |

Two scales of psychosomatic anxiety are also included in this inventory and were used in the data collection of this dissertation. Each of the items on the instrument are rated on a 4-point scale. The total score on each scale was used in the data analysis.

Interview Assessment of Mother-Infant Adaptation
(Appendix D)

The open-ended questions included in this interview were developed and used as outcome measures in a doctoral dissertation which investigated the mother-infant acquaintance process (Kennedy, 1969). From the 12 interview questions asked, four general dimensions

of the adjustment process were identified and used in the coding of the data in this study. They are the mother's perception of baby adaptation, mother adaptation, reciprocal mother-infant communication and mother's overall assessment of the quality of the adjustment. The responses are coded on a 4-point scale which was developed after examining each of the responses provided by the respondents.

During the home visit the mothers were also asked specific interview questions concerning the onset, course, and determinants of their feelings toward their infants. The first three questions asked are ones used by Robson and Moss (1970) in their study of the normative development of maternal attachment. The mothers in their study and the subjects in this study were asked: when did you first experience positive feelings toward your baby; when did the baby first seem to recognize you and when did the baby first become a person for you. A fourth and fifth question were added by the investigator in this study to determine how the mother recalled feeling when she first saw her infant in the delivery room and how difficult did she recall her labor and delivery as being. The responses to these questions were recorded and later coded after the range of responses offered was reviewed.

Feeding Observation Scale

A feeding observation was made during the home visit. This observation included the same rating schedule used during the $T_2$ observation but also included a rating of the infant's behavior during the feeding. The scale used to rate the infant's behavior

was also developed by Osofsky and Danzger (1974) and includes the following assessments:

1. Eye contact based on the quantity and quality of the infant's eye contact with the mother's face and eyes
2. Responsivity to auditory stimulation
3. Responsivity to tactile stimulation
4. Responsivity to functional and nonfunctional handling

These items are rated on a 6-point scale and the total score on the assessment was used in the data analysis as a measure of the infant's responsiveness during a feeding. Inter-rater reliability was established using the same procedure reported in the description of the mother's feeding observation.

## Procedures for Securing Permission and Cooperation for Data Collection

The procedural complexity of conducting this study can be understood when the number of people in various roles essential to the process of data collection is considered. Three groups of individuals, physicians, nursing staff, and patients, were contacted and asked to cooperate with the administration of the research project. This contact was made in the contexts of the hospital and the group practice where the professionals are employed and the patients receive their medical care.

To conduct this study a great deal of logistical planning was essential before the data collection could begin. It was of primary significance that this investigation was conducted at E. W. Sparrow Hospital, a community hospital, rather than in a university medical center. This required that a thorough orientation of the

hospital staff be made since these individuals have had few opportunities to be involved in research work. Aside from the fact that research was somewhat foreign to this particular setting, the novelty of this kind of behavioral study in any medical setting required that careful explanations be made to appropriate individuals so that a full understanding of the study could be assured. Although the hospital has undergone rapid change during the past several years, it can be understood how novel the request to do behavioral observations in the delivery room would seem to the medical community.

A thorough description of the procedural process used to seek appropriate permission to conduct the study will follow. The Flow Chart illustrated in Figure 3 depicts the steps taken before the data collection began. Due to the unique quality of the study, the details of this procedure will be carefully explained since they are related to the process required to receive hospital, group practice, and patient permission and cooperation.

## Procurement of Hospital Permission and Cooperation

To conduct this study required that the proposal be approved by the E. W. Sparrow Hospital Research Committee. This administrative action was essential but represented a minor portion of the effort required to facilitate the data collection.

The assessments to be made while the patients and their infants were being cared for in the hospital included the use of the Delivery Room Observation Scale, the Feeding Observation Scale, and the Brazelton Neonatal Behavioral Assessment Scale.

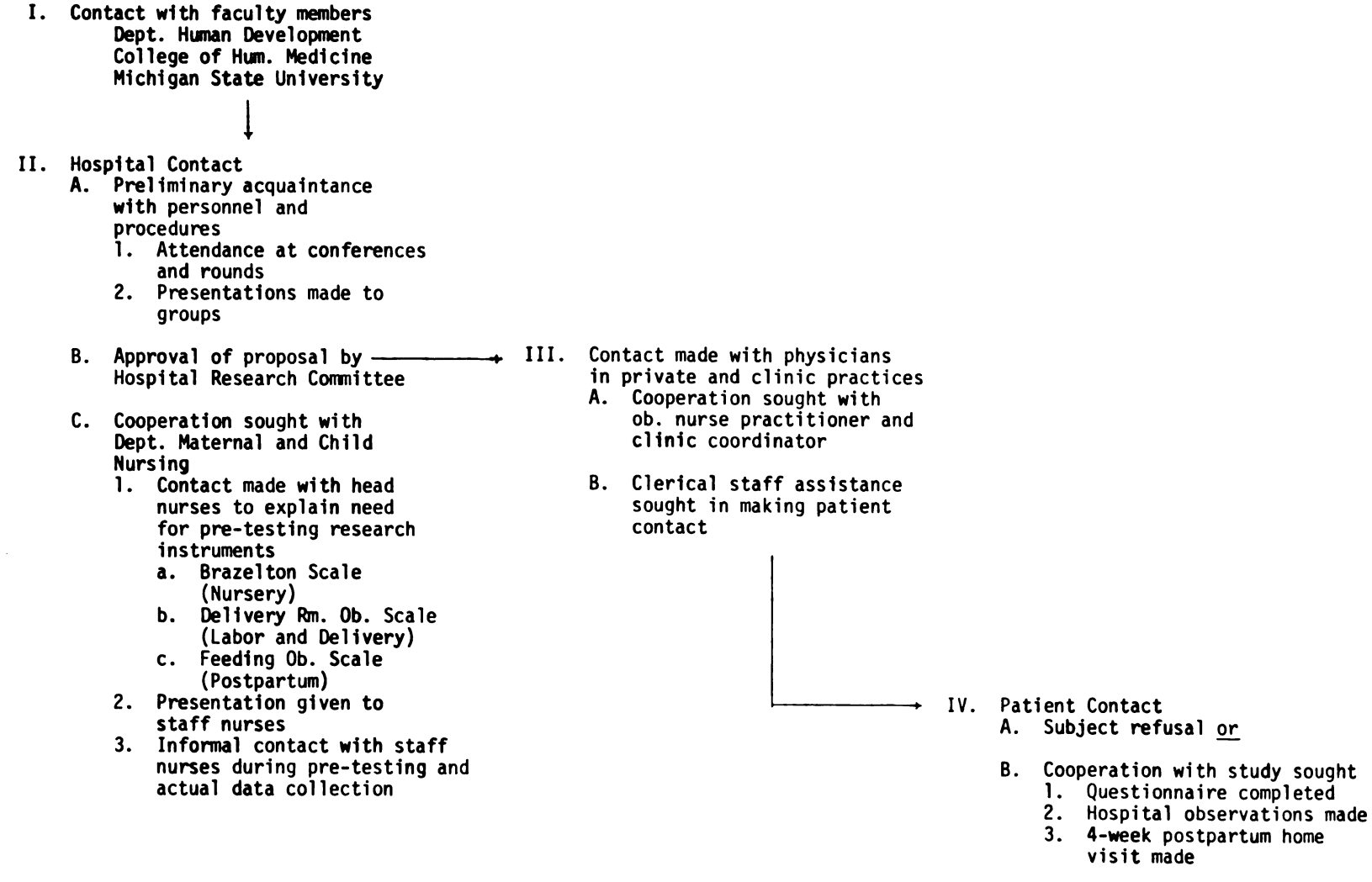


FIGURE 3.--Flow Chart of Procedures Followed to Secure Necessary Permission and Cooperation for Data Collection.

Each of these assessments was to be administered in a different hospital service where different personnel would be caring for the patients. Consequently, extensive contact with the entire spectrum of the hospital had to be made to inform these individuals of the purpose of the study and of how their cooperation would be essential. The procedure for seeking permission was linked to the process of seeking cooperation; how the hospital came to be involved with the study will be described in terms of the actions taken.

Dr. Thomas Helmrath, a member of the faculty of the College of Human Medicine at Michigan State University, who also serves as chief of staff of the Newborn Service at E. W. Sparrow Hospital, helped make the initial contacts with the key personnel to inform them of the general nature of the proposed study. Approximately five months before the proposal was submitted to the hospital research committee, Dr. Helmrath distributed a paper prepared by the investigator entitled "Perinatal Indicators of High Risk Parenting" (Wilson, Note 6). This paper was read by members of the nursing staff and physicians, and it served as an introduction to the general nature of the study to be conducted. The investigator was also working closely with Dr. Ray Helfer of the College of Human Medicine. This association facilitated the credibility of the study as an attempt to make early predictions about patients who may be high risk parents.

Prior to the submittal of the proposal for committee approval, several other actions were taken to expose the hospital staff to the

content of the proposed research. The investigator attended weekly discharge conferences for the Neonatal Intensive Care Unit where the issues of family attachment were discussed in reference to each of the newborns whose cases were reviewed. Through these meetings general acquaintances with the house officers and nursing staff were established.

Another preliminary step taken before beginning with the data collection was the establishment of contact with the nursing staff in Labor and Delivery. The investigator spent several weekends with this service observing deliveries and discussing the nature of the proposed research with the nursing personnel. The arrangements to make these observations were made by Dr. Helmrath through the office of the Head of the Department of Maternal and Child Nursing. The time spent with this service was the beginning of the future development of a working rapport with these individuals.

The topic of attachment was also the subject of a presentation that was given at Pediatric Grand Rounds. The investigator and another graduate student doing a similar project presented talks in which the general nature of the research was explained. At this time questions from the group attending the presentation began a rather lively discussion of the hospital's role in facilitating attachment. Throughout these preliminary contacts close ties were maintained with the pediatric social worker who provided helpful advice on procedural and logistical formalities.

Once the hospital research committee granted approval of the study, contacts were establsihed with key personnel in the nursing

department. The Head of the Department of Maternal and Child Nursing asked the investigator to present a talk about the study at a meeting of head nurses of the Labor and Delivery, Postpartum, and Nursery Services. Presented at this meeting was a thorough description of the observations to be made in the hospital, and information concerning the entire scope of the study and its implications for patient care were discussed.

It was at this meeting that the idea of video taping mothers in the delivery room was first presented to the staff of head nurses. The video taping was a necessary preliminary task that needed to be completed so that a rating scale could be developed for use in the formal data collection of the research project. At first the nurses' reactions were guarded with comments about how crowded the room would be, how the physicians might refuse, and how patients might not be willing. After discussion, the head of the Department and the head nurse in Labor and Delivery agreed it would be worth a try on a limited basis. The group was assured that all attempts would be made by the investigator to be as unobtrusive as possible. The investigator requested that the nursing staff be quite frank in letting her know if she was ever disrupting to hospital procedures.

On another occasion a talk was given as a part of the nursing staff's continuing education program. At this time the staff nurses were asked to engage in a discussion of possible variables that could be used in assessing maternal responsiveness in the delivery room. This provided an excellent opportunity again to

explain the nature and purpose of the study and to elicit the nursing staff's input to the study. This effort helped increase the hospital staff's interest in the uniqueness of the research and emphasized how their cooperation would be a major contribution to the project.

Prior to this meeting a description of the Brazelton Neonatal Behavioral Assessment Scale (Appendix E) was distributed to the entire Newborn Service. At this time questions about how the exam is administered were answered and the significance of its findings were discussed. It was necessary that the investigator administer 10 Brazelton exams before she could be tested for reliability. Permission to use newborns for these practice exams was granted through the attending physician who also contacted a private pediatrician. Newborns under these physicians' care were used in preliminary trials after their mothers gave verbal consent. Since this was a new procedure in the nursery, time was spent with the nurses explaining the exam each time it was administered. After several weeks of working in the nursery the investigator became known to the staff who were helpful in arranging for the exams to be administered.

When the actual collection of the data began, cooperation was maintained through informal contact, mainly over coffee in the nurses' lounge. Throughout the extent of the data collection continuous attempts in as nonthreatening manner as possible were made to stress the importance of the Labor and Delivery Nurses calling the investigator when one of the study patients was admitted to the

hospital. It was after several informal talks with one of the nurses that a system was developed to facilitate this contact. Notes were placed on the patients' prenatal records which are filed in the hospital. The nurse's suggestion of attaching notes on these records was an excellent one since they are pulled and placed in each patient's chart when she is admitted to the hospital for delivery. Although the patients were asked to call the investigator when they left home for the hospital, in many cases they forgot and the nurses' call provided the only way of informing the investigator of the patient's admittance to the hospital.

Occasional boxes of warm cookies brought to the nurses and an honest attempt at maintaining congenial relations most likely helped contribute to the good working relations that were maintained. The house staff physicians were also included in the informal discussions about the study. The investigator was contacted in time to attend each of the deliveries. This record speaks well to the relations that were established and the real effort made by the nursing staff to be of assistance to the investigator.

The feeding observations were made in the postpartum ward several days after delivery. The nurses were informed of how these observations were to be conducted, and they required very little cooperation on the part of the hospital staff. The nursery nurses' assistance was needed only in helping to arrange for babies to be wheeled to the treatment room where the Brazelton Exam was administered. Attempts were always made to explain the exam to the

nurses, and they were most helpful in providing information concerning the newborn's feeding schedule.

## Physician and Practice Contact

Once the hospital research committee approved the proposal, steps were taken to seek cooperation with a group practice and public health clinic. The study protocol required that the physicians be willing to have an observer present in the delivery room and to have his patients contacted and asked to participate in the study.

The choice of which group practice to contact was made by Dr. Helmrath. The practice that was selected was chosen because of its size and the general sensitivity of this group of physicians to the issues involved in the study. An appointment was made with the senior member of the practice at which time the investigator explained the nature of the proposed involvement. Contact was also made at this time with the Obstetric Nurse Practitioner who had extensive contact with each of the patients receiving care through this office of physicians.

It took several weeks of working with the clerical staff and the nurses working in this practice before the logistics of the procedure for contacting patients was established. After several visits to the office, one of the receptionists explained to the investigator the practice's system of sorting the patient's charts. All the obstetric charts are bound in color-coded folders and filed on the same shelf of the automatic filing system. After learning this system, the investigator, with the help of the clerical staff,

pulled each of the charts of primiparous patients with an expected date of delivery within the time frame of the data collection. From the chart the woman's name, due date and telephone number was noted. This information provided the investigator with a complete list of all potential subjects to be contacted.

The next step involved attaching to each of these charts a card (Appendix F) signed by the physicians and addressed to the patient. On this card was a brief statement explaining the nature of the study and an introduction of the investigator as a student doing a research project. A list of all potential subjects was given to the receptionist who checked off the names of patients, who were given the cards as they arrived in the office for their appointments.

It was the clerical staff's assistance in explaining how the charts are filed that greatly helped in developing this system for contacting patients. The nurse practitioner was also most kind in introducing the investigator to the patients after the cards were given to the potential subjects. The nurse also carefully answered each patient's questions and described the study in a positive manner.

After several weeks of contacting patients through the private practice, contact was made with a public health clinic. It was felt that patients from this practice would add to the heterogeneity of the sample. The initial contact was made through Dr. Helfer, who spoke with a senior physician of the Family Practice Center who attends at the clinic selected. With the initial contact made, the

investigator met with the clinic coordinator, who granted permission to use the clinic's patients as potential subjects. Obtaining this permission was facilitated by prior contact with the private practice. The clinic had developed a rigid policy of screening proposed research studies to protect its patients from being used as subjects because of their low poverty status. The clinic coordinator, who expressed a great deal of interest in the study, did not perceive this study as exploiting the patients and immediately provided access to the patients' charts. The same procedure used in the private practice for making contact with patients was established with this clinic population. However, contact was a more simplified process with these potential subjects since the clinic has two scheduled times when patients are seen on a routine basis for pre-natal care. This schedule provided an established time when the investigator could meet with the patients to explain the study.

## Patient Contact

After each of the patients received the card introducing the investigator, direct contact was made with the patient. The investigator met the patients in the office or clinic during each woman's last trimester or pregnancy. This contact was made either in a semi-private part of the waiting room or in one of the physicians' offices where the patient could feel free to talk and ask questions. At this time the investigator introduced herself as a graduate student in child development working with the pediatric department of the Michigan State University medical school. The woman was told

that the project was studying early mother-infant interaction in order to understand better how a mother begins to know her baby. It was explained to the woman that, if she chose to participate in the study, she would be asked to fill out a questionnaire while waiting for her doctor's appointment. The investigator also explained to the woman that, if she agreed to be in the study, she and her baby would be observed in the delivery room, during a feeding, and that the baby would be given a behavioral examination. The follow-up part of the study was also explained, and the women were told that four weeks following delivery they would be visited at home to be observed again during a feeding and to fill out another questionnaire. The patients were assured that all information would be kept strictly confidential, identifiable only by a number.

If the patient agreed to participate in the study, she was given an informed consent form to sign (Appendix G). At this time she was also asked to respond to the initial questionnaire. Each woman was given a card (Appendix H) with the investigator's home and page-boy telephone number and was asked to call these numbers when she left home for the hospital. In cases where the patient chose to discuss the study with her husband before agreeing to consent, a letter describing the study (Appendix I) was given to the woman and arrangements were made to make telephone contact with her to arrange for another meeting in the doctor's office. If the patient refused to participate in the study, an attempt was made to understand the reason for the refusal.

It was apparent that the personal contact made with the patients by the investigator greatly facilitated their granting permission. On a preliminary basis the nurse practitioner introduced the study to six patients and each of these women refused to participate. With personal contact by the investigator, two women changed their minds but a few continued to refuse. It is of importance to note that on two occasions when permission was refused in the doctor's office, it was granted when, by coincidence, the investigator met with the patient at the hospital after her admission to the hospital. It seemed that at this time the women were faced with the reality of the situation and they no longer cared if another person was present in the delivery room.

On several occasions when the investigator was unable to make contact with a patient in the office or clinic, contact was made for the first time in the hospital during the patient's early stages of labor. It is significant to note that at this time each of the patients contacted agreed to participate. It appears that though women were approached only when they were judged fully capable of granting informed consent, they were much more willing to agree to participate in the study when the hospital setting and the delivery process seemed more real to them.

## Procedures for Data Collection

At $T_1$ the data were collected at the same time permission was granted by the subjects to participate in the study. In the great majority of cases this took place in the obstetrician's office when the subject was waiting for her routine prenatal visit.

The data collected at $T_2$ during the subjects' hospital stay involved careful coordination with the hospital staff and the investigator. Either the subject or the nursing staff contacted the investigator when a subject was admitted to the hospital. When the subject was taken to the delivery room the investigator, dressed in a scrub dress, stood against the side or back wall of the room with a clip board and made the observational ratings.

The feeding observations were made by an observer trained by the investigator who sat near the mother's bed during the feeding. The observer scrubbed and gowned and compiled with the hospital regulations concerning visitation to the postpartum floor. The Brazelton exams were administered by the investigator in the hospital treatment room which was dimly lighted and heated to a 80° temperature. This room is isolated from the sounds of nursery and provided a quite place to examine the newborns. The investigator scrubbed and gowned complying with hospital procedures.

As the investigator made the observations with both the Delivery Room Observation Scale and the Brazelton Neonatal Behavioral Assessment Scale the possibility of observer bias does exist. Every attempt, however, was made to maintain objectivity with the use of these instruments. The procedural logistics of the data collection required that this arrangement for data collection be implemented.

At $T_3$ the data were collected during a home visit made when the infants were between the ages of 4 and 5 weeks old. The mean age of the infants at the time of the assessment was 30.4 days

with a S.D. of 3.49 days. For each of these assessments one of the two trained research assistants called the mother and arranged for a convenient time to make the home visit when the baby would be feeding. To prevent possible bias, the research assistant who had not observed the mother and newborn in the hospital administered the questionnaire and the interview and made the feeding observation during this home visit. The entire visit took between 45 minutes to one hour to complete.

All data was collected for this study between March 1, 1975, and July 3, 1975. The first delivery room observation was made on March 8, 1975.

## Sample Description

The women asked to participate in this study were being cared for by the two group medical practices which had agreed to cooperate with the research project. Only primiparous women and their newborns having minimum Apgar Scores of eight at the five minute evaluation were included in the sample. An attempt was made to contact every primiparous patient in each practice who was expected to deliver within the time frame of the data collection. Contact was made with all but approximately five patients who delivered before the investigator was able to discuss with them the possibility of their cooperation with the study.

The recruitment of the sample is described in Table 2. Seventy-five potential subjects were approached and asked to participate in the research project. Eleven women in the private practice

TABLE 2.--Sample Recruitment.

| | Patients Approached N | Refuse N | Agree N | Medical Complications N | Deliveries Post Study Time Frame N | Deliveries Missed N | Subjects N |
|---|---|---|---|---|---|---|---|
| Private practice | 59 | 11 | 48 | 9 | 6 | - | 33 |
| Clinic practice | 16 | 1 | 15 | 3 | 4 | 1 | 7 |
| TOTAL | 75 | 12 | 63 | 12 | 10 | 1 | 40 |

and one woman in the clinic practice refused to cooperate. The primary reason given for turning down the study was related to the desire on the part of these women to experience their first deliveries without an additional obligation to a research project. These women expressed a desire for their first delivery to be as private and personal as possible and wanted just their husbands and the essential medical team present. It is of note that the two unmarried women who refused to participate gave only the reason that they were uninterested and appeared to the investigator to be threatened by the idea of being observed.

Medical complications arose with 12 of the women and/or their newborns which necessitated their being dropped from the sample. Of those dropped, nine women had Caeserian sections, one delivered a baby with Downs Syndrome, one delivery involved severe fetal distress, and one infant died of multiple anomalies shortly after birth. Ten women who had agreed to participate in the study did not deliver before the final date of the data collection. All other deliveries were observed except for one that was missed after notification was received from the hospital that the patient had been admitted for delivery.

## Background Information

### Age

As shown in Table 3, the mean age for the entire study population was 22.38 years with a S.D. of 5.02. The mean age of the subjects in private practice was higher than that of the clinic patients. As a group, the patients who refused to participate in

the study were older than those who agreed to be subjects in the research project.

TABLE 3.--Mean and Standard Deviation of Age of Sample and Patients Refusing Study Participation.

| | Sample Subjects | | Patients Refusing Study Participation | |
|---|---|---|---|---|
| | M | S.D. | M | S.D. |
| Private practice | 23.21 | 5.05 | 24.36 | 3.88 |
| Clinic practice | 18.43 | 2.44 | 18.0 | 0 |
| TOTAL | 22.38 | 5.02 | 23.83 | 4.13 |

## Marital Status and Length of Marriage

Table 4 presents data concerning the marital status and the length of time the subjects had been married. The study population as a whole had seven unmarried subjects and 33 subjects who had been married for a period of time ranging from less than nine months to ten years. Of the clinic population, 85.8% were either unmarried or married for less than nine months. Forty percent of the sample were either unmarried or had been married for less than nine months at the time of delivery.

As a total population, there was a fairly even distribution of subjects in the categories of length of marriage. The largest percentage of subjects in any one category was the 32.5% of the population who had been married between two and a half and five years.

TABLE 4.--Percent and Frequency Distribution of Sample by Marital Status and Length of Marriage.

| | Not Married | | < 9mos. | | 9 mos.-2 yrs. | | 2 1/2 yrs.-5 yrs. | | > 5 yrs. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % | N | % |
| Private practice | 4 | 12.1 | 6 | 18.2 | 5 | 15.2 | 12 | 36.4 | 6 | 18.2 |
| Clinic practice | 3 | 42.9 | 3 | 42.9 | - | --- | 1 | 14.3 | - | --- |
| TOTAL | 7 | 17.5 | 9 | 22.5 | 5 | 12.5 | 13 | 32.5 | 6 | 15.0 |

The 40% of the study population who were unmarried or who conceived out of wedlock contrasted markedly with the 17% of the unmarried patients who refused to participate in the study. Of the entire group who refused to participate, 85% were married for more than nine months with 61.5% being married for more than 2.5 years. As a group, those that rejected participation in the study were older and were married for a longer priod of time than those women who agreed to participate.

Ethnic Background

Table 5 indicates that the sample population as a whole was 85.0% white and 5.0% black. There was one Oriental and three Mexican-Americans in the research sample.

Income

As indicated in Table 6, there was a clear difference in income levels between the two groups in the sample population. In

TABLE 5.--Percent and Frequency Distribution of Sample by Ethnic Background.

| | White | | Black | | Oriental | | Other | |
|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % |
| Private practice | 30 | 90.9 | 2 | 6.1 | 0 | 0 | 1 | 3.0 |
| Clinic practice | 4 | 57.1 | 0 | 0 | 1 | 14.3 | 2 | 28.6 |
| TOTAL | 34 | 85.0 | 2 | 5.0 | 1 | 2.5 | 3 | 7.5 |

the clinic population, 85.7% had an income of less than $4,000 but only 24.2% of the subjects in the private practice had this low a level of income. All subjects in the clinic group had incomes below $6,000 while only about 30% of the subjects in the private practice were represented at this income level. The remainder of the subjects in the private practice were distributed throughout the range of income categories, with 60% of this group earning more than $10,000 a year. In the total sample population, 50% earned more than $10,000 a year.

Education

Table 7 shows that as a group, the clinic subjects had less education than those being cared for by the private practice. Of the subjects in the clinic practice, 42.9% had only an eighth grade education and 57.1% of these subjects had not graduated from high school. In the private practice, 84.8% had completed high school

TABLE 6.--Percent and Frequency Distribution of Sample by Income Level.

| | $4,000 | | $4-6,000 | | $6-10,000 | | $10-15,000 | | $15-20,000 | | $20,000 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % | N | % | N | % |
| Private practice | 8 | 24.2 | 2 | 6.1 | 3 | 9.1 | 8 | 24.2 | 6 | 18.2 | 6 | 18.2 |
| Clinic practice | 6 | 85.7 | 1 | 14.3 | -- | -- | -- | -- | -- | -- | -- | -- |
| TOTAL | 14 | 35.0 | 3 | 7.5 | 3 | 7.5 | 8 | 20.0 | 6 | 15.0 | 6 | 15.0 |

and 60.6% had attended and/or graduated from college. Of the total population, 77.5% had at least a high school education.

TABLE 7.--Percent and Frequency Distribution of Sample by Level of Education.

| | 8th Grade | | 10th Grade | | 12th Grade | | Some College | | Finished College | |
|---|---|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % | N | % |
| Private practice | - | --- | 5 | 15.2 | 8 | 24.2 | 8 | 24.2 | 12 | 36.4 |
| Clinic practice | 3 | 42.9 | 1 | 14.3 | 2 | 28.6 | 1 | 14.3 | -- | --- |
| TOTAL | 3 | 7.5 | 6 | 15.0 | 10 | 25.0 | 9 | 22.5 | 12 | 30.0 |

Pregnancy Planning, Hospital Care Arrangements, and Prenatal Education

Table 8 shows the percent and frequency distribution of the variables related to the subjects' management of their pregnancies. In the private practice, about half the subjects had planned their pregnancies. In the clinic group, only one subject had planned her pregnancy. In the total sample population, 47.5% had planned on becoming pregnant with the expected child.

There was a slight difference between the two groups when they were compared concerning their preference of hospital care for their newborns. A slightly higher percentage of study participants from the clinic preferred the rooming-in option. In the entire study

TABLE 8.--Percent and Frequency Distribution Sample by Pregnancy Management Variables.

| | Pregnancy Planning | | | | Hospital Care Option | | | | Prenatal Education | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Yes | | No | | Rooming-in | | Limited contact | | Yes | | No | |
| | N | % | N | % | N | % | N | % | N | % | N | % |
| Private practice | 18 | 54.5 | 15 | 45.5 | 22 | 66.7 | 11 | 33.3 | 21 | 63.6 | 12 | 36.4 |
| Clinic practice | 1 | 14.3 | 6 | 85.7 | 5 | 71.4 | 2 | 28.6 | 2 | 28.6 | 5 | 71.4 |
| TOTAL | 19 | 41.5 | 21 | 52.5 | 27 | 67.5 | 13 | 32.5 | 23 | 57.5 | 17 | 42.5 |

population, 67.5% of the subjects preferred to have a rooming-in arrangement which would permit them nearly unlimited contact with their newborn.

The two groups did differ in their participation in prenatal education programs. While 63.6% of the private practice subjects attended special classes, only 28.6% of the clinic subjects received some kind of prenatal education.

## Medical Information

### Labor and Delivery

As shown in Table 9, the mean length of the subjects' labors was 10.56 hours with a S.D. of 5.11 hours. Twenty-eight of the deliveries were spontaneous and 12 required the use of forceps. Of the 40 deliveries, one was a breech presentation and the remainder were vertex presentations.

TABLE 9.--Sample Labor and Delivery Information.

| | Length of Labor | | Delivery: Spontaneous | Forceps-Outlet | Low | Mid | Presentation: Vertex | Breech |
|---|---|---|---|---|---|---|---|---|
| | M | S.D. | N | N | N | N | N | N |
| Total Sample | 10.56 | 5.11 | 28 | 7 | 3 | 2 | 39 | 1 |

During labor all but two of the subjects received some form of medication between one and ten hours prior to the delivery. The medication consisted of moderate amounts of sedative and/or analgesic

drugs (10 to 75 mg of valium, vistaril, demerol). The dosages were judged to be insufficient to have affected the subjects' behavior at the time of delivery.

Thirteen of the women received para-cervical anesthetic blocks during labor. At the time of delivery, with the exception of two subjects who were given spinal blocks, all subjects received a local anesthetic alone or in combination with a pudendal anesthetic and/or small amounts of nitrous oxide.

Newborn Characteristics

Table 10 shows that in the sample of 40 newborns, 18 were female and 22 male. The mean birth weight of the newborns was seven pounds, four ounces with a S.D. of 13.9 ounces. The mean Apgar score of the total sample at one minute was 8.23 with a S.D. of 1.25. The mean Apgar score of the total sample at five minutes was 9.03 with a S.D. of .43.

TABLE 10.--Sample Newborn Characteristics.

| | Sex: Male | Female | Birth Weight | | Apgar Score 1 minute | | Apgar Score 5 minutes | |
|---|---|---|---|---|---|---|---|---|
| | N | N | M | S.D. | M | S.D. | M | S.D. |
| Total Sample | 22 | 18 | 7 lbs. 4 oz. | 13.9 oz. | 8.23 | 1.25 | 9.03 | .43 |

Method of Feeding

At the time of the hospital feeding observation, 18 of the mothers were bottle feeding their newborns and 22 were breast feeding. By the time of the four-week postpartum home visit, 27 of the mothers were bottle feeding. Five mothers in the sample had stopped nursing during the first month and had begun to bottle feed their infants.

## Data Analysis

The background information about the subjects in this study was analyzed separately by each of the two populations from which they were recruited. This strategy was employed just for the analysis of the data required for the sample description. The results of the research reported represents a collective analysis of all data collected in the study. The nature of the research question required as much variation as possible in the measurements, and the heterogeneity of the two sample populations combined provides for this need.

Multiple regression analyses using a stepwise procedure were employed to investigate the predictive significance of the observational measures used in this study. Pearson Product Moment Correlations were used to clarify relationships between the specific behavioral observations made at different points in time, and observed behaviors and attitudnal assessments were made at the time of the home visit four weeks following delivery. Analyses of variance were employed to evaluate the internal consistency reliabilities

of the observational rating scales used and the relationships between specific variables and the mean total scores of maternal responsiveness. A probability level of .05 was used to reject the null hypotheses.

Multiple regression, the primary strategy used for the analysis of the data in this study, provided a means of examining the effects and magnitudes of the effects of more than one independent variable on one dependent variable. This analysis technique was used to identify a linear prediction equation and to evaluate its predictive accuracy.

A stepwise technique was used with the multiple regression analyses performed. This procedure determines the order of the inclusion of the variables in the overall predictive equation by the respective contribution that each variable makes to the variation of the dependent variable. The variable which accounts for the greatest amount of the variance in the dependent variable is entered first in the equation. The variable that explains the greatest amount of variance in conjunction with the first is entered second in the equation. The ordering of the variables noted in the tables represents this stepwise procedure of adding variables in terms of their relative contribution to the overall prediction of the dependent variable.

The formula for a multiple regression equation is:

$$Y = A + B_1 X_1 + B_2 X_2 \ . \ . \ . \ . \ . \ . \ .$$

In the formula "Y" represents the dependent variable and "$X_1$" and "$X_2$" represent the independent variables. "A" in the formula is the "constant," so labeled at the end of each variable list represented in the tables. The constant, or Y intercept of the linear equation, represents the predicted value of Y when X = 0.

The "$B_1$" in the formula is the partial regression coefficient and stands for the expected change in the dependent variable (Y) associated with a change of one unit in $X_1$ when $X_2$ is held constant. Similarly, "$B_2$" stands for the expected change in Y with a unit change in $X_2$ when $X_1$ is held constant. These partial regression coefficients or regression weights are identified in the tables as "Beta" and stand for the relative contributions of the independent variables to the dependent variable.

The overall accuracy of the prediction equation is represented by "$R^2$." The $R^2$ reflects the proportion of variation explained by the variables in the regression equations. The standard error of Beta, noted in the tables as "Standard Error of Beta," represents the variance of the partial regression coefficient. "Cumulative Probability" represents the degree of confidence with which the prediction equation including each of the reported variables can be interpreted as having occurred by chance. The notion "stepwise p" appearing at the bottom of each table indicates the probability that the noted predictor independent variables (or that variable and the preceding variables) could be a chance occurrence.

# CHAPTER IV

# RESULTS

## Research Findings

The results of the data analyses will be presented in terms of the specific research hypotheses.[1]

Ho 1: There are no relationships between the background variables and a woman's maternal responsiveness to her newborn in the delivery room.

In order to investigate this hypothesis, a stepwise multiple regression analysis was implemented. The total score of maternal responsiveness in the delivery room was used as the dependent variable, and the background variables were used as the independent variables. As indicated in the results of the analysis reported in Table 11, the two variables which contribute most to the significant relationship are age and choice of rooming-in, their respective probability levels being .006 and .029. Hypothesis 1 is rejected.

To further investigate the factors contributing to maternal responsiveness in the delivery room, the following hypothesis was generated.

Ho 1a: Factors related to labor and delivery do not effect the relationship between background variables and maternal responsiveness in the delivery room.

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[1] A matrix of the Pearson Correlation Coefficients of all ordinal variables used in the data analyses is presented in Appendix J.

TABLE 11.--Results of a Stepwise Multiple Regression Analysis Predicting Maternal Responsiveness in the Delivery Room from Background Variables.

| Variables | $R^2$ | Beta | Standard Error of Beta | Cumulative Probability |
|---|---|---|---|---|
| Age | .1656 | .1802 | .5441 | .009** |
| Choice of rooming-in | .2779 | 7.662 | 3.530 | .002* |
| Planning of pregnancy | .3296 | 8.852 | 3.515 | .002 |
| Prenatal education | .3481 | 3.743 | 4.393 | .004 |
| Income | .3614 | -2.864 | 1.620 | .007 |
| Length of marriage | .3893 | 2.821 | 1.919 | .009 |
| Stress during pregnancy | .4091 | - .0172 | .0136 | .012 |
| Personal resources for child rearing | .4335 | .2499 | .1966 | .014 |
| Education | .4417 | 1.380 | 2.068 | .022 |
| Constant | | 7.000 | 12.90 | |

*stepwise $p < .05$

**stepwise $p < .01$

With the variables father's responsiveness in the delivery room and length of labor added to the multiple regression equation, Table 12 shows that father's responsiveness contributes most to this new equation, with rooming-in continuing to account for approximately 10% of the variation of the dependent variable. The probability levels of these two variables are respectively .006 and .029. Age in this new equation becomes the least predictive variable when it is combined with these additional factors. These findings support the rejection of Hypothesis 1a.

Ho 2: There are no relationships between the background variables and a woman's maternal responsiveness to her newborn during a hospital feeding.

As indicated on Table 13, age and choice of rooming-in are the two most salient predictors of the dependent variable, total score of maternal responsiveness during a hospital feeding. These two variables contribute to the multiple regression equation with probability levels of .006 and .052. Thus the null hypothesis is rejected.

To investigate the significance of other measures of maternal behavior and neonatal behavior, Hypothesis 2a was developed.

Ho 2a: Neonatal behavioral and physical characteristics and maternal responsiveness in the delivery room do not effect the relationship between the background variables and a woman's maternal responsiveness to her newborn during a hospital feeding.

The results of adding these additional variables to the regression equation are reported in Table 14. As indicated in the table, with a broader range of variables being considered, the total

TABLE 12.--Results of a Stepwise Multiple Regression Analysis Predicting Maternal Responsiveness in the Delivery Room from Background Variables and Labor and Delivery Variables.

| Variables | $R^2$ | Beta | Standard Error of Beta | Cumulative Probability |
|---|---|---|---|---|
| Fathers' responsiveness in delivery room | .1836 | .4974 | 1.288 | .006** |
| Choice of rooming-in | .2830 | 7.573 | 3.603 | .002* |
| Planning of pregnancy | .3384 | 7.785 | 3.797 | .002 |
| Stress during pregnancy | .3704 | - .017 | .014 | .002 |
| Length of labor | .4031 | .2540 | .2956 | .003 |
| Prenatal education | .4167 | 3.052 | 4.817 | .005 |
| Income | .4240 | -2.304 | 1.748 | .008 |
| Length of marriage | .4350 | 2.086 | 2.179 | .013 |
| Personal resources for child rearing | .4475 | .1918 | .2085 | .020 |
| Education | .4600 | 1.200 | 2.133 | .028 |
| Age | .4614 | .1499 | .5602 | .047 |
| Constant | | 8.522 | 13.43 | |

*stepwise $p < .05$

**stepwise $p < .01$

TABLE 13.--Results of a Stepwise Multiple Regression Analysis Predicting Maternal Responsiveness during a Hospital Feeding from Background Variables.

| Variables | $R^2$ | Beta | Standard Error of Beta | Cumulative Probability |
|---|---|---|---|---|
| Age | .1855 | .7485 | .4655 | .006** |
| Choice of rooming-in | .2653 | 3.755 | 3.120 | .003* |
| Education | .3008 | -2.302 | 1.794 | .005 |
| Stress during pregnancy | .3226 | - .0119 | .0117 | .007 |
| Planning of pregnancy | .3336 | 4.193 | 3.007 | .013 |
| Prenatal education | .3563 | 4.389 | 3.759 | .018 |
| Personal resources for child rearing | .3691 | .0906 | .1681 | .027 |
| Income | .3803 | -1.551 | 1.386 | .040 |
| Length of marriage | .3960 | 1.448 | 1.642 | .052 |
| Constant | | 31.463 | 11.037 | |

*stepwise $p < .05$

**stepwise $p < .01$

TABLE 14.--Results of a Stepwise Multiple Regression Analysis Predicting Maternal Responsiveness during a Hospital Feeding from Background Variables, Maternal Responsiveness in the Delivery Room, and Neonatal Characteristics.

| Variables | $R^2$ | Beta | Standard Error of Beta | Cumulative Probability |
|---|---|---|---|---|
| Total score of maternal responsiveness in the delivery room | .2228 | .2210 | .1454 | .002* |
| Length of marriage | .2916 | .2281 | 1.308 | .002 |
| Choice of rooming-in | .3181 | 1.920 | 3.101 | .003 |
| Age | .3345 | .8456 | .4842 | .006 |
| Education | .3726 | -3.012 | 1.655 | .006 |
| Personal resources for child rearing | .3918 | - .1495 | .1694 | .008 |
| Prenatal education | .4060 | 4.161 | 3.725 | .013 |
| Newborn interactive processes | .4127 | -1.207 | 1.897 | .021 |
| Planning of pregnancy | .4163 | 1.168 | 2.710 | .036 |
| Constant | | 29.85 | 10.25 | |

Note. The variables income, stress during pregnancy, discrepancy between actual and desired sex of newborn, newborn motoric processes, newborn physiological response to stress, and newborn physical appearance did not contribute significantly to the multiple regression equation.

*stepwise $p < .01$.

score of maternal responsiveness in the delivery room becomes the most predictive variable of maternal behavior during a hospital feeding. This variable has a probability level of .002, and the variables age and choice of rooming-in are no longer significant predictors, having probability levels in this new equation of more than .05. The null hypothesis 2a is therefore rejected.

Ho 3: There is no relationship between a woman's maternal responsiveness to her newborn in the delivery room and her responsiveness to her newborn during a hospital feeding.

The Pearson Product Moment Correlation Coefficient of total score of maternal responsiveness in the delivery room and the total score of maternal responsiveness during a hospital feeding is .4720 ($p < .01$). This finding reported in Appendix J supports the rejection of the null hypothesis.

Ho 4: There are no relationships between the background variables and neonatal behavioral characteristics.

To test this hypothesis, each of the four behavioral dimensions assessed in the neonatal evaluation were used as dependent variables. These variables are interactive processes, motoric processes, organizational processes of state control, and organizational processes of physiological response to stress. Of these four behavioral dimensions, significant relationships were identified between the background variables and the newborn's interactive processes and organizational processes of state control. Hypothesis 4 is thus rejected.

As shown in Table 15, age contributes most to the multiple regression equation used to predict the dependent variable of

TABLE 15.--Results of a Stepwise Multiple Regression Analysis Predicting Newborn Interactive Processes from Demographic and Stress Variables.

| Variables | $R^2$ | Beta | Standard Error of Beta | Cumulative Probability |
|---|---|---|---|---|
| Age | .1214 | .0762 | .0307 | .028* |
| Length of marriage | .1712 | -.1712 | .1107 | .031 |
| Planning of pregnancy | .1918 | .2082 | .2179 | .051 |
| Constant | | .0868 | .5039 | |

Note. The variables education, income, and stress during pregnancy did not contribute significantly to the multiple regression equation.

*stepwise $p < .05$.

interactive processes. This prediction is significant at .028. It is reported in Table 16 that income is the strongest predictor of the newborn's ability to control state behaviors. This variable contributes to the multiple regression equation, with a probability level of .008.

Ho 5: There are no relationships between neonatal behavioral and physical characteristics and maternal responsiveness during a feeding four weeks following delivery.

The results from the stepwise multiple regression analysis shown in Table 17 indicate that only the newborn's interactive processes predict later maternal responsiveness. Because this predictor has a probability level of .035, this analysis supports the rejection of the null hypothesis.

TABLE 16.--Results of a Stepwise Multiple Regression Analysis Predicting Newborn Organizational Processes of State Control from Demographic and Stress Variables.

| Variables | $R^2$ | Beta | Standard Error of Beta | Cumulative Probability |
|---|---|---|---|---|
| Income | .1704 | .1637 | .0996 | .008* |
| Stress during pregnancy | .2003 | -.0012 | .0009 | .016 |
| Length of marriage | .2360 | -.1891 | .1299 | .020 |
| Age | .2510 | -.0272 | .0324 | .034 |
| Constant | | 1.643 | .6283 | |

Note. The F-Levels of the variables education and planning of pregnancy were insufficient for these variables to be included in the multiple regression equation.

*stepwise $p < .01$.

TABLE 17.--Results of a Stepwise Multiple Regression Analysis Predicting Maternal Responsiveness during a Feeding Four Weeks Following Delivery from Neonatal Behavioral and Physical Characteristics.

| Variables | $R^2$ | Beta | Standard Error of Beta | Cumulative Probability |
|---|---|---|---|---|
| Newborn interactive processes | .1115 | 4.005 | 2.041 | .035* |
| Discrepancy between actual and desired sex of newborn | .1592 | 4.129 | 2.852 | .040 |
| Constant | | 24.19 | 4.728 | |

Note. The variables physical appearance of newborn, newborn physiological response to stress, newborn state control, and newborn motoric processes did not significantly contribute to the multiple regression equation.

*stepwise $p < .05$.

Hypothesis 5a was generated to explore further the predictive capability of maternal behavioral variables in combination with the neonatal behavioral and physical characteristics.

Ho 5a: Maternal responsiveness in the delivery room and during a hospital feeding do not affect the relationship between neonatal characteristics and maternal responsiveness during a feeding four weeks following delivery.

It is indicated in Table 18 that the newborn behavioral characteristic interactive processes contributes less to the dependent variable than does the total score of maternal responsiveness measured during the hospital feeding. However, in combination with this variable, the newborn interactive processes continue to account for 11% of the variation in the dependent variable that was identified when newborn characteristics alone were used as predictive variables. The probability levels of the total score of maternal responsiveness during a hospital feeding and the newborn interactive processes are .001 and .014. These results from the analysis support the rejection of the null hypothesis.

Ho 6: There are no relationships between background variables and maternal responsiveness during a feeding four weeks following delivery.

Using a stepwise multiple regression analysis to predict the dependent variable maternal responsiveness during a feeding four weeks following delivery, age, and choice of rooming-in are the most predictive of the background variables. The data presented in Table 19 show that these two variables, having probability levels of .000 and .004, account for .5127 of the variation of this dependent variable. Hypothesis 6 is rejected.

TABLE 18.--Results of a Stepwise Multiple Regression Analysis Predicting Maternal Responsiveness during a Feeding Four Weeks Following Delivery from Neonatal Behavioral and Physical Characteristics and Maternal Responsiveness in the Delivery Room and during a Hospital Feeding.

| Variables | $R^2$ | Beta | Standard Error of Beta | Cumulative Probability |
|---|---|---|---|---|
| Total score of mat. responsiveness during a hospital feeding | .2760 | .5510 | .1729 | .001* |
| Newborn interactive processes | .3853 | 4.141 | 1.895 | .000* |
| Discrepancy between desired and actual sex of newborn | .4325 | 4.283 | 2.487 | .000 |
| Newborn physical appearance | .4524 | -2.224 | 2.240 | .000 |
| Total score of mat. responsiveness in the delivery room | .4584 | .0842 | .1489 | .001 |
| Newborn motoric processes | .4594 | - .6797 | 2.559 | .002 |
| Newborn state control | .4598 | .3345 | 2.052 | .004 |
| Constant | | 5.615 | 10.36 | |

Note. The F-Level of the variable newborn physiological response to stress was insufficient for this variable to be included in the multiple regression analysis.

*stepwise $p < .01$.

TABLE 19.--Results of a Stepwise Multiple Regression Analysis Predicting Maternal Responsiveness during a Feeding Four Weeks Following Delivery from Background Variables.

| Variables | $R^2$ | Beta | Standard Error Error of Beta | Cumulative Probability |
|---|---|---|---|---|
| Age | .3875 | .6345 | .4319 | .000* |
| Choice of rooming-in | .5127 | 8.649 | 2.746 | .000* |
| Income | .5383 | .6935 | 1.161 | .000 |
| Prenatal education | .5533 | -4.619 | 3.263 | .000 |
| Education | .5613 | 1.696 | 1.668 | .000 |
| Length of marriage | .5664 | 1.200 | 1.533 | .000 |
| Personal resources for child rearing | .5717 | .0986 | .1566 | .000 |
| Constant | | .9244 | 10.25 | |

Note. The F-Levels of the variables planning of pregnancy and stress during pregnancy were insufficient for these variables to be included in the multiple regression equation.

*stepwise $p < .01$.

Hypothesis 6a was generated to evaluate how predictive the background variables would be in combination with neonatal characteristics and maternal behavior.

> Ho 6a: Neonatal behavioral and physical characteristics and maternal responsiveness in the delivery room and during a hospital feeding do not affect the relationship between background variables and maternal responsiveness during a feeding four weeks following delivery.

As shown in Table 20, the variables age and choice of rooming-in remain the most salient predictors regardless of their combination with the measures of maternal and neonatal behavior. Their respective levels of probability remain unchanged at .000 and .004. The null hypothesis 6a is not rejected.

Analyses of variance of the mean total scores of maternal responsiveness during a feeding four weeks following delivery across age groups and by choice of rooming-in were conducted to further clarify these findings. The subjects were divided into two groups: those less than or 24 years of age and those older than 24 years of age. As reported in Table 21, the analysis revealed a significant difference ($p < .006$) between these two groups, with the older group having higher scores of maternal responsiveness. When the total sample was divided into two groups by the age 26, differences in the mean scores were no longer significant ($p < .081$).

The analysis of variance of mean total scores of maternal responsiveness during a feeding four weeks following delivery across the groups preferring the hospital option of rooming-in and those not selecting this option is reported in Table 22. The analysis

TABLE 20.--Results of a Stepwise Multiple Regression Analysis Predicting Maternal Responsiveness Four Weeks Following Delivery from Background Variables, Neonatal Characteristics, and Maternal Responsiveness in the Delivery Room and during a Hospital Feeding.

| Variables | $R^2$ | Beta | Standard Error of Beta | Cumulative Probability |
|---|---|---|---|---|
| Age | .3876 | -.0738 | .5036 | .000* |
| Choice of rooming-in | .5127 | 7.672 | 3.148 | .001* |
| Total score of mat. responsiveness during a feeding | .5463 | .4784 | .1751 | .000 |
| Discrepancy between actual and desired sex of newborn | .5754 | 4.282 | 2.442 | .000 |
| Income | .6066 | 1.891 | 1.889 | .000 |
| Newborn interactive processes | .6399 | 3.025 | 1.889 | .000 |
| Education | .6563 | 3.374 | 1.896 | .000 |
| Prenatal education | .6720 | -6.615 | 3.818 | .000 |
| Newborn state control | .6865 | -2.951 | 2.748 | .000 |
| Planning of pregnancy | .7000 | -3.135 | 3.330 | .000 |
| Personal resources for child rearing | .7162 | .1959 | .1741 | .000 |
| Newborn physical appearance | .7197 | -1.112 | 2.217 | .000 |
| Length of marriage | .7220 | .7046 | 1.667 | .000 |
| Total score of mat. responsiveness in delivery room | .7422 | -.0532 | .1535 | .000 |
| Newborn physiological processes | .7251 | 2.719 | 9.287 | .001 |
| Newborn motoric processes | .7261 | .6365 | 2.517 | .002 |
| Stress during pregnancy | .7265 | .0023 | .1218 | .004 |
| Constant | | -17.42 | 22.71 | |

*stepwise $p < .01$.

TABLE 21.--Results of an Analysis of Variance of Maternal Responsiveness during a Feeding Four Weeks Following Delivery by Age.

| | Sum of Squares | DF | Mean Square |
|---|---|---|---|
| Between Groups | 629.7242 | (1) | 629.7242 |
| Within Groups | 2866.1758 | (38) | 75.4257 |
| TOTAL | 3495.9000 | (39) | |

F = 8.3489. $p$ = < .01

TABLE 22.--Results of an Analysis of Variance of Maternal Responsiveness during a Feeding Four Weeks Following Delivery by Choice of Rooming-in.

| | Sum of Squares | DF | Mean Square |
|---|---|---|---|
| Between Groups | 556.0140 | 1 | 556.0140 |
| Within Groups | 2939.8860 | 38 | 77.365 |
| TOTAL | 3495.9000 | 39 | |

F = 7.1869, $p$ < .05

reveals a significant ($p$ < .011) difference between these two groups. The group choosing rooming-in had higher total scores of maternal responsiveness at the time of the feeding observation made four weeks following delivery than did the group which did not chose this option.

Ho 7: There are no relationships between background variables, neonatal characteristics and maternal responsiveness in the delivery room and during a hospital feeding and mother-infant adjustment assessed four weeks following delivery.

The correlational analyses employed to investigate this hypothesis identified the significant relationships reported in Table 23. The Postpartum Research Inventory scales for concern for baby, ignore baby, depression, negative aspects of parenting, and the two scales of psychosomatic anxiety, overall health, and total number of symptoms are significantly related to the variables being examined as predictors of Parenting Potential.

The findings reported in Table 23 also indicate that there is a positive relationship between the degree to which a mother is bothered by infant behavior (Bother Inventory) and the degree of concern about a mother's personal resources for rearing children measured by the Survey on Bringing Up Children. A negative relationship, however, was identified between a mother's perception of her infant's behavior and the evaluation made of the infant's state control assessed several days following birth. Each of these findings contributes to the rejection of Hypothesis 7.

Ho 8: There is no relationship between breast or bottle feeding and the total score of maternal responsiveness on the Feeding Observation Scale.

Two feeding observations were made to assess maternal responsiveness. The first observation was made in the hospital approximately three days following delivery ($T_2$), and the second observation was made four weeks following delivery ($T_3$). As

TABLE 23.--Results of a Pearson Product Moment Correlation Analysis of Relationships between Background Variables, Neonatal Characteristics, and Maternal Responsiveness in the Delivery Room and during a Hospital Feeding and Mother-Infant Adjustment Assessed Four Weeks Following Delivery.

| | | | | |
|---|---|---|---|---|
| Personal resources for child rearing: | | | | |
| bother inventory[a] | | | | |
| .2840 | | | | |
| Age: | | | | |
| concern for baby[a] | overall health[a] | total # symptoms[a] | | |
| -.4056 | .3144 | -.3102 | | |
| Income: | | | | |
| concern for baby[a] | ignore baby[a] | overall health[a] | total # symptoms[a] | |
| -.2830 | -5060 | .4111 | -.2591 | |
| Education: | | | | |
| concern for baby[a] | ignore baby[a] | overall health[a] | | |
| -.3299 | -.5480 | .3652 | | |
| Length of marriage: | | | | |
| concern for baby[a] | total # symptoms[a] | | | |
| .5097 | -.3263 | | | |
| Planning of pregnancy: | | | | |
| depression[a] | | | | |
| .2771 | | | | |
| Choice of rooming-in: | | | | |
| negative aspects of child rearing | | | | |
| .2655 | | | | |
| Stress during pregnancy: | | | | |
| concern for baby[a] | ignore baby[a] | depression[a] | total # symptoms[a] | |
| .4033 | .2611 | .4115 | .3965 | |
| Newborn state control: | | | | |
| maternal perception of newborn[b] | | ignore baby[a] | | |
| -.3375 | | -.2782 | | |
| Physical appearance of newborn: | | | | |
| overall health[a] | total # symptoms[a] | | | |
| -.3065 | .2664 | | | |
| Total score of maternal responsiveness in delivery room: | | | | |
| total # symptoms[a] | | | | |
| -.3627 | | | | |
| Total score of maternal responsiveness during hospital feeding: | | | | |
| ignore[a] | | | | |
| -.3171 | | | | |

Note. Only correlations with $p < .05$ are reported

[a]scale from Postpartum Research Inventory (Schaefer & Manheimer, Note 4)

[b]scale from Maternal Perception of Newborn Inventory (Broussard & Hartner, 1971)

reported in Table 24 the analysis of variance of the mean total scores of maternal responsiveness during the hospital feeding indicates that there is no significant difference between the total mean scores of the two groups using different methods of feeding their newborns. However, the analysis of variance of the mean scores of total maternal responsiveness during a feeding four weeks following delivery indicates with a probability level of .002 that there is a significant difference between the mean scores for the groups of breast and bottle feeding mothers. Those mothers who breast fed their infants showed more responsive behavior than the mothers who bottle fed their infants. This analysis is reported in Table 25.

TABLE 24.--Results of an Analysis of Variance of Maternal Responsiveness during a Hospital Feeding by Feeding Method.

| | Sum of Squares | DF | Mean Square |
|---|---|---|---|
| Between Groups | 171.4586 | (1) | 171.4586 |
| Within Groups | 2420.1414 | (38) | 63.6879 |
| TOTAL | 2591.6000 | (39) | |

F = 2.6922, $p$ = > .1

TABLE 25.--Results of an Analysis of Variance of Total Scores of Maternal Responsiveness during a Feeding Four Weeks Following Delivery by Feeding Method.

| | Sum of Squares | DF | Mean Square |
|---|---|---|---|
| Between Groups | 806.9769 | (1) | 806.9769 |
| Within Groups | 2688.9231 | (38) | 70.7611 |
| TOTAL | 3495.9000 | (39) | |

F = 11.4042, $p$ = < .01

Methodological Question 1

What is the internal consistency reliability of the Delivery Room Observation Scale?

The analysis of variance, reported in Table 26 employed to investigate the reliability of this scale, indicates that the instrument is internally consistent with a reliability coefficient of .8195.

Methodological Question 2

What is the internal consistency reliability of the Feeding Observation Scale?

Separate reliability analyses were run on the data collected during the feeding observations made at $T_2$ and $T_3$. The results of the analysis of variance of the observations made at $T_2$ indicate that the instrument is internally consistent with an alpha of .8491. The results of the analysis of the data from the $T_3$ observation indicate that the instrument is internally consistent with a higher reliability coefficient of .8915. These findings are reported in Table 26.

TABLE 26.--Results of Tests of the Internal Consistency Reliability of Measures of Maternal Responsiveness.

| | Reliability Coefficient | F | DF | Probability |
|---|---|---|---|---|
| Delivery Room Observation Scale | .8195 | 6.7461 | 12 | .0001 |
| Feeding Ob Scale ($T_2$) | .8491 | 19.7001 | 8 | .0001 |
| Feeding Ob Scale ($T_3$) | .8915 | 20.1496 | 8 | .0001 |

Methodological Question 3

> Is there a relationship between the Look Ratio (time mother spends looking at her infant to total time of feeding) and the total score of maternal responsiveness on the Feeding Observation Scale?

The correlation coefficients presented in Table 27 indicate that there is a significant positive relationship ($p < .05$) between the Look Ratio and the total score of maternal responsiveness during the feeding. These significant relationships exist only for the specific feeding observations during which both measures were made.

TABLE 27.--Results of a Pearson Product Moment Correlational Analysis of the Relationship between Two Measures of Maternal Behavior during a Feeding.

| | Total Score on Feeding Observation Scale $T_2$ | Total Score on Feeding Observation Scale $T_3$ | Look Ratio $T_3$ |
|---|---|---|---|
| Look Ratio $T_2$ | .3660* | .2532 | .2378 |
| Look Ratio $T_3$ | .0704 | .537* | |

*$p < .01$

# CHAPTER V

# DISCUSSION

The results of the research for this study will be discussed in four parts. The first part will discuss how the research findings reported in this dissertation contribute to an understanding of what may be used as predictors of Parenting Potential. Considered next is the extent to which methodological constraints limited the nature of the findings of the study. The final two parts of the chapter discuss suggestions for future research and the implications of the research findings for the delivery of health care.

## Contributions of the Study

The stepwise multiple regression analyses performed in this study enable comparative examinations of the strengths of variables as predictors of the primary dependent variable, maternal responsiveness. The findings of this research specifically evaluate the relative predictive ability of measures of maternal and neonatal behavior assessed at the time of hospitalization and also of demographic and questionnaire background information gathered during the women's last trimester of pregnancy. The behavioral observations made of the findings four weeks following delivery provide

the measures of maternal responsiveness which are used to assess attachment and Parenting Potential.

The results indicate that the performance of the variables as predictors is a function of the time at which assessments are made and the combination of variables that are used together in one stepwise multiple regression analysis. This is clearly evident in the interesting interplay of the background variables age and choice of rooming-in and the total scores of observed maternal responsiveness assessed in the hospital and during a home visit four weeks following delivery. Age is coded in this study as a continuous variable.

When only background variables are considered in the regression equation as predictors of maternal behavior in the delivery room, the variables age of mother and choice of rooming-in are the most predictive, together accounting for .28 of the variation in the total scores of maternal responsiveness. The older mothers and those who chose the rooming-in option are shown to have been most responsive four weeks following delivery. The predictive ability of age dramatically drops, becoming marginally significant in the overall equation when the labor and delivery variables--length of labor and father's responsiveness--are considered in combination with the background variables. When all the variables are evaluated as predictors, it becomes clear that the mother's behavior in the delivery room is more a function of the support she receives from her husband (if present) than it is of her age. The length of a

woman's labor appears to be of minimal predictive significance, although the analysis suggests that the length of labor has a positive effect on maternal responsiveness at the time of delivery.

The choice of rooming-in, suggestive of a mother's intention to maintain as much contact as possible with her newborn, predicts with equal significance maternal responsiveness when only background variables or background and labor and delivery variables are included in the regression equations. In each equation the choice to have rooming-in accounts for 10% of the variation in this dependent measure. This finding reflects the salience of a mother's desire, expressed prenatally, to have optimal contact with her newborn and her actual responsive behavior at the time of delivery, regardless of her husband's presence and/or behavior at this time.

An examination of maternal responsiveness during a feeding several days following delivery indicates that again, when the predictive significance of the background variables is assessed, age of the mother and choice of rooming-in are the best predictors of this behavior. However, in combination with the behavioral measures of maternal responsiveness in the delivery room and newborn characteristics, the background factors continue to contribute to the overall regression equation but fail as significant individual predictors of maternal behavior several days following birth. The results show that at this point in time maternal behavior is most significantly related to response measures made at the time of delivery.

These findings may be interpreted to indicate that maternal behavior, as it is assessed in the hospital, is stylistically

consistent, reflecting the mother's initial overt attempts to attend to and attach to her newborn infant. This initial display of maternal behavior reflects the father's responsiveness to both the mother and newborn and the mother's intent expressed prenatally to maintain an optimal amount of contact with her newborn during their hospital stay.

The results reveal that certain dimensions of newborn behavior can be predicted from the background information about the mother. These dimensions, newborn interactive processes and state control, are each predicted by different combinations of demographic variables and the amount of stress encountered by the mother during pregnancy. The newborn's interactive processes or capacity to respond to social stimuli were measured by an assessment of the infant's ability to orient, to cuddle, and to be consoled. This capacity can be understood to reflect the infant's ability to be responsive to parental overtures to establish a rewarding interpersonal relationship with the newborn infant. Maternal age is a significant predictor of the newborn's interactive process, accounting for 12% of the variation in the variable assessed several days following birth. Though this is a small percentage of the variation, it is of importance to note that older mothers have newborns who exhibit a greater capacity to orient to both visual and auditory stimuli. The variable income level is shown by the results to predict how well a newborn is able to organize his state behaviors. The assessment of this newborn behavioral characteristic of state

control was made with the scale items which measure state lability and irritability and rapidity of the newborn's build-up of states from being asleep, to crying. This finding can be interpreted in terms of the factors that are related to income status that may affect the prenatal environment.

The variables stress during pregnancy, length of marriage, and age also contribute to the overall regression equation which when complete accounts for 25% of the total variation in newborn state control. The amount of stress and length of marriage have negative Beta values, indicating that the less stress a mother encountered during a pregnancy, the less difficulty her infant has in controlling his behavioral responses to change in state.

Though the variables having overall significance account for only a little over a third of the total variation in these two newborn behaviors, these findings do provide intriguing evidence of possible prenatal effects on fetal development. Other studies have indicated that maternal responses to pregnancy and maternal stresses during pregnancy are related to both infant behavior in the immediate postnatal period and to maternal adjustment and maternal care. Sontag's (1941) early observations of the relationship of maternal stresses during pregnancy to infant behavior have been confirmed by more recent investigations (Ottinger & Simmons, 1964; Ferreira, 1960). It is especially interesting to consider the findings of this research study concerning the effects of income on state control in terms of Doty's findings (1967) which revealed a

positive relationship between low social class, emotional disturbances during pregnancy, and later maternal and infant behavior.

The combination and direction of effects of the variables identified in this study as predictors of interactive processes and state control clearly indicate that the newborn behaviors found to be predictable reflect a prototype of stability or lack of stability in the individual mother's life situation. It can be understood that perhaps the stress generated from events occurring during pregnancy or the more generalized stress accounted for by age, education, income, marital status, and pregnancy planning do in fact have effects on the newborn's development in utero which become manifest in behavioral patterns less reinforcing to parental ministrations.

The results so far reported indicate that, when considered alone, background variables assessed prenatally predict maternal responsiveness in the delivery room and during a hospital feeding. When, however, background variables are considered in combination with other behavioral measures, the strength of their predictive ability, with the exception of the choice of rooming-in, decreases. It appears that during the period of hospitalization, maternal behavior is consistent across time and situations. A shift in the predictive significance of the behavioral and background variables occurs when their ability to predict maternal responsiveness four weeks following delivery is assessed.

When observations of both mothers and newborns during their hospitalization are used as predictors of later maternal behavior

during a home visit, it is apparent that both the infant's interactive processes assessed three days following birth and the mother's responsiveness during a hospital feeding are significant predictors, alone or in combination with each other, of maternal responsiveness four weeks following delivery. This predictive relationship is, however, altered when the background variables are considered in combination with the behavioral measures. The results of the regression analyses indicate that alone or in combination with the measure of maternal and neonatal behavior the variables age and rooming-in are most predictive of maternal behavior four weeks following delivery. Although the Beta value is negative for the age variable, its minimal weighting makes this direction of little relevance. The analysis of variance conducted clearly shows that the older mothers in the sample are more responsive to their infants during this feeding observation.

Whereas behavioral factors are more salient than the background predictors of maternal behavior during the mother's and infant's hospital stay, the background factors of mother's age and desire expressed during pregnancy to maintain close contact with her infant following birth predict most powerfully how responsive her behavior will be towards her newborn during a feeding four weeks following birth. How a mother responded to her newborn in the delivery room and during a hospital feeding and the newborn's behavioral characteristics decrease in their predictive ability during the four weeks following delivery. The significance of age

and rooming-in increases when their predictive ability is evaluated by measures of maternal behavior assessed four weeks following delivery.

The importance of the variable maternal age can thus be understood as significantly affecting both maternal responsiveness and neonatal interactive capacity. That older mothers exhibit more responsive behavior toward their month old infants and that neonates born to older mothers are more responsive to visual and auditory stimulation provide evidence of how these mother-infant pairs may have mutually reinforcing patterns of behavior from the beginning of their relationship. It can be suggested that these mothers and infants have a better potential for a positive parenting relationship.

It is of special importance that it is the variable newborn interactive processes which is the behaviorally significant predictor of maternal responsiveness. It is clearly substantiated throughout the literature that the visual interaction between a mother and her newborn is of essential importance for the emergence of feelings of attachment and relatedness. In their studies of maternal influences on early social visual behavior, Moss and Robson (1968) have found that a pregnant woman's expression of interest in her yet unborn child is related positively to the amount of face-to-face gazing she and her infant engage in when the baby is 1 and 3 months old. These researchers' findings are supported by the results of this study which indicate that the choice to have

rooming-in is a significant predictor of later maternal responsive behavior.

The behavioral observations of mothers' behavior during a feeding, used as measures of maternal responsiveness in this study, were compared by a simple measure of the ratio of time a mother spends looking at her infant to the total time of the feeding. The correlation coefficients from the analysis indicate that the ratio measures are significantly related to the more comprehensive assessments of discrete maternal behaviors comprising the total score of maternal responsiveness. This finding is illustrative of how maternal visual attention alone can be used as a representative sample of more complex measures of responsive behavior.

Maternal attachment, which is used in this study as an index of Parenting Potential has been described, using empirical data, as a process which evolves during the first three months of an infant's life. Robson and Moss (1970) found that a mother's lack of emotional involvement in her infant is characteristic of the immediate post-partum period. The findings from their sample indicate that for the first three to four weeks at home, mothers most frequently report feelings of fatigue and insecurity. At this point maternal energies were reported as being most focused on mastering tasks of infant-care and on appeasing the unpredictable demands of their infants.

Interview data from this dissertation (Appendix K) indicate that there is a negative relationship between how soon women first report experiencing feelings of love or attachment to their newborns

and their assessments of their personal health four weeks following delivery. The findings, however, also reveal that no relationship appears to exist between the self-reported feelings of attachment and observations of maternal responsiveness during a feeding four weeks following delivery. This disparity between reported feelings of attachment and behavior does not appear when mothers are asked in more general terms "how things are going" between them and their infants. The women's responses to this more global kind of question are related positively to both their reported physical health and to their total score of responsiveness assessed four weeks following delivery.

Though the variable overall health is not related to other measures of mother-infant adjustment at four weeks, the research findings indicate that positive relationships do exist between this variable and several of the background variables shown to be predictive of later maternal responsiveness. The significant positive relationships are those between this variable and age, income, and education.

The normative data presented in the Robson and Moss (1970) study of attachment and the descriptive information gathered in this study from interviews indicate that a woman's overall assessment of her personal health appears to be related to the vitality of her emotional relationship to her infant. Her responsiveness in this study is also shown to be related to the responsiveness of the infant during a feeding and negatively related to the degree to

which she reports that she ignores her infant (Appendix L). There may, however, be more contributing to maternal behavior than these findings reported by the mothers themselves.

Klaus et al. (1972) through experimental manipulation of the amount of time given to mothers to be with their newborns following birth have identified what they feel may be a sensitive period for maternal attachment. Their findings, indicating that there may be positive effects on attachment behavior following at least one hour of additional contact time between mother and infant in the first three hours following birth and five hours of additional time each day during the first three days, support the hypothesis that a sensitive period for attachment does exist. The distant emotional tone toward their infants and general sense of being fatigued and overwhelmed which Robson and Moss (1970) saw in the attitudes expressed by the mothers in their study may be in part a function of the care these women and their newborns received as obstetric and nursery patients. If a sensitive period for attachment immediately following birth does exist, the evolution of feelings of attachment which was identified by these investigators as taking approximately three months may be understood as the consequence of the limited contact time women are granted with their newborns following birth.

Though data analyses in this study indicate that the older age of a mother and her preference for rooming-in are the most significant predictors of maternal behavior four weeks following delivery, information from interviews with these mothers indicates

a significant though mild relationship between self-assessment of their overall situation one month following delivery and the assessments made of their responsiveness in the hospital both in the delivery room and during a feeding. Such findings can be interpreted as indicative of the establishment of a positive trend. Those mothers being most responsive at delivery and during a feeding several days later also expressed in an interview four weeks after delivery the most positive pictures of the adjustment between themselves and their infants to the parenting relationship.

Although maternal responsive behavior in the delivery room and during a hospital feeding do continue to contribute to the overall regression equation predicting maternal responsiveness four weeks following delivery, their significance as variables is of minor importance. The reason that this trend established in the hospital is not manifest in significant proportions in the behavior assessment of maternal responsivesness four weeks following delivery can be explained in terms of the notion of a sensitive period for human attachments. Perhaps the limited contact time permitted these mothers interferes with the establishment of the strength of this initial trend of responsive behavior. It would subsequently follow that, though separated during the recovery period, those mothers who desired rooming-in were able to have more contact time with their newborns. This additional time and their expression of interest in the baby which it represents can be interpreted as contributing to the increased measure of maternal responsiveness observed in these women's behavior four weeks following delivery.

Although the findings from these studies which have investigated the effects of additional contact time have positive implications for roomig-in, several studies have explored this hospital care option as an independent variable. McBryde (1951) reported that when rooming-in became compulsory in the ward and private newborn service at Duke Hospital, there was a marked drop in the numbers of telephone calls made to the hospital by the mothers following their discharge requesting advice on baby care. It was also noted that when rooming-in became compulsory there was an increase in breast feeding among the patients.

A study conducted in Sweden (Greenberg, Rosenberg, & Lind, 1973) compared 50 primiparous mothers assigned to have rooming-in with 50 mothers who were not given this option. The women were matched by age, socioeconomic characteristics, and age and education of the father and randomly assigned to the two groups. The findings from the study showed that the daily eight hour presence of the newborn in the mother's room in the first postpartum week resulted in significant differences in the two groups. The day before discharge the rooming-in mothers judged themselves to be more confident and competent in caring for their newborns. They also thought they would need less help in caring for their newborns at home and could attribute more to their newborns' cries than could the mothers who did not have rooming-in.

These findings add strength to the results reported in this dissertation which indicate that the mother's choice of

rooming-in predicts maternal responsiveness four weeks following delivery. The additional time with the newborn may enhance feelings of attachment as well as caregiving ability.

The importance of maternal responsiveness has been illustrated in a variety of investigations for the longitudnal effect it has on infant development. Schaefer and Bayley (1963) suggest with their extensive analyses of correlations of maternal behavior and child development that both maternal acceptance and involvement during infancy are correlated with favorable early development. Moss and Robson (1968) indicate that mothers' attitudes which are positive, accepting, and which express eagerness for close interaction with their infants are positively related to infant development. Stern, Caldwell, Hershey, Lipton, and Richmond (1969) have empirically shown that overt demonstration of affection is related to enhanced infant development, social and play initiative, and ability to cope with stress. Furthermore, it has been shown that physical handling that is gentle, firm, close, and relatively frequent seems to have a beneficial effect on the infant's early cognitive and motor development and on his attachment and responsiveness to his mother (Ainsworth, Bell, Blehar, & Main, Note 7).

Studies also indicate that styles of maternal behavior with an infant may stabilize during the early weeks and months following delivery. Bell and Ainsworth (1972) report that their findings indicate that a mother's responsiveness to her infant's crying during the first three months is significantly correlated with

maternal responsiveness throughout the first years of life. Moss (1967) has also shown a highly significant correlation between observations of maternal behavior made at three weeks and at three months.

These findings highlight the relevance of maternal behavior in terms of its stability over time and its relationship to future child development. Clark-Stewart (1973) summarizing the research literature to date, identifies the optimal mother as an individual who is affectionate, accepting, nonrestrictive, aware of and responsive to her infant's needs and wishes, and who immediately and contingently gives care or stimulation to the infant according to his state, capacity, and developmental level. This is quite a demanding role for any woman to play and reflects how maternal characteristics must mesh with the infant's behavioral disposition. The outcome measure used in this dissertation assesses many of these qualities during the observation of mother-infant interaction during a feeding.

Maternal responsiveness has been discussed in terms of the variables affecting the overall adjustment between mother and infant and in terms of the hypothesis regarding a sensitive period following birth during which time attachment may be enhanced with the amount of contact time provided. The most potent predictor identified in this investigation, age of the mother, has yet to be discussed in light of these findings. It is significant to note that in this study all mothers were primiparous and the variable age needs to be considered in relation to this fact.

Very little, if anything, is known about child rearing patterns as they are related to maternal age. In one exhaustive search of the literature conducted to find studies helpful for developing programs for young mothers, no studies were identified which used age as the primary focus of the research (Williams, 1974b). There is the contribution of studies which have investigated the stresses and supports which affect maternal care. Elmer's (1967) study of abusive and nonabusive mothers found that among the childbearing and family structure variables contributing to the likelihood of physical abuse were maternal age of less than 21 and the conception out of wedlock of the abused child.

It is of increasing concern to those involved with infant care programs that one half of all births occur to mothers below the age of 20 (NICH & HD, Note 8). It is also true today that 10% of American women become pregnant during high school. The majority of these women will not marry but will keep their infants (Williams, 1974a). The findings from this study which show that maternal age most significantly predicts maternal responsiveness in the four week follow-up assessment of mother-infant interaction highlights the importance of age to the quality of maternal care.

In a study which employed national survey data it was shown that early motherhood is closely associated with a high incidence of marital dissolution, poverty, and limited education (Bacon, 1974). It can be assumed from data like these that social and emotional stability increase with age. The findings of this dissertation may be interpreted to show that overall stability may be more

significant than maternal behavioral reactions observed in the hospital setting. The sensitive period hypothesis can also be used to interpret the findings from this study. If there is a critical period for attachment, younger mothers may be more vulnerable to the effects of being separated from their newborns immediately following birth. Adoption agencies in the United States and Canada report some evidence that very young mothers who keep their infants but choose to have them cared for in group settings later have a tendency to relinquish their children for adoption several years following birth. There is some speculation about the effects of group care practices on these mothers' developing feelings of relatedness to their infants (Williams, 1974a). The findings from this dissertaion may be reflecting differential effects of the separation of the newborns and mothers in conjunction with maternal age.

If Parenting Potential is to be predicted from background information and actual behavioral observations of maternal behavior in the hospital, the findings from this study would indicate that attention be paid to the age of the mother and her desire expressed prenatally of wanting to maintain optimal contact with her newborn evaluated by her choice of the hospital option of rooming-in. The significance of the hospital observations of maternal behavior as less predictive than age can be explained as a function of the overall salience of age and the social stability which it represents or by the hospital management procedures which limit contact time.

In either case, there is an attenuation of the effects of the first behavioral manifestations of responsive behavior in the younger mothers. The findings which indicate that age and income and other measures of social stability also predict more desirable newborn behavioral characteristics further highlight the importance of an assessment of these basic factors in predicting the potential of the parenting relationship.

Although newborn and maternal behavior in the hospital provides some indication about future parenting capacity, evaluations of such behaviors can best be interpreted as representative of a stylistic trend reflective of positive acceptance of the newborn. This behavioral style is of less significance than the maternal desire for and the assumed optimal contact time that these mothers had with their infants during their first days following delivery. The combination of age and desire for contact together provide the best prediction of future behavior.

It would be wrong to conclude from these findings that skill in maternal care innately accompanies increased age. Studies with monkeys show that even in primates the so-called "instinctive" nurturant behavior is heavily dependent upon a mother's prior life experiences and learning (Harlow et al., 1966). Human child rearing must be considered as a learned response. These findings which indicate that it is age and rooming-in which together most significantly predict behavior at four weeks underscores the importance of what

may be a maternal predisposition for contact. It is this predisposition that may be most reflected in the parenting behavior assessed in this study and may be most predictive of the potential in the parenting relationship.

## Limitations of the Study

The low predictive significance of the behavioral observations made prior to the mother's and infant's hospital discharge has been explained in terms of a possible interruption of a stylistic trend apparent in the mother's behavior during the hospital stay. This finding may also be interpreted as a function of the limitation of the sample population that was used. Observations with a random sample of women may have yielded different results. The limited variation in the total scores of maternal responsiveness in the delivery room and during a feeding that was apparent in the observations that were made could have limited the predictive capability of these measures.

The insignificant correlations between the observational assessments and measures of mother-infant adjustment evaluated from the self-report questionnaires and interviews can also be explained in terms of the limited variation in the responses. Though the sample used in this study represented a heterogeneous mixture of women in terms of background information, the variance in the responses to questionnaire items and interview questions was limited. It is to be noted that of the range provided in the Survey on Bringing Up Children (Helfer & Schneider, 1975) the subjects' total

scores were all below the level of moderate degree of concern related to the individual mother's personal resources for childrearing.

In spite of the limitations imposed by the lack of variation in the sample on the measures used, these findings provide reason to speculate on the possibility of a disparity between actual behavior and reported attitudes. The importance of maternal attitudes has been examined by Davids, Holden, and Gray (1963), who indicated that attitudes toward childrearing are established prior to the birth of a child. These attitudes they showed to be in turn related to performance on the Bayley Infant Mental Scales. The findings in this dissertation indicate the importance of assessing variation in both behavioral and attitudinal measures of mother-infant interaction. There is certainly reason to believe that the attitudes expressed by a mother will also in some form be expressed in her behavior as she relates to her child.

The limitation apparent in the behavioral assessments can perhaps also reflect more than the lack of variance inherent in the study sample's behavior. The moments immediately following birth may be an inappropriate time to be making the first assessments. It was the suggestion of the nurses that perhaps a better time to observe the mother-infant interaction would be in the recovery room prior to the admittance of the baby to the transitional nursery. Members of the nursing staff felt that the mothers seem to be more relaxed and less intimidated in the recovery room than they appear to be in the more surgical surroundings of the delivery room.

This reference made to the nature of the setting in which the data were collected highlights the importance of considering the totality of the situation and the circumstances which affect maternal behavior as it is assessed in the delivery room. The ecological perspective used throughout the study facilitates an understanding of how environmental and experiential factors may influence the total scores of maternal responsiveness. The positive finding that the father's responsiveness in the delivery room affects maternal behavior is an example of how the ecology of the setting is functional in affecting behavior. Certainly, the effects of drugs, fatigue, pain, type of delivery, and behavior of the nurses and physicians can also be considered to play a role in influencing the maternal behavior. A consideration of how culture permits the way in which emotions are expressed is also important. All these variables must be considered when evaluating the nature of the behavior observed.

The operationalization of the variables used in this study may also have limited the nature of the study findings. The failure of the early measures of maternal responsiveness to predict future behavior may be attributed to the variables that were selected as predictors and the combinations of the variables that were used in the regression analyses. Had different variables been considered together or apart from the ones included in these data analyses, their differential impacts may have been found to vary from the findings that have been reported in this study.

The statistical method used in this study also affected the nature of the findings reported. While discriminative cluster

analysis or factor analysis could have been employed, the stepwise multiple regression analysis was chosen because of the use of variables in this study which had not before been operationalized as predictors. Other statistical treatment of the data may influence the nature of the findings.

After a consideration of these methodological limitations which may have affected the study findings, it can also be suggested that behavior during the period of time following delivery may in fact be irrelevant to future parenting style. However, further investigations need to assess the validity of the instrument used, and it would be inappropriate to make this assumption until replications of the study indicate with clarity the relevance of the measure made.

Emphasis should be placed on the finding that the total delivery room score did predict the responsiveness of maternal behavior during a hospital feeding. This information indicates that though long-term prediction does not appear from this sample to be possible, behavior in the delivery room predicts maternal behavior several days following delivery. Such an indication provides evidence that the score of the Delivery Room Observation Scale can be employed as an assessment useful in identifying women in need of supportive assistance during their first few days with their newborn. Such support could help to alleviate a women's hesitancy to display more overt responsive behavior which may intensify her feelings of attachment and relatedness to her newborn.

## Suggestions for Future Research

The significant predictive trends which account for mild amounts of the variation identified in this research justify a more comprehensive inventigation of the findings reported in this study. The research requires replication to verify that background information has more long-term predictive significance than do the behavioral observations. Since the mothers' desire expressed during pregnancy to have rooming-in did predict maternal responsiveness four weeks following delivery, it would be worthwhile to investigate the predictive capability of other prenatal assessments. Perhaps such data is alone as predictive of future behavior as observations of responsiveness made during the mothers' and newborns' hospital stay. If in fact demographic variables and maternal predisposition for contact and care giving are most predictive of future responsive behavior, screening programs could effectively utilize such information.

It would be especially interesting to investigate women's rationale for their choice of rooming-in. An exploration of reasons given for this choice may provide insight into the advantages of this option. The perceived advantages of rooming-in perhaps could be provided to patients through other forms of hospital care. Rooming-in may represent different advantages to individual mothers. An understanding of the range of these reasons could provide clues about what has been called in this dissertation as a maternal predisposition for contact and care giving.

If future findings again show that the Delivery Room Observation Scale has little predictive power, clinical impressions would suggest that this scale, in spite of its limitations, has the potential of being used to evaluate behavioral manifestations of maternal behavior at the time of birth. These evaluations could be used to inform nurses on each shift of initial maternal behavior as it is observed in the delivery room. These observations can then be used to provide appropriate supportive care for the mothers during their postpartum hospital stay. Before the scale is implemented for even these purposes, it needs to be refined and tested using a large random sample of obstetric patients. Such a field study would reveal if the scale is sensitive enough to pick up differences in maternal behavior. Further testing would also indicate if there are significant differences in maternal behavior when it is evaluated with a standardized observation during the first ten minutes following delivery. Methodological issues link these two questions which require research investigation.

A field study of how the scale could be routinely implemented would also need to be conducted to investigate the feasibility of its hospital use. It would be important to know if nurses can routinely make reliable observations and if the notations of the observations affect the postpartum care the mothers receive.

Another study that would provide useful information helpful in planning for the postpartum care of a mother and newborn would involve an evaluation of the effects of doing a Brazelton exam on

a newborn with the mother present. A notation of the mothers' reactions to watching their newborns' performance combined with observational data from the delivery room and a feeding could provide insight into how the mother and newborn may adjust to each other during their first days together. Again, it would be of interest to know how background variables function to mediate the effects of these initial behaviors of the mother and the newborn.

## Implications of Research Findings for the Delivery of Health Care

The nature of the sample used in this study limits the kinds of generalizations that can be drawn from these research findings. It must be understood that since a random sample was not used, the conclusions drawn can only be considered in terms of the population of subjects who participated in the research project. Certain clinical impressions, however, can be shared.

Observations made during the data collection of this study are supported by other research findings and can be used in giving patient care. Hospital staff are especially encouraged to apply the findings reported throughout the literature in the area of maternal attachment that eye to eye contact plays a very important role in mediating the interactions of mothers and their newborns. It was the observation of the investigator in the delivery room that as soon as the newborns were wheeled in their carts close to their mothers' sides the mothers' affectual response heightened as they began, with animated expression, to talk to and touch their newborns.

The talking seemed only to begin when a mother was given the opportunity to touch and to look at her newborn. Providing a mother with optimal contact with her newborn from the moment the baby is removed from the sterile field and/or after the cord is cut certainly should receive the attention of all those present in the delivery room.

It was also of interest to the investigator how she was received by the families participating in the study. The mothers often seemed pleased when they saw the investigator when she arrived at the hospital prior to the deliveries. The investigator many times was the only familiar face for the mothers when they came to the hospital. The women sometimes had had little contact with the physician in their clinic or group practice who happened to be on call at the time they were admitted for delivery. The hospital staff were also, of course, unfamiliar to the patients before they are admitted. Seeing someone familiar seemed to be comforting to the patients and often to their husbands, many of whom had only heard about the study from their wives' descriptions of it.

After delivery the mothers (and fathers) appeared to honestly enjoy having the opportunity to talk about their newborn and the experience of delivery with someone who had attended the birth and who had had contact with them during their pregnancy. The parents also seemed to enjoy knowing that the investigator was going to be doing a behavioral examination on their newborns. It became clear that the fragmentation of the care the mothers receive provides little continuity from the doctors' office to the hsopital and

between the three shifts of the three services in the hospital, labor and delivery, postpartum, and the nursery. The mothers appeared to enjoy having a familiar person visit them in the hospital who had been interested in them when they were pregnant, who was present during their labor and delivery, and who also took a special interest in their newborns. The logistics of providing more continuous care are immense and there are good reasons for why the fragmentation exists. However, more continuity of care could provide women more support at a time when they are at the threshold of assuming roles and behaviors they have never before experienced.

This especially is the case with the young mother who may still be in the process of detaching from her own parents and thus having little energy for the demands of the newborn whose care has suddenly become her responsibility. This woman obviously needs special help while in the hospital and throughout the early months of her child's life.

Individuals who work with obstetric patients often seem to have an intuitive feeling for the behavior they observe in terms of its meaning as it is related to potential maternal responsive behavior. What is needed is a way to record systematically such impressions so that they are not lost with the change in shifts or the patient's move from labor and delivery to the postpartum floor of a hospital. The Delivery Room Observation Scale could provide an instrument with which the observations could be made and recorded. Until such a scale can be developed, the general findings from this

study would indicate that observations made should be recorded as nursing progress notes. Effective management plans for patients whose behavior gives cause for concern need to be carefully designed and implemented to provide the special care these patients require.

Modern medicine provides safe care for obstetric patients and their newborn infants. Efficient practices have been developed and are today implemented routinely in labor-delivery and post-partum services of hospitals. These practices are successful in accomplishing their mission of providing for the physical needs of patients. What is now needed is a broader focus for perceiving the needs of obstetric patients as including more than their physical well-being. The process of giving birth and being born is a major life event for mothers, fathers, and babies. It is an event which involves more than a physiological process and requires the sensitivity of all those who give care to pregnant and post-partum patients.

Now that medical care can be efficiently delivered, it is time to examine how modifications in practices can be made to facilitate more effective care. A balance needs to be found which includes a means of providing for the total needs of a family without compromising the high standards for physical care which have developed with modern medicine. Such a balance can provide a perspective that accounts for both the emotional and physical needs of individuals.

# CHAPTER VI

## SUMMARY AND CONCLUSIONS

This study evaluated measures that could be systematically employed to identify the potential of a parenting relationship. Measures of maternal responsiveness were used to assess maternal attachment considered to be central to the quality of the mother-infant relationship. Parenting Potential is the term used in this study to describe mother-infant interaction that is functional in facilitating positive child growth and development. The assessment of the major dependent variable, maternal responsiveness during a feeding four weeks following delivery, reflected both the mother's and the infant's interaction with each other. The research results provided evidence that variation in this dependent measure can be predicted from background information about the mother and behavioral assessments of maternal and neonatal behavior in the hospital. Though mild, relationships were shown to exist between background variables and behavioral ratings and self-report measures of the mother's and infant's adjustment to each other four weeks following delivery.

The most significant finding apparent in the results of this study is the evidence provided that age and choice to have rooming-in are salient predictors of maternal responsiveness. This study also

provides evidence which supports the notion that maternal responsiveness represents a bilateral interplay of both maternal and neonatal behaviors. It was shown that the newborn's capacity to respond to auditory and visual stimuli is predictive of maternal behavior in interaction with him. The newborn's behavior in turn was shown to be predicted by maternal age.

These findings represent the importance of assessing age as predictive of a mother's potential attentive interaction with her newborn. The woman's decision to request rooming-in also, according to these findings, can be regarded as an important indication of maternal desire to establish a responsive relationship with her infant. Behavior observed in the delivery room and during a hospital feeding appear from the research results to be stylistically consistent and more a function of the impact of situation specific variables rather than of maternal age. When used as predictors of future maternal responsiveness these hospital behavioral assessments contribute marginally to the overall predictive significance of a multiple regression equation.

The marked decrease over time of the predictive capacity of the hospital measures and the increased salience of the variables age and choice of rooming-in has been discussed in terms of the social and emotional stability assumed to accompany age. It is also suggested that these findings support the sensitive period hypothesis (Klaus et al., 1972) which indicates that the amount of contact time experienced between a mother and her newborn immediately following

birth enhances the process of attachment. The interruption of the behavioral style observed in the hospital may be a function of the immediate separation of the mother and newborn which the subjects encountered as obstetric and nursery patients. That the choice of rooming-in remained as a significant predictor would support this conclusion, indicating that those mothers desirous of this hospital option had more contact time with their newborns. The salience of age as a predictor may also indicate that younger women are more vulnerable to the suggested effects of separation.

The combination of the predisposition for contact, reflected in the mothers' desire expressed prenatally for rooming-in, and maternal age provides the strongest evidence of the predictive ability of any of the variables examined in this study. Though the results of this research provide indications of these significant trends, interpretations of the overall findings must recognize the limited amount of variance which is accounted for by the identified predictors. It is to be noted that the highly innovative quality of the administration of this research limited the kinds of measures made. Perhaps, if more attitudinal inventories or a more sophisticated method were employed for the hospital data collection, results from such measures could have had more predictive significance.

The procedural complexity inherent in the process of seeking appropriate permission and cooperation for the data collection that was administered in this study is to be clearly recognized.

The process of working with key individuals in the medical community before beginning to collect the data represents a major component of this research project. The rapport that was established with the hospital personnel, whose assistance was essential for the data collection, is a major positive outcome of the study. These individuals' acceptance of the investigator and their involvement with her in the process of data collection represents a successful entrée of a behavioral science researcher into a medical system. With the progression of the study, it became clear that the nursing staff began to take an active interest in making observations of maternal behavior in the delivery room and on the postpartum ward of the hospital. Their questions, comments, and requests for recommendations all reflected an increased sensitivity to the role they can play in the early identification of mothers with the potential for parenting difficulty.

The Delivery Room Observation Scale developed for the data collection in this study has potential for being routinely administered. From the use of this scale in this dissertation, it can be concluded that, although its predictive significance is minimal, it does provide an assessment of a mother's immediate responsive behavior towards her newborn. It can be stated from the research findings that this initial overt display of behavior does predict later maternal responsiveness during a hospital feeding. In this sense, the total score on the Delivery Room Observation Scale is similar to the Apgar Score in that it has short term predictive significance

and clearly describes the mother's immediate reaction to her newborn following birth.

As a means of assessment, scores from the Delivery Room Observation Scale can be used by the hospital staff to provide appropriate support to new mothers. Women who appear responsive and eager for contact with their newborns should receive encouragement for their responsive behavior. Women whose behavior appears hesitant or rejecting need sensitive assistance from those who care for them. Such a use of the scale would provide a systematic way for a hospital staff to become aware of the need to observe and record their impressions of their patient's maternal behavior.

Human bonds of attachment provide the stimulus of nurturant care giving. The delicacy of their formation and the complexity of the human interaction which they represent demand the sensitive attention of all those involved in providing human services. The ontogeny of attachment begins with conception and the capacity for attachment reflects one's personal experience of having received nurturant care. A focus on the first behavioral manifestations of attachment between a mother and her newborn infant is rich with opportunities for assessing the strengths of their emerging bonds.

It has been the purpose of this research to evaluate how such strengths can be measured and how such assessments can be used to predict the quality of future parenting. The major finding of the study indicates that maternal age and the desire expressed by the mother before delivery to have rooming-in most capably predict

future attachment manifest in maternal responsive behavior. It can be suggested from such findings that a woman's capacity for nurturance may be inherent and can be expressed prior to the birth of her child. Such a capacity, or predisposition for nurturant caregiving, may well be linked to future parenting skill and the child's eventual development as an individual with the same capacity for building fulfilling bonds of attachment.

# APPENDICES

# APPENDIX A

## SOURCE LIST OF RESEARCH INSTRUMENTS

## APPENDIX A

## SOURCE LIST OF RESEARCH INSTRUMENTS

Survey on Bringing Up Children

Information about the use of this instrument is available from:

Ray Helfer, M.D., Department of Human Development
B-240 Life Sciences
Michigan State University
East Lansing, Michigan 48823

Social Readjustment Scale

The instrument is available from:

Department of Psychiatry, University of Washington School of Medicine
Seattle, Washington 98105

Delivery Room Observation Scale

Information about this scale is available from:

Ann L. Wilson, Child Development Project
University of Michigan Medical Center
201 East Catherine Street
Ann Arbor, Michigan 48104

Neonatal Behavioral Assessment Scale

The scale may be ordered from:

J. B. Lippinoctt Company
Philadelphia, Pennsylvania

Feeding Observation Scale

The scale is available from:

Joh Osofsky, Ph.D., Department of Psychology
Temple University
Philadelphia, Pennsylvania 19122

Neonatal Perception and Bother Inventory

Information about the use of this instrument is available from:

Elsie E. Broussard M.D., School of Public Health, Room 209
University of Pittsburgh
Pittsburgh, Pennsylvania 15213

Postpartum Research Inventory

This instrument is available from:

Earl S. Schaefer Ph.D.
Department of Maternal and Child Health
School of Public Health
University of North Carolins
Chapel Hill, North Carolina 27514

# APPENDIX B

# SUPPLEMENTAL BACKGROUND QUESTIONS

## APPENDIX B

## SUPPLEMENTAL BACKGROUND QUESTIONS

1. Did you plan this pregnancy?

   1. yes  2. No

2. If you had the choice, what sex would you prefer your baby to be?

   1. girl  2. boy

3. If possible, will you request to have a rooming-in arrangement while you are in the hospital with your baby after delivery?

   1. yes  2. no

4. Have you attended Expectant Parent Classes since you have been pregnant?

   1. yes  2. no

5. If you are married, how long have you been married to your present spouse?

   _____

# APPENDIX C

# DELIVERY ROOM OBSERVATION SCALE

FDR _____ No. _____

Date _____

## APPENDIX C

## DELIVERY ROOM OBSERVATION SCALE

Response to Baby's Sex

1. no response, flat affect
2. negative verbalizations and/or disappointed response
3. diffuse display of emotion
4. some indication of pleasure, smiles or positive verbalizations

(1) ___ 5. very positive response, smiles and happy verbalizations

Immediate Attempt to Reach

1. no

(2) ___ 2. yes

Visual Tracking of Baby to Cart

1. no

(3) ___ 2. yes

Questions re Physical Status

1. no

(4) ___ 2. yes

Comments Made About Baby

1. no verbalizations
2. negative rejecting tone and content to verbalizations
3. comments re a physical feature or term of endearment
4. comments re physical feature and term of endearment

(5) ___ 5. comments showing recognition of personhood

Distal Looking-Quality

1. no affect
2. rejecting tone
3. diffuse display of interest
4. some animation and attentiveness

(6) ___ 5. much animation and curious attentiveness

Distal Looking Quantity

1. never
2. quick glances or gaze on baby less than 50% of time
3. 50% of time looking at baby
4. 50-90% of time

(7) ___ 5. 90-100% of time

Proximal Touching (60 seconds)

1. none
2. tentative fingertip touching
3. whole hand on baby's hand, beginning to explore

(8) ___ baby's body

Talks to Baby

1. no attempt to talk to baby
2. general statements -- "Hello"

(9) ___ 3. empathy in statements -- "You look tired"

Use of pronouns

1. no reference to baby
2. use of "it"
3. "it" and inappropriate pronoun
4. "it" or inappropriate pronoun first and then appropriate use of pronoun

(10)___ 5. immediate use of appropriate pronoun

Name

1. When asked -- no name chosen
2. When asked name used

(11)___ 3. Self initiated use of name

Focus of Attention (if father is present "baby" includes "father")

1. on self most of time
2. 50% of gaze or verbalizations oriented on self
3. 50% of gaze and verbalizations oriented on baby
4. more than 50% of gaze and verbalizations oriented on baby

(12)___ 5. 90-100% of gaze and verbalizations oriented on baby

General Tone

1. flat, no affect
2. negative
3. diffuse emotion
4. positive

(13)___ 5. joy

Father Responsivity (if he is present)

1. no support or affect
2. rejecting tone to interactions
3. diffuse emotional response
4. some support (talking, handling)

(14)___ 5. very supportive, animated response to baby

# APPENDIX D

# INTERVIEW ASSESSMENT OF MOTHER-INFANT ADJUSTMENT

## APPENDIX D

## INTERVIEW ASSESSEMENT OF MOTHER-INFANT ADJUSTMENT

### Mother-Infant Adaptation Questions

1. How are things going?
2. Since most babies become fussy at times, they often need someone to help them quiet down. Sometimes holding them or talking to the baby comforts them. Some babies don't seem to be comforted at all when they get fussy. How about your baby? What usually happens when he or she gets fussy?
3. Some babies seem pretty much the same at one month as they did when they were born. Other babies seem to change somewhat. What can you tell me about your baby?
4. How are the feedings (breast or bottle) going?
5. Babies sometimes try to let their mothers know when they're hungry, tired, or just want to be held. How about your baby?
6. Since some infants often have their days and nights mixed up at first, they may sleep better during the day and become more active at night, or they can be more awake during the day. Can you tell me when your baby becomes restful?
7. With all of the activity involved in the first couple of weeks after mothers leave the hospital, some mothers are tired at the end of the day. How about you? Do you feel that you are getting enough rest?
8. How have the usual daily chores been going?
9. What seems to be the most difficult thing so far since you've been home?
10. What seems to be the easiest thing so far since you've been home?
11. Is there anything you and your baby seem to enjoy most, or don't like so far?
12. Some babies smile after they are fed, or held, or spoken to. How about your baby?

### Maternal Attachment Questions

1. Have you begun to have positive feelings or love for your baby? When?
2. Have you begun to see your baby as a person with individual personality? When?
3. Do you think your baby has begun to recognize you? When?

### Maternal Recall of Labor and Delivery Experience

1. How do you remember feeling when you first saw your baby?
2. When you think back to your labor and delivery, do you remember it as being:

| | | | | |
|---|---|---|---|---|
| Very hard | Hard | Neither hard nor easy | Easy | Very Easy |

# APPENDIX E

## EXPLANATION OF BRAZELTON BEHAVIORAL ASSESSMENT SCALE DISTRIBUTED TO HOSPITAL STAFF ON NURSERY SERVICE

MICHIGAN STATE UNIVERSITY

DEPARTMENT OF HUMAN DEVELOPMENT
B240 LIFE SCIENCES

EAST LANSING • MICHIGAN • 48824

January 17, 1975

To: Sparrow Hospital Newborn Service

From: Ann L. Wilson

You may have seen me in the nursery this past week observing the babies and watching them respond to my bell, rattle and flashlight. I am a graduate student in Child Development and will be doing part of my dissertation research in the Sparrow Nursery. My proposal has been passed by the Hospital Research Review Board and presently I am preparing to begin my study. My bell ringing etc. is part of the Brazelton Neonatal Behavioral Assessment Scale which I will be using in my research. I will be going to Boston next month to standardize myself with those who developed the scale. In the next few weeks I will be administering the scale for practice so that I will be able to become a reliable examiner.

The following is a short explanation about newborn behavior and a description of the Brazelton Scale. If you have any questions about the scale or my research please feel free to ask or call me. I can be reached at these numbers: 353-7999 or 353-9242.

I appreciate the help that many of you have given me and I trust you will let me know if there are ways that I can be more cooperative.

For many years it was widely believed that newborns perceive the world around them as a buzzing, blooming blob of confusion. In the last ten years there has been a great deal of interest in disproving such a conceptualization of the newborns' capabilities and today behavioral scientists talk about the "competent infant." Research increasingly indicates that infants are born with well developed sensory capacities enabling them to discriminate visual stimuli, tonal qualities, odors and tastes.

Along with the increased knowledge of the capabilities of newborns has come an awareness of the individual nature of each newborn's behavioral repertoire. These new findings have lead to an interest in understanding how an infant's unique constitution can affect his caretaker's behavior. Traditionally, research on parent-child relations focused on how parents shape their childrens' behavior neglecting to evaluate the child's contribution to the relationship. With this new perspective on infant behavior, researchers are now beginning to examine the role a newborn's behavior can have on the emerging parent-child relationship.

T. Berry Brazelton, a pediatrician at Boston Childrens' Hospital and Clinical Assistant Professor at Harvard Medical School, has developed the Neonatal Behavioral Assessment Scale to be used to evaluate an infant's responses to environmental stimuli. This scale can consequently be used to evaluate how an infant will interact with his environment. It is Brazelton's belief that neonatal behavioral and physiological precursors of individuality need to be as clearly documented as do neurological precursors of future

development. His scale measures dimensions of an infant's capabilities that are relevant to his developing social relationships.

In administering the Neonatal Assessment Scale, the infant's state of consciousness is carefully observed to evaluate how the newborn is able to use state behaviors to control reactions to environmental and internal stimuli. These observations are helpful in assessing the infant's ability for self organization. Brazelton has developed a schema for identifying six levels of an infant's state by describing behaviors ranging from deep sleep to intense crying. Brazelton claims that an evaluation of the infant's pattern of state behavior and transition from one state to another may be the best predictor of the infant's receptivity and ability to respond to stimuli in a cognitive sense.

The scale was standardized with "average" seven pound + full term normal Caucasian infants whose mothers had not received more than 100 mg of barbiturates and 50 mg of other sedative drugs prior to delivery. As many infants are discoordinated for 48 hours after delivery, the behavior measured on the third day after delivery has been used by those who developed the scale as the expected mean.

A nine point scale is used to assess the behavior demonstrated on each of the behavioral items on the assessment scale. There is no optimal score for each item nor a summary score for the entire scale. The nature of the scoring system reflects Brazelton's belief that there is no such thing as "optimal behavior" as every baby's optimal behavior can be represented by a different cluster of scores.

The examination begins with the infant asleep, covered, dressed and about midway between two feedings. After an observation of the infant, stimuli are presented and the infant's reactions are evaluated. The following is a list and brief description of the individual items on the scale. The appropriate state of the infant for the presentation of the stimulus is indicated in parentheses beside the title of each item.

## SUMMARY OF THE BRAZELTON NEONATAL BEHAVIORAL ASSESSMENT SCALE

1-4 Response Decrement to light, rattle, ball, pinprick (Asleep States)
The newborn's capacity to decrease his response to repeated presentations of the same stimuli is called "response decrement" and is observed as the infant habituates or "shuts down" his reaction to a stimulus. These items measure the amount of stimulation required before a shut down is reached.

4-9 Orientation Response to inanimate visual, inanimate auditory animate visual and animate auditory stimuli (Awake States)
The ability to alert and fix on an object or sound is measured by the newborn's response of turning toward the direction of stimulation. This item measures the quality of the newborn's orienting response to these stimuli.

10. Alertness (Alert State)
This is measured when the infant brightens and widens his eyes. The frequency of this response throughout the exam is measured in this item.

11. General Tonus (Awake States)
This is a summary assessment of the resistance of parts of the infant's body to being handled by passive movement.

12. Motor Maturity (Awake States)
This is a measure of both the smoothness versus jerkiness of the infant's movement and the freedom of arcs versus restricted arcs of movement of arms and legs in flexion.

13. Pull to Sit (Awake States)
The infant's head and shoulder tone is evaluated as the examiner pulls the infant to a sit using his forefingers placed in each of the infant's palms.

14. Cuddliness (Awake States)
The infant's response to being held is measured in this item of the exam.

15. Defensive Movements (Alert State)
The infant's reactions when a small cloth is placed over the upper part of his face is assessed in this item.

16. Consolability with Intervention (Crying to Awake or Asleep State)
This measure is made when the infant is in an upset state and has been actively fussing to assess how much intervention is necessary before he quiets for at least five seconds.

17. Peak of Excitement (Crying State)
The overall amount of motor and crying activity observed throughout the examination is measured by this item.

18. Rapidity of Buildup (From Awake to Crying State)
The infant's use of states is assessed by this item by a measure of the timing and number of stimuli which are used before a transition is made from a quiet state to a more agitated one.

19. Irritability (Awake States)
This item measures the number of times the infant gets upset and the kind of stimuli which make him cry.

20. Activity (Alert States)
This is a summary score of spontaneous and elicited activity seen during the entire observation.

21. Tremulousness (All States)
Observations throughout the exam for temors are assessed by this item.

22. Amount of Startle During Exam (Awake and Crying States)
Observations of both spontaneous and elicited startles are measured by this item.

23. Lability of Skin Color (From Sleep to Crying States)
This item measures the changes of color and vascularity which take place during the period of the examination.

24. Lability of States (All States)
The infant's reactions when a small cloth is placed over the upper part of his face is assessed in this item.

25. Self-Quieting Activity (From Crying State to Awake or Asleep State)
The activity which the baby initiates in a fussing state to quiet himself is measured in this item.

26. Hand to Mouth Facility (All States)
The infant's ability to bring his hands to his mouth and insert them is measured in this item.

27. Smiles (Awake States)
The number of smiles observed during the exam are recorded in this item.

The neurological assessment includes evaluation of these elicited responses:

Plantar grasp
Hand grasp
Ankle clonus
Babinski
Standing
Automatic walking
Placing
Incurvation
Glabella
Tonic deviation of head and eyes
Nystagmus
Tonic neck reflex
Moro
Rooting (intensity)
Sucking (intensity)
Passive movement of arms and legs

# APPENDIX F

# INITIAL PATIENT CONTACT CARDS

Dear Ms.

Our practice is cooperating in a study of early mother-infant interaction being done by the College of Human Medicine, Michigan State University. A graduate student in Child Development, Ann Wilson, will be contacting you to give you more information about the details of the study.

Your willingness to cooperate will be greatly appreciated.

M. Sharp, M.D.
R. Johnson, M.D.
J. Sheets, M.D.
J. Hazen, M.D.

Dear Ms.

Our clinic is helping with a study of newborns and mothers being done at the College of Human Medicine at Michigan State University. Ann Wilson, a graduate student in Child Development, will be contacting you to give you more information about the study.

Your willingness to cooperate will be greatly appreciated.

Model Cities Medical Clinic

# APPENDIX G

# INFORMED CONSENT FORM

Number _____

INFORMED CONSENT FORM

Recently doctors and other people who work with families have become interested in learning more about how parents begin to know and rear their children. This study will provide information about young families that will be helpful in better understanding early parent-child relations. Observations will be made of you and your baby in the delivery room and during a feeding. Your baby will also be given a behavioral examination and you will be asked to fill out several questionnaires before and after your baby's birth.

All information gathered in this study will be confidential and your name and address will only be used to contact you. Only a number will appear on any of the information sheets used and not your name.

I understand the above points and agree to voluntarily participate in the study.

Witness _____ Signed _____

Address _____

_____

_____

Phone _____

Date _____

# APPENDIX H

## INSTRUCTIONS TO SUBJECTS ON HOW TO CONTACT INVESTIGATOR

## APPENDIX H

## INSTRUCTIONS TO SUBJECTS ON HOW TO CONTACT INVESTIGATOR

Please call Ann Wilson when you leave home for the hospital. In the evenings she can be reached at 351-4802.

If she does not answer at this number and during days call 487-7160. This is a page boy number. After the dial tone stops, give your name and say you are going to Sparrow Hospital.

Thank you.

# APPENDIX I

## LETTER TO POTENTIAL SUBJECTS CONCERNING RESEARCH PROJECT

MICHIGAN STATE UNIVERSITY

DEPARTMENT OF HUMAN DEVELOPMENT
B240 LIFE SCIENCES

EAST LANSING · MICHIGAN · 48824

February 25, 1975

Dear Ms.

Recently doctors and other professionals who work with families have become very interested in learning how mothers begin to know and understand their newborn babies. This information is very helpful for planning the kinds of care that can be given to women before and after delivery. For years people thought that babies were all pretty much alike. Now, it is an accepted fact that each baby, like each mother, is very different and requires different kinds of help.

Here in Lansing we are fortunate that Sparrow Hospital and many physicians are interested in learning more about the early days of an infant's life. I am a graduate student and am doing research for my Ph.D. in child development through the College of Human Medicine at Michigan State University. My study will provide new information that may be useful for developing programs for young families.

I am asking patients of Drs. Sharp, Johnson, Sheets and Hazen to participate in this study. This would involve filling out several questionnaires and permitting me to observe you and your baby in the delivery room, nursery and during a feeding. I would also visit you in your home six weeks after your baby's birth. All information collected would be kept strictly confidential and you could drop out of the study any time. Your cooperation in this project would be greatly appreciated. If you have any questions ask Arlene or call me at the numbers listed below. Your help would be of assistance to those of us working on the project.

Thank you,

Ann L. Wilson, M.A.

Please feel free to call me at 353-7999 or 353-9242 during the day and 351-4802 in the evening.

# APPENDIX J

## MATRIX OF THE PEARSON PRODUCT MOMENT CORRELATION COEFFICIENTS OF THE ORDINAL VARIABLES EMPLOYED IN THE DATA ANALYSIS

# APPENDIX J

## MATRIX OF THE PEARSON PRODUCT MOMENT CORRELATION COEFFICIENTS OF THE ORDINAL VARIABLES EMPLOYED IN THE DATA ANALYSIS

### Codes for Correlation Matrix

The following are the codes of the ordinal variables presented in the matrix of Pearson Product Moment Correlation Coefficients.

CONC Total Concern Score on Survey on Bringing Up Children
Code: Total concern score as a continuous variable.

CLINIC Omit

AGE Age
Code: Age in years as continuous variable

INCOME Yearly income
Code: 6 categories from $4,000 to $20,000

ED Years of formal schooling
Code: 6 categories from 8th grade to college completed

LMAR Length of marriage
Code: 4 categories from not married to more than 5 years

PLAN Planning of Pregnancy
Code: 0 = no 1 = yes

RMIN Choice of Rooming-In
Code: 0 = no 1 = yes

PRENAT Participation in Prenatal Education Progarm
Code: 0 = no 1 = yes

STRESS Total Score on Social Readjustment Scale
Code: Total score as continuous variable

SEX Discrepancy between desired and actual sex
Code: 0 = no 1 = yes

TDELSC Total Score on Delivery Room Observation Scale
Code: Total score as continuous variable with a range of 0 to 52

FATP Father's Presence in Delivery Room
Code: 0 = no 1 = yes

FATR Score on Father's Responsiveness in the Delivery Room
Code: Score on scale item

LENGTH Length of Labor
Code: Hours of labor as a continuous variable

APGAR L Apgar Score at 1 minute
Code: Score as continuous variable

APGAR 2 Apgar score at 5 minutes
Code: Score as continuous variable

BRINT Brazelton Neonatal Behavioral Assessment Scale Score[1] - Interactive Process
Code: 1 = concerning behavior
2 = average behavior
3 = good behavior

BMOTOR Brazelton Neonatal Behavioral Assessment Scale Score[1] - Motoric Processes
Code: 1 = concerning behavior
2 = average behavior
3 = good behavior

BSTATE Brazelton Neonatal Behavioral Assessment Scale Score[1] - Organizational Process: State Control
Code: 1 = concerning behavior
2 = average behavior
3 = good behavior

BPHSY Brazelton Neonatal Behavioral Assessment Scale Score[1] - Organizational Processes: Physiological Response to Stress
Code: 1 = concerning behavior
2 = average behavior
3 = good behavior

PHYAP Physical Appearance of Baby
Code: 1 = ugly, 2 - average, 3 = attractive

LOOK Look Ratio - Time mother spends looking at baby: Total feeding time
Code: 6 = 10 minutes: 10 minutes
5 = >9 minutes 45 seconds: 10 minutes
4 = >9 minutes 15 seconds: 10 minutes
3 = >8 minutes 30 seconds: 10 minutes
2 = >7 minutes: 10 minutes
1 = <7 minutes: 10 minutes

---

[1]See Adamson et al. (Note 4).

MATRES Total Score of Maternal Responsiveness on Feeding Observation Scale
Code: Total score as a continuous variable with a range of 0 to 54

MATPER Score on Neonatal Perception Inventory
Code: Score as a continuous variable

BOTHER Total Score on Bother Inventory
Code: Total score as a continuous variable with a range of 0 to 18+

The following are scales on the Postpartum Research Inventory
Code: Total score of scale items, higher scores indicate a stronger response to scale items

IRRIT Irritability
CONCERN Fear or Concern for Baby
NEG Negative Aspect of Childrearing
PUNIT Intrapunitive
IGN Ignorning Baby
REASUR Need for Reassurance
DEPRES Depression
HEALTH Mother's Perception of her Overall Health
Code: 5 categories range from very poor to excellent

TSYMP Total Number of Symptoms on Health Inventory
Code: Total number of symptoms by their severity

LOOK2 See LOOK

TMATRES See MATRES

BRES Total Score of Infant's Responsiveness on Feeding Observation Scale
Code: Total score as a continuous variable

ADJI Mother's Perception of Overall Adjustment
Code: Mean score of scale items from Mother-Infant Adaptation interview, range from poor to good adaptation

ADJ2 Mother's Perception of Mother-Baby Reciprocity
Code: Mean score of scale items from Mother-Infant Adaptation range from poor to good adaptation

ADJ3 Mother's Perception of Baby Adjustment
Code: Mean score of scale items from Mother-Infant Adaptation interview, range from poor to good adaptation

ADJ4 Mother's Perception of Personal Adjustment
Code: Mean score of scale items from Mother-Infant Adaptation interview, range from poor to good adaptation

ATTI Time of Onset of Mother's Feelings of Love
Code: 1 = 4 weeks after delivery or not yet
2 = first 3 weeks after hospital discharge
3 = during hospital stay
4 = with delivery i.e. right away
5 = when pregnant

ATT2 Time of Onset of Mother's Perception of Baby as Individual Person
Code: see ATT1

ATT3 Time of Onset of Mother's Perception of Baby's Recognition of Her
Code: 1 = not yet
2 = at 4 weeks after delivery
3 = at 3 weeks after delivery
4 = at 2 weeks after delivery
5 = during first week after delivery

RECALL2 Mother's Recall of Difficulty of Labor and Delivery
Code: 1 = very easy
2 = easy
3 = neither easy nor hard
4 = hard
5 = very hard

FILE NONAME (CREATION DATE = 08/19/75 )

- - - - - - - - - - - - PEARSON CORRELATION COEFFICIENTS - - - - - - - - - - - -

| | CONC | CLINIC | AGE | INCOME | ED | LMAR | PLAN | RMIN | PRENAT | STRESS |
|---|---|---|---|---|---|---|---|---|---|---|
| CONC | 1.0000 | .2639 | -.2498 | -.2821 | -.3281 | -.3801 | -.0590 | -.4067 | -.2858 | .2409 |
| | ( 0) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .001 | S= .050 | S= .060 | S= .039 | S= .019 | S= .008 | S= .359 | S= .005 | S= .037 | S= .067 |
| CLINIC | .2639 | 1.0000 | -.3666 | -.4937 | -.5033 | -.4042 | -.3063 | .0386 | -.2695 | .1834 |
| | ( 40) | ( 0) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .050 | S= .001 | S= .010 | S= .001 | S= .001 | S= .005 | S= .027 | S= .406 | S= .046 | S= .129 |
| AGE | -.2498 | -.3666 | 1.0000 | .7696 | .7819 | .7243 | .3016 | .0740 | .5648 | -.4685 |
| | ( 40) | ( 40) | ( 0) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .060 | S= .010 | S= .001 | S= .001 | S= .001 | S= .001 | S= .029 | S= .325 | S= .001 | S= .001 |
| INCOME | -.2821 | -.4937 | .7696 | 1.0000 | .7020 | .8115 | .4403 | .0922 | .5062 | -.4803 |
| | ( 40) | ( 40) | ( 40) | ( 0) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .039 | S= .001 | S= .001 | S= .001 | S= .001 | S= .001 | S= .002 | S= .286 | S= .001 | S= .001 |
| ED | -.3281 | -.5033 | .7819 | .7020 | 1.0000 | .5665 | .1989 | .1614 | .6768 | -.3755 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 0) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .019 | S= .001 | S= .001 | S= .001 | S= .001 | S= .001 | S= .109 | S= .160 | S= .001 | S= .008 |
| LMAR | -.3801 | -.4042 | .7243 | .8115 | .5665 | 1.0000 | .2597 | .1041 | .4781 | -.4913 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 0) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .008 | S= .005 | S= .001 | S= .001 | S= .001 | S= .001 | S= .053 | S= .261 | S= .001 | S= .001 |
| PLAN | -.0590 | -.3063 | .3016 | .4403 | .1989 | .2597 | 1.0000 | .0187 | -.0937 | .0462 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 0) | ( 40) | ( 40) | ( 40) |
| | S= .359 | S= .027 | S= .029 | S= .002 | S= .109 | S= .053 | S= .001 | S= .454 | S= .283 | S= .388 |
| RMIN | -.4067 | .0386 | .0740 | .0922 | .1614 | .1041 | .0187 | 1.0000 | .3752 | .0913 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 0) | ( 40) | ( 40) | ( 40) |
| | S= .005 | S= .406 | S= .325 | S= .286 | S= .160 | S= .261 | S= .454 | S= .001 | S= .009 | S= .288 |
| PRENAT | -.2858 | -.2695 | .5648 | .5062 | .6768 | .4781 | -.0937 | .3752 | 1.0000 | -.3310 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 0) | ( 40) |
| | S= .037 | S= .046 | S= .001 | S= .001 | S= .001 | S= .001 | S= .283 | S= .009 | S= .001 | S= .018 |
| STRESS | .2409 | .1834 | -.4685 | -.4803 | -.3755 | -.4913 | .0462 | .0913 | -.3310 | 1.0000 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 0) |
| | S= .067 | S= .129 | S= .001 | S= .001 | S= .008 | S= .001 | S= .388 | S= .288 | S= .018 | S= .001 |
| SEX | -.1124 | .1364 | .1492 | .0807 | .0430 | .1172 | .1949 | -.0513 | -.0793 | -.1101 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .245 | S= .201 | S= .179 | S= .310 | S= .396 | S= .236 | S= .114 | S= .377 | S= .313 | S= .249 |
| TDELSC | -.1423 | -.1998 | .4070 | .3318 | .3713 | .3809 | .3385 | .3642 | .3745 | -.2116 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .191 | S= .108 | S= .005 | S= .018 | S= .009 | S= .003 | S= .016 | S= .010 | S= .009 | S= .095 |
| FATP | .2356 | .0658 | -.5093 | -.4879 | -.3756 | -.5086 | -.2503 | -.1601 | -.4551 | .2361 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .072 | S= .343 | S= .001 | S= .001 | S= .008 | S= .001 | S= .060 | S= .162 | S= .002 | S= .071 |

FILE NONAME (CREATION DATE = 08/19/75 )

- - - - - - - - - - - - PEARSON CORRELATION COEFFICIENTS - - - - - - - - - - -

| | CONC | CLINIC | AGE | INCOME | EO | LMAR | PLAN | RMIN | PRENAT | STRESS |
|---|---|---|---|---|---|---|---|---|---|---|
| FATR | -.1800 | -.1051 | .5653 | .4928 | .4357 | .6228 | .2719 | .1194 | .5008 | -.2531 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .133 | S= .259 | S= .001 | S= .001 | S= .002 | S= .001 | S= .045 | S= .232 | S= .001 | S= .058 |
| LENGTH | .2096 | .2584 | .0572 | -.0324 | .0356 | .0442 | .1097 | -.0514 | -.0093 | .0012 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .097 | S= .054 | S= .363 | S= .421 | S= .414 | S= .393 | S= .250 | S= .376 | S= .477 | S= .497 |
| APGAR1 | -.1525 | .0432 | .1340 | .0422 | .1561 | -.0055 | .0286 | .1028 | .2559 | -.3088 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .174 | S= .396 | S= .205 | S= .398 | S= .168 | S= .487 | S= .430 | S= .264 | S= .055 | S= .026 |
| APGAR2 | -.1486 | -.1187 | .0407 | .0763 | .0432 | .1501 | -.1093 | .0051 | .1392 | -.4277 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .180 | S= .233 | S= .402 | S= .320 | S= .396 | S= .178 | S= .251 | S= .488 | S= .196 | S= .003 |
| BRINT | .1694 | .0905 | .3484 | .2471 | .1960 | .0985 | .2282 | -.0039 | .0403 | -.0081 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .148 | S= .289 | S= .014 | S= .062 | S= .113 | S= .273 | S= .078 | S= .491 | S= .403 | S= .480 |
| BMOTOR | .2190 | .0602 | .0959 | -.0896 | .0924 | -.0053 | -.0410 | -.0026 | .0268 | .0693 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .087 | S= .356 | S= .278 | S= .291 | S= .285 | S= .487 | S= .401 | S= .494 | S= .435 | S= .336 |
| BSTATE | .1600 | -.3923 | .3833 | .4128 | .3536 | .2468 | .1493 | 0 | .1508 | -.3499 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .162 | S= .006 | S= .007 | S= .004 | S= .013 | S= .062 | S= .179 | S= .500 | S= .177 | S= .013 |
| BPHSY | .0119 | -.3477 | .1736 | .1837 | .0665 | .1237 | .1523 | .2308 | .1863 | -.0939 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .471 | S= .014 | S= .142 | S= .128 | S= .342 | S= .223 | S= .174 | S= .076 | S= .125 | S= .282 |
| PHYAP | .0218 | .2882 | -.2509 | -.1756 | -.3349 | -.1676 | -.0376 | .0921 | -.2439 | .2803 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .447 | S= .036 | S= .059 | S= .139 | S= .017 | S= .151 | S= .409 | S= .286 | S= .065 | S= .040 |
| LOCK | -.1194 | -.1395 | .1313 | -.0171 | .1510 | .0083 | .1948 | .1286 | .3676 | .0630 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .231 | S= .195 | S= .210 | S= .458 | S= .176 | S= .480 | S= .114 | S= .215 | S= .010 | S= .350 |
| MATRES | -.3062 | -.1610 | .4307 | .3199 | .2503 | .4223 | .2059 | .3137 | .3625 | -.2883 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .027 | S= .160 | S= .003 | S= .022 | S= .060 | S= .003 | S= .101 | S= .024 | S= .011 | S= .036 |
| MATPER | -.0204 | .2580 | .0198 | -.1317 | -.0999 | -.0848 | -.1518 | -.1273 | -.0307 | .0235 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .450 | S= .054 | S= .452 | S= .209 | S= .270 | S= .302 | S= .175 | S= .217 | S= .425 | S= .443 |
| BOTHER | .2840 | .1458 | -.0223 | -.0905 | .0419 | -.0377 | -.0662 | .1600 | .1532 | .2622 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .038 | S= .185 | S= .446 | S= .289 | S= .308 | S= .409 | S= .342 | S= .162 | S= .173 | S= .051 |

FILE NONAME (CREATION DATE = 08/19/75 )

- - - - - - - - - - - - PEARSON CORRELATION COEFFICIENTS - - - - - - - - - - -

| | CONC | CLINIC | AGE | INCOME | ED | LMAR | PLAN | RMIN | PRENAT | STRESS |
|---|---|---|---|---|---|---|---|---|---|---|
| IRRIT | .0960 | -.1075 | .0999 | .0261 | -.0041 | .2115 | .1008 | .0766 | .0781 | .2733 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .278 | S= .255 | S= .270 | S= .437 | S= .490 | S= .095 | S= .268 | S= .319 | S= .316 | S= .044 |
| CONCERN | .2277 | .1673 | -.4056 | -.2830 | -.3299 | -.1783 | -.0340 | .1525 | -.1685 | .4033 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .079 | S= .151 | S= .005 | S= .038 | S= .019 | S= .135 | S= .418 | S= .174 | S= .149 | S= .005 |
| NEG | .0178 | .1417 | .1880 | .0433 | .2392 | .1062 | -.1539 | .2655 | .2002 | .0727 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .457 | S= .192 | S= .123 | S= .395 | S= .069 | S= .257 | S= .171 | S= .049 | S= .108 | S= .328 |
| PUNIT | .1327 | .0503 | -.1093 | -.0491 | -.1643 | .1369 | .0077 | -.2313 | -.1676 | .1537 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .207 | S= .379 | S= .251 | S= .382 | S= .156 | S= .200 | S= .481 | S= .075 | S= .151 | S= .172 |
| IGN | .0804 | .1336 | -.4880 | -.5060 | -.5480 | -.3332 | .0687 | -.0908 | -.5192 | .2611 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .311 | S= .205 | S= .001 | S= .001 | S= .001 | S= .018 | S= .337 | S= .289 | S= .001 | S= .052 |
| REASUR | .1049 | .0623 | -.1450 | -.2026 | -.1914 | -.0295 | -.1568 | .0816 | -.0552 | .3825 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .260 | S= .351 | S= .186 | S= .105 | S= .118 | S= .428 | S= .167 | S= .308 | S= .367 | S= .007 |
| DEPRES | .0120 | -.0854 | .1685 | .1270 | .0851 | .1433 | .2771 | .0182 | .0587 | .4115 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .471 | S= .300 | S= .149 | S= .217 | S= .301 | S= .189 | S= .042 | S= .456 | S= .359 | S= .004 |
| HEALTH | -.2651 | -.3039 | .3144 | .4111 | .3652 | .5097 | -.1156 | .1233 | .2920 | -.2026 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .049 | S= .028 | S= .024 | S= .004 | S= .010 | S= .001 | S= .239 | S= .224 | S= .034 | S= .105 |
| TSYMP | .1948 | .0375 | -.3102 | -.2591 | -.1532 | -.3263 | -.0857 | -.1179 | -.1470 | .3965 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .114 | S= .409 | S= .026 | S= .053 | S= .173 | S= .020 | S= .300 | S= .234 | S= .183 | S= .006 |
| LOCK2 | -.4659 | -.1897 | .3741 | .3192 | .3645 | .3224 | .3555 | .2386 | .0969 | -.1218 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .001 | S= .121 | S= .009 | S= .022 | S= .010 | S= .021 | S= .012 | S= .069 | S= .276 | S= .227 |
| TMATRES | -.2833 | -.2122 | .6225 | .5936 | .5657 | .5570 | .2755 | .3988 | .3930 | -.2516 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .038 | S= .094 | S= .001 | S= .001 | S= .001 | S= .001 | S= .043 | S= .005 | S= .006 | S= .059 |
| BRES | -.4349 | -.1158 | .2744 | .2578 | .1673 | .4505 | .0116 | .0782 | .1776 | -.1552 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .003 | S= .238 | S= .043 | S= .054 | S= .151 | S= .002 | S= .472 | S= .316 | S= .136 | S= .169 |
| ADJ1 | -.0251 | .0785 | .1836 | .1893 | .1358 | .1619 | -.0968 | .1078 | .0437 | -.1292 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .439 | S= .315 | S= .128 | S= .121 | S= .202 | S= .159 | S= .276 | S= .254 | S= .394 | S= .213 |

FILE NONAME (CREATION DATE = 08/19/75 )

- - - - - - - - - - - - - PEARSON CORRELATION COEFFICIENTS - - - - - - - - - - - -

| | CONC | CLINIC | AGE | INCOME | ED | LMAR | PLAN | RMIN | PRENAT | STRESS |
|---|---|---|---|---|---|---|---|---|---|---|
| ADJ2 | -.4024 | .0249 | .1925 | .1246 | .2914 | .0417 | .0189 | .1816 | .1720 | -.0741 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .005 | S= .439 | S= .117 | S= .222 | S= .034 | S= .399 | S= .454 | S= .131 | S= .144 | S= .325 |
| ADJ3 | -.0563 | -.0276 | -.0264 | .0359 | .0373 | -.1620 | .0105 | -.1902 | .0212 | .0147 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .365 | S= .433 | S= .436 | S= .413 | S= .410 | S= .159 | S= .474 | S= .120 | S= .448 | S= .464 |
| ADJ4 | -.0709 | -.2260 | .0359 | -.0270 | .0432 | -.0217 | -.1094 | .0019 | .1210 | -.2304 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .332 | S= .080 | S= .413 | S= .434 | S= .396 | S= .447 | S= .251 | S= .495 | S= .228 | S= .076 |
| ATT1 | -.1432 | -.1579 | .0825 | .0691 | .0949 | .0361 | .1420 | .1631 | .0662 | -.0795 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .189 | S= .165 | S= .306 | S= .336 | S= .280 | S= .412 | S= .191 | S= .157 | S= .342 | S= .313 |
| ATT2 | -.1669 | -.1646 | .0741 | .0712 | .0599 | .1276 | -.0637 | .1007 | .0155 | -.3829 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .152 | S= .155 | S= .325 | S= .331 | S= .357 | S= .216 | S= .348 | S= .268 | S= .462 | S= .007 |
| ATT3 | .1523 | .1218 | -.1568 | -.2718 | .0276 | -.3160 | -.1947 | .1210 | -.0831 | .2645 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .174 | S= .227 | S= .167 | S= .045 | S= .433 | S= .023 | S= .114 | S= .228 | S= .305 | S= .050 |
| RECALL2 | .1752 | .2396 | -.1586 | -.1484 | -.1931 | -.0700 | -.2983 | -.2474 | -.1423 | -.0404 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .140 | S= .068 | S= .164 | S= .180 | S= .116 | S= .334 | S= .031 | S= .062 | S= .191 | S= .402 |

FILE NONAME (CREATION DATE = 08/19/75 )

- - - - - - - - - - - - PEARSON CORRELATION COEFFICIENTS - - - - - - - - - - -

| | SEX | TDELSC | FATP | FATR | LENGTH | APGAR1 | APGAR2 | BRINT | BMOTOR | BSTATE |
|---|---|---|---|---|---|---|---|---|---|---|
| CONC | -.1124 | -.1423 | .2356 | -.1800 | .2096 | -.1525 | -.1486 | .1694 | .2190 | .1600 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .245 | S= .191 | S= .072 | S= .133 | S= .097 | S= .174 | S= .180 | S= .148 | S= .087 | S= .162 |
| CLINIC | .1364 | -.1998 | .0658 | -.1051 | .2584 | .0432 | -.1187 | .0905 | .0602 | -.3923 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .201 | S= .108 | S= .343 | S= .259 | S= .054 | S= .396 | S= .233 | S= .289 | S= .356 | S= .006 |
| AGE | .1492 | .4070 | -.5093 | .5653 | .0572 | .1340 | .3407 | .3484 | .0959 | .3833 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .179 | S= .005 | S= .001 | S= .001 | S= .363 | S= .205 | S= .402 | S= .014 | S= .278 | S= .007 |
| INCOME | .0807 | .3318 | -.4879 | .4928 | -.0324 | .0422 | .0763 | .2471 | -.0896 | .4128 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .310 | S= .018 | S= .001 | S= .001 | S= .421 | S= .398 | S= .320 | S= .062 | S= .291 | S= .004 |
| ED | .0430 | .3713 | -.3756 | .4357 | .0356 | .1561 | .0432 | .1960 | .0924 | .3536 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .396 | S= .009 | S= .008 | S= .002 | S= .414 | S= .168 | S= .396 | S= .113 | S= .285 | S= .013 |
| LMAR | .1172 | .3809 | -.5886 | .6228 | .0442 | -.0055 | .1501 | .0985 | -.0053 | .2468 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .236 | S= .008 | S= .001 | S= .001 | S= .393 | S= .487 | S= .178 | S= .273 | S= .487 | S= .062 |
| PLAN | .1949 | .3385 | -.2503 | .2719 | .1097 | .0286 | -.1093 | .2282 | -.0410 | .1493 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .114 | S= .016 | S= .060 | S= .045 | S= .250 | S= .430 | S= .251 | S= .078 | S= .401 | S= .179 |
| RMIN | -.0513 | .3642 | -.1601 | .1194 | -.0514 | .1028 | .0051 | -.0039 | -.0026 | 0 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .377 | S= .010 | S= .162 | S= .232 | S= .376 | S= .264 | S= .488 | S= .491 | S= .494 | S= .500 |
| PRENAT | -.0793 | .3745 | -.4551 | .5008 | -.0093 | .2559 | .1392 | .0403 | .0268 | .1508 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .313 | S= .009 | S= .002 | S= .001 | S= .477 | S= .055 | S= .196 | S= .403 | S= .435 | S= .177 |
| STRESS | -.1101 | -.2116 | .2361 | -.2531 | .0012 | -.3088 | -.4277 | -.0081 | .0693 | -.3499 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .249 | S= .095 | S= .071 | S= .058 | S= .497 | S= .026 | S= .003 | S= .480 | S= .336 | S= .013 |
| SEX | 1.0000 | -.0490 | -.0506 | .1131 | .2112 | .1724 | .2448 | .0329 | -.1242 | 0 |
| | ( 0) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .001 | S= .382 | S= .378 | S= .244 | S= .095 | S= .144 | S= .064 | S= .420 | S= .222 | S= .500 |
| TDELSC | -.0490 | 1.0000 | -.3500 | .4284 | .2408 | .0460 | -.0870 | .0738 | .1188 | .2856 |
| | ( 40) | ( 0) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .382 | S= .001 | S= .013 | S= .003 | S= .067 | S= .389 | S= .297 | S= .326 | S= .234 | S= .037 |
| FATP | -.0506 | -.3500 | 1.0000 | -.9583 | -.1547 | -.0635 | -.0949 | .0724 | .0482 | .0745 |
| | ( 40) | ( 40) | ( 0) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .378 | S= .013 | S= .001 | S= .001 | S= .170 | S= .349 | S= .280 | S= .329 | S= .384 | S= .324 |

FILE NONAME (CREATION DATE = 08/19/75 )

## PEARSON CORRELATION COEFFICIENTS

| | SEX | TOELSC | FATP | FATR | LENGTH | APGAR1 | APGAR2 | BRINT | BMOTOR | BSTATE |
|---|---|---|---|---|---|---|---|---|---|---|
| FATR | .1131 | .4284 | -.9583 | 1.0000 | .1993 | .0609 | .0303 | -.0231 | .0154 | -.0238 |
| | ( 40) | ( 40) | ( 40) | ( 0) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .244 | S= .003 | S= .001 | S= .001 | S= .109 | S= .355 | S= .426 | S= .444 | S= .462 | S= .442 |
| LENGTH | .2112 | .2408 | -.1547 | .1993 | 1.0000 | -.0225 | -.1246 | -.1722 | .0536 | -.0595 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 0) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .095 | S= .067 | S= .170 | S= .109 | S= .001 | S= .445 | S= .222 | S= .144 | S= .371 | S= .358 |
| APGAR1 | .1724 | .0460 | -.0635 | .0609 | -.0225 | 1.0000 | .5245 | -.0628 | -.2662 | -.0631 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 0) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .144 | S= .389 | S= .349 | S= .355 | S= .445 | S= .001 | S= .001 | S= .350 | S= .048 | S= .349 |
| APGAR2 | .2448 | -.0870 | -.0949 | .0303 | -.1246 | .5245 | 1.0000 | -.0755 | -.3246 | 0 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 0) | ( 40) | ( 40) | ( 40) |
| | S= .064 | S= .297 | S= .280 | S= .426 | S= .222 | S= .001 | S= .001 | S= .322 | S= .020 | S= .500 |
| BRINT | .0329 | .0738 | .0724 | -.0231 | -.1722 | -.0628 | -.0755 | 1.0000 | .2475 | .3236 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 0) | ( 40) | ( 40) |
| | S= .420 | S= .326 | S= .329 | S= .444 | S= .144 | S= .350 | S= .322 | S= .001 | S= .062 | S= .021 |
| BMOTOR | -.1242 | .1180 | .0482 | .0154 | .0536 | -.2662 | -.3246 | .2475 | 1.0000 | .2872 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 0) | ( 40) |
| | S= .222 | S= .234 | S= .384 | S= .462 | S= .371 | S= .048 | S= .020 | S= .062 | S= .001 | S= .036 |
| BSTATE | 0 | .2856 | .0745 | -.0238 | -.0595 | -.0631 | 0 | .3236 | .2872 | 1.0000 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 0) |
| | S= .500 | S= .037 | S= .324 | S= .442 | S= .358 | S= .349 | S= .500 | S= .021 | S= .036 | S= .001 |
| BPHSY | -.1863 | .2074 | -.1601 | .1535 | -.1446 | .1593 | -.0456 | .0348 | .0231 | .4774 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .125 | S= .100 | S= .162 | S= .172 | S= .187 | S= .163 | S= .390 | S= .416 | S= .444 | S= .001 |
| PHYAP | .0649 | -.1764 | .0442 | -.0989 | .0581 | -.0946 | -.1302 | -.0928 | -.1896 | .0000 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .345 | S= .138 | S= .393 | S= .272 | S= .361 | S= .281 | S= .212 | S= .284 | S= .121 | S= .500 |
| LOCK | .2155 | .0987 | .0206 | .0329 | -.2189 | .2689 | .2091 | .1385 | .0526 | -.0614 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .091 | S= .272 | S= .450 | S= .420 | S= .087 | S= .047 | S= .098 | S= .197 | S= .374 | S= .353 |
| MATRES | .0019 | .4720 | -.3292 | .3314 | -.1543 | .0587 | .2630 | .0063 | -.0497 | .1389 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .495 | S= .001 | S= .019 | S= .018 | S= .171 | S= .360 | S= .051 | S= .485 | S= .380 | S= .196 |
| MATPER | .2760 | .0774 | -.1213 | .0904 | .2528 | .0830 | .0729 | -.1024 | -.1616 | -.3375 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .042 | S= .318 | S= .228 | S= .290 | S= .058 | S= .305 | S= .327 | S= .265 | S= .160 | S= .017 |
| BOTHER | -.0424 | .0053 | -.2740 | .2726 | .2512 | .0602 | -.0349 | -.0187 | -.0124 | .1050 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .398 | S= .487 | S= .044 | S= .044 | S= .059 | S= .356 | S= .415 | S= .454 | S= .470 | S= .259 |

FILE NONAME (CREATION DATE = 08/19/75 )

- - - - - - - - - - - - PEARSON CORRELATION COEFFICIENTS - - - - - - - - - - -

| | SEX | TDELSC | FATP | FATR | LENGTH | APGAR1 | APGAR2 | BRINT | BMOTOR | BSTATE |
|---|---|---|---|---|---|---|---|---|---|---|
| IRRIT | .1228 | .0157 | -.1896 | .2566 | -.0963 | -.1569 | -.0608 | .0202 | -.0039 | -.0269 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .225 | S= .462 | S= .121 | S= .055 | S= .277 | S= .167 | S= .355 | S= .451 | S= .490 | S= .435 |
| CONCERN | -.1509 | .0146 | .0789 | -.0252 | .0281 | -.3139 | -.4031 | -.1725 | -.0844 | -.1765 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .176 | S= .464 | S= .314 | S= .439 | S= .432 | S= .024 | S= .005 | S= .144 | S= .302 | S= .138 |
| NEG | .0471 | -.1055 | -.2915 | .2974 | -.0679 | .1013 | .0348 | .1368 | -.1264 | -.0280 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .387 | S= .259 | S= .034 | S= .031 | S= .339 | S= .267 | S= .416 | S= .200 | S= .219 | S= .432 |
| PUNIT | .0645 | -.0184 | .0510 | .0228 | -.0664 | -.1997 | -.1307 | -.0184 | -.0319 | .0304 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .346 | S= .455 | S= .377 | S= .444 | S= .342 | S= .108 | S= .211 | S= .455 | S= .422 | S= .426 |
| IGN | .0083 | -.2175 | .2306 | -.2701 | .1055 | -.0872 | -.2136 | -.2026 | .0661 | -.2782 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .480 | S= .089 | S= .076 | S= .046 | S= .259 | S= .296 | S= .093 | S= .105 | S= .343 | S= .041 |
| REASUR | -.0921 | .1527 | .0146 | .0419 | -.0011 | -.1650 | -.1175 | .0369 | .0316 | -.1085 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .286 | S= .173 | S= .464 | S= .399 | S= .497 | S= .155 | S= .235 | S= .411 | S= .423 | S= .252 |
| DEPRES | -.1140 | .0923 | -.2186 | .3012 | -.1019 | -.2184 | -.4215 | -.0148 | -.0757 | -.1732 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .242 | S= .285 | S= .088 | S= .029 | S= .266 | S= .088 | S= .003 | S= .464 | S= .321 | S= .143 |
| HEALTH | 0 | .1917 | -.2309 | .2766 | .2247 | -.1467 | 0 | -.0836 | 0 | 0 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .500 | S= .118 | S= .076 | S= .042 | S= .082 | S= .183 | S= .500 | S= .304 | S= .500 | S= .500 |
| TSYMP | .1589 | -.3627 | .1389 | -.1615 | -.1342 | .0021 | .0570 | -.0092 | -.2510 | -.0353 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .164 | S= .011 | S= .196 | S= .160 | S= .204 | S= .495 | S= .364 | S= .478 | S= .059 | S= .415 |
| LOOK2 | .2945 | -.0123 | -.2515 | .2411 | -.1306 | .1192 | -.0716 | .2226 | -.0382 | 0 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .033 | S= .470 | S= .059 | S= .067 | S= .211 | S= .232 | S= .330 | S= .084 | S= .407 | S= .500 |
| THATRES | .2291 | .3497 | -.2781 | .2904 | -.0307 | .0382 | .0746 | .3340 | .0291 | .2033 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .078 | S= .013 | S= .041 | S= .035 | S= .425 | S= .408 | S= .324 | S= .018 | S= .429 | S= .104 |
| BRES | .1202 | .1542 | -.2874 | .2530 | -.1206 | .0518 | .1590 | -.0908 | -.1212 | -.1778 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .230 | S= .171 | S= .036 | S= .058 | S= .229 | S= .375 | S= .164 | S= .289 | S= .228 | S= .136 |
| ADJ1 | -.2101 | .2742 | -.1234 | .0920 | .4337 | -.0792 | -.3162 | -.0566 | -.0773 | .0000 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .097 | S= .043 | S= .224 | S= .286 | S= .003 | S= .313 | S= .023 | S= .364 | S= .318 | S= .500 |

FILE NONAME (CREATION DATE = 08/19/75 )

- - - - - - - - - - - - PEARSON CORRELATION COEFFICIENTS - - - - - - - - - - -

| | SEX | TDELSC | FATP | FATR | LENGTH | APGAR1 | APGAR2 | BRINT | BMOTOR | BSTATE |
|---|---|---|---|---|---|---|---|---|---|---|
| ADJ2 | -.0956 | .1709 | -.1512 | .0724 | .0170 | .1040 | -.0359 | -.0820 | -.0546 | -.0563 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .279 | S= .146 | S= .176 | S= .328 | S= .459 | S= .261 | S= .413 | S= .307 | S= .369 | S= .365 |
| ADJ3 | -.0742 | -.0225 | .0000 | -.1005 | .0167 | -.0533 | -.1393 | -.1593 | -.0303 | -.1563 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .325 | S= .445 | S= .500 | S= .269 | S= .459 | S= .372 | S= .196 | S= .163 | S= .426 | S= .168 |
| ADJ4 | -.0509 | .1419 | .0347 | -.0776 | .1207 | .0742 | .2338 | -.0778 | .1487 | .2586 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .378 | S= .191 | S= .416 | S= .317 | S= .229 | S= .325 | S= .073 | S= .317 | S= .180 | S= .054 |
| ATT1 | .1545 | .2280 | -.1637 | .1743 | -.3071 | .2033 | .1864 | -.0237 | .0105 | .2033 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .171 | S= .079 | S= .156 | S= .141 | S= .027 | S= .104 | S= .125 | S= .442 | S= .474 | S= .104 |
| ATT2 | .0289 | .1887 | -.0439 | .0982 | -.3174 | .1143 | .1375 | -.0731 | .0994 | .1636 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .430 | S= .122 | S= .394 | S= .273 | S= .023 | S= .241 | S= .199 | S= .327 | S= .271 | S= .157 |
| ATT3 | -.2115 | .0653 | .1456 | -.1130 | -.0277 | -.0313 | -.1994 | -.1791 | .1413 | -.0310 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .095 | S= .344 | S= .185 | S= .244 | S= .433 | S= .424 | S= .109 | S= .134 | S= .192 | S= .425 |
| RECALL2 | .0586 | -.3586 | -.0414 | .0529 | .0570 | .1822 | -.0471 | -.0240 | -.1355 | -.1542 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .360 | S= .012 | S= .400 | S= .373 | S= .363 | S= .130 | S= .386 | S= .442 | S= .202 | S= .171 |

FILE NONAME (CREATION DATE = 08/19/75 )

## PEARSON CORRELATION COEFFICIENTS

| | BPHSY | PHYAP | LOOK | MATRES | MATPER | BOTHER | IRRIT | CONCERN | NEG | PUNIT |
|---|---|---|---|---|---|---|---|---|---|---|
| CONC | .0119 | .0218 | -.1194 | -.3062 | -.0204 | .2840 | .0960 | .2277 | .0178 | .1327 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .471 | S= .447 | S= .231 | S= .027 | S= .450 | S= .038 | S= .278 | S= .079 | S= .457 | S= .207 |
| CLINIC | -.3477 | .2882 | -.1395 | -.1610 | .2580 | .1458 | -.1075 | .1673 | .1417 | .0503 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .014 | S= .036 | S= .195 | S= .160 | S= .054 | S= .185 | S= .255 | S= .151 | S= .192 | S= .379 |
| AGE | .1736 | -.2509 | .1313 | .4307 | .0198 | -.0223 | .0999 | -.4056 | .1880 | -.1093 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .142 | S= .059 | S= .210 | S= .003 | S= .452 | S= .446 | S= .270 | S= .005 | S= .123 | S= .251 |
| INCOME | .1837 | -.1756 | -.0171 | .3199 | -.1317 | -.0905 | .0261 | -.2830 | .0433 | -.0491 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .128 | S= .139 | S= .458 | S= .022 | S= .209 | S= .289 | S= .437 | S= .038 | S= .395 | S= .382 |
| ED | .0665 | -.3349 | .1510 | .2503 | -.0999 | .0819 | -.0041 | -.3299 | .2392 | -.1643 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .342 | S= .017 | S= .176 | S= .060 | S= .270 | S= .308 | S= .490 | S= .019 | S= .069 | S= .156 |
| LMAR | .1237 | -.1676 | .0083 | .4223 | -.0848 | -.0377 | .2115 | -.1783 | .1062 | .1369 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .223 | S= .151 | S= .480 | S= .003 | S= .302 | S= .409 | S= .095 | S= .135 | S= .257 | S= .200 |
| PLAN | .1523 | -.0376 | .1948 | .2059 | -.1518 | -.0662 | .1008 | -.0340 | -.1539 | .0077 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .174 | S= .409 | S= .114 | S= .101 | S= .175 | S= .342 | S= .268 | S= .418 | S= .171 | S= .481 |
| RMIN | .2308 | .0921 | .1286 | .3137 | -.1273 | .1600 | .0766 | .1525 | .2655 | -.2313 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .076 | S= .286 | S= .215 | S= .024 | S= .217 | S= .162 | S= .319 | S= .174 | S= .049 | S= .075 |
| PRENAT | .1863 | -.2439 | .3676 | .3625 | -.0307 | .1532 | .0781 | -.1685 | .2002 | -.1676 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .125 | S= .065 | S= .010 | S= .011 | S= .425 | S= .173 | S= .316 | S= .149 | S= .108 | S= .151 |
| STRESS | -.0939 | .2803 | .0630 | -.2883 | .0235 | .2622 | .2733 | .4033 | .0727 | .1537 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .282 | S= .040 | S= .350 | S= .036 | S= .443 | S= .051 | S= .044 | S= .005 | S= .328 | S= .172 |
| SEX | -.1863 | .0649 | .2155 | .0019 | .2760 | -.0424 | .1228 | -.1509 | .0471 | .0645 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .125 | S= .345 | S= .091 | S= .495 | S= .042 | S= .398 | S= .225 | S= .176 | S= .387 | S= .346 |
| TOELSC | .2074 | -.1764 | .0987 | .4720 | .0774 | .0053 | .0157 | .0146 | -.1055 | -.0184 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .100 | S= .138 | S= .272 | S= .001 | S= .318 | S= .487 | S= .462 | S= .464 | S= .259 | S= .455 |
| FATP | -.1601 | .0442 | .0206 | -.3292 | -.1213 | -.2740 | -.1896 | .0789 | -.2915 | .0510 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .162 | S= .393 | S= .450 | S= .019 | S= .228 | S= .044 | S= .121 | S= .314 | S= .034 | S= .377 |

FILE NONAME (CREATION DATE = 08/19/75 )

- - - - - - - - - - - - PEARSON CORRELATION COEFFICIENTS - - - - - - - - - - - -

| | BPHSY | PHYAP | LOOK | MATRES | MATPER | BOTHER | IRRIT | CONCERN | NEG | PUNIT |
|---|---|---|---|---|---|---|---|---|---|---|
| FATR | .1535 | -.0989 | .0329 | .3314 | .0904 | .2726 | .2566 | -.0252 | .2974 | .0228 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .172 | S= .272 | S= .420 | S= .018 | S= .290 | S= .044 | S= .055 | S= .439 | S= .031 | S= .444 |
| LENGTH | -.1446 | .0581 | -.2189 | -.1543 | .2528 | .2512 | -.0963 | .0281 | -.0679 | -.0664 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .187 | S= .361 | S= .087 | S= .171 | S= .058 | S= .059 | S= .277 | S= .432 | S= .339 | S= .342 |
| APGAR1 | .1593 | -.0946 | .2689 | .0587 | .0830 | .0602 | -.1569 | -.3139 | .1013 | -.1997 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .163 | S= .281 | S= .047 | S= .360 | S= .305 | S= .356 | S= .167 | S= .024 | S= .267 | S= .108 |
| APGAR2 | -.0456 | -.1302 | .2091 | .2630 | .0729 | -.0349 | -.0608 | -.4031 | .0348 | -.1307 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .390 | S= .212 | S= .098 | S= .051 | S= .327 | S= .415 | S= .355 | S= .005 | S= .416 | S= .211 |
| BRINT | .0348 | -.0928 | .1385 | .0063 | -.1024 | -.0187 | .0202 | -.1725 | .1368 | -.0184 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .416 | S= .284 | S= .197 | S= .485 | S= .265 | S= .454 | S= .451 | S= .144 | S= .200 | S= .455 |
| BMOTOR | .0231 | -.1896 | .0526 | -.0497 | -.1616 | -.0124 | -.0039 | -.0844 | -.1264 | -.0319 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .444 | S= .121 | S= .374 | S= .380 | S= .160 | S= .470 | S= .490 | S= .302 | S= .219 | S= .422 |
| BSTATE | .4774 | .0000 | -.0614 | .1389 | -.3375 | .1050 | -.0269 | -.1765 | -.0280 | .0304 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .001 | S= .500 | S= .353 | S= .196 | S= .017 | S= .259 | S= .435 | S= .138 | S= .432 | S= .426 |
| BPHSY | 1.0000 | .0213 | .0297 | .1810 | -.2525 | .1642 | .0622 | .1441 | -.0407 | -.0082 |
| | ( 0) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .001 | S= .448 | S= .428 | S= .132 | S= .058 | S= .156 | S= .352 | S= .187 | S= .402 | S= .480 |
| PHYAP | .0213 | 1.0000 | -.1339 | -.0126 | .1520 | .1686 | .0443 | .1600 | .2001 | .0248 |
| | ( 40) | ( 0) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .448 | S= .001 | S= .205 | S= .469 | S= .175 | S= .149 | S= .393 | S= .162 | S= .108 | S= .440 |
| LOOK | .0297 | -.1339 | 1.0000 | .3660 | .0991 | .0227 | .2031 | -.2578 | .0083 | -.0325 |
| | ( 40) | ( 40) | ( 0) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .428 | S= .205 | S= .001 | S= .010 | S= .272 | S= .445 | S= .104 | S= .054 | S= .480 | S= .421 |
| MATRES | .1810 | -.0126 | .3660 | 1.0000 | .0728 | -.1343 | .1757 | -.1603 | -.0436 | .1071 |
| | ( 40) | ( 40) | ( 40) | ( 0) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .132 | S= .469 | S= .010 | S= .001 | S= .328 | S= .204 | S= .139 | S= .162 | S= .395 | S= .255 |
| MATPER | -.2525 | .1520 | .0991 | .0728 | 1.0000 | -.2592 | -.1880 | -.3402 | -.1722 | -.2453 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 0) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .058 | S= .175 | S= .272 | S= .328 | S= .001 | S= .053 | S= .123 | S= .016 | S= .144 | S= .064 |
| BOTHER | .1642 | .1686 | .0227 | -.1343 | -.2592 | 1.0000 | .3906 | .2191 | .5636 | .2183 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 0) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .156 | S= .149 | S= .445 | S= .204 | S= .053 | S= .001 | S= .006 | S= .087 | S= .001 | S= .088 |

FILE NONAME (CREATION DATE = 08/19/75 )

## PEARSON CORRELATION COEFFICIENTS

| | BPHSY | PHYAP | LOOK | MATRES | MATPER | BOTHER | IRRIT | CONCERN | NEG | PUNIT |
|---|---|---|---|---|---|---|---|---|---|---|
| IRRIT | .0622 | .0443 | .2031 | .1757 | -.1880 | .3906 | 1.0000 | .4888 | .5637 | .6863 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 0) | ( 40) | ( 40) | ( 40) |
| | S= .352 | S= .393 | S= .104 | S= .139 | S= .123 | S= .006 | S= .001 | S= .001 | S= .001 | S= .001 |
| CONCERN | .1441 | .1600 | -.2578 | -.1603 | -.3402 | .2191 | .4888 | 1.0000 | .1750 | .4935 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 0) | ( 40) | ( 40) |
| | S= .187 | S= .162 | S= .054 | S= .162 | S= .016 | S= .087 | S= .001 | S= .001 | S= .140 | S= .001 |
| NEG | -.0407 | .2001 | .0083 | -.0436 | -.1722 | .5636 | .5637 | .1750 | 1.0000 | .2249 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 0) | ( 40) |
| | S= .402 | S= .108 | S= .480 | S= .395 | S= .144 | S= .001 | S= .001 | S= .140 | S= .001 | S= .082 |
| PUNIT | -.0082 | .0248 | -.0325 | .1071 | -.2453 | .2183 | .6863 | .4935 | .2249 | 1.0000 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 0) |
| | S= .480 | S= .440 | S= .421 | S= .255 | S= .064 | S= .088 | S= .001 | S= .001 | S= .082 | S= .001 |
| IGN | .0440 | .0413 | -.1865 | -.3171 | -.0182 | -.0958 | .2186 | .4083 | -.0666 | .2648 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .394 | S= .400 | S= .125 | S= .023 | S= .456 | S= .278 | S= .088 | S= .004 | S= .342 | S= .049 |
| REASUR | .0117 | -.0225 | -.1034 | .0498 | -.2220 | .2537 | .6054 | .5668 | .2211 | .6275 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .472 | S= .445 | S= .263 | S= .380 | S= .084 | S= .057 | S= .001 | S= .001 | S= .085 | S= .001 |
| DEPRES | -.0328 | .0030 | .1787 | .1222 | -.1265 | .2787 | .6051 | .3895 | .2512 | .5024 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .420 | S= .493 | S= .135 | S= .226 | S= .218 | S= .041 | S= .001 | S= .006 | S= .059 | S= .001 |
| HEALTH | 0 | -.3065 | -.1426 | .0932 | .0280 | -.0994 | .0417 | -.0638 | -.0217 | .0824 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .500 | S= .027 | S= .190 | S= .284 | S= .432 | S= .271 | S= .399 | S= .348 | S= .447 | S= .307 |
| TSYMP | .0951 | .2664 | .0481 | -.2369 | -.0087 | .4052 | .3362 | .2083 | .3432 | .2401 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .280 | S= .048 | S= .384 | S= .071 | S= .479 | S= .005 | S= .017 | S= .099 | S= .015 | S= .068 |
| LOOK2 | .0837 | -.0009 | .2378 | .0704 | -.0900 | -.0147 | -.0211 | -.2074 | .1981 | -.1944 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .304 | S= .498 | S= .070 | S= .333 | S= .290 | S= .464 | S= .449 | S= .099 | S= .110 | S= .115 |
| TMATRES | .0762 | -.1625 | .2532 | .5253 | .0084 | .0645 | .1696 | -.1928 | .1269 | -.0597 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .320 | S= .158 | S= .057 | S= .001 | S= .479 | S= .346 | S= .148 | S= .117 | S= .218 | S= .357 |
| BRES | -.0303 | -.1733 | .2429 | .3507 | .1573 | -.1286 | .2228 | -.0864 | -.0164 | .2906 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .426 | S= .142 | S= .065 | S= .013 | S= .166 | S= .215 | S= .083 | S= .298 | S= .460 | S= .034 |
| ADJ1 | .0956 | .2202 | -.3362 | -.0475 | .2445 | .0441 | -.3413 | -.0006 | -.1272 | -.2412 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .300 | S= .086 | S= .017 | S= .385 | S= .064 | S= .393 | S= .016 | S= .498 | S= .217 | S= .067 |

FILE NONAME (CREATION DATE = 08/19/75 )

- - - - - - - - - - - - PEARSON CORRELATION COEFFICIENTS - - - - - - - - - - - -

| | BPHSY | PHYAP | LOOK | MATRES | MATPER | BOTHER | IRRIT | CONCERN | NEG | PUNIT |
|---|---|---|---|---|---|---|---|---|---|---|
| ADJ2 | .0605 | .2842 | .0233 | .2958 | .1314 | -.2101 | -.2559 | -.1611 | .0391 | -.2120 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .355 | S= .038 | S= .443 | S= .032 | S= .209 | S= .097 | S= .055 | S= .160 | S= .405 | S= .095 |
| ADJ3 | -.1343 | -.1669 | -.0388 | -.1328 | .2119 | -.2560 | -.2517 | -.1308 | -.2326 | -.2780 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .204 | S= .152 | S= .406 | S= .207 | S= .095 | S= .055 | S= .059 | S= .211 | S= .074 | S= .041 |
| ADJ4 | -.0167 | .0138 | .0479 | -.0246 | .1164 | -.0019 | -.1224 | -.4541 | -.0917 | -.2034 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .459 | S= .466 | S= .385 | S= .440 | S= .237 | S= .495 | S= .226 | S= .002 | S= .287 | S= .104 |
| ATT1 | .1048 | .1062 | .2606 | .1173 | -.0529 | .0290 | -.0473 | -.2446 | .1252 | -.1447 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .260 | S= .257 | S= .052 | S= .236 | S= .373 | S= .429 | S= .386 | S= .064 | S= .221 | S= .187 |
| ATT2 | .0773 | .0136 | -.0533 | -.0196 | -.2396 | -.1653 | -.1795 | -.0672 | .0565 | -.1723 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .318 | S= .467 | S= .372 | S= .452 | S= .068 | S= .154 | S= .134 | S= .340 | S= .364 | S= .144 |
| ATT3 | -.1566 | -.0911 | -.1615 | -.1300 | .0261 | .0386 | .0265 | .0982 | .2290 | .0265 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .167 | S= .288 | S= .160 | S= .212 | S= .437 | S= .407 | S= .436 | S= .273 | S= .078 | S= .435 |
| RECALL2 | .1080 | .1604 | -.0886 | -.3218 | .0468 | .2540 | .0493 | .1555 | .2615 | .1097 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .257 | S= .149 | S= .293 | S= .021 | S= .387 | S= .057 | S= .381 | S= .169 | S= .052 | S= .250 |

FILE NONAME (CREATION DATE = 08/19/75 )

- - - - - - - - - - - - PEARSON CORRELATION COEFFICIENTS - - - - - - - - - - - -

| | IGN | REASUR | DEPRES | HEALTH | TSYMP | LOOK2 | TMATRES | BRES | ADJ1 | ADJ2 |
|---|---|---|---|---|---|---|---|---|---|---|
| CONC | .0804 | .1049 | .0120 | -.2651 | .1948 | -.4659 | -.2833 | -.4349 | -.0251 | -.4024 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .311 | S= .260 | S= .471 | S= .049 | S= .114 | S= .001 | S= .038 | S= .003 | S= .439 | S= .005 |
| CLINIC | .1336 | .0623 | -.0854 | -.3039 | .0375 | -.1897 | -.2122 | -.1158 | .0785 | .0249 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .205 | S= .351 | S= .300 | S= .028 | S= .409 | S= .121 | S= .094 | S= .238 | S= .315 | S= .439 |
| AGE | -.4880 | -.1450 | .1685 | .3144 | -.3102 | .3741 | .6225 | .2744 | .1836 | .1925 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .001 | S= .186 | S= .149 | S= .024 | S= .026 | S= .009 | S= .001 | S= .043 | S= .128 | S= .117 |
| INCOME | -.5060 | -.2026 | .1270 | .4111 | -.2591 | .3192 | .5936 | .2578 | .1893 | .1246 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .001 | S= .105 | S= .217 | S= .004 | S= .053 | S= .022 | S= .001 | S= .054 | S= .121 | S= .222 |
| ED | -.5480 | -.1914 | .0851 | .3652 | -.1532 | .3645 | .5657 | .1673 | .1358 | .2914 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .001 | S= .118 | S= .301 | S= .010 | S= .173 | S= .010 | S= .001 | S= .151 | S= .202 | S= .034 |
| LMAR | -.3332 | -.0295 | .1433 | .5097 | -.3263 | .3224 | .5570 | .4505 | .1619 | .0417 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .018 | S= .428 | S= .189 | S= .001 | S= .020 | S= .021 | S= .001 | S= .002 | S= .159 | S= .399 |
| PLAN | .0687 | -.1568 | .2771 | -.1156 | -.0857 | .3555 | .2755 | .0116 | -.0968 | .0189 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .337 | S= .167 | S= .042 | S= .239 | S= .300 | S= .012 | S= .043 | S= .472 | S= .276 | S= .454 |
| RMIN | -.0908 | .0816 | .0182 | .1233 | -.1179 | .2386 | .3988 | .0782 | .1076 | .1816 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .289 | S= .308 | S= .456 | S= .224 | S= .234 | S= .069 | S= .005 | S= .316 | S= .254 | S= .131 |
| PRENAT | -.5192 | -.0552 | .0587 | .2920 | -.1470 | .0969 | .3930 | .1776 | .0437 | .1720 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .001 | S= .367 | S= .359 | S= .034 | S= .183 | S= .276 | S= .006 | S= .136 | S= .394 | S= .144 |
| STRESS | .2611 | .3825 | .4115 | -.2026 | .3965 | -.1218 | -.2516 | -.1552 | -.1292 | -.0741 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .052 | S= .007 | S= .004 | S= .105 | S= .006 | S= .227 | S= .059 | S= .169 | S= .213 | S= .325 |
| SEX | .0083 | -.0921 | -.1140 | 0 | .1589 | .2945 | .2291 | .1202 | -.2101 | -.0956 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .480 | S= .286 | S= .242 | S= .500 | S= .164 | S= .033 | S= .078 | S= .230 | S= .097 | S= .279 |
| TOELSC | -.2175 | .1527 | .0923 | .1917 | -.3627 | -.0123 | .3497 | .1542 | .2742 | .1709 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .089 | S= .173 | S= .285 | S= .118 | S= .011 | S= .470 | S= .013 | S= .171 | S= .043 | S= .146 |
| FATP | .2306 | .0146 | -.2186 | -.2309 | .1389 | -.2515 | -.2781 | -.2874 | -.1234 | -.1512 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .075 | S= .464 | S= .088 | S= .076 | S= .196 | S= .059 | S= .041 | S= .036 | S= .224 | S= .176 |

FILE NONAME (CREATION DATE = 08/19/75 )

## PEARSON CORRELATION COEFFICIENTS

| | IGN | REASUR | DEPRES | HEALTH | TSYMP | LOOK2 | THATRES | BRES | ADJ1 | ADJ2 |
|---|---|---|---|---|---|---|---|---|---|---|
| FATR | -.2701 | .0419 | .3012 | .2766 | -.1615 | .2411 | .2904 | .2530 | .0920 | .0724 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .046 | S= .399 | S= .029 | S= .042 | S= .160 | S= .067 | S= .035 | S= .058 | S= .286 | S= .328 |
| LENGTH | .1055 | -.0011 | -.1019 | .2247 | -.1342 | -.1306 | -.0307 | -.1206 | .4337 | .0170 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .259 | S= .497 | S= .266 | S= .082 | S= .204 | S= .211 | S= .425 | S= .229 | S= .003 | S= .459 |
| APGAR1 | -.0872 | -.1650 | -.2184 | -.1467 | .0021 | .1192 | .0382 | .0518 | -.0792 | .1040 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .296 | S= .155 | S= .088 | S= .183 | S= .495 | S= .232 | S= .408 | S= .375 | S= .313 | S= .261 |
| APGAR2 | -.2136 | -.1175 | -.4215 | 0 | .0570 | -.0716 | .0746 | .1590 | -.3162 | -.0359 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .093 | S= .235 | S= .003 | S= .500 | S= .364 | S= .330 | S= .324 | S= .164 | S= .023 | S= .413 |
| BRINT | -.2026 | .0369 | -.0148 | -.0836 | -.0092 | .2226 | .3340 | -.0908 | -.0566 | -.0820 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .105 | S= .411 | S= .464 | S= .304 | S= .478 | S= .084 | S= .018 | S= .289 | S= .364 | S= .307 |
| BMOTOR | .0661 | .0316 | -.0757 | 0 | -.2510 | -.0382 | .0291 | -.1212 | -.0773 | -.0546 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .343 | S= .423 | S= .321 | S= .500 | S= .059 | S= .407 | S= .429 | S= .228 | S= .318 | S= .369 |
| BSTATE | -.2782 | -.1085 | -.1732 | 0 | -.0353 | 0 | .2033 | -.1776 | .0000 | -.0563 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .041 | S= .252 | S= .143 | S= .500 | S= .415 | S= .500 | S= .104 | S= .136 | S= .500 | S= .365 |
| BPHSY | .0440 | .0117 | -.0328 | 0 | .0951 | .0837 | .0762 | -.0303 | .0856 | .0605 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .394 | S= .472 | S= .420 | S= .500 | S= .280 | S= .304 | S= .320 | S= .426 | S= .300 | S= .355 |
| PHYAP | .0413 | -.0225 | .0030 | -.3065 | .2664 | -.0009 | -.1625 | -.1733 | .2202 | .2842 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .400 | S= .445 | S= .493 | S= .027 | S= .048 | S= .498 | S= .158 | S= .142 | S= .086 | S= .038 |
| LOOK | -.1865 | -.1034 | .1787 | -.1426 | .0481 | .2378 | .2532 | .2429 | -.3362 | .0233 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .125 | S= .263 | S= .135 | S= .190 | S= .384 | S= .070 | S= .057 | S= .065 | S= .017 | S= .443 |
| MATRES | -.3171 | .0498 | .1222 | .0932 | -.2369 | .0704 | .5253 | .3507 | -.0475 | .2958 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .023 | S= .380 | S= .226 | S= .284 | S= .071 | S= .333 | S= .001 | S= .013 | S= .385 | S= .032 |
| MATPER | -.0182 | -.2220 | -.1265 | .0280 | -.0087 | -.0900 | .0084 | .1573 | .2445 | .1314 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .456 | S= .084 | S= .218 | S= .432 | S= .479 | S= .290 | S= .479 | S= .166 | S= .064 | S= .209 |
| BOTHER | -.0958 | .2537 | .2787 | -.0994 | .4052 | -.0147 | .0645 | -.1286 | .0441 | -.2101 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .278 | S= .057 | S= .041 | S= .271 | S= .005 | S= .464 | S= .346 | S= .215 | S= .393 | S= .097 |

FILE NONAME (CREATION DATE = 08/19/75 )

## PEARSON CORRELATION COEFFICIENTS

| | IGN | REASUR | DEPRES | HEALTH | TSYMP | LOOK2 | TMATRES | BRES | ADJ1 | ADJ2 |
|---|---|---|---|---|---|---|---|---|---|---|
| IRRIT | .2186 | .6054 | .6051 | .0417 | .3362 | -.0211 | .1696 | .2228 | -.3413 | -.2559 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .088 | S= .001 | S= .001 | S= .399 | S= .017 | S= .449 | S= .148 | S= .083 | S= .016 | S= .055 |
| CONCERN | .4083 | .5668 | .3895 | -.0638 | .2083 | -.2074 | -.1928 | -.0864 | -.0006 | -.1611 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .004 | S= .001 | S= .006 | S= .348 | S= .099 | S= .099 | S= .117 | S= .298 | S= .498 | S= .160 |
| NEG | -.0666 | .2211 | .2512 | -.0217 | .3432 | .1981 | .1269 | -.0164 | -.1272 | .0391 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .342 | S= .085 | S= .059 | S= .447 | S= .015 | S= .110 | S= .218 | S= .460 | S= .217 | S= .405 |
| PUNIT | .2648 | .6275 | .5024 | .0824 | .2401 | -.1944 | -.0597 | .2906 | -.2412 | -.2120 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .049 | S= .001 | S= .001 | S= .307 | S= .068 | S= .115 | S= .357 | S= .034 | S= .067 | S= .095 |
| IGN | 1.0000 | .1975 | -.0668 | -.2155 | .1056 | -.1094 | -.3937 | -.0312 | -.1649 | -.1701 |
| | ( 0) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .001 | S= .111 | S= .341 | S= .091 | S= .258 | S= .251 | S= .006 | S= .424 | S= .155 | S= .147 |
| REASUR | .1975 | 1.0000 | .3930 | .1766 | .1281 | -.2973 | -.0440 | .1506 | -.0869 | -.1706 |
| | ( 40) | ( 0) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .111 | S= .001 | S= .006 | S= .138 | S= .215 | S= .031 | S= .394 | S= .177 | S= .297 | S= .146 |
| DEPRES | -.0668 | .3930 | 1.0000 | .0789 | .1000 | .0331 | .0844 | .2409 | -.0927 | -.1395 |
| | ( 40) | ( 40) | ( 0) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .341 | S= .006 | S= .001 | S= .314 | S= .270 | S= .420 | S= .302 | S= .067 | S= .285 | S= .195 |
| HEALTH | -.2155 | .1766 | .0789 | 1.0000 | -.4847 | .1117 | .2995 | .4533 | .3325 | .0436 |
| | ( 40) | ( 40) | ( 40) | ( 0) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .091 | S= .138 | S= .314 | S= .001 | S= .001 | S= .246 | S= .030 | S= .002 | S= .018 | S= .395 |
| TSYMP | .1056 | .1281 | .1000 | -.4847 | 1.0000 | -.1548 | -.2474 | -.4122 | -.3761 | -.0950 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 0) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .258 | S= .215 | S= .270 | S= .001 | S= .001 | S= .170 | S= .062 | S= .004 | S= .008 | S= .280 |
| LOOK2 | -.1094 | -.2973 | .0331 | .1117 | -.1548 | 1.0000 | .5337 | .2725 | .1663 | .1243 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 0) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .251 | S= .031 | S= .420 | S= .246 | S= .170 | S= .001 | S= .001 | S= .044 | S= .152 | S= .222 |
| TMATRES | -.3937 | -.0440 | .0844 | .2995 | -.2474 | .5337 | 1.0000 | .3683 | .2999 | .0708 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 0) | ( 40) | ( 40) | ( 40) |
| | S= .006 | S= .394 | S= .302 | S= .030 | S= .062 | S= .001 | S= .001 | S= .010 | S= .030 | S= .332 |
| BRES | -.0312 | .1506 | .2409 | .4533 | -.4122 | .2725 | .3683 | 1.0000 | .0781 | .2517 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 0) | ( 40) | ( 40) |
| | S= .424 | S= .177 | S= .067 | S= .002 | S= .004 | S= .044 | S= .010 | S= .001 | S= .316 | S= .059 |
| ADJ1 | -.1649 | -.0869 | -.0927 | .3325 | -.3761 | .1663 | .2999 | .0781 | 1.0000 | .2332 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 0) | ( 40) |
| | S= .155 | S= .297 | S= .285 | S= .018 | S= .008 | S= .152 | S= .030 | S= .316 | S= .001 | S= .074 |

FILE NONAME (CREATION DATE = 08/19/75 )

- - - - - - - - - - - - - PEARSON CORRELATION COEFFICIENTS - - - - - - - - - - - -

| | IGN | REASUR | DEPRES | HEALTH | TSYMP | LOOK2 | TMATRES | BRES | ADJ1 | ADJ2 |
|---|---|---|---|---|---|---|---|---|---|---|
| ADJ2 | -.1701 | -.1706 | -.1395 | .0436 | -.0950 | .1243 | .0708 | .2517 | .2332 | 1.0000 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 0) |
| | S= .147 | S= .146 | S= .195 | S= .395 | S= .280 | S= .222 | S= .332 | S= .059 | S= .074 | S= .001 |
| ADJ3 | .0345 | -.1450 | -.1074 | -.1210 | .0180 | -.0892 | -.0858 | -.1955 | .1466 | .1585 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .416 | S= .186 | S= .255 | S= .228 | S= .456 | S= .292 | S= .299 | S= .113 | S= .183 | S= .164 |
| ADJ4 | .0590 | -.1238 | -.4006 | .1602 | -.2171 | -.0262 | -.0098 | .1262 | .0557 | .0918 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .359 | S= .223 | S= .005 | S= .162 | S= .089 | S= .436 | S= .476 | S= .219 | S= .367 | S= .287 |
| ATT1 | -.1198 | -.1430 | .0149 | -.3150 | .1174 | .0169 | -.0053 | -.0444 | -.2154 | .1237 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .231 | S= .189 | S= .464 | S= .024 | S= .235 | S= .459 | S= .487 | S= .393 | S= .091 | S= .223 |
| ATT2 | -.1133 | -.2142 | -.1470 | -.1267 | -.1987 | .1554 | -.0491 | .0483 | -.0054 | .1493 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .243 | S= .092 | S= .183 | S= .218 | S= .110 | S= .169 | S= .382 | S= .384 | S= .487 | S= .179 |
| ATT3 | -.0057 | .0470 | .1009 | -.1441 | -.0119 | -.0849 | -.1510 | -.1500 | -.0590 | -.0079 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .486 | S= .387 | S= .268 | S= .187 | S= .471 | S= .301 | S= .176 | S= .178 | S= .359 | S= .481 |
| RECALL2 | .0545 | .0663 | -.0170 | -.0717 | .2696 | .1826 | -.0872 | -.1764 | .2928 | -.1564 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .369 | S= .342 | S= .459 | S= .330 | S= .046 | S= .130 | S= .296 | S= .138 | S= .033 | S= .168 |

FILE NONAME (CREATION DATE = 08/19/75 )

- - - - - - - - - - - - PEARSON CORRELATION COEFFICIENTS - - - - - - - - - - -

| | ADJ3 | ADJ4 | ATT1 | ATT2 | ATT3 | RECALL2 |
|---|---|---|---|---|---|---|
| CONC | -.0563 | -.0709 | -.1432 | -.1669 | .1523 | .1752 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .365 | S= .332 | S= .189 | S= .152 | S= .174 | S= .140 |
| CLINIC | -.0276 | -.2260 | -.1579 | -.1646 | .1218 | .2396 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .433 | S= .080 | S= .165 | S= .155 | S= .227 | S= .068 |
| AGE | -.0264 | .0359 | .0825 | .0741 | -.1568 | -.1586 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .436 | S= .413 | S= .306 | S= .325 | S= .167 | S= .164 |
| INCOME | .0359 | -.0270 | .0691 | .0712 | -.2718 | -.1484 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .413 | S= .434 | S= .336 | S= .331 | S= .045 | S= .180 |
| ED | .0373 | .0432 | .0949 | .0599 | .0276 | -.1931 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .410 | S= .396 | S= .280 | S= .357 | S= .433 | S= .116 |
| LMAR | -.1620 | -.0217 | .0361 | .1276 | -.3160 | -.0700 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .159 | S= .447 | S= .412 | S= .216 | S= .023 | S= .334 |
| PLAN | .0105 | -.1094 | .1420 | -.0637 | -.1947 | -.2933 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .474 | S= .251 | S= .191 | S= .348 | S= .114 | S= .031 |
| RMIN | -.1902 | .0019 | .1631 | .1007 | .1210 | -.2474 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .120 | S= .495 | S= .157 | S= .268 | S= .228 | S= .062 |
| PRENAT | .0212 | .1210 | .0662 | .0155 | -.0831 | -.1423 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .448 | S= .228 | S= .342 | S= .462 | S= .305 | S= .191 |
| STRESS | .0147 | -.2304 | -.0795 | -.3829 | .2645 | -.0404 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .464 | S= .076 | S= .313 | S= .007 | S= .050 | S= .402 |
| SEX | -.0742 | -.0509 | .1545 | .0289 | -.2115 | .0586 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .325 | S= .378 | S= .171 | S= .430 | S= .095 | S= .360 |
| TDELSC | -.0225 | .1419 | .2280 | .1887 | .0653 | -.3586 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .445 | S= .191 | S= .079 | S= .122 | S= .344 | S= .012 |
| FATP | .0000 | .0347 | -.1637 | -.0439 | .1456 | -.0414 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .500 | S= .416 | S= .156 | S= .394 | S= .185 | S= .400 |

FILE MONAME (CREATION DATE = 08/19/75 )

- - - - - - - - - - - - - PEARSON CORRELATION COEFFICIENTS - - - - - - - - - - - -

| | ADJ3 | ADJ4 | ATT1 | ATT2 | ATT3 | RECALL2 |
|---|---|---|---|---|---|---|
| FATR | -.1005 | -.0776 | .1743 | .0982 | -.1130 | .0529 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .269 | S= .317 | S= .141 | S= .273 | S= .244 | S= .373 |
| LENGTH | .0167 | .1207 | -.3071 | -.3174 | -.0277 | .0570 |
| | ( 40) | ( 40) | ( 40) | ( 43) | ( 40) | ( 40) |
| | S= .459 | S= .229 | S= .027 | S= .023 | S= .433 | S= .363 |
| APGAR1 | -.0533 | .0742 | .2033 | .1143 | -.0313 | .1822 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .372 | S= .325 | S= .104 | S= .241 | S= .424 | S= .130 |
| APGAR2 | -.1393 | .2338 | .1864 | .1375 | -.1994 | -.0471 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .196 | S= .073 | S= .125 | S= .199 | S= .109 | S= .386 |
| BRINT | -.1593 | -.0778 | -.0237 | -.0731 | -.1791 | -.0240 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .163 | S= .317 | S= .442 | S= .327 | S= .134 | S= .442 |
| BMOTOR | -.0303 | .1487 | .0105 | .0994 | .1413 | -.1355 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .426 | S= .180 | S= .474 | S= .271 | S= .192 | S= .202 |
| BSTATE | -.1563 | .2586 | .2033 | .1636 | -.0310 | -.1542 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .168 | S= .054 | S= .104 | S= .157 | S= .425 | S= .171 |
| BPMSY | -.1343 | -.0167 | .1048 | .0773 | -.1566 | .1060 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .204 | S= .459 | S= .260 | S= .318 | S= .167 | S= .257 |
| PHYAP | -.1669 | .0138 | .1062 | .0136 | -.0911 | .1684 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .152 | S= .466 | S= .257 | S= .467 | S= .288 | S= .149 |
| LOCK | -.0388 | .0479 | .2606 | -.0533 | -.1615 | -.0886 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .406 | S= .385 | S= .052 | S= .372 | S= .160 | S= .293 |
| MATRES | -.1328 | -.0246 | .1173 | -.0196 | -.1300 | -.3218 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .207 | S= .440 | S= .236 | S= .452 | S= .212 | S= .021 |
| MATPER | .2119 | .1164 | -.0529 | -.2396 | .0261 | .0468 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .095 | S= .237 | S= .373 | S= .068 | S= .437 | S= .387 |
| BOTHER | -.2560 | -.0019 | .0290 | -.1653 | .0386 | .2540 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .055 | S= .495 | S= .429 | S= .154 | S= .407 | S= .057 |

FILE NONAME (CREATION DATE = 08/19/75 )

- - - - - - - - - - - - PEARSON CORRELATION COEFFICIENTS - - - - - - - - - - - -

| | ADJ3 | ADJ4 | ATT1 | ATT2 | ATT3 | RECALL2 |
|---|---|---|---|---|---|---|
| IRRIT | -.2517 | -.1224 | -.0473 | -.1795 | .0265 | .0493 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .059 | S= .226 | S= .386 | S= .134 | S= .436 | S= .381 |
| CONCERN | -.1308 | -.4541 | -.2446 | -.0672 | .0982 | .1555 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .211 | S= .002 | S= .064 | S= .340 | S= .273 | S= .169 |
| NEG | -.2326 | -.0917 | .1252 | .0565 | .2290 | .2615 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .074 | S= .287 | S= .221 | S= .364 | S= .078 | S= .052 |
| PUNIT | -.2780 | -.2034 | -.1447 | -.1723 | .0265 | .1097 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .041 | S= .104 | S= .187 | S= .144 | S= .435 | S= .250 |
| IGN | .0345 | .0590 | -.1198 | -.1133 | -.0057 | .0545 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .416 | S= .359 | S= .231 | S= .243 | S= .486 | S= .369 |
| REASUR | -.1450 | -.1238 | -.1430 | -.2142 | .0470 | .0663 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .186 | S= .223 | S= .189 | S= .092 | S= .387 | S= .342 |
| DEPRES | -.1074 | -.4006 | .0149 | -.1470 | .1009 | -.0170 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .255 | S= .005 | S= .464 | S= .183 | S= .268 | S= .459 |
| HEALTH | -.1210 | .1602 | -.3150 | -.1267 | -.1441 | -.0717 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .228 | S= .162 | S= .024 | S= .218 | S= .187 | S= .330 |
| TSYMP | .0180 | -.2171 | .1174 | -.1987 | -.0119 | .2696 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .456 | S= .089 | S= .235 | S= .110 | S= .471 | S= .046 |
| LOOK2 | -.0892 | -.0262 | .0169 | .1554 | -.0949 | .1826 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .292 | S= .436 | S= .459 | S= .169 | S= .301 | S= .130 |
| TMATRES | -.0858 | -.0098 | -.0053 | -.0491 | -.1510 | -.0872 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .299 | S= .476 | S= .487 | S= .382 | S= .176 | S= .296 |
| BRES | -.1955 | .1262 | -.0444 | .0483 | -.1500 | -.1764 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .113 | S= .219 | S= .393 | S= .384 | S= .178 | S= .138 |
| ADJ1 | .1466 | .0557 | -.2154 | -.0054 | -.0590 | .2928 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .183 | S= .367 | S= .091 | S= .487 | S= .359 | S= .033 |

FILE NONAME (CREATION DATE = 08/19/75 )

## PEARSON CORRELATION COEFFICIENTS

| | ADJ3 | ADJ4 | ATT1 | ATT2 | ATT3 | RECALL2 |
|---|---|---|---|---|---|---|
| ADJ2 | .1585 | .0918 | .1237 | .1493 | -.0079 | -.1564 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .164 | S= .287 | S= .223 | S= .179 | S= .481 | S= .168 |
| ADJ3 | 1.0000 | -.0145 | .0629 | -.0782 | .0741 | .0998 |
| | ( 0) | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .001 | S= .465 | S= .350 | S= .316 | S= .325 | S= .270 |
| ADJ4 | -.0145 | 1.0000 | .1060 | .1112 | -.0152 | -.3043 |
| | ( 40) | ( 0) | ( 40) | ( 40) | ( 40) | ( 40) |
| | S= .465 | S= .001 | S= .258 | S= .247 | S= .463 | S= .028 |
| ATT1 | .0629 | .1060 | 1.0000 | .6178 | .0953 | -.0497 |
| | ( 40) | ( 40) | ( 0) | ( 40) | ( 40) | ( 40) |
| | S= .350 | S= .258 | S= .001 | S= .001 | S= .279 | S= .380 |
| ATT2 | -.0782 | .1112 | .6178 | 1.0000 | .1068 | .0799 |
| | ( 40) | ( 40) | ( 40) | ( 0) | ( 40) | ( 40) |
| | S= .316 | S= .247 | S= .001 | S= .001 | S= .256 | S= .312 |
| ATT3 | .0741 | -.0152 | .0953 | .1068 | 1.0000 | -.0585 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 0) | ( 40) |
| | S= .325 | S= .463 | S= .279 | S= .256 | S= .001 | S= .360 |
| RECALL2 | .0998 | -.3043 | -.0497 | .0799 | -.0585 | 1.0000 |
| | ( 40) | ( 40) | ( 40) | ( 40) | ( 40) | ( 0) |
| | S= .270 | S= .028 | S= .380 | S= .312 | S= .360 | S= .001 |

A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED.

# APPENDIX K

## PEARSON PRODUCT MOMENT CORRELATION COEFFICIENTS OF RESPONSES TO INTERVIEW QUESTIONS AND BACKGROUND VARIABLES, NEONATAL CHARACTERISTICS, MATERNAL RESPONSIVENESS IN THE DELIVERY ROOM AND DURING FEEDINGS, AND MOTHER-INFANT ADJUSTMENT ASSESSED FOUR WEEKS FOLLOWING DELIVERY

APPENDIX K

TABLE K1.--Pearson Product Moment Correlation Coefficients of Responses to Interview Questions and Background Variables, Neonatal Characteristics, Maternal Responsiveness in Delivery Room and During Feedings, and Mother-Infant Adjustment Assessed Four Weeks Following Delivery.

| | | | | |
|---|---|---|---|---|
| Maternal perception of overall adjustment[a] | | | | |
| overall health[b] | total no. symptoms[b] | irritability[b] | recall of dif. of labor and delivery | total score mat. resp. during home feeding |
| .3325 | -.3761 | -.3413 | .2928 | .2999 |
| Maternal perception of mother-infant reciprocity[a] | | | | |
| per. resources for child rearing[d] | | education | irritability[b] | |
| -.4024 | | .2914 | -.2559 | |
| Maternal perception of infant's adjustment[a] | | | | |
| bother inventory[b] | punitiveness[b] | | | |
| -.2560 | -.2780 | | | |
| Maternal perception of personal adjustment[a] | | | | |
| newborn state control | concern for baby[b] | | | |
| .2586 | -.4541 | | | |
| Onset of maternal feelings of attachment[c] | | | | |
| overall health[b] | onset of recognition of baby as person[c] | | | |
| -.3150 | .6178 | | | |
| Onset of maternal recognition of baby as person[c] | | | | |
| stress during pregnancy | onset of maternal feelings of attachment[c] | | | |
| -.3829 | .6178 | | | |
| Onset of mother's perception of baby's recognition of her[c] | | | | |
| income | | | | |
| -.2718 | | | | |
| Maternal recall of difficulty of labor and delivery[e] | | | | |
| planning of pregnancy | total score of mat. responsiveness in the delivery room | | total score of mat. responsiveness during hospital feeding | |
| -.2983 | -.3586 | | -.3218 | |
| negative aspect of caregiving[b] | total No. symptoms[b] | | maternal perception of overall adjustment[a] | |
| -2615 | .2696 | | .2928 | |
| maternal perception of personal adjustment[a] | | | | |
| -.3043 | | | | |

Note. Only correlations with $p < .05$ are reported.
[a]Scale from Mother-Infant Adaptation Interview (Kennedy, 1969).
[b]Scale from Postpartum Research Inventory (Schaefer & Manheimer, Note 2).
[c]Attachment questions (Robson & Moss, 1970).
[d]Total concern score, Survey on Bringing Up Children (Helfer & Schneider, 1975).
[e]Recall questions from Interview Assessment of Mother-Infant Adaptation.

# APPENDIX L

## PEARSON PRODUCT MOMENT CORRELATION COEFFICIENTS OF MATERNAL RESPONSIVENESS DURING A FEEDING FOUR WEEKS FOLLOWING DELIVERY AND MEASURES OF MOTHER-INFANT ADJUSTMENT FOUR WEEKS FOLLOWING DELIVERY

## APPENDIX L

TABLE L1.--Pearson Product Moment Correlation Coefficients of Maternal Responsiveness during a Feeding Four Weeks Following Delivery and Measures of Mother-Infant Adjustment Four Weeks Following Delivery.

| Total score of maternal responsiveness during feeding: | | |
|---|---|---|
| ignore baby[a] | overall health[a] | baby responsiveness during feeding |
| -.3937 | .2995 | .3683 |

| maternal perception of overall adjustment[b] |
|---|
| .2999 |

Note. Only correlations with $p < .05$ are reported.

[a]Scale from Postpartum Research Inventory (Schaefer & Manheimer, Note 2).

[b]Scale from Mother-Infant Adaptation Interview (Kennedy, 1969).

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