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THE EFFECTS OF PERINATAL COACHING ON MOTHER-INFANT INTERACTIONS

By

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ABSTRACT

THE EFFECTS OF PERINATAL COACHING ON MOTHER-INFANT INTERACTIONS

By

Martha Wingerd Bristor

The objective of this study was to evaluate the effects of perinatal coaching on mother-infant interactions, stress in the parenting system, and maternal adaptation. Perinatal coaching is a program in which communication skills are taught to mothers. Forty-two first time mothers and their clinically well newborns delivered in Sparrow Hospital were the sample. All mothers and infants were from one private pediatric practice in Lansing, Michigan. Twenty-one of the mothers received perinatal coaching on days one, two, and seven postpartum, while the remaining 21 served as the control group. Three standardized self-report instruments, videotaped recordings of mother-infant interactions, and demographic information collected 28 days postpartum were used for evaluation.

Three major hypotheses looking at mother-infant interactions, stress in the parenting system, and maternal adaptation were tested. Data related to the description of the sample and demographic information were also analyzed.

The coached and control groups were found to be comparable on all descriptive data analyses performed. The test of the first hypothesis, in which nine mother-infant interactions coded from videotaped sessions in the home were examined, showed that the coached mother-infant pairs scored significantly higher on five of the nine behaviors (vocalizations, pitch of voice, feeding time, movement by

mother, and engagement of baby). No difference was found between groups on stress in the parenting system and maternal adaptation so the second and third hypotheses were rejected. Perinatal coaching was effective as documented by the behavioral assessments 28 days postpartum.

To Stephen, Michael, and Kirk

May you uncover the beauty to be found in books

With love,

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Giving due credit to those teachers, co-workers, friends, and family who have been helpful during this effort is difficult. Hopefully, they have been as aware of my appreciation as I have been of their support.

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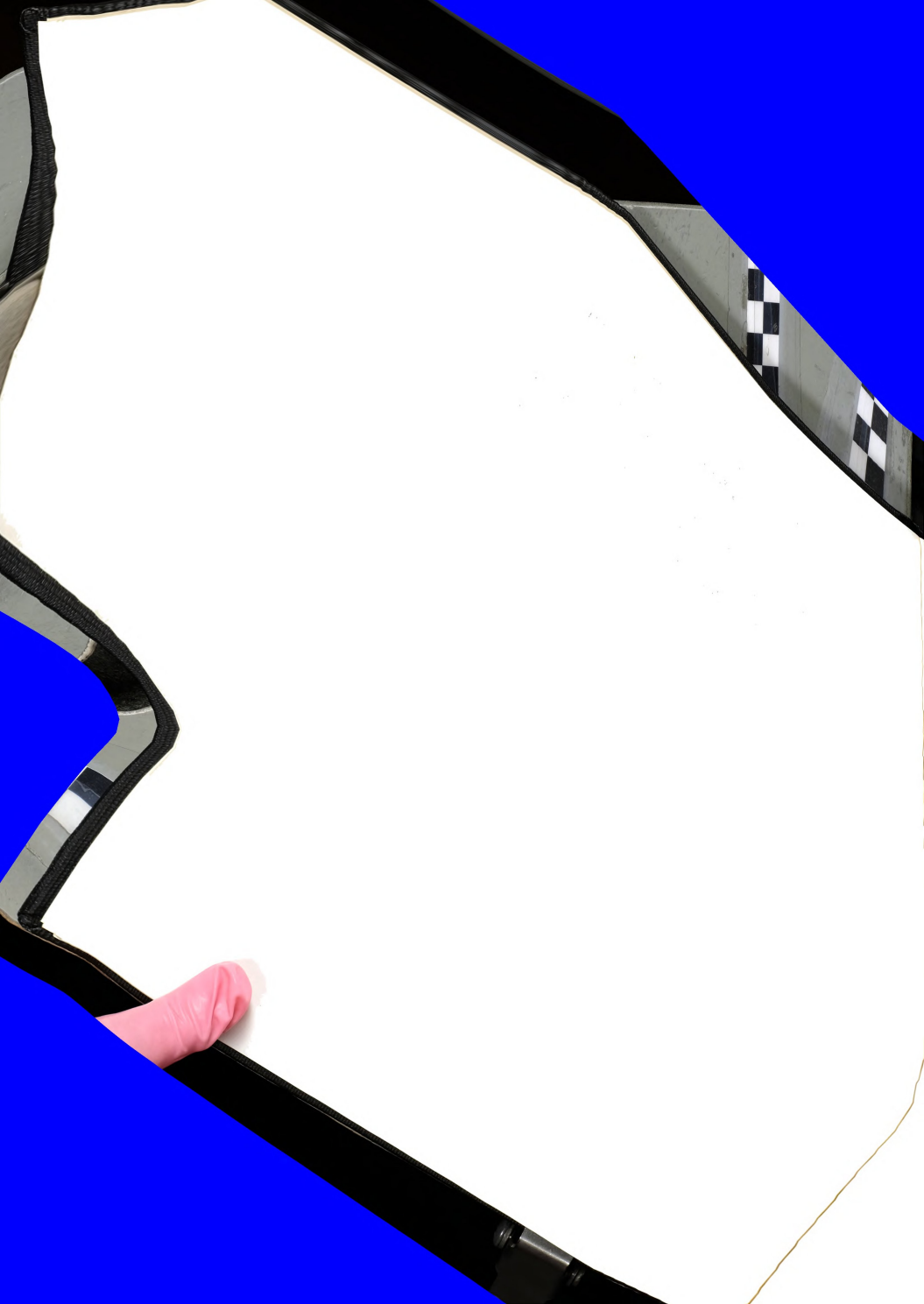

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CHAPTER I

INTRODUCTION

Background of the Problem

One commonplace miracle that has not been diminished by this complex world is birth. The marvel of new life on earth, particularly a human life, has been cause for wonderment over the ages. While parenthood is instantly conferred on the mother and father, a kaleidoscope of complex interrelationships plays a role in how parenting begins. An accumulation of past experiences, communication skills, knowledge of infant communication skills, knowledge of infant development and child rearing practices affect parenting. Temperament, appearance, and sex of the child, as well as relationships with spouse, extended family, and others all impact significantly on how parenting begins. This time of exciting new beginnings affects the relationship between parents and child, between parent and parent, and how parenting proceeds during the important perinatal period.

The perinatal period refers to the period of time from the 20th week of fetal life to the infant's 28th day of human life. This period represents a crucial transition time in the life of both the baby and the family. In this critical time the neonate is adjusting to a new environment while the parents move from a dyad to a triad and face the experience of caring for an infant who is exclusively theirs as they continue to maintain their own relationship. This new way of life requires adjustments to a changing pattern of living and of responding to the constant needs of a dependent new member. This can

become even more difficult when parents leave the security of the hospital and face the reality of total responsibility for child care alone, especially if they are ill prepared and/or without previous experiences in child care.

Cultural trends have deprived new parents of the availability and dependence on the older generations. In past eras with larger families and less mobile society, learning to care for a child took place as a natural part of growing up. In larger families there was usually a younger sibling in need of care, or there was frequently a baby at every social gathering of the extended family. Children observed how babies were cared for, and often helped in child care. These family members provided social support while offering help to the new family. Experienced relatives and friends nurtured new parents as they adjusted to the changing demands and experiences of being parents.

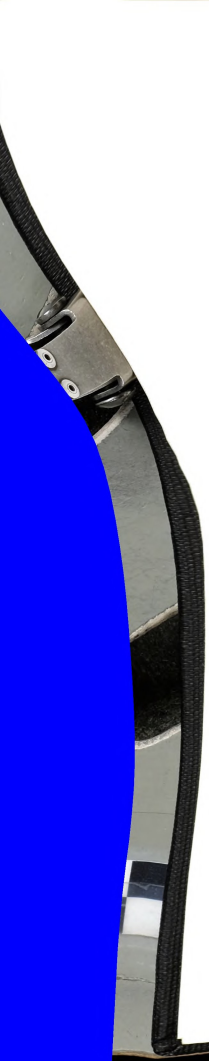
There are far too few supports for new parents in our contemporary society. Today smaller families and a mobile society frequently create a different atmosphere for child rearing. New parents may live a distance from their extended families. Often they become mothers and fathers with little experience in child care, and frequently do not have the kind of help and companionship that is helpful at this critical time of demanding new experiences.

Parents, especially mothers, can experience loneliness and confusion. All parents, even those with the most positive role models, nurturant early childhood experiences, and satisfying social relationships, at times find that an infant's behavior can be extremely exhausting. Disillusionment with so many demands may lead

to frustration and a feeling of inadequacy to cope with such a time consuming situation.

A set of beliefs that may be a further source of conflict for a new mother concerns the "joys of becoming a new parent." The woman in particular is expected to be ecstatic at becoming a new mother. Researchers (Lemasters, 1971; Hobbs, 1968) indicate that this is at times not the case. "Cabin fever", a feeling of exhaustion, and "postpartum blues" are a few reactions to the birth of a child. Even with knowledge of the demands of motherhood, many women who have these reactions often feel guilty because of their unrealistic concept of the time involved in child care along with maintaining a spouse relationship and a home, while dealing with the romantic myth of motherhood. The birth of a child often leaves the woman physically worn out for a period of weeks. An infant's need for constant attention adds to the lack of energy. A combination of exhaustion and frustration may seem insurmountable at times. The sad result of this stressful situation in its most extreme form for an isolated mother may be inadequate or inappropriate care of the infant.

Many families have been unable to establish a positive communication pattern with their infant. They describe this time of early infancy as disappointing, non-rewarding, and even frightening. These parents are both anxious and angry that they were unable to establish an ongoing relationship and interact effectively with their newborn. The outcome, all too often, is child abuse, failure-to-thrive syndrome, multiple accidents or ingestion of harmful substances.



Another issue of importance to the background of this study involves the changing perspective on child development. For years a child's development and behavior were considered to reflect care provided primarily by parents. In the late 60's a new way of viewing the development of the child was introduced (Bell, 1968). This view took on the elements of a feedback mechanism from the child to the mother. The realization and understanding of how children influenced their caregivers' reactions increased. Parent-child interactions, which were formerly viewed as a one-way system, began to be viewed as a two-way system with both the child and the parents eliciting behavior. Today the baby is considered an active participant who contributes significantly to the development of the evolving relationship (Stone, 1973). Becoming comfortable with a new baby requires more than knowing the basics of feeding, bathing, and diapering; it requires a recognition of the uniqueness and individuality of an infant's capabilities and personality, learning specific communication skills, and adjusting to a new pattern of living.

Parents who cannot communicate with an infant suffer much frustration in trying to care for their baby. Some of these adults had been nurtured by "cold" and/or unresponsive caregivers; others not held at all. As children they often blocked out sounds which were too painful to listen to, and learned that touching was associated with pain instead of pleasure. A large number of these adults experienced a childhood that required them to "desensitize" their sensory communication system to survive. In general, their sensory system was conditioned negatively because of the association with pain, turmoil,

and/or neglect (Helfer, 1978). Along with negative conditioning came suppression of senses. Helfer (1979) states that there is no handicap more detrimental to the establishment of a two-way interaction between mother and child than an adult reared to suppress the senses.

Recognizing the need to help all adults adjust to the many new demands and experiences of parenthood, professionals and lay groups have taken an interest in developing programs for new parents. Prenatal care, expectant parents' classes, changes in hospital care for mothers during labor and delivery, and the postpartum period have all been the focus of much discussion among those looking for ways to ease the transition to parenthood and the critical adjustment time of the perinatal period (Klaus and Kennel, 1981). Such programs are incorporated to create an atmosphere where mother and newborn may begin the adjustment of meshing their unique personalities to establish a foundation for a positive mother-infant relationship.

The interest in programs of parent education to facilitate the adjustment of the mother-infant dyad reflects an increasing awareness on the part of professionals who are dealing with the outcome of parental disorders affecting children such as failure to thrive, multiple accidents, and abuse, to the value of these programs as preventive measures (Kaplan, 1981). Perinatal coaching, a program developed by Helfer and Wilson (1980), has been utilized in teaching parents how to apply basic knowledge of the fundamentals of infant development to learn skill development in communicating with a newborn in an effort to facilitate the transition to parenthood.

Purpose of the Study

The purpose of this study was to evaluate the effects of perinatal coaching on mother-infant interactions, stress in the parenting system, and maternal adaptation. The effects of perinatal coaching were evaluated with first time mothers and their clinically well newborns analyzing videotaped sessions of behavioral interactions of feeding, burping, and diapering while self-report questionnaires were used to assess the attitudes of mothers.

Statement of the Problem

Many parents have demonstrated difficulty in establishing an effective communication system with the newborn resulting in the inappropriate treatment of the child often with an outcome of maltreatment or abuse. Further, in recent years, the perspective of infant development has changed with the recognition that the child is born with a highly developed sensory mechanism capable of interactions, and these senses are an important part of the communication system of the mother-infant dyad.

Thus, the problem involves parents and newborns who are ready and eager to communicate with each other, however, the parent may be ineffective in observing, sending, or receiving cues in a way that is geared to the baby's receptive sensory mode of communication. Thus, the lack of skills to interact effectively hinders the development of satisfying communication between mother and infant.

What has not been demonstrated is whether research findings can justify parent programs as effective in influencing positively the interactions between mother and infant. The question addressed in

this study is whether Perinatal Coaching, one example of a parent program, is an effective approach to improving mother-infant interactions as measured by behavioral interactional analysis and attitude assessments.

Research Questions

In an effort to assess the effects of perinatal coaching on mother-infant interactions, stress in the parenting system, and maternal adaptation, the following research questions are asked:

1. Will first time mothers who receive perinatal coaching differ in interactions with their newborns from a comparison group of mothers who did not receive perinatal coaching as measured by assessment of behavioral interactions recorded via videotaped sessions of feeding, burping, and diapering?

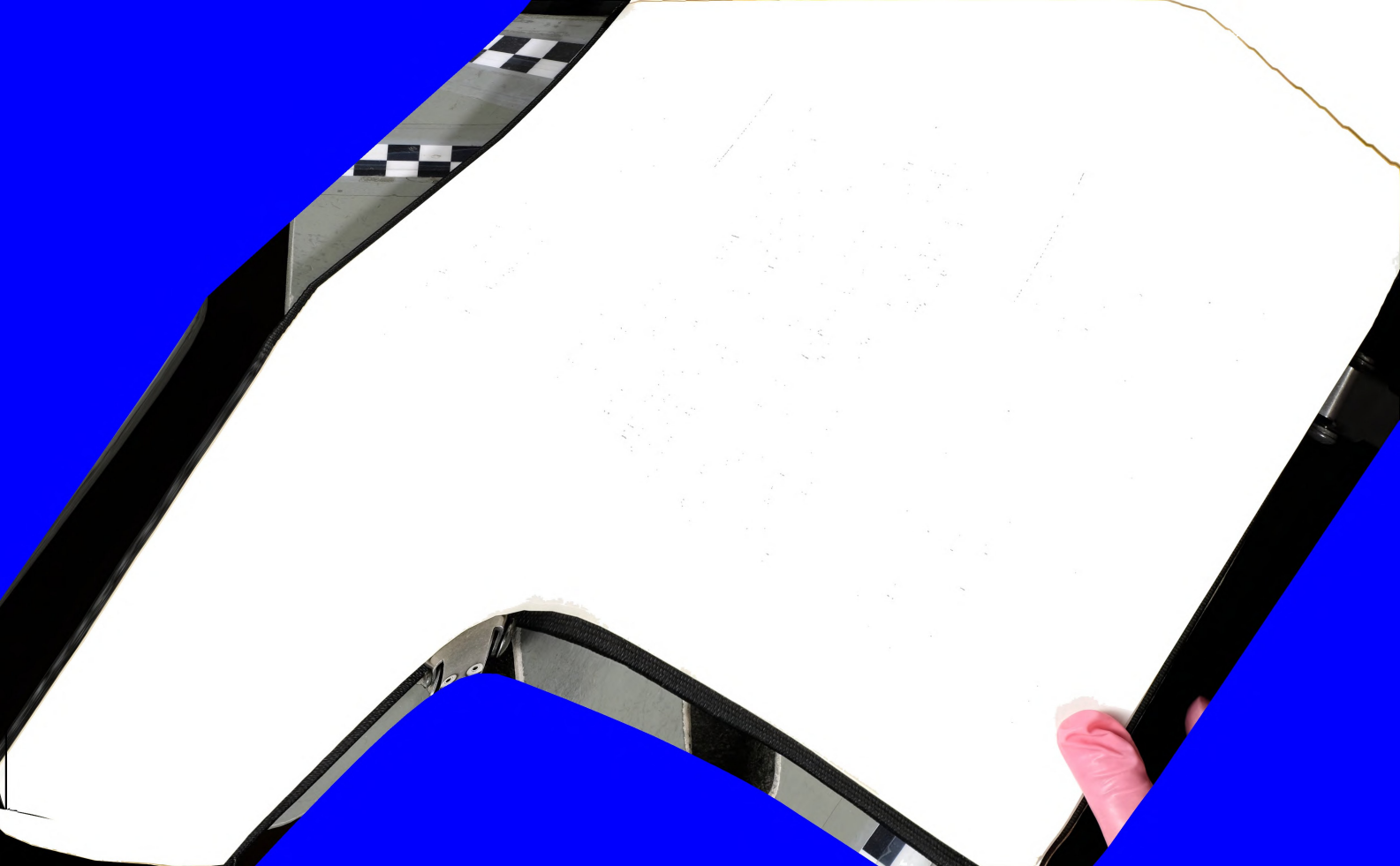
2. Will first time mothers who receive perinatal coaching experience less stress in the parenting system than a comparison group of mothers who did not receive perinatal coaching as measured by the self-report questionnaire, The Parenting Stress Index?

3. Will maternal adaptation be influenced by perinatal coaching in comparable groups of coached and non-coached mothers as measured by the self-report questionnaire, The Postpartum Self-evaluation Questionnaire?

Conceptual Framework

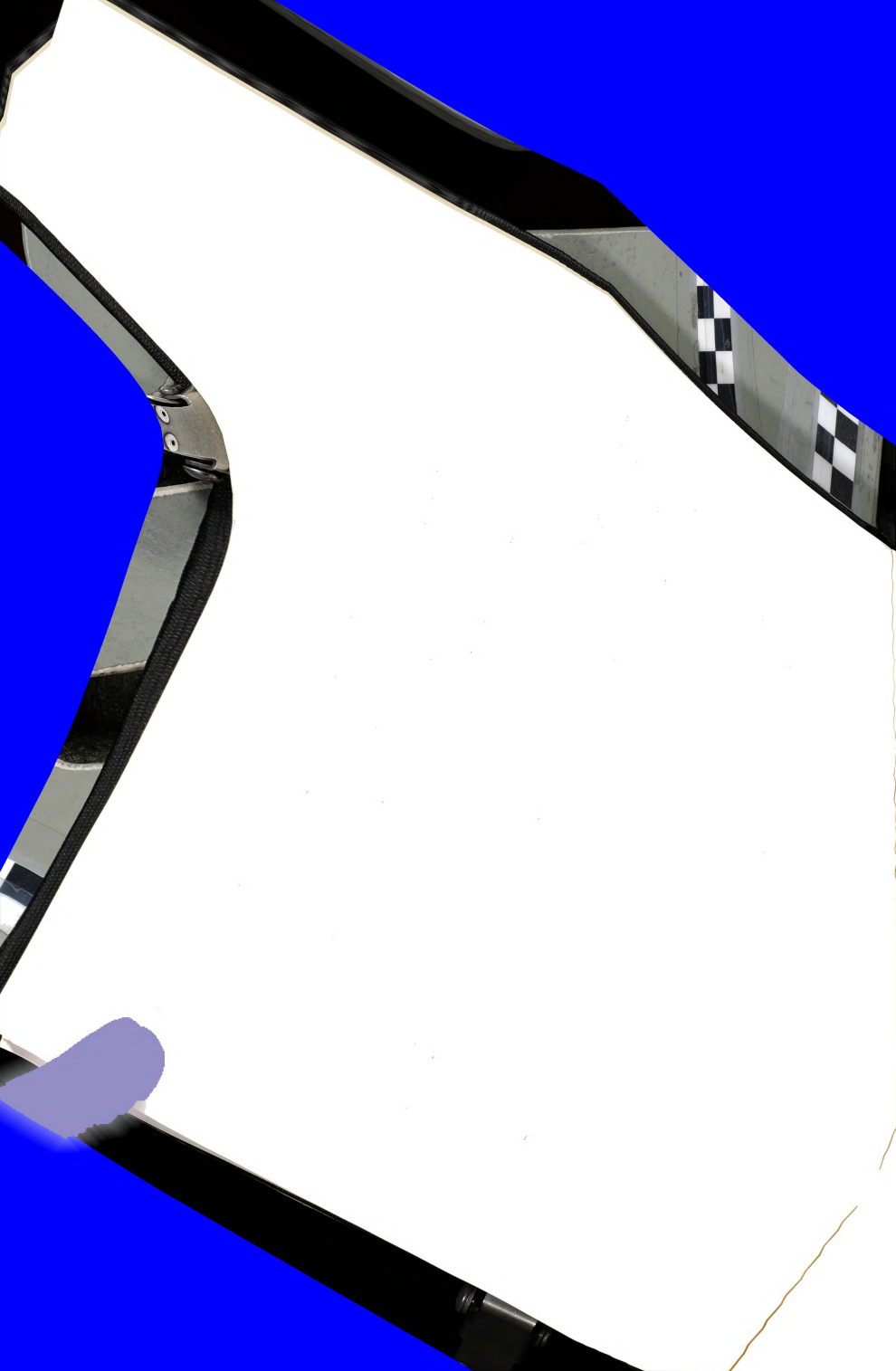
An individual is born into an on-going society with common symbols and established patterns. The phenomenon of the development of this individual integrates a variety of theoretical perspectives so that development may be viewed as a continuing reciprocal interaction between a changing organism within a changing environment (Hartup, 1978).

In looking at human development and human behavior, the systems approach is a valuable framework under which various theoretical



perspectives may be applied. The family ecological approach constitutes a way of explaining a unit, such as the mother-infant dyad, and how this dyadic pair relates and interacts with both larger and smaller units or systems. The basis for this approach is the assumption that matter, in all its forms, living and non-living, can be regarded as forming systems that have discrete properties capable of being studied. Using a systems theory perspective, focus is on the interaction among the various parts of the system rather than describing the function of the parts themselves (Miller, 1971). The interaction and interdependence of the elements creates a unique functioning whole. The whole can be understood only by considering all the parts and their interactions simultaneously (Buckley, 1967; Kantor and Lehr, 1975).

The ecological environment is conceived as a set of nestled structures, each inside the next. At the intermost level is the immediate or near environment containing the developing person, the infant within the family, as a system ecologically suspended in multiple systems. The ecological systems approach requires looking beyond this single near environment and viewing the relationship that occurs between individuals, the mother-infant dyad and the other dyadic relationships in the family. This perspective further considers that the person's development is affected by events occurring in settings in which the person is not present. These introduce elements in the family from outside the home. As part of this theoretical perspective, if one member of the family undergoes a change in the process of development, the other does also. It also recognizes that the capacity of a dyad to serve as an effective



context for human development is crucially dependent on the presence and participation of third parties, such as spouse, relatives, friends, and neighbors. Bronfenbrenner (1979) states that if such third parties are absent, or play a disruptive role, the developmental process considered as a system breaks down; "Like a three-legged stool, it is more easily upset if one leg is broken, or shorter than others" (p. 58).

The same triadic principle applies to relations between settings and in the hierarchy of settings from the near to the far environment of the community. Three environments have been defined and include the natural environment, the human-made environment, and the social-emotional environment (Morrison, 1974; Bubolz, Eicher and Sontag, 1979). Resources are available to families from each of the environments. Also inputs from the various environments, both positive and negative, influence the developing individual and family.

An ecological-systems approach was utilized in this study of the mother-infant dyad within the family context. The view of mother-infant interaction as a subsystem within a developing family offers a productive way for studying interactions within natural human environments. The family-ecological approach allows for the conceptualization of the interdependent reciprocal relationship of the mother-infant dyad within the context of the social environment of parents, and physical environment of the hospital and home. Specifically, rather than look for a one-way cause and effect relationship, the developing mother-infant relationship is viewed as interdependent. For example, response from the infant tends to elicit further behaviors from the mother. According to an ecological systems

approach, a change in one part of the relationship can create changes in other parts. Changes cause the system to seek equilibrium and adjust. The family ecological approach allows a focus on the interrelationship between the mother-infant dyad and the environmental context in which the dyad is having its beginning. According to systems theory, in the case of the mother-infant dyad, a change in the mother's attitude, health, or skill learning in infant care will cause change in the interaction with her newborn. The nature of such dynamic interactions occurring at this time of adding an additional member to the family environment requires a holistic model to consider the many aspects involved. As Sameroff (1975) notes, developmental outcomes are the product of the characteristics and environments of mother and child, and the transactions between the two. The ecological systems perspective allows a point of convergence among the disciplines of the biological, psychological, and social sciences as they bear on the evolution of the individual. By combining this type of holistic, integrative and systemic thinking, all the components that influence mother-infant interactions can be considered. This perspective gives an emphasis to the interactive processes and has reduced the proposed importance of any single variable. This conforms with suggestions that there is a need to shift the emphasis from assessing outcome measures to identifying the process underlying the changes that occur (Sameroff and Chandler, 1975).

Definitions

The following terms and their definitions were used in this study:

Perinatal Coaching. A skill development program, with a strong content base in which new parents are taught how to communicate and calm a newborn. Parents are shown how to apply knowledge of (1) states of consciousness, (2) social capabilities, (3) timing of interactions, and (4) unique behavioral traits. Specifically, perinatal coaching includes demonstrations and practice in the hospital with follow-up in the home. Helfer (1980) stated that the primary goal of the Perinatal Coaching Program is to develop patterns of interaction and to improve communication systems between new parents and their first born infants.

Perinatal Coach. A resource person who coaches the new mother and father in the skills of interacting with the newborn. The coach, usually a volunteer, teaches ways to calm and communicate with the infant, provides modeling of important skills along with observation and feedback of skills to be learned.

Mother-Infant Interaction. A communication exchange between mother and infant including vocalizations, touch, play, eye contact and other meaningful activities.

Maternal Adaptation. The adaptation of a woman to the role of motherhood including caring for the newborn along with other tasks involved in infant care. These include the instrumental and non-instrumental care giving activities.

Human Resources. The abilities and characteristics of the individual which cannot be utilized independent of the individual. Specific human resources include time, skills, and abilities.

Assumptions

The following assumptions are made in this study:

1. Early mother-infant interactions are critical for establishing a foundation of behaviors which will mediate the nature of the parenting relationship and the child's development.
2. All behaviors occur in interaction. The mother-infant relationship involves a dyadic system in which both parties contribute to the nature of the mutual interaction.
3. The mother's previous experiences and their views of parenting play a role in family interaction, the mother role, and how parenting will proceed.

Hypotheses

The following null hypotheses are tested:

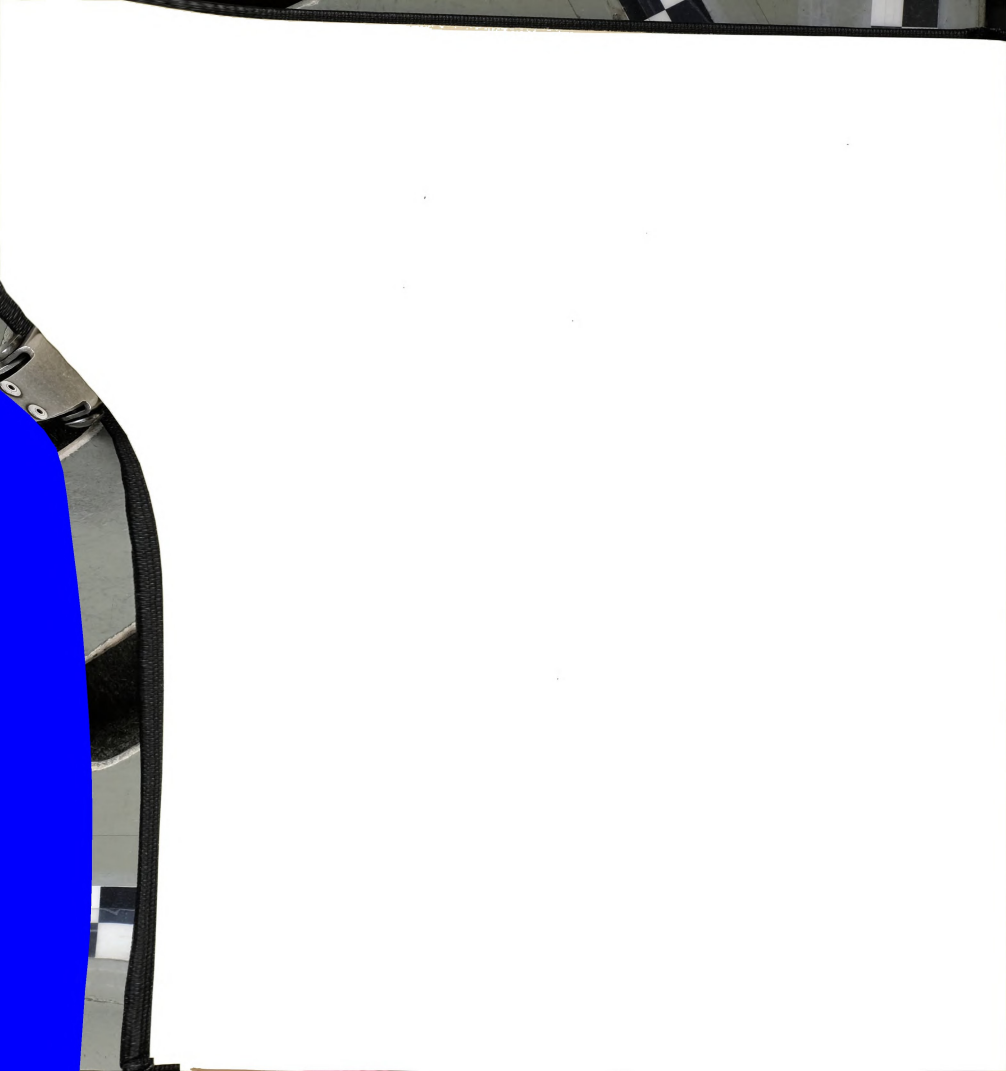
Hypothesis 1. There will be no differences in interactions between first time mothers who receive perinatal coaching and their newborns and a comparison group of mothers who did not receive perinatal coaching as measured by assessment of behavioral interactions recorded via videotaped sessions.

Hypothesis 2. There will be no differences experienced in stress in the parenting system by mothers who receive perinatal coaching, and a comparison group of mothers who did not receive perinatal coaching as measured by The Parenting Stress Index.

Hypothesis 3. There will be no differences in maternal adaptation between mothers who receive perinatal coaching, and a comparison group of mothers who do not receive perinatal coaching as measured by The Postpartum Self-evaluation Questionnaire.

Overview

The importance of the perinatal period in establishing a workable system of adaptation and communication between parent and child has been discussed in Chapter I. Also a theoretical perspective for viewing mother-infant interactions has been proposed. In Chapter II, the applicable literature is reviewed including the infant's socially responsive capabilities, the parent's ability to utilize these responsive capabilities to communicate with and calm the infant, and the stresses in the parenting system at a critical time in the development of the family system. In Chapter III, the methodology chapter, the sample is described along with a description of the operational measures used to examine the characteristics studied, the testable hypotheses, the design, and analysis of data. In Chapter IV, the findings from the analysis of the data and statements of significance are included. Discussion of results, conclusions, the theoretical impact of these findings, and speculation for future research along with the limitations and some practical application for the study will be presented in Chapter V.



CHAPTER II

REVIEW OF LITERATURE

The research literature important in this study is reviewed to understand more fully the factors that contribute to the complexity of the mother-infant dyad, what influences this interactive process, and the impact of these on the developing child. The research literature pertinent to this study is reviewed under the following headings: parental attitude and behavioral influence; family and parenting stress; mother-infant interactions, including the social-interactive system, infant states of consciousness; and the socially responsive capabilities of the newborn.

Parental Attitude and Behavioral Influence

The importance of what parents believe regarding the essence of what a child should be and the qualities valued by the family seem relevant for consideration as to how this may relate to the interactive process. Although the development of the child has been a topic of study for decades, theories concerning what is pertinent to the development of the child have changed considerably through the years. The present trend is to integrate a variety of theoretical perspectives so that development may be viewed as a continuing reciprocal interaction between a changing organism within a changing environment (Hartup, 1978). When the development of mother-infant interaction is studied, the ecological environment of the family must be considered. This includes the mother-infant dyad, the social environment of parents, and the physical environment of the home.

The family is often viewed as a semi-closed system of interacting persons, varying in age and sex, whose interaction is organized in terms of interrelated social positions (dyads) with norms and roles defined by both the society and the interacting persons who are unique to the system (Rollins and Cannon, 1974). Pregnancy brings about reevaluation of the roles, norms, and attitudes (Soule, 1974; Brazelton, 1981). As a child is added to the family the number of dyads multiplies. The child can be influential in the husband-wife dyad through interactions in one of the parent-child dyads.

Each generation of parents holds a set of beliefs regarding the essence of what a child should be, the qualities valued by the family, local community, and culture, and the experiences believed to enhance the child's acquisition of these qualities. These beliefs influence what parents believe important and their behavior toward their children. Stolz (1976) reported the result of interviews of 78 parents and their children. The interviews were conducted to obtain self-reports of what parents felt influenced their behavior toward their children. She categorized various factors under past childhood and adult experiences; present personality factors, values, beliefs, and spouse interactions; and immediate parental goals, parental urges, perception of the child, and behavior setting.

Brim (1959) after reviewing child rearing literature named six categories of parental behavior influences: ability factors including physical, intelligence, and health; unconscious factors including attitudes, and feelings; cultural values including all those things held important; interpersonal and social controls including rules from the culture, spouse, relatives, neighbors, child, person with decision

making power in the family, and sex roles within the family; group structural determinants such as family size and patterns of interaction; and ecological and physical factors including effects of poverty, labor force participation of parents, and housing.

Family and Parenting Stress

The family is considered to operate on a basis of interactions between family members holding various social positions and roles with resulting norms (Aldous, 1978). Each individual family member brings to the assigned role special and unique qualities that are blended with another person in the formation of the dyad. A stressor with resultant strain occurs which may cause dysfunction within the interactive system when a member is added to the family and the dyad becomes a triad. This is especially true if the new member does not live up to the expectations envisioned by the parents. Each role in the family is a demanding one with accompanying stress, and each role requires a kind of dedication for which individuals have already been shaped by past experiences (Brazelton, 1981).

Hill (1958) states that the level of dysfunction a family experiences is dependent upon the level of family function at the onset of crisis and the significance of the crisis to family members. The family's ability to recover is dependent on two factors, the ability of family members to communicate and various family resources that can be utilized such as cultural, educational, economic, and medical.

According to Hans Selye:

> Stress is a non-specific respnse of the body to any demand . . . It is immaterial whether the agent or situation we face is pleasant or unpleasant; all that counts is the intensity of the demands for readjustment or adaptation (Selye, 1974, pp. 83-84).

Pelletier (1977) further notes that general environmental and social stressors affect all people to some degree and include living and working conditions, increased mobility, and the constant influx of information from mass media. An individual is under stress every time an adaptation is required to adjust to personal, social, and environmental influences, positive or negative. Adaptation is necessary all the time to varying degrees (Pelletier, 1977). The system changes to seek a homeostatic condition (Buckley, 1967). Changes, both positive and negative, over the life span, are stress inducers that must be dealt with for adaptation and personal growth (Schneider, 1983). These stressors include such events as change in job status, income, or employment, change in familiar environments such as a move to a new location, and changes in the family such as the addition of a new member (Holmes and Rahl, 1967). Despite the romantic mythology that surrounds parenting, learning to be a parent is likely to be a complex process for most people and entails change in the individual with resulting stress.

Pregnancy is well recognized as a time of normal psychological stress and turmoil (Bibring, 1959; Bibring, Dwyer, and Huntington, 1961; Brazelton, 1963; Sherashefsky and Yarrow, 1973). This turmoil is present in all men and women who face new roles as parents. The importance of this stress in activating energy for the coming

adjustments to parental roles becomes obvious. Brazelton (1976, 1981) states that without the "disruption reaction" that serves to unseat old role adjustments, young parents might fall into an inflexible replica of their relationship with their own parents as they adjust to the new baby. During pregnancy, young parents rework their relationship with each other, with their own parents, and their life style in order to mobilize themselves for the task of parenthood. With the stress of anxiety as a motivator, the couple reworks their relationship and develops sensitivities that will be helpful to the specific needs of the baby. Further, they are more likely to adjust to the infant as an individual with unique characteristics and specific needs (Brazelton, 1981).

Added to the psychological adjustment of pregnancy is the physical stress and bodily change. Readjustment of bodily mechanisms takes much energy. During pregnancy a woman concurrently experiences two types of developmental changes: physical and emotional changes within herself, and the growth of the fetus within the uterus (Klaus and Kennel, 1981). Parents normally experience a certain degree of stress to which they are able to adapt without dysfunctional consequences. These disturbing and often competitive feelings experienced during pregnancy stir up energy for attachment and adjustment to the baby. If these stresses are understood and dealt with in a positive way while the parents are gaining their equilibrium, they can become a renewing force for strengthening the parents' attachment to each other and the new member (Brazelton, 1981). However, the existence of stress at very high levels may result in adverse consequences. High levels of stress can interfere

with the development of positive parent-child interactions. These adverse consequences affect the parent as an individual and the developing parent-child relationship at a critical time. This parent-child relationship, which serves as the foundation for the child's emotional and social development (Mahler, Pine, and Bergman, 1975), is very influential in the course of later development.

A large body of research literature exists relevant to the topic of stressors that operate in families with young children. Studies on the influence of chlidren's temperamental characteristics on later development (Thomas, Chess, and Birch, 1968) and the development of maternal feelings toward children (Robson and Moss, 1970) are examples of the variety of existing research regarding the roles that social factors, child characteristics, and parent variables play in the development of children. Literature exists that has as a focus the early identification of children who are at risk for later developmental difficulty in the cognitive domain (Abiden, 1979), while considerably less attention has been paid to the area of social-emotional development of children. Those efforts that focus on predicting the future emotional-behavioral development of children have approached the task by almost exclusively assessing the child's attributes (Carey, 1972; McInery and Chamberlain, 1978). Research regarding the development of behavioral disorders (Thomas, Chess, and Birch, 1968) has identified the existence of excessive stressful characteristics of the child as only one of the major factors contributing to the development of behavioral disturbances. Stress in the parenting system during the initial encounter of the mother and infant, from birth through the first three years, is especially

critical in relation to the child's emotional-behavioral development and to the parent-child relationship (Abidin, 1979). Child characteristics, situational factors, the interactional system, and life stressor events are some of the demands affecting the relationship. Understanding the stress in early parent-child relationships requires that this existing information be integrated within a framework that can account for the operation of the many and varied factors relevant to stress.

In summary, theoretical discussions and research concerning how families cope with stressful situations have produced information which often appears conflicting. Surprisingly, many of these stressful events seemed very positive in nature, such as marriage, a new baby, or an outstatnding achievement. Even happy events required some adjustment to change in one's life; this change induces stress, and stress and the resulting behaviors and outcomes may be viewed as either a positive or negative influence in the family system.

Mother-Infant Interaction

Most mothers are believed to experience positive feelings for their infant from birth. However, there has not been extensive research investigating the developmental aspects of these affectional relationship bonds. Two pediatricians, Klaus and Kennell (1976, 1981), are concerned with the effects of forced separation of mothers and infants immediately postpartum which occurs in many hospital deliveries. They believe that the early interaction between mother and infant serves to promote mother-infant bonding and that there is a biological basis for early and continuing contact. They also believe

that the baby acts as a stimulus to elicit mothering behaviors and establishes the basis for the mother to provide care and comfort for the baby.

Studies of premature infants have shown consistent findings that opportunities for contact between mothers and premature infants increased mother's frequency of looking at, smiling, holding close, fondling, and caressing their infants (Barnett, Leiderman, Grobstein and Klaus, 1970; Leiderman, Leifer, Seashore, Barnett, and Grobstein, 1973 Klaus and Kennell, 1976). Ethological writings (Bowlby, 1969; Robson and Moss, 1970), provide further support for a relationship between extended contact and attachment behaviors.

Despite the convincing nature of this research, one must question whether providing opportunities for mothers and infants to be together is sufficient for satisfying and nurturing mother-infant interactions. Egeland and Vaughn (1981) question whether contact results in bonding and write that it is not possible to conclude that limited contact between mother and infant immediately after birth results in bonding failures which in turn cause disorders of mothering. However, the study did suggest the possibility that early and extended contact of the mother with her infant may enhance their relationship.

The quality of the time spent in the contact experience must be considered. Mothers and infants are not always mutually satisfying to each other. Cases in which infants have shown only two states, sleeping and crying, have been extremely frustrating for parents (Brazelton, 1961, 1981). Parents often blame themselves although crying and lack of responsiveness are not the fault of the mother. However, she does have to make an adjustment in her care and behavior

when confronted with responses that do not match parental expected patterns of behavior. If maternal forces can be mobilized, the mother can facilitate the development of the infant. Rewarding communication between a baby and parents is critical to the development of a reciprocal relationship.

Communication, our most important medium for social contact, is utilized in most of the activities in our daily lives (Berlo, 1960). Communicating with others is necessary for our existence and helps us get what we need (Johnson, 1981). From the moment of birth, communication is a tool utilized to alter the environment to meet our needs.

Although every person communicates, whether verbally or nonverbally, the skills to do so are learned by observing and listening. Any communication system requires a feedback mechanism from the environment. From a systems perspective, feedback (a process by which a system informs its component parts how to relate to one another and to the external environment in order to facilitate the understanding of the input) becomes a crucial feature. The parent must not only recognize and understand the methods of communication of the newborn, but also be able to transmit messages utilizing a similar system. Many times, in order for learned techniques to be an effective and satisfying means of interaction, they must be altered to fit the recipient, especially if the recipient is a newborn. Some adults are not able to communicate with the senses, the mechanism that can be received by the newborn, and often must learn new techniques to set up a mutually satisfying interaction (Helfer, 1979), while others feel uncomfortable using this sensory method of communication. The

result is that when these ill prepared adults are forced to develop a communication system with the newborn, they often do not do well and set up a highly stressful environment.

The Social Interactive System. In a social interaction system, the responses of each participant serve as stimuli for the other. The ability of the infant to influence the behavior of the caregivers has been demonstrated in work with infants (Bell, 1968; Korner, 1965, 1970, 1971, 1973; Osofsky and Danzger, 1974; Osofsky, 1976; Moss, 1967; Stern, 1974). The newborn is capable of reaching out to the parents with a great variety of abilities and responses and has a very developmentally advanced system of senses which are readily used at birth.

A number of infant characteristics have been found to affect the mother-infant relationship. These characteristics include temperament (Carey, 1970; Fries and Wolff, 1953; Rutter, 1970; Thomas, Chess, Birch, Hertzig, and Korn, 1963; Thomas and Chess, 1977), sex (Korner, 1974; Moss, 1967, 1974; Moss and Robson, 1968; Wolff, 1966; Freedman, 1974), birth order (Brody, 1966; Thoman, Leiderman, and Olson, 1970, 1971, 1972), states of consciousness (Ashton, 1973; Bennett, 1971; Brazelton, 1961; Brown, 1964; Jones and Moss, 1971; Korner, 1973, 1974; Lewis, 1972; Moss, 1967), and responsiveness to tactile, visual, and auditory stimuli (Brazelton, Koslowski, and Main, 1974; Lusk and Lewis, 1972; Moss, 1967; Osofsky, 1976; Osofsky and Danzger, 1974; Robson and Moss, 1970; Wolff, 1971). Results from increasing numbers of studies with infants convincingly show the view of an infant as a complex individual with unique patterns of activity preferences from birth that coincide with, impinge upon, and influence maternal

interests. The infant is socially responsive, equipped to enter a social relationship, and respond to caregivers' overtures.

The interaction between mother and infant can best be described as a fitting together of two complex organisms and personalities. Each infant is born with a unique rhythm and organization of the arousal and inhibitory systems (Bennet, 1976; Brazelton, 1976; Lazoff, Brittenham, Trause, Kennel and Klaus, 1976; Schaffer, 1974) and a characteristic temperament (Bonem, 1978; Thomas, Chess and Birch, 1963). One of the mother's tasks is to adjust to the infant's basal characteristics, to learn the infant's rhythms, and to learn to recognize and interpret the signals given by the infant (Sander, 1976, 1977; Thoman, 1975). The caregiver's mode of adaptation to these characteristics alters them and thus alters the stimuli to which a response is made. The infant appears to be in charge at this stage, with the caretaker adapting to the infant's needs and signals (Brazelton, 1976; Lozoff, Brittenham, Trause, Kennell, and Klaus, 1977). At the same time the mother is simultaneously shaping the infant's sleep-wake cycle (Sander, 1970, 1976) by using her particular style of caretaking and handling with the infant (Call and Marshak, 1976; Thoman, 1974). When the fit occurs in an optimal situation, mother and infant learn each other's characteristics and styles and learn to identify signals utilized by each of them. When behavioral synchrony has been achieved, mother-infant interactions generally are characterized by definite sequences of give and take (Brazelton, 1976; Sander, 1970, 1976; Schaffer, 1974).

To complement the interactive process the infant possesses characteristics such as sighs, helplessness, appearance, and crying

that facilitate the initiation of care by the parents (Moss, 1967; Richards, 1971). The responses common in adult social relationships are important for parents to see in their infants so that parents feel that they are relating socially to their infant. Robson and Moss (1970) and Bennett (1971) hypothesized that a combination of adult and infant characteristics are better elicitors of maternal attention than either one observed separately. Helfer (1982) suggests that the adult must learn to communicate with the newborn in the manner in which the infant is equipped to receive communication. These observations emphaisze the fact that actions, characteristics, and styles of behavior exhibited by the infant play an important role in determining the stimulation received and how the interactive process will proceed.

Since the responsiveness of the infant to overtures provided by the mother may affect her feelings of attachment and competency, and the frequency of her attempts to elicit responses, these measures are important when considering the infant's role in the interactive process. The Perinatal Coaching Program (Helfer and Wilson, 1980) demonstrates techniques to stimulate socially responsive techniques to elicit infant responses. In addition, early behavioral characteristics such as self-quieting ability, irritability, consolability, and activity are included in the Program. These measures help identify those early behavior characteristics that will advance our understanding of what it is that the infant brings to the environment which makes a difference in how the infant develops (Helfer, 1981).

Infant States of Consciousness. The importance of infant states has been stressed in the program to help parents identify the times

when parent-infant communication will be most gratifying to both parents and infants. The states of sleep or consciousness of a newborn include deep sleep, light sleep, drowsy, alert, active and crying. The importance of infant states in research has been stressed by Ashton (1973), Brazelton (1961, 1973), Korner (1973, 1974), Levy (1958), Lewis (1972), Moss (1967), Yarrow and Goodwin (1965), and Jones and Moss (1971). States reflect the time of need as well as the availability of the infant for contact with the environment, and reflect an important element to attend to for mother-infant interactions. The state influences the infant's awareness of the environment and affects maternal behavior. An alert infant is usually very receptive to interactions and provides a gratifying experience for the mother. Efforts to arouse an infant from a sleep state or to calm an infant in a crying state provide mothers different experiences which are probably less gratifying. Infant modulation of state provides an index of the control an infant can exert over behavior (Osofsky and Connors, 1979).

Levy (1958) reported differences in maternal greeting response which showed variance depending on the state of the infant. During the first week postpartum, mothers greeted quiet, alert infants one-third of the time, while the incidence with crying infants dropped to one-sixth of the time. Moss (1974) observed that the amount of time an infant was awake and crying was an influential modifier of maternal treatment.

Individuality of the infant along with variability of states related to stimulation affects the relationship between mothers and infants. Some infants are difficult to arouse while others are easily

soothed. Responsiveness may be minimal or delayed. Infants who respond to any type of stimulation with rapid state change may be highly responsive to stimulation in general, and may be overstimulated. A mother's feelings of competence as a caregiver may be related to these variables (Osofsky and Connors, 1979).

According to Wolff (1971), there has been insufficient recognition that infant's behavior influences a mother's behavioral responses as much as her past experiences. With the newborn, much of the change that occurs in interactions is based on maternal variations in response to the infant's state or feeding behavior. A mother can be made aware of the states of consciousness so that she may learn appropriate ways to deal with the infant's states.

Socially Responsive Capabilities of the Newborn

Evidence exists to show that the infant is socially responsive, equipped to enter a social relationship, and responds to the caregivers' overtures. The major capabilities which help initiate and bind the early relationship include the elements of the sensory system. Not only is the infant equipped with auditory, visual, olfactory, tactile, and vestibular (movement) capabilities, but the infant responds to this type of stimulation which is provided by people in the environment. Further, the infant can effectively use vocal capabilities to elicit behavior.

Auditory Interaction. Communication between mother and infant begins in the immediate postpartum period, but whether communication is the intended purpose of infant vocalization is not discernable. Intent to communicate is inferred by parents wishing to "understand"

the infant or believe that the infant is attempting to communicate. Purposeful communication on some level does appear to develop quickly, and the first cry, a reflex biological phenomenon (Tonkova-Yampol'skaya, 1969), does provide the mother with a sense of assurance that her infant is alive and responding as expected. Later, crying acquires a communicative function and remains the form of communication signaling discomfort, hunger, and pain (Wolff, 1971). Wolff noted that mothers could identify three distinct cries and categorize them according to hunger, pain, and anger. Discriminations were made on the basis of pitch, pattern, and intonation.

Lind and his associates (1973) showed that a hunger cry causes a physiological reaction in nursing mothers, stimulating the flow of milk that makes nursing the most likely response. They also demonstrated that very early in the relationship, mothers as well as infants are set to respond to auditory stimulation produced by the other. Need and the expressive vocalization of need set up the dialogue betweeen the baby and the human partner.

A model may be envisioned of the newborn as an "open system." The infant within the system is an active seeker and responder to environmental stimulation and employs a variety of alternative behaviors through which modifications of the world are made. The child filters stimuli from the environment, choosing what is wanted to be pulled in, and subsequently integrating new selected stimuli.

A newborn is able to hear well and visually locate the source of auditory stimulation, while mothers are sensitive to their own infant's auditory cues. The infant has a heightened sensitivity to human-like auditory stimuli (Hutt, Hutt, Lenard, Bernuth, and

Muntjewerff, 1968). A newborn will turn his head and visually fixate upon a source of auditory stimuli (Muir and Field, 1979). Further, a newborn has demonstrated selected responsiveness to sounds resembling human speech (Eisenberg, 1976) and has been shown to be able to identify the sound of the mother's voice (DeCasper and Fifer, 1980).

Infants listen selectively to auditory stimuli as early as two days of age. In their report of microanalysis of filmed sequences (Condon and Saunder, 1974), patterning of movement during speech was found to occur across cultures and involved interactional synchrony with the speaker's vocal patterns. This synchronous movement was observed between adult speech and infant movement. According to Condon and Saunder (1974), if the infant moves in shared rhythms with the organization of the speech structure of the culture, the infant participates developmentally through repetitions of linguistic forms before using them later in spoken communication.

Other studies have noted auditory responsivity in infants. Hammond (1970) found positive-orienting behavior in 25 of 31 two-week-old infants in response to calling the infant's name by the mother. Barrett-Goldfarb and Whitehurst (1973) found that infants who were vocalizing surpressed their vocalizations during records of the parents' voices. These results show that suppressed infant vocalization produced by adult vocal stimuli is a measure of selectivity when the infant wishes to listen. This ability to be selective and suppress sounds is a helpful adaptive mechanism for the infant.

Ainsworth (1967, 1969) wrote of the importance of vocalizations for imitative behavior and functional significance of infant

vocalizations as demonstrations of attachment behavior. Ainsworth commented that even though physical contact was very important many significant interactions between caregiver and infant involved distance receptors. Vocalization is one way infant contact and attachment can be maintained through distance.

A number of different methods for studying auditory/vocal interchange in the context of mother-infant interaction have been used. Some have used time sampling (Lewis, 1972; Yarrow, Rubenstein, and Pedersen, 1973); others have videotaped or filmed interactions (Brazelton, Kozlowski, and Main, 1974; Condon and Saunder, 1974; Stern, 1974); while other investigators have coded mother-infant behaviors continuously (Jones and Moss, 1971). Results of these investigations have suggested that for the young infant between three and six months of age, maternal vocalization contingent on the vocal responding of the infant was positively related to the overall infant vocalization, although measures of total maternal vocal response were not related to infant vocalization (Jones and Moss, 1971; Yarrow, Rubenstein, and Pederson, 1973).

These findings provide evidence that babies are ready to respond to those who care for them. They are able to discriminate and preferentially respond to the sound of the human voice which has social significance for them. Knowing these facts can facilitate parents' ability to develop an auditory exchange with their infants, thus leading to a true communication.

Visual Interaction. Newborns can see immediately following birth (Cohen, DeLoache, and Strauss, 1979). Accompanying the baby's visual skills is the ability to explore the environment visually. Very young

babies in the quiet alert state will scan the environment until they see an object of interest and fixate on it with compelling intensity.

During this period mutual gazing is important to the mother. Eye-to-eye contact provides mothers with a feeling of familiarity with their baby (Robson, 1967). It also gives a sense that the baby is a real person, a social being who can enter into a social relationship and arouse positive feelings for the baby (Klaus and Kennell, 1981; Robson and Moss, 1970). When eye-to-eye contact is absent, as in blind infants, Fraiberg (1974) reports the effect is disruptive to the usual course of development of the mother-infant relationship. Eyes appear to be the most compelling of the infant's traits and mothers read character and personality traits by gazing in them (Bennett, 1971). The eyes serve as distance receptors and allow visual interaction to occur more often than just when the mother is in physical contact (Walters and Parke, 1965).

Techniques developed by Fantz (1961) have been used to investigate visual preferences of newborns. Fantz (1963) found by presenting two visual stimuli to infants and measuring how long they look at each configuration, the stimuli which are best able to attract babies' attention can be detected.

These studies showed that new babies prefer patterns over plain stimuli and that they especially prefer configurations resembling the human face. Round shapes similar to eyes are particularly pleasing. Eye-to-eye gazing seems to be an elementary response that is a critical aspect of human interaction, which can be observed as the new infant responds to the caregiver.

The neonate can best focus upon an object approximately six to eight inches away (Cohen, et al. 1979), which is the visual distance between the infant and the person caring for them when in an enface, or face-to-face position. This establishes the possibility that the visual modality can be used for making and maintaining contact with the social environment. In review of the then available evidence on the role of the distance receptors in infancy, Walters and Parke (1965) concluded that the visual as well as auditory modalities served to facilitate the development of social responsiveness. Since 1965 other investigators have suggested that the visual regard of infant and caregiver for one another serves a number of functions. In the above mentioned study by Walters and Parke (1965) of early contact between mothers and newborns, the enface position was stressed. Klaus and Kennell (1976, 1980) suggested the mutual visual gazing facilitated by the enface position is one of the most powerful mechanisms for the stimulus of maternal attachment. Robson (1967) repeats that eye-to-eye contact may act as an innate releasing mechanism for maternal caregiving responses. In their study of 54 firstborns and their mothers, Moss and Robson (1968) studied the visual behavior of the dyads in relation to maternal attitudes. They found a positive correlation between the amount of time the infant and mother spent looking at each other's faces and prenatal attitudes toward infants. The infant appears to regulate social behavior with other people in the environment through selective visual attention.

The relationship between mutual visual regard and facial expressions have also been noted. Tronick and colleagues (Tronick, Als, Adamson, 1978) described what occurred when a mother approached

the infant and made eye contact, but failed to smile or move her face, the infant eventually turned his/her head away and avoided looking at the mother. This finding may indicate that mutual eye contact is a signal that positive interaction and facial expression are going to take place. When the expected behavior does not occur, the infant withdraws.

Since the mother is the major mediator of stimulation, her visual attentiveness affects the visual activity pattern of her infant. Bennett (1971) emphasized the importance of the infant's alertness, which is necessary for interactions with the environment. In addition to the infant's capacity to remain in an alert state, infant awareness is dependent on the mother's norms that influence the attainment and maintenance of awake and alert states (Osofsky, 1979).

The combined research on visual communication between mother and infant suggests that the mother's visual attention functions as a setting within which the infant may or may not establish and maintain contact. The infant appears to use the visual regard of the mother to signal the beginning of a communication. The visual modality also seems to serve as a signal of positive affect for mother and infant. Most of the smiling within the social context occurs when the two are looking at each other. Merely focusing or mutual gazing is not sufficient for understanding the mother-infant interactive system.

Olfactory Stimulation. Olfactory stimulation has been the most difficult type of stimulation to demonstrate in studies of infant social awareness and responsiveness. Macfarlane (1975), observed that infants could recognize maternally produced olfactory cues. Although the study was not conducted using a naturalistic setting, the findings

are relevant. Macfarlane determined that infants could differentiate their own mother's odor from another woman's by giving a choice of breast pads. The results indicated that when the infants were six days or older, they turned to their own mother's pads significantly more often than to other pads. The results reveal that not only do infants have differential sensitivity to odor, but their discriminatory ability becomes keener with age. In another study, findings indicate that newborns are innately responsive to odors and will, by turning away from, avoid an offensive odor such as ammonia hydroxide (Rieser, Yonas, and Wilkner, 1976). Research also indicates that newborn babies show differential responses to various tastes (Crook, 1978).

Other olfactory cues are probably given off by the mother and there are questions as to the mother's olfactory sensitivity to her infant. Mothers report that they can detect a lovely odor that is distinct to their own infant.

Tactile and Vestibular Movement Stimulation. A maternal calming response is the usual reaction to crying, one of the infant's most powerful signaling behaviors (Bowlby, 1969). A likely response is to pick up the crying infant after which a variety of possible events can occur. A crying newborn demonstrates proprioceptive responsiveness by quieting and becoming alert when lifted to a caretaker's shoulder (Korner and Thoman, 1970). Infant researchers have included such behaviors as touching, rocking, jiggling, caressing, and tactile playing (Lewis, 1972; Moss, 1976). The studies which use some form of manual holding are sometimes unclear as to whether contact or vestibular, proprioceptive or kinesthetic stimulation is primary in

producing acceleration of development. Since most handling of the infant involves changing the infant's position or otherwise moving his body, all three probably play a part.

Despite the fact that several investigators have noted the importance of tactile and vestibular stimulation of healthy development in infrahuman organisms such as with rhesus monkeys (Harlow 1971), with rats (Denenberg 1964), and with rabbits (Dennenberg, DeSantis, Waite, and Thoman, 1977), there are few studies of the effect of these kinds of stimulation on human infants. Controversy in the animal literature exists as to whether tactile and vestibular stimulation has beneficial effects or whether other kinds of stimulation can produce the same beneficial outcome.

Although the results of animal studies can be generalized to humans only with great caution, there is little doubt that human studies, such as those of Spitz (1945) and Mason (1942) of stimulus deprivation and the infant studies of the effects of extra stimulation on newborns, confirm the results of the animal studies (that stimulus deprivation is deleterious and stimulus enrichment beneficial).

Among the salutory effects reported for human infants who receive extra tactile or vestibular stimulation are increased weight gain for premature infants (Hasselmeyer, 1964; Solkoff, Yaffee, Weintraub, and Blase, 1969), enhanced visual alertness (Korner, 1972); higher developmental scores on the Gesell Developmental Schedule (Casler, 1965); and lower levels of crying (Ambrose, 1969). However, there has been little focus on such behaviors in the study of human infants in interaction with mothers. Perhaps one important outcome has been the practice of earlier maternal contact, thus, bringing the nursery back

into a holistic model of medical care, and allowing earlier and more frequent contact between mother and infant.

Resources for Mother-Infant Interactions

The variables mentioned in the research literature influencing mother-infant interactions are many and varied. By looking at these resources in a systemic and integrative way a holistic approach to mother-infant interactions emerges. The varied nature of these resources illustrates the interactive processes and reduces the proposed importance of any single variable. This conforms with suggestions that there is a need to shift the emphasis from assessing outcome measures to identifying the process underlying the changes that occur (Sameroff and Chandler, 1975). In Figure 1, resources for mother-infant interactions are given.

Summary

In this chapter, the factors related to parental attitudes and behavioral influences as to what parents believe a family and a child in the family should be are influential in the qualities the parents believe are important. The family is viewed as a dynamic system and the introduction of a new member into the parental dyad is a stress inducer. The family's ability to recover is dependent both on the ability of each member to communicate with one another and their various resources.

Mother-infant interactions are believed to be positive from birth, but the question is raised if just time together is sufficient. The quality of the time and communication skill learning is believed

Maternal Resources	Infant Resources
Biological and genetic endowment	Biological and genetic endowment
Mother's care by own mother What was childhood like?	Appearance of infant
Experience in child care with younger siblings or baby sitting	
Life experiences	Life experiences
Relationship with parents while in family of origin	
Education--especially as related to child development	
Parent education classes	
Health of mother	Health of infant
Ability to respond and pick up on baby's cues	
Family stability	
Relationship with husband	
On-going relationship with family of origin	
Relationship with others	
Course of pregnancy and delivery	
Planning, course, and events during pregnancy	
Experience with previous pregnancies (terminated by voluntary or spontaneous abortion)	
Type of delivery Coached vs. alone Vaginal vs. Ceasarian Section	Ease or difficulty of delivery
Drugs received during pregnancy and delivery	Effects of drugs prenatally and from delivery Effects of eye medication on eye-to-eye contact
Supply of milk	Ability to suck
Ability to respond to infant	
Time allowed for mother-infant contact--especially during first hour of life and during hospital stay	Amount of contact during first hours of life
Course of Postpartum	
Attitudes, statements, and behavior of hospital personnel	Attitudes, statements, and behavior of hospital personnel
Hospital routine--time allowed for mother-infant contact	Amount of ongoing mother-infant contact

Figure 1
Resources for Mother-Infant Interaction

to facilitate positive interactions.

The social interactive system of the newborn is well developed and receptive to stimuli. The interaction of mother and infant is pictured as a fitting together of two complex systems which are interrelated and interdependent.

The infant's states of consciousness have been reviewed to identify the times when parent-infant communication will be most gratifying to both parents and infants. The quiet alert state is identified as the most rewarding time for interactions.

Finally, the socially responsive capabilities of the neonate are discussed including all the highly developed senses of the newborn. The newborn responds dramatically to the touch, warmth, and closeness of another human being. If this sensory system of the newborn is matched with a caregiver who is sensitive and receptive to the infant's communication system, the result is an intensity and awareness that exceeds vocal exchange, and a positive communication pattern will ensue.

CHAPTER III

METHODOLOGY AND HYPOTHESIZED RELATIONSHIP

The purpose of this study was to determine the effects of perinatal coaching on mother-infant interactions, stress in the parenting system, and maternal adaptation. Three standardized self-report instruments, videotaped recordings of mother-infant interactions, and demographic information were used in the evaluation. Two different methods of assessment were used in the evaluation of this study. Videotaped sequences were analyzed to examine behavioral interactions between mother and infant while self-report questionnaires were used to assess the attitudes of the mothers in the sample.

This chapter includes a description of the sample selection and the research design procedure used in the study including the description of the intervention program, the testable hypotheses, and finally, the analysis to be used to interpret the data.

Sample Selection

Since this was research involving families in the community, the research proposal for this study was reviewed by the University Committee on Research Involving Human Subjects for approval before beginning sample selection. Further, an informed consent form (Appendix A) was signed by each participant in the study.

The sample consisted of 42 first time mothers and their newborns derived from one private pediatric practice, the Lansing Pediatric Associates, in Lansing, Michgan. The practice was selected because it

is the largest pediatric practice in the area. The size of the practice and the diversity of population served offered a representative sample of private pediatric families living in Lansing and the surrounding area. Each subject was in command of the English language. Each first time mother who had a normal pregnancy and clinically normal full term infant, who was delivered in Sparrow Hospital and cared for in the regular postnatal floor of the hospital was asked to participate. To gather 42 first time mothers who met these criteria and were living in Ingham, Eaton, or Clinton Counties in Michgan, 65 primiparious women who delivered between November 1981 and May 1982 were asked to participate in the study. Thus the subjects were random by time of birth which can be argued to be one of the most effective randomization methods of all.

First time mothers were selected to avoid the intervening variable of learning experienced in caring for another child of the family. A normal pregnancy and a well baby were included as criteria to avoid the effects of illness or other pathology either in the mother or newborn. The women were required to be English speaking to assure understanding of both the program and questionnaires utilized in the evaluation. Residence in Ingham, Eaton, and Clinton Counties was specified to limit the distance the researcher would need to travel for in-home data collection.

The sample size (see Figure 2) was limited to 42 because it was the largest sample size manageable within the limits of the researcher's resources. All women who met the criteria were asked to participate until the sample size was fulfilled. The women had the right to refuse to participate or withdraw from the study at any time.

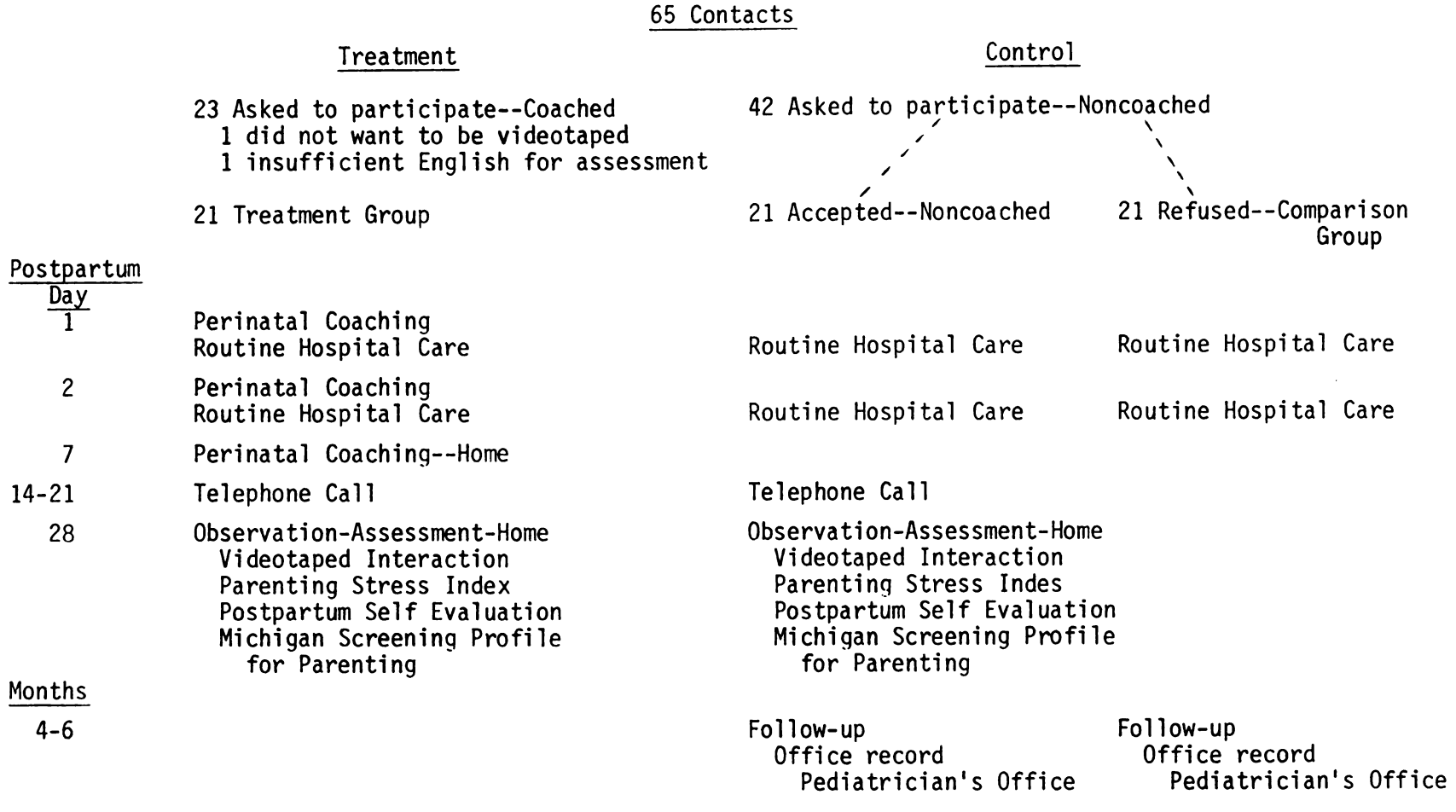
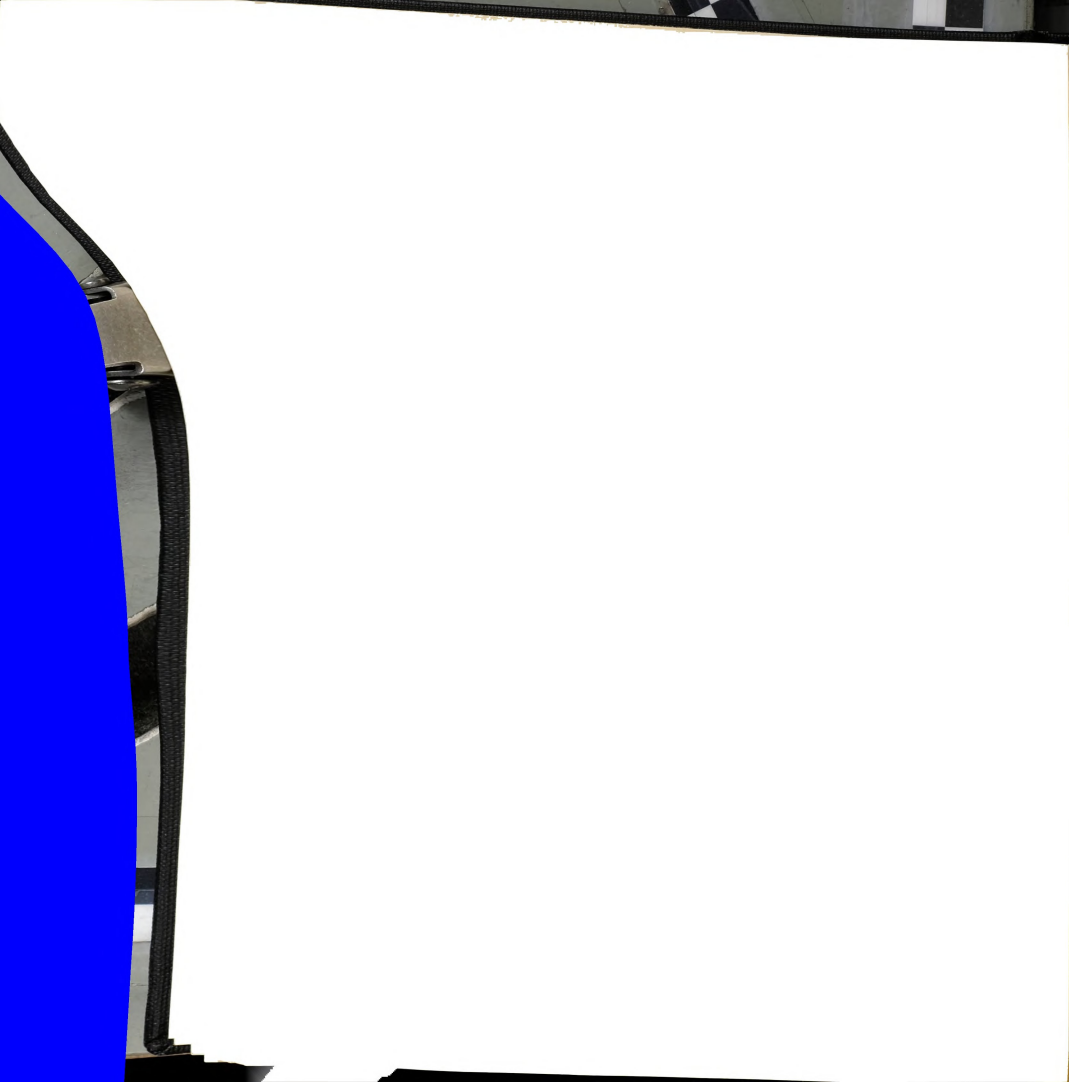


Figure 2. Steps in Sample Selection for Research



The first 21 mother-infant pairs were placed in the control group. However, 42 mothers were contacted before 21 agreed to participate as the control group. The names of those who refused to participate were recorded and later those women's records were used as a second comparison group.

The next 21 mother-infant pairs who met the same criteria as the comparison groups made up the treatment group and were contacted in Sparrow Hospital, Lansing, Michgan. To obtain 21 mother-infant pairs, 23 mothers were offered perinatal coaching. All of these mothers completed the three coaching sessions in the hospital and home, however, two mothers did not complete the fourth session. One preferred that the follow-up session not be completed because of an objection to being videotaped. Another mother was unable to read and understand sufficient English to complete the written assessments. The two mothers who did not complete the program were eliminated from the study.

Design and Procedure

The total sample (n=42) was divided into two groups. The control group of mothers (n=21) received routine postpartum hospital care while the treatment group (n=21) received routine postpartum care plus perinatal coaching on days one, two, and seven postpartum. The independent variable was perinatal coaching. The dependent variables were mother-infant interactions as measured by frequency counts of interactions recorded on videotape sequences of diapering, feeding, and burping; parenting stress as measured by self-report responses to the Parenting Stress Index; and maternal adaptation as measured by

self-report responses on the Postpartum Self-evaluation Questionnaires.

A time sampling technique was used in obtaining the research sample (Figure 2). The names of women who had recently delivered in Sparrow Hospital were obtained from the office of Lansing Pediatric Associates to be contacted for the control group. A letter (Appendix B) was sent to the home residence of new mothers briefly describing the study as an evaluation of programs and services received during their pregnancy and hospital stay. In a follow-up telephone call the study was explained further, and if the mother agreed, a time was set for a home visit by the researcher so the mother could complete questionnaires and the researcher could videotape mother-infant interactions. This visit was scheduled 28 days postpartum and designed to be completed in less than one and one-half hours. The visit was scheduled at the convenience of the mother at a feeding time when the baby was expected to be awake. The researcher went alone to each home with a one-half inch reel Sony Portapak videotape machine and captured the mother-infant interaction on videotape. Both auditory and visual images were recorded.

The nature of contact for recruitment of the control group, an introductory letter with a follow-up phone call, gave a high refusal rate. This was due to the lack of personal contact and very little incentive to participate. Thus, 42 mothers were contacted before 21 agreed to participate. A review of the pediatrician's office records revealed that the group of 21 mothers who refused to participate and the 21 who did participate were similar in demographic information, regularity of office visits, and other pertinent recorded information.

Twenty-one of the mothers who met the same criteria as the control group were seen in Sparrow Hospital, Lansing, Michigan. The initial contact with a mother following her delivery was made by an office nurse from the Lansing Pediatrics Associates who introduced the researcher's program, and stated the researcher would be in to explain the program in detail.

Shortly after receivng a prospective mother's name, the researcher/perinatal coach arrived on day one postpartum and introduced the Perinatal Coaching Program. Since the Perinatal Coaching Program is a voluntary program, the new parents were asked if they wished to participate. The new mothers were very receptive to the program when this introductory contact was made. Usually, new parents were eager to learn skills that would help them do well with their new infants, resulting in a low refusal rate.

Follow-up visits with coaching occurred on the second postpartum day in the hospital and the seventh postpartum day in the home. Finally, on 28 days postpartum, the same assessment measures were gathered in both the study and the control groups. Behavioral mother-infant interactions were recorded on videotape and the self-report questionnaires were completed.

Perinatal Coaching-The Intervention

Perinatal coaching is an intervention program which is a skill-learning program, with a content base that teaches new parents the art of interacting with their newborn. The program includes demonstration and practice time for parents to observe and interact with their newborn. The phrase "perinatal coaching" was selected to describe

not only the period of time when learning these skills is optimal, but also the type of relationship needed between the teacher and the new parent (Helfer and Wilson, 1982).

The Perinatal Coaching Progam provides parents with knowledge about the behavioral capabilities of their newborn. In this program parents are informed what their baby can do and also shown how to utilize these capabilities when interacting with the baby. The coaching program includes a demonstration of many of the capabilites as assessed by the Brazelton Neonatal Assessment Scale, however, it goes further than demonstration (Helfer, 1980). The coaching program provides a supportive one-to-one demonstration-feedback environment for learning of skills at a time when a new mother needs and is ready to utilize ways to interact with, care for, and calm her infant.

In the days immediately following birth, perinatal coaching expands what is routinely taught to new parents to include assistance about how to respond to the baby's sensory capabilities. Parents not only learn that the baby can see and hear, but parents learn how to encourage the baby to follow with his/her eyes and the parents watch the baby become attentive as they talk or change the pitch of their voice. With the assistance of the perinatal coach, parents observe, try what they have seen demonstrated, and gain confidence by knowing about the baby's capabilities, how to attend to the baby's needs, and how to respond to the baby by calming and communicating (Helfer and Wilson, 1982).

The Perinatal Coaching Program has four content areas: the states of consciousness of the infant, social responsive capabilities of the newborn, the infant's ability to be selective of stimuli, and

the uniqueness of each individual baby. Specifically, the Perinatal Coaching Program includes demonstrations and practice time for parents to observe and interact with their newborn. Parents are taught how to apply knowledge of states of consciousness for the most rewarding interaction time with the newborn, the social capabilities of the newborn that are used to interact with the environment, timing of interactions, and the unique behavioral traits of the newborn.

The following is a brief overview of the perinatal coaching experience in this study:

1. A baby is born of a primiparious woman and is examined by one of the four pediatricians from the Lansing Pediatric Associates.

2. The baby is examined by the physician and the mother is advised of the baby's condition. A nurse from the Lansing Pediatric Associates speaks with the new mother about the Perinatal Coaching Program and gives the coach/researcher's name to the mother.

3. The coach/researcher arrives and begins the first of four sessions if the mother agrees to participate. The four sessions are briefly outlined in Figure 3.

In the initial encounter with the new mother on day one postpartum, the perinatal coach/researcher introduces herself and The Perinatal Coaching Program. The first session occurs in the new mother's hospital room on the postpartum unit of Sparrow Hospital. The meeting serves to give an overview of the program, establish a relationship with the mother, and review specific content of the program. Specifically, the content of The Perinatal Coaching Book is reviewed including sensory development of the newborn, capabilities of the newborn, communication systems of the newborn, waking/sleeping states, reflexes and habituation, normal characteristics of infants, and individual characteristics of the newborn. After session one, the

Session	Location	Content	Day-Postpartum	Time
I	Hospital	Explanation of Program Establish relationship with new member Review of content of picture book, Perinatal Coaching Book Leave book with mother Encourage mother to try activities to facilitate interactions with her newborn	1-2	30 min.
II	Hospital	Skill session with newborn (father should be present at either Session I or II) Review interaction skills from Perinatal Coaching Book Demonstrate interaction skills as needed Reinforce interaction skills and give feedback on skill development as shown by mother or father Arrange for home visit at 7-9 days postpartum	2-3	45 min. to 1 hr.
III	Home	Repeat of interaction skill session with baby Answer questions and concerns of mother	7-9	45 min. to 1 hr.
IV	Home	Answer questions Feedback of interaction skills with baby Videotape of feeding, burping, and diaper change Mother completes self-report instruments: (1) Parenting Stress Index (2) Postpartum Self Evaluation Questionnaire (3) Michigan Screening Profile for Parenting	28	1 3/4 to 2 hours 20 min. 15 min. 25 min. 15 min.

Figure 3
The Perinatal Coaching Program

book is left with the mother over night to be reviewed and shared with the father of the baby. Time involved for session one is about 30 minutes.

The coaching content in session one includes direct demonstration with the baby present, when possible, of each of the content items mentioned above plus demonstrating and modeling the following skills: touching and holding, rocking and movement, looking at the baby, especiallly eye-to-eye contact, verbally interacting and talking with the baby, quieting techniques, and observational skills.

Session two is a review of the content of The Perinatal Coaching Book and more of the direct demonstration and modeling of coaching content plus feedback to the new mother on her developing skills. Ideally, the father should be present in either session one or two. Total time for session two is 45 minutes to one hour.

Visit three occurs in the mother's home about one week after discharge. The visit serves as a reinforcement and repetition of all the materials reviewed in the hospital sessions. It further serves as a time for the new mothers to ask questions concerning baby care and behaviors, and voice their fears, apprehensions, and experiences. In this capacity, the perinatal coach is not only a resource person, but a support person in the tenuous time of initial adjustments at home away from the secure environment of knowledgeable hospital personnel.

A fourth session was scheduled about 28 days postpartum for the purpose of follow-up and evaluation. Although the primary goal of this visit is for gathering data, any concerns the mother may have are discussed and questions raised by the mother concerning the baby are answered prior to the administration of the measurement procedures.

Measurement Procedures

Videotaping. A videotaped sequence of mother-infant interactions including a feeding, burping, and diaper change were filmed in the mother's home at 28 days postpartum to evaluate behavioral interactions between mother and infant in a natural setting. Eleven variables were assessed by frequency counts at 15 second intervals for the length of the tape. The tapes varied in length from 10 to 23 minutes with most tapes being 20 minutes long. The shorter recordings on the tapes were due to mechanical difficulties and equipment failures in recording.

The interactions on the videotapes selected for evaluation were chosen because of their face validity based on current studies in the literature. The variables included type of activity such as feeding, burping, diapering, the position of the baby in relationship to the mother, vocalizations by the mother including the pitch of her voice, any external stimulation provided by the mother, movement, touch, and facial orientation of the mother, and finally the movement, involvement, and vocal behavior of the infant in the recorded interactions. A complete list of the variables with the categories for each variable is included in Appendix C.

The variables were formulated for their construct validity after consultation and correspondence with several other researchers who were studying interactional analysis. Further, a test tape made by the researcher of mother-infant interactions of feeding, burping, and diapering, was viewed to select and categorize all meaningful interactions. Variables were selected so that all mother-infant interactions could be recorded and each activity was mutually

exclusive allowing little question as to the category a variable should be placed in when coding the activities. A unique feature of this interactional analysis was the recording of both mother and infant interactions while assessing the mother-infant activities.

The researcher could not assess the videotapes without a bias effect. Therefore, a student researcher who was not aware of the purpose of the study nor the group membership of the mother-infant pairs, was trained by the researcher in the coding of the interactional analysis. During the interactional assessment, the videotapes were manually stopped every 15 seconds to allow time to code the variables accurately. A continuous casette tape with an audible tone every 15 seconds alerted the coder so each variable could be rated within the designated time frame.

In order to establish reliability, a recorded test tape was encoded by both individuals before coding of the study tapes began. Agreement was reached on the test tape assessments. Interrater reliability was established by recoding five minutes of this prerecorded test tape after every 10th study tape for reestablishment of the coding standards. In addition, entire study tapes were given to the student researcher with new identification numbers in order to assess intracoder reliability. The results of this intrarater reliability check (Appendix D) revealed that the coder selected the same response options a high percentage of the time.

The Parenting Stress Index. The Parenting Stress Index (Abiden and Burke, 1981) is a self-report instrument designed to identify mother-child systems which are under stress, and to indicate the source of the stress. The Parenting Stress Index (PSI) was developed

to provide a measure of factors frequently cited in the research literature as related to the stresses of parenting. The self-administered questionnaire contains 150 items and takes approximately 25 minutes to complete. The instrument was based on the resarch literature in child development, effective parenting, and stress. The Parenting Stress Index capitalizes on the research efforts and findings of Thomas, Chess, and Birch (1968), Broussard (1970), Rahe (1974), Holmes and Masuda (1974), Bell (1975), Ainsworth (1975), and Cameron (1978).

The authors of the instrument considered several guidelines. The first was that the instrument was built with face validity. The second was that sources of stress are additive, and the work of Selye (1952, 1974) and Rahe (1974) on life stress events supports this. The third was the assumption that stressors are multi-dimensional, come from many sources and frequently become cumulative. These assumptions by the authors of the instrument were used to identify three major sources of stress called domains. These domains were derived by factor analysis and are Child Characteristics, Mother Characteristics, and Situational/Demographic Characteristics. Within these domains, the kinds of stressors identified range from objective life events such as the death of a family member, to a mother's judgment of the child's activity level, to the mother's subjective feelings of being trapped by parenting responsibilities.

The responses required on the standardized questionnaire vary. Some questions require a check of the appropriate given response while other responses follow a five point Likert Scale format ranging from "strongly agree" to "strongly disagree."

The Parenting Stress Index reliability was assessed by researcher Abidin (1979) using a test-retest procedure at three week intervals. The researcher reported the Alpha reliability coefficients were as follows: Total score r = .93, child characteristics domain r = .87, mother characteristics domain r = .91, and situational/demographic domain r = .68. The researcher (Abidin, 1979) is currently testing The Parenting Stress Index's validity.

The Parenting Stress Index was used in this study to assess stress in the parenting system as perceived by the mothers of the sample population. The self-report responses were analyzed to detect levels of perceived stress in the family.

Postpartum Self-Evaluation Questionnaire. The Postpartum Self-Evaluation Questionnaire (Lederman, Weingarten, and Lederman, 1980) was developed to provide a measure of factors frequently cited in the literature that are considered related to maternal adaptation. The self-administered questionnaire contains 82 items which are divided into eight scales. The response options on the questionnaire follow a four point Likert Scale format ranging from "very much so" to "not at all." The scale has both positively and negatively worded questions to avoid response set biases. The self-administered questionnaire takes approximately 15 minutes to answer. The measures include: quality of relationship with the husband, mother's perception of father's participation in child care, mother's gratification from her labor and delivery experience, mother's satisfaction with her life situation and circumstances, mother's confidence in her ability to cope with the tasks of motherhood and infant care, support for the maternal role from parents, and support for the mother from friends

and family members. The reliability of this instrument was tested by researchers Lederman, Weingarten and Lederman (1981) by test-retest at three days and six weeks postpartum. The researchers reported that the correlation of the repeated measures were statistically significant for all scales. The correlations on the subscales ranged from r = .44 to .85.

The purpose of the Postpartum Self-Evaluation Questionnaire is to provide a quantifiable measure of factors relevant to maternal adaptation. It was used in this study to assess the adaptation to and satisfaction with the role of motherhood. Conflicts and concerns assessed during the early postpartum period may be indicative of the need for maternal support systems.

Michigan Screening Profile of Parenting (MSPP). The Michigan Screening Profile of Parenting (Hoffmeister, Helfer, and Schneider, 1976) is designed to provide demographic data plus information about how parents perceive their childhood experiences, how their children should interact with them as parents, and their current interactions with family members and friends. The instrument provides a profile of parental perceptions in areas which are presumed to be critically important for positive parent-child interactions.

The purpose of having all mothers from each group complete the Michgan Screening Profile of Parenting was to determine if there were any significant within or between group differences in either demographics or perceptions. While these data were gathered at the end of the study (day 28 postpartum), they were used to determine whether or not differences within or between groups may have affected the outcome results.

The Michigan Screening Profile for Parenting is self-administered, contains 50 questions, and takes approximately 15 minutes to complete. The MSPP is divided into four sections. Information about the family history, the respondent's health history, and relationships with employers, social agencies, and spouse is sought along with information about the respondent's perceptions of childhood experiences and current interaction with family and friends. Additional information about the characteristics of the respondent's child and the interactions with the child is sought.

Four subscales are currently generated from responses to the scale items. The measures include Emotional Needs Met (ENM), Relationship with Parents (RWP), Expectations of Children (EOC), and Coping (COP). Analysis of the data is made by convergent analysis to account for inconsistency in response that may be made by some respondents.

The reliability of this instrument was tested by Hoffmeister (1977). The test-retest stability information for the four MSPP measures are based on a sample of 92 mothers. Results indicate that 85 percent of the respondents have stable scores on ENM; 69 percent on RWP; 62 percent on EDC; and 65 percent on COP. These results suggest that the stability characteristics of ENM are quite acceptable; those for RWP are acceptable; and those for EDC and COP are marginal. However, in the latter two cases, a maximum of about seven percent of the respondents had extreme changes in their scores. Therefore, the scores appear to provide a reasonably stable starting point from which to view the respondent's profile of parenting (Hoffmeister, 1977).

The responses required on the standardized questionnaire vary. Some questions require a circle of the appropriate multiple choice response while other responses follow a seven point Likert Scale format ranging from "strongly agree" to "strongly disagree."

The purpose of the MSPP is to determine how individuals perceive their own childhood and parenting, and how they currently interact with those about them. The instrument is a screening questionnaire which provided a descriptive profile of an individual's perception of childhood. The MSPP was analyzed by Hoffmeister, one of the authors, and returned to this researcher. Analysis of responses with the individual's perception were defined as positive, negative, and ambivalent. The negative and ambivalent perceivers are considered as one group.

The MSPP was used in this study to further analyze the individual subjects. The perception types from the data were used in analysis to further the comparison of the individual subject's responses on all the assessment measures.

Hypotheses

Three major hypotheses were tested in this study.

H1. Mothers who receive perinatal coaching will interact more with their newborn than a comparison group of mothers who did not receive perinatal coaching as measured by a frequency count of interactions on a videotaped sequence of mother-infant feedings, burping, and a diaper change.

H2: Mothers who receive perinatal coaching will experience less stress in the parenting system than a comparison group of mothers who do not receive perinatal coaching as measured by The Parenting Stress Index.

H3: Mothers who receive perinatal coaching will experience less difficulty with the role of mothering than a comparison group of mothers who did not receive perinatal coaching as measured by The Postpartum Self-Evaluation Questionnaire.

Analysis

The data collection yielded interval data. The three major hypotheses were analyzed using Student's t-tests. Means of the subscales of the videotaped interactions were derived to create an interaction scale. The variables of the videotaped sequences were then analyzed using Student's t-tests. The responses from the two questionnaires, The Parenting Stress Index and The Postpartum Self-Evaluation Questionnaire were analyzed with Student's t-tests. Further evaluations by Chi-square analysis were completed comparing demographic and descriptive data from the sample.

Summary

The population for this study was first-time mothers from one pediatric practice in Lansing, Michigan, a medium-sized city in the north central region of the United States. The sample consisted of 42 first-time mothers and their well neonates from the Lansing Pediatric Associates who were delivered in Sparrow Hospital.

A time sampling technique was used in obtaining the research sample. All the women who met the criterion were asked to participate until the required number was obtained. Over sampling occurred to assure a minimum sample size of 20 mother-infant pairs for each group.

A treatment of perinatal coaching was given to one-half of the mothers (n=21) while the control group (n=21) received only routine postpartum hospital care. Data from videotaped interaction sequences

and self-report questionnaires were analyzed using Student's t-tests. Further evaluations by Chi-square analysis of the descriptive characteristics of the sample and demographic information were completed.

CHAPTER IV

FINDINGS

This research study was designed to explore the effects of perinatal coaching on the dependent variables of mother-interactions as recorded from videotaped sequences, stress in the parenting system as measured by the Parenting Stress Index Scale, and maternal adaptation as measured by the Postpartum Self-Evaluation Questionnaire Scale. The sample included 42 first time mothers and their clinically normal newborns. Three standardized self-report instruments, videotaped recordings of mother-infant interactions, and demographic information were used for evaluation. Two modes of assessment were used in this study. Videotaped sequences were utilized to evaluate behavioral interactions, while self-report questionnaires were used to assess the attitude of the mothers.

Data related to the description of the sample and the findings from the three major hypotheses are reported in this chapter. Each research hypothesis and analysis is addressed separately.

Sample Description

Descriptive data of the sample were analyzed to investigate the comparability of the treatment and control groups on the demographic information (Table 1). Comparison of groups via Chi-square analysis and Student's t-tests showed no significant differences in age of mother or father, education of father, occupation of mother or father, or family income. A difference was found in the education of the mother (x^2=.04, df-3, p. < .05) with the coached group having a wider

Table 1

Demographic Characteristics of Sample

	Age of Sample Population	
	Range	Mean
Coached/Teatment	22-36	28.2
Noncoached/Control	20-36	26.1

	Education Level of Mothers and Fathers			
	Mother		Father	
	Coached	Non-Coached	Coached	Non-Coached
Grades 9-12	4	0	1	2
Some College	4	9	9	5
College Graduate	7	10	7	6
Graduate/Professional	6	2	4	8

	Family Income	
Income	Coached	Noncoached
Over $20,000	14	11
$15,000 to $20,000	4	4
$10,000 to $15,000	2	4
$5,000 to $10,000	1	1
Less than $5,000	0	1

range of educational completions. The treatment group had more mothers on the lower end of the educational scale, (completion of 9-12th grade; n=4 for treatment, n=0 for the control) and more graduate professionals, (n=6 for treatment, n=2 for the control). The difference appears to be lodged in the variance and not the median level of education. The entire sample is comparable on the above demographic variables demonstrating no systematic bias.

Chi-square analysis showed the sample to be comparable by sex of infant and feeding method (breast or bottle). The distribution by sex of infant showed no difference between treatment and control groups. There were eight males and 13 females in both the treatment and control groups.

The distribution of types of feeding are shown in Table 2. The Chi-square analysis revealed no significant difference between the groups thus demonstrating no systematic bias as to type of feeding.

Further Analysis of Perceptions of Childhood

The Michigan Screening Profile for Parenting was used to further the comparison of the individual subjects. With groups of this size, the possible effects of within group differences in mothering techniques needed to be assessed. The assumption was made that those who perceived their life and childhood negatively would be affected by perinatal coaching differently than those who had positive perceptions.

The treatment and control groups had equivalent proportions of negative perceivers. In the coached group, 16 perceived their childhood as positive while, five were negative or ambivalent

Table 2

Chi-Square of Type of Feeding
for Treatment and Control Groups

	1. Breast	2. Bottle	Row Total
1. Treatment	n = 11	n = 10	n = 21 50.0%
2. Control	n = 14	n = 7	n = 21 50.0%
Column Total	n = 25 59.5%	n = 17 40.5%	n = 52 100.0%

perceivers. In the control group four were negative or ambivalent perceivers, while 17 had positive perceptions of childhood. Chi-square analysis of positive and negative perceivers revealed no statistical differences. The positive perceivers, irrespective of treatment conditions, were further compared with the negative perceivers by Student's t-tests revealing no differences between groups in mothering techniques.

Hypothesis 1

> Mothers who receive perinatal coaching will interact more with their newborn that a comparison group of mothers who did not receive perinatal coaching as measured by a frequency count of interactions on a videotaped sequence of mother-infant feeding, burping, and a diaper change.

A variety of modes of behavioral interactions were analyzed to test hypothesis 1 (see Appendix C). The dependent variable of amount and quality of interaction was measured by a frequency count of interactions on the videotaped segments of mother-infant feeding, burping, and diaper changing. The dependent variable was the percent of total time engaged in specific interactional components used in the analysis of the videotapes. Analysis by Student's t-tests revealed support for this hypothesis in most of the major components.

Major interactional components considered important in the research were coded from the videotaped sequence. Twenty-three minutes of videotaped activity were recorded with scoring being adjusted when the taped activity did not continue for 23 minutes due to mechanical or equipment failure. Eleven interactional components or variables were recorded during 15 second intervals as being present

or absent. The variables were then scaled and converted to total percentages of time for the duration of the occurring activity.

Eleven categories were coded, however, one of the categories, the position of the baby, was included primarily to keep track of the position of the baby relative to the mother. Thus, 10 major behavioral categories in the interactional analysis of the videotaped sequences were considered important because of their prominence in the research literature. One of these variables, external stimulation by the mother, had too few occurrences during the interactional analysis to include it in the data analysis. The remaining nine variables are presented with the appropriate findings, while the statistics for the variables are in Table 3.

Activity

Five major categories were coded for activity which included breast or bottle feeding, burping, diapering, or noninstrumental activity. Play and other meaningful activities between mother and infant engaged in while not feeding, burping, or diapering were captured in this category. The coached group spent a higher percentage of time with the baby in the category of non-instrumental behavior ($t=1.83$, $df=40$, $p.< .05$).

The type of feeding, breast or bottle, was analyzed by Chi-square with no statistical difference shown. However, the group who bottle fed their infants spent a greater percentage of total time feeding than the group of mothers who breast fed ($t=1.97$, $df=40$, $p.< .05$).

Vocalization of Mother. Either the presence or absence of maternal vocalizations was recorded for this component of the scale.

Table 3

Student's t-tests Showing Behavioral Variables of Videotaped Mother-Infant Interaction

Frequency of Videotaped Interactions[A]

Behavioral Category	Coached/Treatment		Noncoached/Control		T
	Mean	Standard Deviation	Mean	Standard Deviation	
Activity					
Play	16.34	17.89	8.62	7.33	1.83*
Breast feed[B]	24.48	28.68	43.22	32.76	-1.97*
Bottle feed[C]	24.09	26.47	17.16	25.32	.87
Diapering	15.38	7.56	13.89	6.06	.71
Burping	19.71	11.37	17.11	8.00	.86
Vocalization					
Absent	27.36	23.29	42.86	24.95	-2.08*
Present	72.64	23.19	57.14	24.95	2.08*
Pitch					
Absent	27.60	23.44	42.83	24.82	-2.04*
Normal	2.26	6.85	4.24	12.89	- .62
High	70.14	27.11	52.93	25.96	2.10*
Movement by Mother					
Carry	.86	1.79	.76	.98	.22
Shift position	16.58	6.61	12.67	5.38	2.10*
Rock/Bounce	13.59	19.00	13.25	22.09	.05
Touch					
Caregiving	54.22	22.58	48.42	18.95	.90
Emotion transmitting	45.78	22.50	45.66	23.17	.02
Visual Gaze					
Focus (enface)	85.76	8.38	84.59	12.22	.36
Focus (except face)	13.98	8.42	13.52	10.72	.15
Nonfocus	.29	1.08	1.89	5.23	-1.38+
Movement by Baby					
Quiet	71.84	15.78	74.15	14.53	- .49
Active	28.16	15.78	25.85	14.53	.49
Engagement of Baby					
Engaged-feeding	91.27	11.30	81.71	13.71	2.47**
Disengaged	8.73	11.30	18.29	13.71	-2.47**
Baby Vocal Behavior					
Cry/Scream	4.36	5.87	4.63	7.52	- .13
Vocalization	21.87	10.68	22.40	16.42	- .12
Cough/Hiccough	.72	.89	.70	.95	.05

* P. < .05
** P. < .01
\+ P. < .10

A Percent of total time engaged in each category-proportion calculated using 15 second intervals

B For breast feeding n = 25

C For bottle feeding n = 17

For all other categories n = 42
df = 40

The coached group spent a greater percentage of the total time talking with their infants ($t=2.08$, $df=40$, $p. < .05$).

Vocal Pitch of Mother. The vocal pitch of the mother refers to the pitch of the mother's voice when talking with the infant. A normal pitch is the tone utilized in normal conversation. By comparison, an animated high pitched voice is raised an octave and tends to attract attention when communicating. The treatment or coached group of mothers spent a higher percentage of time in high pitched vocal interactions with the infants ($t=1.09$, $df=40$, $p. < .05$).

External Stimulation by Mother. The presence or absence of external stimulation by an inanimate object was recorded as present or absent. Stimulation could occur with an inanimate object including a pacifier, toys, or a stuffed animal. The movement of a mobile or turning on a musical toy were also included. Little activity was noted in this variable during the interactional analysis of the videotaped sequences, therefore, the variable was not included in the statistical analysis.

Movement by Mother. The presence or absence of movement plus the type of movement by the mother was recorded with three categories of movement designated. These categories included carrying the infant, shifting the position of the infant, and some type of purposeful behavior for calming or playing with the infant including rocking or gentle bouncing movements of the baby. No differences in the categories of movement by mother were found, except for shifting of the baby's position in which the coached mothers moved their babies more ($t=2.10$, $df=40$, $p. < .05$).

Touch by Mother. The type of touch given by the mother was recorded with two categories of touch designated. They were caregiving and emotion transmitting touch. Caregiving touch is associated with any care given to the baby such as diapering, transporting, and holding to feed. Emotion giving touch is the touch given as pats, strokes, or caresses. No differences in the categories caregiving and emotion transmitting touch were found.

Visual Gaze of Mother. The facial orientation of the mother clarified whether the mother's attention was focused on the baby's face (en face), on an area of the infant other than the face, and the third choice of non-focused attention. Although this was not supported statistically, there was a trend ($t = 1.38$, $df = 40$, $p. = < .09$) showing the mothers in the coached group having more segments of focused attention on the infant than the control group of mothers. No difference in the categories en face and focused attention on other areas of the infant were found.

Movement by Baby. The presence or absence of movement plus the type of movement of the baby were recorded with four categories of movement designated. The categories included quiet in which the baby does not move, active in which the baby is moving his/her own extremeties, puppeting in which the baby's extremeties are moved by the mother, and touch in which the baby touches the mother. No differences in the categories of movement by baby were found.

Engagement-Involvement of Baby. Engagement or disengagement of baby with the mother, in some type of activity, was recorded in this variable. The infants of the treatment or coached group were engaged a higher percentage of the time ($t=2.47$, $df=40$, $p. = < .01$) than the

control group.

Baby Vocal Behavior. The baby's vocal behavior was recorded as present or absent plus the types of vocal behavior were observed in four categories. These categories included cry/scream, vocalizations of babbling or cooing, smiling, burping, and cough or hiccough. No differences were found in the categories of baby vocal behavior.

Hypothesis 2

> Mothers who receive perinatal coaching will experience less stress in the parenting system than a comparison group of mothers who do not receive perinatal coaching as measured by self-report responses to the Parenting Stress Index.

A hypothesized relationship, that the coached group would experience less stress than the control group was made. The dependent measure of stress in the parenting system was composed of a total score and three subscales or domains called the child characteristic scale, mother characteristic domain scale, and the situational/demographic characteristic domain.

The findings of the analysis of the data from The Parenting Stress Index showed that all the subject's responses from this researcher's sample scored above the 90th percentile. Correspondence with the author of the instrument revealed that the percent conversion table sent along with the questionnaire to interpret the data was in error and is currently being restandardized. The raw scores were unaffected. Therefore, raw scores were used in the analysis of data.

Analysis by Student's t-tests revealed that the treatment and control group did not differ significantly in stress within the parenting system (Table 4). The results did approach significance in

Table 4

Student's t-tests Showing Analysis
of Parenting Stress Index

Variable	Coached/Treatment		Noncoached/Control		
Domain Category	Mean	Standard Deviation	Mean	Standard Deviation	T
Total Child Domain	114.62	18.44	114.14	17.24	- .09
Total Mother Domain	150.14	29.17	162.19	25.29	-1.43+
Total Situational/ Demographic	31.10	6.65	34.48	8.52	-1.43+
Total Prenting Stress Index	295.86	46.42	310.81	40.30	-1.11

* P.<.05
\+ P.<.10
df = 40

the mother domain scale and the situation/demographic domain scale indicating more stress in the control group of mothers ($t=-1.43$, $df=40$, $p.= < .08$).

Hypothesis 3

> Mothers who receive perinatal coaching will experience less difficulty with the role of mothering than a comparison group of mothers who did not receive perinatal coaching as measured by the Postspartum Self-Evaluation Questionnaire.

The dependent measure of maternal adaptation was measured by eight subscales of the Postpartum Self-Evaluation Questionnaire. Analysis by Student's t-tests revealed that out of the eight subscales in the questionnaire only one subscale, support by parents, was significant ($t=2.30$, $df=40$, $p. = < .02$) in favor of the control group (Table 5). Overall there was little support for this hypothesis.

Summary

The descriptive data of the sample and three major hypotheses were reported with statistical findings. No statistical differences were found in the treatment and control groups in the descriptive and demographic variables when compared by Chi-square analysis and Student's t-tests, thus demonstrating no systematic bias. Analysis via Student's t-tests indicated there was support for five of the nine variables of mother-infant interactional behavior. Coached mothers showed enhanced interactional patterns on five variables compared to the control group. Hypothesis 2, in which stress in the parenting system was analyzed, approached significance showing some evidence of increased stress in the control groups in the mother domain and the

Table 5

Student's t-tests Showing Analysis
of Postpartum Self-evaluation Questionnaire

Variable	Coached/Treatment		Noncoached/Control		
Scales	Mean	Standard Deviation	Mean	Standard Deviation	T
Mother's:					
Quality of Relationship with Husband	45.43	4.40	44.95	3.62	.32
Perception of Husband's Participation	42.29	3.00	42.33	2.85	- .05
Satisfaction with Labor & Delivery	35.38	5.93	35.05	5.01	.20
Satisfaction with Life Circumstances	32.48	4.91	31.38	4.15	.78
Confidence in Ability to Cope with Motherhood	46.48	5.38	45.48	5.79	.58
Satisfaction with Motherhood and Infant Care	45.81	3.75	46.48	4.36	- .53
Support for Maternal Role from Parents	22.62	1.80	23.57	.60	-2.30*
Support for Maternal Role from Friends	17.57	1.54	17.52	1.21	.11

* P. < .05
+ P. < .10
df = 40

situational/demographic domain. However, statistical significance was not reached. Little support was shown for hypothesis 3, the analysis of maternal adaptation.

CHAPTER V

SUMMARY AND CONCLUSIONS

This study was designed to explore the effects of perinatal coaching on the dependent variables of mother-infant interaction, stress in the parenting system and maternal adaptation. Forty-two first time mothers and their clinically-well newborns who were delivered in Sparrow Hospital served as the sample, All mothers and infants were from one private pediatric practice in Lansing, Michigan. Twenty-one of the mothers received perinatal coaching on days one, two, and seven postpartum, while the remaining served as the control group. Three standardized self-report instruments, videotaped recordings of mother-infant interactions, and demographic information collected 28 days postpartum were used for evaluation. Two modes of assessment were used to acquire the data for analysis. Videotaped sequences of feeding and diapering permitted the evaluation of behavioral interactions, while self-report questionnaires, The Parenting Stress Index, Postpartum Self-Evaluation Questionnaire, and Michigan Screening Profile of Parenting, were used to assess the attitude of the mothers.

Three major hypotheses assessing mother-infant interactions, stress in the parenting system, and maternal adaptation were tested. Data related to the description of the sample and demographic information were also analyzed.

The coached and control groups were found to be comparable on all descriptive data analyses performed. The test of the first hypothesis in which nine major mother-infant interactions were examined and

analyzed from videotaped sessions in the home, showed that the coached mother-infant pairs scored significantly higher on five of the nine behaviors. Vocalizations, pitch of voice, feeding time, movement by mother, and engagement of the baby were statistically significant, while touch, visual gaze, movement by the baby, and baby vocal behavior were not statistically significant. A trend approaching significance was found for the second hypothesis where coached mothers showed less stress in two of the three subscales. However, the second hypothesis was not statistically significant. No difference was found between groups on maternal adaptation so the third hypothesis was rejected. Perinatal coaching was effective as documented by the behavioral assessments of videotaped sequences at 28 days postpartum.

In this final chapter, some of the methodological factors that may have contributed to these results are explored. The discussion also focuses on the theoretical impact of the present findings, new avenues of future research, and finally, the implications for practical application.

Conclusions

Three major hypotheses were tested in the present study. In the first hypothesis, behavioral interactions were examined via videotapes, while in the remaining two hypotheses, attitudes concerning stress in the parenting system and maternal adaptations were examined via self-report questionnaires.

The behavioral variables examined in the first hypothesis concerning activity, vocalizations, pitch, movement by mother, touch, visual gaze of the mother, and engagement, movement and vocal behavior

of the baby were carefully selected for their face validity from the research literature. The composition and selection of each variable became complementary so that each activity was mutually exclusive and every possible alternative in the interactional process was considered. Also of importance is the complementarity which extended to both individuals in the dyad, the baby's activity as well as the mother's activity were coded. This application is congruent with the understanding and realization that children influence their caregivers' reactions (Bell, 1960). The application is also congruent with an ecological systems approach which postulates that development may be viewed as a continuing reciprocal interaction between a changing organism within a changing environment (Hartup, 1978). In summary, the model allowed for the activity of both the mother and the infant to be examined along with the interactions between the two.

Hypothesis 1

The first hypothesis evaluated in this research was the effect of perinatal coaching on mother-infant interactions. The hypothesized relationship proposed that the coached group of mothers would interact more with their infants than the noncoached mothers. Analysis was made by Student's t-tests on a variety of modes of behavioral interactions and revealed support for five of the nine major variables confirming that the coached group showed greater quality and amount of time spent in interactions than the uncoached group (see Table 3). The modes of behavioral interaction that were analyzed were the key to differentiating specific activities engaged in between mother and infant and are discussed separately to provide a more comprehensive

understanding of each component which contributed to the assessment of interactions in this research.

Activity. Activity included type of feeding (breast or bottle), diapering, burping, and non-instrumental activity such as play and other meaningful activities. The coached group of mothers spent a significantly higher percent of time in play and other meaningful activities which stimulated interactions with their infants than the noncoached mothers. The Perinatal Coaching Program shows parents what their baby is capable of doing, and shows them how to utilize these capabilites in interacting with the baby. From the analysis, coached mothers appear to have integrated the knowledge about the behavioral capabilities of the newborn. Since the coached mothers spent a significantly higher percentage of their time in play, results of the analysis of this variable indicate strong support for this component of the hypothesis.

Type of Feeding. Another component of this category to be examined was the analysis of type of feeding and percentage of time spent feeding. There was no significant difference in groups by type of feeding. What was significant, however, was the fact that mothers who breast fed their baby in the coached group spent significantly less time feeding which allowed more time for play and other meaningful interactions (see Table 2).

Vocalization of Mother. The presence or absence of maternal vocalization was examined in this variable. The coached group spent a greater percentage of the total time talking with their infants than did the noncoached group. The higher percentage of time spent in vocalizations demonstrated again that the coached group utilized the

knowledge acquired in the perinatal coaching program of the behavioral capabilities of the newborn.

This finding is congruent with research studies which support the auditory responsivity of infants. Hammond (1970) found positive-orienting behavior a greater percent of the time in two-week-old infants in response to calling the infant's name by the mother, supporting the idea that the infant is receptive to auditory stimulation and that sound is an integral part of the communcation system of the newborn.

Vocal Pitch of Mother. The analysis of this variable indicated the pitch of the mother's voice when talking with the infant. The coached group of mothers spent a higher percentage of the communication time in high pitched vocal interactions with the infant than the noncoached group. Condon and Saunders (1974) report from microanalysis of filmed sequences, that infants listen selectively to auditory stimuli as early as two days of age. Applying the content of the perinatal coaching program, coached mothers utilized knowledge of behavioral and socially responsive capabilities to interact with the newborn.

External Stimulation by Mother. The category of external stimulation included the use of inanimate objects to calm or attract the baby's attention. The lack of frequency of activity in this category may be attributed to the age of the child and the newness of motherhood for the sample population. Since the mothers were so intent in their activities of feeding, burping, and diapering, they did not offer external inanimate objects for stimulation such as toys or a pacifier during the videotaped sequences. Also the infants were very

young (28 days old) and the majority of their time is spent in a sleep state when not involved in the caretaking activites of feeding and diapering , allowing little time for play.

Further, these types of stimulation of the baby by the mother seemed to occur after the feeding and diapering of the infant which indicates that inanimate objects such as toys were used but not during feeding time while this researcher was videotaping. The play that did occur during the videotaped sessions was primarily vocal exchange and stimulation through touch and movement.

Movement by Mother. No significant differences between groups were shown on the types of movement by the mother including carrying the infant, along with some type of purposeful behavior for calming or playing with the infant including rocking or gentle bouncing movements of the baby. Both groups appeared to engage in about the same proportion of this type of behavior during the videotaped interactional analysis. The category which recorded shifting or changing the position of the baby by the mother was significantly different with the coached group of mothers showing more activity. An interpretation of this could indicate that the coached mothers were involved in the increased movement as a calming activity with the infant.

Touch by Mother. No differences between groups were shown on this variable, including caregiving touch and emotion transmitting touch. Although one might expect the coached group to score higher on this variable, a difference did not occur. An explanation in this study may have been the quality of videotaped sequences. Although the researcher was very aware of seeing mothers communicating by touch, the quality of the tape may have precluded the coder from seeing the unobtrusive

strokes and gentle pats that occurred in conjunction with the other activities that may have dominated the sequence.

Another possibility is, of course, that each group of mothers communicated equally well by touch because of past learnings from books and other educational media. In the research literature, emphasis of the salutory effects for infants who receive extra tactile stimulation ranging from weight gain to higher developmetnal scores on assessments has been noted. These findings have been disseminated widely in the current literature and parent education classes. The possibility occurs that learnings from sources disseminated to the public have been distributed widely and have been integrated into current caregiving by most mothers.

Visual Gaze of Mother. The facial orientation clarified whether the mother's attention was focused on the baby's face (enface), on another area of the baby's body, or not focused on the infant at all. A mother's attention directed to watching television, looking out the window, or a variety of other distracting activities would be coded as non-focused attention. The coached group had more focused attention on their infants than the noncoached group. Although this was not supported statistically a definite trend approaching a statistical difference was present in the groups with the coached group of mothers showing more focused attention.

Movement by Baby. Two types of movement, recorded as quiet or active, were included to assess the activity level of the infant in relation to the mother's response to that activity. Further categories of puppeting and infant touching of mother were included as possible interactional occurrences. The activity level of the infant seems to

affect mothers in about the same manner showing that an active infant elicits response from the mother. Other movements in this category are probably more appropriate for an older infant and were seen infrequently on the sequences at 28 days postpartum.

Engagement-Involvement by Baby. This component was included to show the infant's response to stimuli by being engaged or disengaged with the mother in some type of activity. The infants of the coached group of mothers were engaged a higher percentage of the time than the control group of infants. It can be assumed that the coached mothers utilize skills from the Perinatal Coaching Program to interact effectively with the infants in order to capitalize on the awake time of the infant for mother-infant interactions.

One of the strong points of the variables examined in this hypothesis is the fact that the baby is viewed as an active part of the mother-infant dyad. Since the mother is the major mediator of stimulation, her visual attentiveness affects the visual activity pattern of her infant. Bennet (1971) emphasized the importance of the infant's alertness, or engagement, which is necessary for interactions with the environment.

Baby Vocal Behavior. This category was included to assess the effects of any baby vocal behaviors on mother's response. Both groups of mothers responded with similar frequency and no statistical differences were shown. Vocal behavior is one of the infant's most commanding means of communication and it was expected that mothers, whether coached or noncoached would respond with similar frequency.

Hypothesis 2

A hypothesized relationship that the coached group would experience less stress in the parenting system than a comparison group of noncoached mothers was made. The results did show a trend revealing the coached mothers had less stress in the mother domain and in situational stresses, but the differences were not statistically significant. The mother domain included feelings of competence and support as a mother, and situational stress included life stress encountered such as marriage, pregnancy, debts, promotions, and moves.

Several reasons could account for lack of support for this hypothesis. Since the instrument measuring these attitudes is a self-report questionnaire and dependent on the subjective views of the respondent, three issues are relevant. The problem of semantics may have caused difficulty in communicating ideas, varying moods of respondents may have affected the attitude responses, and most importantly, the impossibility of determining whether or not the written expression of the respondent was an accurate picture of the attitude.

Since motherhood is often given a positive value judgment and a certain type of expected behavior within that role configuration is perceived, some respondents may have answered questions as they thought a "good mother" may have answered. On a self-report questionnaire, it would be possible to answer the way the respondent perceives "I should answer" as opposed to the way "I really feel", especially for one who is viewed as a professional, as any researcher probably would be. The bias of answering in a manner that the respondent felt she should, could have influenced the outcome of this hypothesis.

Hypothesis 3

A hypothesized relationship that the coached group would experience greater maternal adaptation than a comparison noncoached group was given little support. After administering this instrument, this researcher feels that the content of the questions was extremely relevant, however, the specificity of the outcome measure was not refined sufficiently to be meaningful. From a methodological point of view, measurement was weakened by the large number of subscales in comparison to the total items on the questionnaire. A smaller number of more meaningful subscales might have provided more accuracy and reliability of key issues. Perhaps a restructuring of the subscales would have produced more meaningful results on this hypothesized relationsihp.

The three problems inherent in all self-report instruments that measure attitudes mentioned previously also apply to this instrument. Questions of accuracy of measurement in attitudes originate in semantics involving communication of meaning, varying moods of respondents, and the question of whether the written expression is an accurate picture of the individual's attitude.

Additional Information

The direction of causation is not always clear in interactional analysis; that is did the child's behavior lead to parenting behavior or vice versa? Certainly a neglected aspect of many parent-child studies is the extent to which the child's characteristics and behavior have contributed to the parenting behavior and the resulting interaction. Parent-child relationships cannot be viewed solely as

products of parent's influence (Bell, 1968; Walters and Stinnett, 1977; Clark-Stewart, 1977; Bromwich, 1981).

Perhaps the most significant change in research in both child development and the study of parenting is the increased focus on naturalistic studies of parent-child interactions, as contrasted to the earlier use of attitude questionnaires and the study of dynamics of individual behavior. Researchers are critical of attitude data, particularly those derived from parental contact through questionnaires (Hess, 1970; Martin, 1975) as a means of obtaining accurate information for evaluation. Currently favored are multiple sources of information and, especially, direct observation of interaction and naturalistic observations in the home. After reviewing various sources of data regarding parenting behavior, Cox (1975) concludes that each has advantages and disadvantages and that employing only one is no longer satisfactory.

This research study had the advantage of having two different modes of assessment within a naturalistic observation. An effort to view the interactional process between mother and infant as a two way process that is interdependent and interrelated was utilized in this study. Naturalistic observations of behavioral interactions were captured by videotaping, while the attitudes of the sample were measured by self-report questionnaires. Both assessments were carried out in the home within a time frame of two hours. Of the two assessment tools, the videotaped interactions appear to be more sensitive to discriminating differences in the two groups.

The natural setting, the home, eliminates some of the stress of "being on stage" which may occur when videotaping is carried out in a

clinical setting or laboratory. Since the researcher went to the home much of the stress of "packing up" the baby with all belongings to make an appointment was relieved. There is the stress of being in front of the camera, however, most mothers reported that after the first few minutes they were able to block out the fact that they were being filmed.

The findings in this study indicate the importance of assessing variations in both behavioral and attitudinal measures of mother-infant interactions. The videotaping was extremely useful for recording the accuracy of interactions. The videotaped sequence is a primary data source which captures objective sequences of actual interactions, while self-report questionnaires are a secondary data collection tool which relies on the individual's subjective perceptions of events. The primary data collection tool of videotaping proved to be valuable in this study.

The Perinatal Coaching Program

The implementation of the program in this study went smoothly. The format allows sufficient flexibility and has a solid content base to make application of the program meaningful. The books were easily comprehended because of the many explanatory pictures. Also, the book had a sufficiently attractive appearance to be reviewed even by the most exhausted mother.

This research study utilizing the Perinatal Coaching Program originated from a pediatrician's office. Other possibilities for implementing the program would be a hospital based program which would operate in a similar manner as this study in the hospital visiting

phase. A program operating from a family practice center could begin teaching some of the materials prior to delivery and use the time immediately postpartum to reinforce materials already covered while reviewing coaching skills with demonstration and practice sessions. The program can be utilized with minor modifications from various sponsoring bases.

Limitations of Study

This study was a primary analysis of data collected in a medium sized city and the three contiguous counties. The generalizability of findings is limited based on any biases of the sampled community. This study, therefore, is limited to the mother-infant pairs who participated in this study. Certain impressions can, however, be shared.

This research study was conducted within a limited time period, albeit a very critical one in the family system, therefore long term effects can not be speculated upon.

The validity of the self-report instruments was a limiting factor in the collection of data. In a broader sense, the lack of availability of instruments that can measure attitudes in the postpartum period is a limiting factor to most research pursuits.

Implications for Family Theoretical Model

An ecological approach was utilized in this research to explore the effects of perinatal coaching on mother-infant interactions. The specific variables included in this research provided a partial model for understanding the dynamics of mother-infant interaction. Further

identification of variables is needed to expand the understanding of the intricacies of the process of mother-infant communication. Greater specificity in the identification of tangible and intangible, human and nonhuman resources is also necessary.

Based on this research, however, the concept of interdependence and interrelatedness between mother and infant was especiallly evident. Mothers who were coached, and implemented communication skills for effective interaction with the newborn, were more likely to interact a greater percentage of the time with their infant. The research also showed the infant's response by being engaged with the coached mother a greater percentage of the interaction time, showing that the coached mothers were able to capitalize on the newborn's awake time and maintain the infant's attention a greater percentage of the time than the noncoached mothers.

From this perspective, the ecological model provides a framework beneficial to the exploration of family change and adaptation when a new member is added and the system changes from a dyad to a triad. Also the model provides a framework that is capable of assessing transformations in both mother and infant.

Implications for Future Research

As a result of this study, the researcher recommends further research of three types:

1. Research that is similar to this study but aimed at increasing the knowledge base of the effects of perinatal coaching on mother-infant interaction.

2. research which is similar but which eliminates some of the limitations of this study; and
3. research that is similar but cross-cultural in design.

Finally, one of the more intriguing implications of the present study is the dire need for practical assessments of behavioral interactions. When we begin to understand the complexities of the transactions among the intricate interactional variables in mother-infant interactions, our ability to predict developmental outcome will increase tremendously.

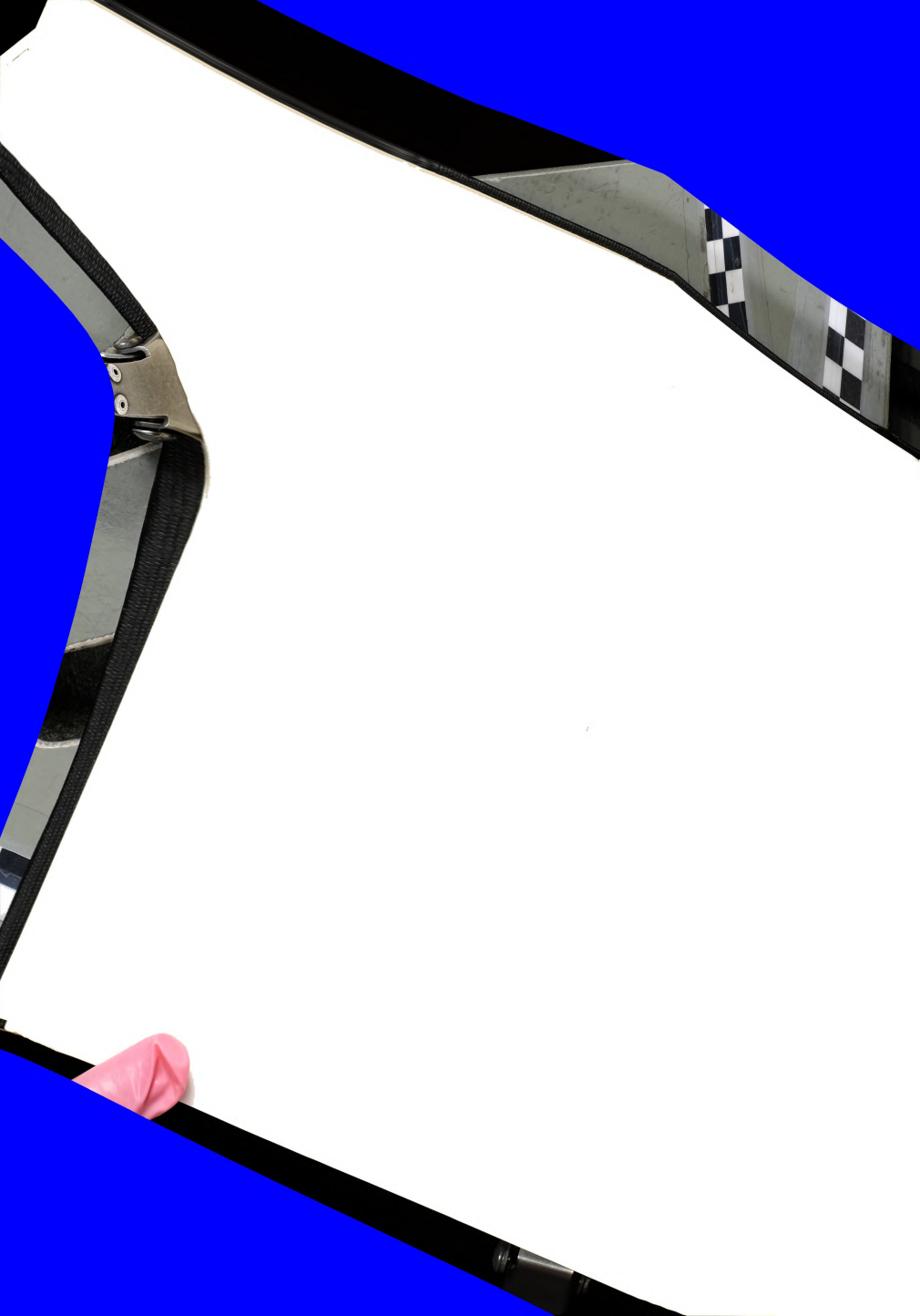
Further Research Related to this Study

This study should be:

1. repeated using the same planned coaching intervention program followed by participant observation instead of videotaping for a 20 minute mother-infant interaction sequence of feeding, burping and diapering. The investigation should utilize the variables for behavioral observations and the self-report instruments to measure attitudes of the mothers. Such a study would show if the same study can be assessed by recording interactions on a check list which would eliminate bulky videotaping equipment and the presence of a camera which sometimes proves inhibitory to interactions.
2. repeated utilizing more compact and sensitive videotaping equipment that allows quality control of filmed images and greater mobility for the researcher to improve the quality and clarity of the tapes providing sharper, more vivid images for evaluation of the major behavioral variables. The bulky

nature of the present equipment necessitates that the mother carry out all activities in one location to accomodate filming with equipment that has limited mobility within the home.

3. continued on a longitudinal basis administering the same questionnaires at three and nine months postpartum and utilizing a Bailey Development Assessment at 12 months postpartum to evaluate differences in infant development between children in the coached and non-coached groups.
4. repeated using a larger sample and controlling for socioeconomic status and race.
5. expanded beyond one pediatric practice to see if a wider range of variability in the sample produces a different outcome.
6. repeated using a hospital based program to see if differences in origin of the program become apparent.
7. extended to other locations in the United States to expand the generalizability of the research.
8. continued to develop a concise evaluation tool through ongoing research, refining the evaluation procedures so that assessments are more efficient and reliable.
9. repeated with other cultural groups to evaluate what modifications, if any, need to be made for specific cultural groups.
10. continued for assessment of carry over effects to other children which might be investigated when siblings arrive.



Implications for Practical Use

The results of this study could be useful to new parents and all those interested in parenting programs. In the more global sense, the perinatal coaching program could offer health care providers a valuable tool to facilitate communication and positive mother-infant interactions to enhance the transition to parenthood. The establishment of such a program could alleviate many of the major frustrations for new parents in developing a positive beginning, especially in the perinatal period in the hospital and during those first critical weeks at home when the family patterns are being established. The perinatal coach can not only teach skills to facilitate communication between mother and infant, but function as a very important support person who could act as a liaison between the health care system and the family.

A perinatal coaching program could be established as an integral part of every hospital's postpartum routine. The beauty of the program lies in the fact that the sessions are in the hospital when the parents are so ready and eager to learn, and also in the home when parents are away from the protective environment of the hospital. Especially in the home setting, parents have a profound need to learn communication skills to interact with and calm their infant. An ongoing hospital based program with follow-up visits in the home would provide the greatest opportunity for continuity and reinforcement of the skills of communication for effective mother-infant interaction.

Another very practical aspect of the program is that volunteers are utilized as coaches, probably women who have recently become mothers and who were coached during their hospital confinement and in

their home. Utilizing volunteers keeps the cost of the program in a range that can be easily integrated into a community based hospital program at a very low expense. In fact, speculating on long range effects for a community in terms of preventive care, this program may be one of the most cost effective programs available. Long term benefits from improved mother-infant communication with child effects can range from higher developmental scores for the child, increased quality and quantity of interactions between parent and child, to a lower incidence of inappropriate abusive behaviors. In short, when the mother-infant system is operating and adapting well, many benefits are accrued for both individuals and the family as a whole.

Finally, mothers who have had a positive experience in the Perinatal Coaching Program, make enthusiastic volunteers, which adds to the receptivity of the program by new mothers when approached. Satisfaction is the catalyst that generates the positive cycle to ensure that the program is ongoing.

APPENDICES

APPENDIX A

CONSENT FORM

CONSENT FORM

1. I have freely consented to take part in a study conducted by:

   _____

2. The study has been explained to me and I understand the explanation that has been given to me.
3. I understand that I am free to discontinue my participation in the study at any time without penalty.
4. My child's medical care will not be influenced by my decision to participate or withdraw from the study.
5. The questionnaires I will be answering will take approximately 30 minutes to complete. I have agreed to be videotaped, and taping will take less than 20 minutes.
6. I understand that the results of the study will be treated in strict confidence and that I will remain anonymous.
7. I understand that, at my request, I can receive additional explanation of the study at any time.
8. Should problems or questions arise concerning any portion of my participation in this study, I may call the researcher at 353-5795 for a discussion of any problem related to the study or any referral needed.

Signed _____

Dated _____

APPENDIX B

LETTER TO RECRUIT CONTROL GROUP MOTHERS

Dear New Mother,

I am a nurse working with your Pediatricians at the Lansing Pediatric Associates evaluating services and programs for new mothers. I am doing this in the home by asking new mothers to answer some questions and observing mother-infant interactions, such as feeding and a diaper change. Interview time will be less than one and one half hours. Your decision to participate is voluntary, and all information will be confidential.

I shall be telephoning you within a few days to make an appointment to discuss this program with you at your convenience. Thank you for your consideration of this matter.

Sincerely yours,

Martha W. Bristor

APPENDIX C

BEHAVIORAL INTERACTION VARIABLES

DEFINITION OF VARIABLES

SCORING GRID

Variables for Rating Video Tapes

v1	Type of Activity/Feeding	1 = Not observable on tape (N/O Tape) 2 = Noninstrumental - Play 3 = Breast 4 = Bottle 5 = Diapering 6 = Burping
v2	Position of Baby	1 = N/O Tape 2 = 3 = Sitting on Mom 4 = Supine on Mom 5 = Prone on Mom 6 = Upright on Shoulder 7 = Sitting on Inanimate Object 8 = Supine on Inanimate Object 9 = Prone on Inanimate Object
v3	Vocalization of Mother	1 = N/O Tape 2 = Absent 3 = Present
v4	Voice Pitch of Mother	1 = N/O Tape 2 = Absent Pitch 3 = Normal Tenor 4 = High Pitch
v5	External Stimulation by Mother	1 = N/O Tape 2 = Absent 3 = Present
v6	Movement by Mother	1 = N/O Tape 2 = Absent 3 = Carry 4 = Shift Position 5 = Rock/Bounce
v7	Touch by Mother	1 = N/O Tape 2 = Absent 3 = Caregiving 4 = Emotion transmitting touch
v8	Facial Orientation of Mother	1 = N/O Tape 2 = Absent 3 = Focused (Enface) attention 5 seconds. 4 = Focused (Except face) attention 5 = Nonfocused attention

v9	Movement by Baby	1 = N/O Tape 2 = Absent 3 = Quiet 4 = Active 5 = Puppeting 6 = Touch
v10	Engagement-Involvement by Baby	1 = N/O Tape 2 = Absent 3 = Engaged 4 = Disengaged
v11	Baby Vocal Behavior	1 = N/O Tape 2 = Absent 3 = Cry, Scream 4 = Vocalization 5 = Smile 6 = Burp 7 = Cough, Hiccough

Definition of Variables

v1 = Type of Feeding/Activity

1 = N/O Tape: Not observable on tape
2 = Play and other meaningful activities
3 = Breast feeding
4 = Bottle feeding
5 = Diapering
6 = Burping

v2 = Position of Baby

1 = N/O Tape: Not observable on tape.
2 =
3 = Sitting on Mother
Body contact with baby sitting upright or standing supported by mother.
4 = Supine on Mother
Body contact with baby lying in mother's arms or lap. Cradled in mother's arm.
5 = Prone on Mother
Body contact with baby lying on abdomen over mother's knees.
6 = Upright on shoulder
Body contact with baby supported upright looking over mother's shoulder.
7 = Sitting or standing on inanimate object
Supported by mother on changing table, crib, chair, couch, or other furniture.
8 = Supine on inanimate object
Lying on back on changing table, crib, floor, or furniture.
9 = Prone on inanimate object
Lying on abdomen on changing table, crib, floor, or furniture

v3 = Vocalization by Mother

1 = N/O Tape
2 = Absent: No verbal interaction between mother and baby
3 = Present: Talking, singing, babbling by mother

v4 = Voice Pitch of Mother

1 = N/O Tape
2 = Absent
3 = Normal tenor of voice
4 = High pitched voice

v5 = External Stimulation by Mother

1 = N/O Tape
2 = Absent
3 = Present: Mother uses inanimate object to attract baby's attention such as toy, stuffed animal, or pacifier. Also turning on music box or moving mobile.

v6 = Movement by Mother

1 = N/O Tape
2 = Absent
3 = Carry: Pick up baby and transport from changing table, crib, other piece of furniture, or floor. Both mother and baby moving.
4 = Shift position: Baby's position moves - Position shifting
5 = Rock/Bounce: Purposeful behavior for calming or playing with infant
such as: (1) Rock in arms with mother's body stationary.
(2) Rocking in movable chair
(3) Bounce infant while sitting on knee

v7 = Emotive Touch by Mother

1 = N/O Tape
2 = Absent: No tactile contact between mother and infant
3 = Care Giving:
Contact necessary for caregiving including transporting, cleaning for diaper change or wiping excess after burp. Holding to feed.
4 = Emotion Transmitting Touch:
Contact excluding care giving such as pat, stroke, caress, fondle, tickle, kiss, or mouthing of baby.

v8 = Facial Orientation of Mother

1 = N/O Tape
2 = Absent: Mother out of frame - Left area of baby.
3 = Focused: Focus of attention on face. Mother's face is parallel to within 10 degrees to the infant's face so that her eyes are directed to infant.
4 = Focused (except face): Attention focused on other part of body.
5 = Nonfocused attention:
Visual focus not directed to infant. Looking at surroundings, T.V., clock, watch, or other object.

v9 = Movement by Baby

1 = N/O Tape
2 =
3 = Quiet: Baby does not move on own.
4 = Active: Baby moves body and/or extremities on own.
5 = Puppeting: Baby's extremeties moved by mother in play or exercise
6 = Touch: Baby touches mother

v10 = Engagement-Involvement by Baby

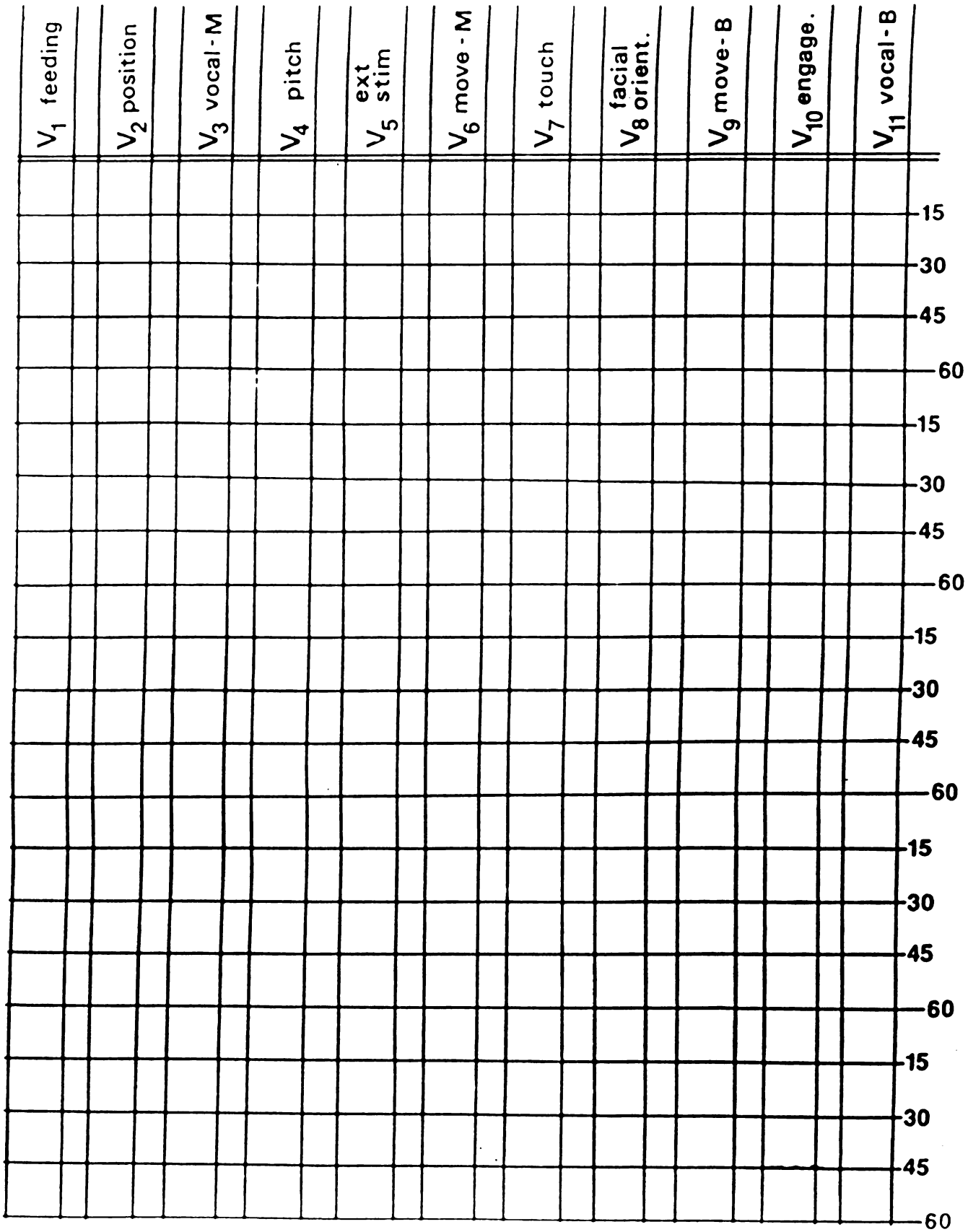
1 = N/O Tape
2 = Absent
3 = Engaged: Baby engaged in interaction with mother.
Feeding is engaged.
4 = Disengaged: Baby disengaged from interaction with mother.

v11 = Baby Vocal Behavior

1 = N/O Tape
2 = Absent
3 = Cry, Scream
4 = Vocalizations: Baby cooing, babbling, or other vocal sounds.
5 = Smile: Baby smiles
6 = Burp: Uncontrolled expulsion of air
7 = Cough, Hiccough: Baby uncontrolled reflex cough or hiccough.

Subject # _____ Observer _____ Sheet # _____

Date _____



APPENDIX D

VIDEOTAPE RELIABILITY OF INTERACTIONAL ANALYSIS

Videotape Reliability of Interactional Analysis Reported in Percentages

Variable	Tape 1	Tape 2	Tape 1	Tape 2	Tape 1	Tape 2	Tape 1	Tape 2
Activity								
Play	27	27	6	3	8	10	14	15
Breast Feed	48	49	58	58	0	0	0	0
Bottle Feed	0	0	0	0	70	70	48	52
Diapering	11	12	18	20	10	11	24	25
Burping	14	12	18	19	12	10	13	8
Position of Baby								
Sitting on Mother	9	10	10	14	14	14	3	1
Supine on Mother	76	76	65	59	76	75	63	60
Prone on Mother	0	0	5	5	0	0	0	0
Upright on Shoulder	4	2	5	6	0	0	10	12
Sitting-Inanimate	0	0	0	0	0	0	0	0
Sitting-Animate	12	12	16	16	10	11	24	27
Prone-Inanimate	0	0	0	0	0	0	0	0
Vocalization of Mother								
Absent	49	54	34	32	0	0	30	29
Present	51	46	66	68	100	100	70	71
Vocal Pitch of Mother								
Absent	53	54	34	35	0	0	30	30
Normal Tenor	0	0	0	0	0	0	1	0
High Pitch	47	46	66	65	100	100	68	70
Movement by Mother								
Absent	72	75	79	83	90	93	42	39
Carry	0	0	0	0	0	0	1	2
Shift Position	12	10	21	17	8	7	12	10
Rock/Bounce	16	15	0	0	1	0	45	49
Touch by Mother								
Absent	0	0	15	0	0	0	0	0
Caregiving	65	73	48	45	90	90	58	97
Emotion Transmitting Touch	35	27	37	55	10	10	42	3

Variable	Tape 1	Tape 2	Tape 1	Tape 2	Tape 1	Tape 2	Tape 1	Tape 2
Facial Orientation of Mother								
Focused (enface)-5 sec.	90	88	76	83	93	92	93	96
Focused (except face)	10	11	24	17	7	8	7	4
Nonfocused attention	0	1	0	0	0	0	0	0
Movement of Baby								
Quiet	95	83	70	75	80	78	62	63
Disengaged	5	17	30	25	20	22	38	37
Engagement of Baby								
Engaged	95	91	59	76	90	89	93	84
Disengaged	5	9	41	24	10	11	7	16
Baby Vocal Behavior								
Absent	78	82	73	75	82	78	75	79
Cry, Scream	5	4	0	0	11	12	4	3
Vocalization	14	14	27	23	7	8	17	15
Smile	0	0	0	0	0	1	2	2
Burp	2	0	0	2	0	0	1	0
Total	84		133		27		148	
Average	2.33		3.69		.75		4.11	

The results are reported in percentages. Within each variable the percentages total 100 percent. Therefore, an error in one response option is reflected by an error with the same variable in another response option, making this a very conservative estimate of reliability.

To determine the intrarater reliability of the videotaped interactional analysis, the researcher calculated the total differences in the response options between the first and second videotapes. This total difference score was divided by 36 (the number of response options). The result indicates the average percent difference occurring across the response options for that test tape pair.

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