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ABSTRACT

THE INFLUENCE OF SELECTED VARIABLES ON MATERNAL PERCEPTIONS OF THEIR INFANTS AT ONE MONTH

By

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The purpose of this study was to examine those selected factors associated with the positive and negative perceptions of mothers toward their infants at one month. The ability to accurately predict child outcomes during infancy would greatly enhance efforts by professionals to help assure the optimal growth and development of every individual. The specific factors examined were: the mothers' treatment or control status, where treatment involved a program of perinatal parenting support, age of mother, the birth weight of the infant, the one-minute APGAR score assigned the infant, and the opportunity for mother-infant physical contact while still in the delivery room. The relationship between these variables and the mothers' responses to a telephone administration of the Neonatal Perception Inventory (NPI) at one month was explored. The NPI has been shown to be associated with a probability of risk for the subsequent psychosocial outcome of the child. The first five research hypotheses tested for mean differences

on the NPI between arbitrarily defined groups within each independent variable. Significant differences were found between mothers whose infants scored 8 or more on the one-minute APGAR and those mothers' whose infants scored less than 8. The mean differences for the birth weight and age groups were in the hypothesized direction, but not large enough to be significant. The sixth research hypothesis was a test of a multiple linear regression model, which included all five independent variables, to predict one-month NPI scores. Using a backward elimination technique, the one-minute APGAR, birth weight, and age of the mother were found to significantly predict NPI score. The results of this study indicated dimensions important in planning programs for individuals or groups with a higher probability of dysfunction in adapting to the parental role. It was recommended that this study be replicated with a more heteogenerous and statistically representative sample, and that the sample studied here be followed until the children are at least 4 1/2 so that subtle differences will become apparent and allow for the analysis of the relationship between early constitutional differences, intervention, and later development.

To my dear wife

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who throughout this long process

always had unquestioned faith in my ability,

was tolerant and understanding,

worked harder than one has the right to ask,

helped to put everything into perspective,

and most importantly,

gave us that special someone who put balance into our lives,

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CHAPTER I

THE PROBLEM

Introduction

The ability to accurately predict child outcomes during infancy would greatly enhance efforts by professionals to help assure the optimal growth and development of every individual. Unfortunately, the state-of-the-art does not yet allow for such projections. Developmental tests in infancy fail to predict later cognitive functioning (Bayley, 1970; Scott & Ball, 1965). Lewis and Fox (1980) point out that there are at least two reasons why this is so: "Part of the explanation resides in the make-up of the tests, what skills they attempt to tap and how these skills change with time. Part of the explanation resides in the fallacy of expecting that future performance can be predicted from measures of infant status alone." (p. 53).

The latter statement by Lewis and Fox indicates why much of current research on infancy has focused not only upon the growth and development of the infant but also upon the environmental factors which affect the young infant in its home (Caldwell & Hersher, 1964) and on the kind and quality of caregiver behavior (mainly maternal behavior)

which the infant receives. Schaffer (1977) and Lewis and Rosenblum (1974) have extensively explored the early social experience of infants, and their research deals almost exclusively with mother-infant interaction. There are numerous differences across studies and among researchers regarding which caregiving behaviors should be focused upon; however, most would agree on the importance of proper caregiving for social development (Brazelton, 1974), language development (Bruner, 1969), and intellectual development (Lewis & Coates, 1978).

Moss (1967) and Broussard & Hartner (1970, 1971) present evidence which suggests support for the intuitive notion that there are measurable psychological antecedents of later parenting behavior. The influence of such parental attitudes finds strong support among clinicians, including pediatricians, nurses and clinical psychologists (Carter-Jessop, 1981). Negative parental attitude sensed by a clinician (Jenkins & Westhaus, 1981) can be an important factor in determining the nature and extent of services provided to a particular parent.

Recent research from medical, psychological, nursing and educational disciplines has provided the opportunity for better understanding of both fetal and infant development. As our knowledge of normative developmental patterns has increased, attention has been directed toward those factors which place some infants at-risk for abnormal development.

Rationale

Cremin (1978) defines education as "the deliberate, systematic, and sustained effort to transmit, evoke, or acquire knowledge, attitudes, values, skills, and sensibilities, and any learning that results from the effort, direct or indirect, intended or unintended" (p. 701). While this definition provides one useful guide, it is assumed throughout this study that an understanding of education must include not only "deliberate, systematic and sustained effort," but also those processes that are unplanned or unintended. This study also assumes that education takes place in a wide range of institutions and settings. Among them are the family, the neighborhood, the school, the playground, shops and stores, churches and hospitals, and elsewhere within and outside the community. It is also assumed that the education which takes place outside of the formal school setting is important and needs to be understood in its own right. Education, when viewed in this manner, is conceived as a process which occurs continually throughout the lifetime of the individual. The study reported here investigates selected factors present at birth, the onset of each individual's educational experience.

Essential to this educational experience is the family unit, the structure of which is changing in our time. Debate continues over the extent of the change and the variety of forms the family may well take. There are profound differences of opinion, however, as to how widespread the changes are and which are the most significant. Regardless, the family remains a basic educational institution, even

with the variety of cultural and alternative forms that may be found today. Leichter (undated) notes that:

> The...family is...(where)...most individuals have their earliest and perhaps their most profound eductional experiences, and it is an institution to which individuals return throughout their lives so that it is a basic institution of life-long learning (p. 6).

Boger, Richter, Paolucci, and Whitmer (1978) note that the function of parent as educator of the child begins very early. In describing the role of parent as educator, it is often assumed that the influence is one way--from parent to child (Leichter, 1974, p. 186). Although at first the responsibility for initiating behavior rests principally with the parent, interaction is influenced by the characterisics and behavior of the infant, even during the neonatal period (Boger et al., 1978). "This neonatal behavior provides feedback to the parent, so that one parent may respond differently to successive infants, although the mother's experience with previous infants may play a part in this" (Ainsworth, 1973, p. 45).

Educational literature has focused, for the most part, upon the nuclear family in urban, industrial settings. Within this literature, the majority of publications have dealt with the education of children by parents, with little attention paid to the education of parents by children or the education of siblings by siblings, to say nothing of the influence of kin and others outside the family (Leichter, 1974). The family is only one of many educators in contemporary society. Each person in an educator role would benefit from a more adequate understanding of what roles are played by all and how educators from various institutions and settings interface with each other.

Shane (1977) suggests that the interface between the family and the school system should help prevent future problems during a process of lifelong learning that allows for a child to be born as defect-free as possible.

> This is why the model of educational continuum (should) begin shortly after conception with the "-8" months! This is meant to suggest that parent education and careful physical examinations, with remedial follow-up as needed, are an essential part of being born as close to free and equal as possible in the United States. In effect in the model, provision for the future ability of the young person to profit from his or her education is made even before birth through adequate prenatal care (Shane, 1977, p. 100).

After birth, Shane (1973) advocates the continued provision for careful physical and mental examination with appropriate follow-up for the infant and the opportunity for experiences that promise to create desirable cumulative cognitive input. Shane (1973) feels that this would "'personalize' a program, with concentration on the learner's optimum development, rather than merely focusing on attempts to bring him or her up to group norms" (p. 63).

Bronfenbrenner (1976) argues that interactions between and among people are the essence of the educative process. This premise is supportd by the findings of Goodson and Hess (1975) who reviewed the outcomes of a group of twenty-nine preschool intervention programs develoed to help parents teach their own children. The results can be summarized as showing that the programs consistently produced significant immediate gains in the childrens' I.Q. scores, seemed to show long-term effects on the childrens' I.Q. scores and school performance, and also appeared to positively alter the teaching behavior of the parents. These findings are reinforced by Lazar,

Hubbell, Murry, Rosche, and Royce (1977) who looked at the longitudinal effects of experimental infant and preschool programs when the youngsters were nine to nineteen years of age. Out of twelve research groups with only two exceptions, the mean I.Q. of program groups were higher than the mean I.Q. of control groups. Although this was not seen as a permanent increase in intellectual skills, they noted that fewer of the resarch group participants were assigned to special education classes or had been retained in grade. This may be a better measure than a predicitive instrument.

John Dewey (1916) often remarked that the goal of education was growth and that the process of growth had no end beyond itself. Dewey felt that the ideal of growth resulted in the conception of education as a constant reorganization and reconstruction of experience. To understand the process of education within the family and the interaction between the educational processes of the family and the educational processes outside the family, one must apply the ideas of this educational leader and focus with full precision on the processes themselves.

Statement of the Problem

The specific purpose of this exploratory study is to investigate the relationship between the mother's perception of her infant at one month with measures of maternal and infant status at the time of birth

collected as part of a larger program of perinatal primary prevention.[1] Maternal status measures examined included experimental status, maternal age at last birthday, and opportunity for mother-infant physical contact in the delivery room. Infant status measures examined include birth weight and the one-minute APGAR score recorded for the infant.

The mother's perception of her infant at one month has been shown to be associated with a probability of risk for the subsequent psychosocial outcome of the child (Broussard & Hartner, 1970, 1971).

Background

The data for this study are part of the data collected for a larger program of perinatal primary prevention, Perinatal Positive Parenting (Boger, Andrews, & Richter, 1979). This program was designed to:

> ...provide parents with relevant childrearing information and support during the postpartum hospital period following the birth of their first child. Parents of firstborns are interested in and receptive to information offered to them during the prenatal or early postpartum period. This is especially true when they feel that the information is immediately relevent and usable. The 'readiness to learn' dynamic surrounding the birth of the first child is an important reality of the program (Boger, 1980, p. 1).

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[1]Perinatal Positive Parenting, funded by Grant No. 90-CA-2137 from the National Center on Child Abuse and Neglect, DEPARTMENT OF HEALTH AND HUMAN SERVICES. PPP is under the directorship of Dr. Robert P. Boger, Ph.D., Professor and Director, Institute for Family and Child Study, College of Human Ecology, Michigan State University, East Lansing, Michigan 48824.

Perinatal Positive Parenting begins in the mother's hospital room one to three days after she has delivered. A trained volunteer meets with the mother, and father if he is available, to explain the program and inquire about their interest in participating. If the parent(s) are interested, the volunteer explains that there are videotapes produced by the project available for viewing right in her room. The topics covered in the videotapes include: the abilities of the newborn; feeding, crying, and sleeping; postpartum depression; parenting as a couple; and single parenting. The basic knowledge and support given to new parents in these videotapes and through interaction with the volunteer lays the foundation for positive parent-child transactions. Boger (1982) notes that:

> It is often assumed that parenting abilities develop naturally as a part of being human, as a part of having been a member of a family. Although the specifics of that training vary from family to family, this assumption was probably a valid one in this society until the second half of this century. Today's small, mobile, nuclear family, however, does not provide the same opportunity for experience with young children as did the large extended family of two or three generations ago (p. 16).

The volunteer is available to answer any questions which the parent(s) may have concerning the topics covered in the videotapes and/or to discuss other needs or concerns the parent(s) might have.

Once the mother and infant have been discharged from the hospital, the volunteer makes weekly telephone calls to the mother to inquire about "how everything is going." When the infant is one month old, the volunteer offers to make a home visit for the purpose of extending the information and support provided in the hospital. The volunteer also gives the family a copy of a project-produced book of age-appropriate parent-infant activities at this one month visit. Should the volunteer

see a need for additional home visits or if the mother suggests that the volunteer visit again, further visits are arranged. Otherwise, the volunteer only maintains telephone contact with the family.

When the infant is approximately three months old, the one-on-one relationship between the parent and volunteer concludes. At the same time the parents are invited to meet with other new parents in a parent resource group. These project-run groups are designed to provide parents with the opportunity to meet on a regular basis with other new parents who share their needs and concerns. Throughout the parents' involvement with Perinatal Positive Parenting, from the hospital beginning through participation in the parent resource groups, the emphasis of the program is on prevention:

> ...aimed at helping parents early, before small difficulties become major parenting pathologies. When a baby comes into the family system for the first time the system is changed and stress is often induced (Boger, 1980, p. 1).

Hypotheses

The purpose of this exploratory investigation is to identify those factors which contribute to the positive and negative perceptions of mothers toward their one month old infants. Specifically, the following research hypothesis are posed:

1. Mothers who participate in a program of primary prevention beginning in the immediate postpartum hospital period will have higher (positive) maternal perception scores of their infants at one month than mothers who do not participate in such a program.

2. Older mothers will have higher (positive) maternal perception scores of their infants at one month than younger mothers.

3. Mothers of heavier infants (birth weight in grams) will have higher (positive) maternal perception scores of their infants at one month than mothers of lighter infants (birth weight in grams).

4. Mothers of infants who score higher on the one-minute APGAR scale will have higher (positive) maternal perception scores of their infants at one month than mothers of infants who score lower on the one-minute APGAR scale.

5. Mothers who have the opportunity for physical contact with their infants in the delivery room will have higher (positive) maternal perception scores of their infants at one month than mothers who do not have the opportunity for physical contact with their infants in the delivery room.

6. The combined effect of experimental status, maternal age, birth weight, one-minute APGAR score, and opportunity for physical contact is needed to predict the dependence of the criterion variable (maternal perception score) over and above the separate mean effects of experimental status, maternal age, birth weight, one-minute APGAR score, and opportunity for physical contact.

Assumptions

1. The beliefs that an individual holds about him/herself as a parent and about his/her infant will influence attitudes toward parenting and, to varying degrees, influence actual parenting behavior.

2. The personal norms that a parent holds regarding behavior and the norms of the social environment will impact in varying degrees to influence parental attitude and behavior in terms of parental motivation to comply with perceived social environmental norms.

3. Parental inputs and infant inputs and the interactions of the inputs from both will alter behaviors in the parent-infant relationship and, consequently, parental belief and attitudes may change with variation in needs or demands.

Definitions

One-minute APGAR score: a numerical expression of one to ten which describes an infant's condition 60 seconds after birth. The APGAR measures heart rate, respiratory effort, muscle tone, reflex irritability, and color.

Birth weight: a numerical expression of an infant's weight at birth in grams.

Exploratory study: the investigation reported in this study is labeled an "exploratory study" because (a) the number of subjects

included in this study are only a limited portion of those subjects who were involved in the larger program of perinatal primary prevention; (b) only five independent variables related to maternal and infant status at birth are employed; and (c) the dependent variable employed in this study was collected at one month postpartum, an extremely short period of time to precisely predict eventual outcomes.

Experimental status: the random assignment of a subject to either a treatment status or control status (no treatment given).

Mother's perception of her infant at one month: the score derived from administering the Neonatal Perception Inventory (NPI)[2] to the mother one month after her baby's birth. The NPI score is obtained by subtracting the total numerical value of six 5-point scale items on a "Your Baby" inventory from the numerical value of six 5-point scale items on an "Average Baby" inventory. The items covered in both inventories include: crying, feeding, spitting up or vomiting, sleeping, elimination, and predictable pattern of eating and sleeping. The difference between the two scores represents the NPI score. A positive score indicates a favorable perception of the infant; a negative score indicates a less favorable perception. An infant with a minus or zero score is at risk for subsequent developmental problems. An infant with a plus score has been rated as better than the average baby and is at low risk.

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[2]The Neonatal Perception Inventory can be obtained by writing to: Dr. Elsie R. Broussard, M.D., GSPH-209 Parron Hall, University of Pittsburgh, 130 DeSoto Street, Pittsburgh, Pennsylvania 15261.

Mother's age: a numerical expression of the age of the mother, in years, at her last birthday.

Mother-infant physical contact: the presence or absence of physical contact of varying lengths of time between the mother and infant while in the delivery room.

Perinatal: relating to the period of time from birth to three months.

Psychosocial risk: those psychological (intellectual/cognitive, personality/temperamental, and social/behavioral) and physical (genetic/status) characteristics particular to an infant and mother that have the potential to place the infant at a disadvantage for current adaptation and functioning, as well as for future physical and/or psychological functioning.

CHAPTER II

REVIEW OF LITERATURE

Introduction

The review of the literature begins with a conceptual framework of attitudes from multidimensional and unidimensional standpoints. This is followed by a general discussion of parental attitudes and review of Broussard and Hartner's (1970) Neonatal Perception Inventory. The history of parent education in the United States and primary prevention efforts in this area comprise the next sections of the literature review. The final section of the review of literature looks at the known effects of birth weight, one-minute APGAR scores, maternal age, and mother-infant physical contact in the immediate postpartum period on child outcome measures.

Conceptual Framework of Attitudes

Attitudes may be viewed as either multidimensional or unidimensional. In the multidimensional framework, attitudes are broadly defined to include cognitive, conative, and affective components (Himmelfarb & Eagly, 1974; Fishbein, 1967b). The

multidimensional concept of attitudes leads to the methodological assumptions that attitudes are empirically reflected in all three of these components and that any one component alone does not necessarily reflect the totality of attitude toward an object. Despite these assumptions, Fishbein (1967b) notes that proponents of the multidimensional framework typically operationalize attitudes in terms of unidimensional measures. The proponents of a unidimensional concept of attitudes argue that attitude should be identified with only the affective dimension. Thurston (1931) was the first to expose the unidimensional notion of attitude. Consistent with Thurston's position has been the work of Fishbein (1965, 1967b) who supports the undimensional concept. Fishbein (1967a & 1967b) has argued effectively that attitudes should be considered as a phenomenon distinct from, but related to, concepts such as beliefs, behavioral intentions, and overt behavior.

Fishbein and Ajzen (1975) conceptualize attitude in their unidimensional framework as "...the amount of affect for or against some object" (p. 11). Such a conceptual system "...in which only the affective component is treated as attitudinal, and the other two components (cognitive and conative) are linked to beliefs and behavioral intentions, permits a more productive approach to the study of attitudes" (Fishbein, 1967b, p. 257).

Fishbein and Ajzen (1975) refer to attitude as a person's favorable or unfavorable evaluation of an object, and belief in their model represents the individual's information about the object. Specifically, "...a belief links an object to some attribute" (1975,

p. 12). Fishbein (1967c) sees beliefs and behavioral intentions as determinants or consequences of an individual's attitude. In this model Fishbein (1967b) suggests that the cognitive component refers to beliefs about the nature of the object and its relations to other "objects," while the action or conative component refers to beliefs about what should be done with respect to the object.

Doob (1947) suggested that there may not be any one-to-one relationship between attitude and behavior. He felt that two people may learn to hold the same attitude toward a given stimulus; however, he clearly stated, supporting a unidimensional view, that they may also learn to make different responses given the same learned attitude.

Fishbein (1967c) follows this line of thought in discussing attitude as a relatively simple unidimensional concept. Rather than viewing beliefs and behavioral intentions as a part of attitude, Fishbein (1967c) prefers "...to define them independently and to view them as phenomena that are related to attitudes" (pp. 478-479). He sees beliefs and behavioral intentions as determinants or consequences of an individual's attitude. Rather than viewing statements about the object (i.e., beliefs) and statements about actions that one would take with respect to the object (i.e., behavioral intentions), Fishbein (1967c) feels that "these statements can best be viewed as indicants of an individual's attitude" (p. 479).

A unidimensional view of attitude makes sense when one considers how attitudes are measured. Thurstone Scaling, Likert Scaling, and the Semantic Differential Technique all attempt to arrive at a single score which represents how favorably or unfavorably an individual is disposed toward the attitude object in question. If one were to conceptualize a

multidimensional view of attitude, the task would be to measure the "attitude" of any one person toward an object that might fall on three very different positions (i.e., favorable, neutral, or unfavorable) on three different dimensions (i.e., cognitive, conative, and affective).

Taking a unidimensional view of attitude does not imply that one should ignore the dimensions of cognition and conation. Fishbein (1967c) points out that:

> ...it implies that beliefs and behavioral intentions must be studied in their own right, as independent phenomena that may be related to attitude and behavior. Thus the problem is not simply to investigate relationships between attitude and behavior; rather, one must be concerned with at least four things: attitudes, beliefs, behavioral intentions and behavior. The problem, then, is to investigate the interrelations among all four of these concepts (p. 479).

The unidimensional view of attitude implies that the relations among attitude (affect) and beliefs (cognition) and behavioral intentions (conation) explain how two people may have the same attitudes, but these attitudes may be based on different beliefs or may be related to different behavioral intentions. As the multidimensional view of attitude points out, this may well be one of the major reasons why attitudes are uncorrelated with behavior. Fishbein (1967c), however, argues that it is not because the attitude measure is inappropriate or incomplete. Fishbien (1967c) says:

> Attitude is a hypothetical variable abstracted from the totality of an individual's beliefs, behavioral intentions, and actions toward a given object. Any belief, behavioral intention, or behavior, therefore, may be uncorrelated or even negatively correlated with his attitude. Thus, rather than viewing specific beliefs or classes of beliefs and specific behavioral intentions or types of behavioral intentions as part of attitude, these phenomena must be studied as variables in their own right, which, like attitudes, may or may not function as determinants of behavior (p. 483).

Is there a relationship between attitude and behavior? Fishbein (1967c, 1970) has adapted from Dulany's (1961, 1964) theory of propositional control an explanation of the ability to predict an individual's intention to perform any behavior (and his actual performance of the behavior) as a function of" (1) his attitude toward performing the behavior in a given situation, and (2) the norms governing that behavior in that situation and his motivation to comply with those norms" (p. 489). This can be expressed algebraically as follows:

$$B \simeq BI = A_{act}\, w_o + (NB_p)(Mc_p)\, w_1 + (NB_s)(Mc_s)\, w_2$$

where:

B = Behavior

BI = Behavior Intention

A_{act} = Attitude to Act

NB_p = Normative Beliefs (Personal)

Mc_p = Motivation to Comply (Personal)

NB_s = Normative Beliefs (Social)

Mc_s = Motivation to Comply (Social)

$w_0 w_1 w_2$ are weights applied to the respective components of the equation (Fishbein, 1967c, p. 490)

This approach to understanding the attitude-behavior relationship does not assume some underlying relationship between the individual's attitude toward an object and his/her behavior with respect to that object. Rather, Fishbein's (1967c) proposed theory recognizes the importance of situational variables, norms, and motivation as factors influencing behavior. This theory suggests that other variables can also influence behavior, but it indicates that "these other variables

operate indirectly by influencing one or more of the three basic determinates" (Fishbein, 1967c, p. 490). Thus the weightings of the three components may vary with the type of behavior that is being considered, and they may also vary for different individuals. This theory is an attempt to show that beliefs (cognitions) and behavioral intentions (conations) can best be viewed as determinants or consequences of behavior. Rather than being viewed as parts of attitude, these variables should be viewed as independent phenomena that are related to, and serve as indicants of, an individual's attitude.

Parental Attitudes

Parental influences are crucial and pervasive. In the field of child development, it is almost impossible to discuss any aspect of the discipline without considering its relationship to parent attitudes and parent behavior. Parent-child relationships are perhaps the most important category of variables which impinge on the personality development and socialization of the child.

Parent-child relationship begin and develop within the context of the family. Despite the numerous forms that the family can take, it universally performs the same basic functions. The family extends physical and emotional support to children, takes responsibility for their socialization and enculturation, and provides the means to share goods and services through a continuous group structure which divides labor and differentiates tasks (Ausubel, 1958).

Parenthood involves satisfactions and frustrations. The demands that the role of parent puts on people are more compatible with the needs and personality traits of some individuals than they are with those of others. The psychoanalytic understanding of parental attitudes explains this by interpreting the phenomenon as having its natural center in the unconscious meaning which having children or a specific child has for a parent and factors of reality that dominate the picture (Coleman, Kris, & Provence, 1953). The reality factors which can contribute to understanding parental attitudes include such elements as whether or not the child was wanted, the status of the relationship between the parents, and whether the parents can accept the responsibility and sacrifices necessary to care for an infant, or if they themselves are struggling to establish their own identity and independence and see the child as an imposed burden. The unconscious meaning or "unconscious fantasies" associated with parental attitudes refer to the revival of the past that is employed by parents and constitutes a central point in their experience of parenthood. Coleman, Kris, and Provence (1953) state that "...the relation to one's own parents is repeatedly reenacted by repetition or avoidance. In parenthood the psychological life cycles of two generations overlap and a third one is regularly involved" (p. 23).

The functions of a parent vary in both context and emphasis with the age of the child. Because of this, the affinity of a parent toward his or her role is subject to change. A parent may enjoy the early years of a child's life and lose interest as the child matures, becomes more competent and acquires interests outside the home. These changing

attitudes of a parent toward his or her role can be explained psychoanalytically as being continuously influenced by the child's growth and development. Coleman, Kris, and Provence (1953) see the interaction between a child's development and the unconscious material which it generates in a parent's attitude as being "...subject to variations in accordance with the varying needs and demands of the child" (p. 25). This can be understood in terms of the interaction between a parent and a child who accepts cuddling and one who refuses such intimacy and is difficult to comfort. The influence of parents' unconscious or fantasy interact with factors of reality to produce parental attitude. In describing parental attitudes from a psychoanalytic view, we need to note the capactity of the parent to adapt to changes in the child and his or her individuality as it manifests itself over time.

Ausubel (1958) has delineated four categories of determinants in the formation of parental attitudes: the wider culture, the parent's own family and childhood experience, the parent's personality structure, and various situational variables. Ausubel (1958) notes that "the first factor accounts for intercultural or subcultural (psychosocial) variability in parent attitudes, and the latter three factors account for idiosyncratic variability" (p. 350). Regardless of their source, Ausubel feels that parental attitudes affect all child-rearing practices.

Aside from situational factors, ambivalent feelings, or particular idiosyncrasies, Ausubel (1958) suggests that a parent's child-rearing attitudes might be expected to remain about as stable as the parent's personality. Thus, it is plausible to assume that within certain

limits of variation, a given parent will tend to demonstrate the same general attitudes toward child-rearing throughout his or her period of parenthood.

Davids and Holden (1970), in a study about the stability of maternal attitudes revealed before childbirth and at some time after living with the child, found a high association between two administrations of the Parent Attitude Research Instrument (PARI). They obtained product moment correlations of .54 on the PARI Hostility factor, .80 for the Control factor, and .72 for Total Negative Attitudes. All of these coefficients were significant beyond the .01 level. This study provides some statistical evidence of consistency in family and child-rearing attitudes expressed before childbirth and after living with the child for several months. Davids and Holden (1970) suggest that changes in maternal attitudes, from positive to negative or negative to positive, might well be a function of the infant's physical and/or tempermental attributes; or, it might be changes in the mother's physical condition, or changes in the family's socioeconomic situation which are responsible for differences in maternal attitudes found during pregnancy and several months after childbirth.

The effect of parental attitudes on the development of the child has been recognized by professionals for many years. In the 1929 Yearbook of the National Society for the Study of Education, the authors stated that:

> In all cases of behavior disturbances the problem cannot be solved and treatment satisfactory without taking into consideration the problems of the environment...in the preschool age we have primarily to do with problems of the home. Many points arise. The attitude of the parents

> toward their children and expectations toward them; their ideas of discipline; their knowledge of what to expect of a child at given ages... all these and many other emotionally determined attitudes which may be extremely upsetting in the evolution of the child's patterns of behavior and must be kept in mind (NSSE, 1929, p. 760).

Can parental attitudes be modified to enhance the parent-child relationship? Many parents can be helped to begin to recognize how their own feelings influence their attitudes and how this influence reflects their degree of acceptance of the everyday concerns of parents. Bruce (1965) states that a meaningful supportive relationship of trust can help the new parent overcome handicapping fears and attitudes. This comes at a time when "...the physical and psychosocial adjustments of new mothers in the neomaternal period are comparable to the adjustments of a baby in the neonatal period" (Rubin, 1967, p. 391). Bruce (1965) suggests that "...parents need to be helped to look at themselves, to discover what they know (which is often more than they think) and what they need to know, to examine thoughtfully their own emotional responses, and to check their responses against reality" (p. 104). Bruce feels that discussion groups for new parents can serve to expand and refine the parents' perception. With this improved perception, "modification of attitudes and behavior as well as greater flexibility in choices of reaction to the infant or to the infant and young child can occur" (Bruce, 1965, p. 107).

An obvious starting point to prepare individuals for parenthood would be before the baby is born. The focus of parental classes, however, is almost exclusively on pregnancy, labor, and delivery with little or no information provided about child development or parental attitudes (Joy, Davidson, Williams, & Painter, 1980). Researchers

(Halstead & Fredrickson, 1978; Shapiro & Schmitt, 1973) who have looked at the benefits derived from participation in prenatal programs have primarily concentrated upon differences in labor and delivery outcomes. Scott and Rose (1976) and Thorardson and Costanzo (1976) reported emotional and attitudinal benefits for women prepared for the childbirth experience, but Stark (1976) could find no differences between prepared and unprepared women on measures of perception of the baby and concerns about childbearing.

Brody (1956), in her study of 32 mothers, their infants, and their interactions, from both observational and theoretical standpoints, offers a convincing explanation of the variety of maternal attitudes and their consequences. Her sample was divided into four groups, from those mothers who were sensitive, consistent, and attentive, to those mothers who were hypersensitive, very inconsistent, and hyperactive. She found similarities in degrees of maternal experience and consistencies in maternal attitudes toward their role as mothers and toward some aspects of their child-rearing practices. In Brody's Group A mothers', their attitudes were characterized by sensitivity, consistency, and attentiveness. All of the women except one in this group were experienced mothers. They were also:

> ...all supportive toward their infants and with one exception did not interfere with their infant's freedom of behavior. They were also free to enjoy physical and social intimacies with their infants. Mothers in Group D differed significantly in their attitudes. Most of these mothers were inexperienced, and the three who previously had children expressed feelings of unfamiliarity or uneasiness in their maternal tasks. Group D mothers, ...handled and stimulated their infants excessively, often inconsiderately and awkwardly... Most of these mothers were enthusiastically active with their infants, self-conscious,

> and insecure... (and) tended to idealize their maternal competence, understanding, and self-sufficiency (Brody, 1956, p. 279).

The Neonatal Perception Inventory

The Neonatal Perception Inventory (Broussard & Hartner, 1970) was developed in 1963 to measure a mother's perception of her newborn as compared to the mother's concept of the average infant. It also provides a measure of the adaptive potential of the mother-infant dyad during the first month of life (Broussard, 1980).

Broussard (1978) developed the Neonatal Perception Inventory (NPI) when, in her clinical practice of pediatrics and later as an Assistant County Health Officer, she observed a wide range of responses of mothers to their healthy newborns. Some mothers were seen to make a smooth transition from pregnancy to motherhood while other mothers lacked pride in their infants or evidenced little pleasure in motherhood, although their infants were clinically healthy and appealing during routine pediatric examinations.

The NPI is best viewed as a projective measure. The mother is presented with a set of ambiguous stimuli--the "average baby" and "your baby"--upon which she projects her concept of what most little babies are like and her expectation of what her newborn will be or is like (Broussard, 1980). The NPI includes six behavioral items: crying, feeding, spitting up, sleeping, elimination, and predictability. These items were chosen because they are known to be areas of concern that mothers have about their babies and they were seen as "...crucial areas that reflect the functioning of the mother-infant unit during the neonatal period" (Broussard, 1978, p. 47).

The mother is asked to rate the "average" baby and then "her" baby on each of the six items on a five-point scale from "a great deal" to "none" (See Appendix C for a complete description of the NPI and the instructions that were given to each mother before administering this instrument.)

The NPI score is obtained by determining the discrepancy between the mother's rating of her own infant and the average baby. If the mother perceives her baby as better than average, her perception is considered to be positive. If the mother does not rate her baby as better than average, her perception is considered to be negative. Broussard (1978) notes that:

> Experience with this instrument indicates that it reflects the mother's ability to idealize her infant, i.e., view the infant as better than average. The mother's ability to idealize her newborn--to regard him as a potential source of gratification and satisfaction--seems an essential ingredient if she is to provide the 'holding environment' needed to establish optimal psychophysiological equilibrium in the child (p. 48).

The NPI consists of two distinct inventories, (a) the Neonatal Perception Inventory I, which can be administered during the mother's hospital stay, one to four days after delivery, and (b) the Neonatal Perception Inventory II, administered approximately one month after the birth of the child (four to six weeks).

The predictive validity of the NPI was established through the longitudinal study of 318 first-born, healthy, full-term neonates born in five Pittsburg, Pennsylvania, hospitals during a 2 1/2 month period in 1963 (Broussard & Hartner, 1970). When the children from the original study were 4 1/2 years old, 155 families from the original 318 family study population were located (Broussard & Hartner, 1970,

p. 18). The educational backgrounds of the parents ranged from grammar school to post graduate training, with occupations ranging from skilled to unskilled industrial work, and to white collar and professional occupations. The ages of the mothers ranged from 18 to 41 years at the time of delivery, with the median at 21.8 years. All mothers were married at the time of delivery except for one single and one widowed mother. The demographics of the original population (N=318) were comparable with the follow-up population at 4 1/2 years (N=120) except that no black mothers were included in the follow-up (Broussard & Hartner, 1970).

On the basis of the original NPI ratings, the children in the follow-up population were divided into Low- and High-Risk groups at the end of the neonatal period (one month). Sixty percent of the children (N=72) were viewed as better than average by their mothers and were assigned to the Low-Risk group. Forty percent (N=48) were not viewed as better than average by their mothers and were assigned to the High-Risk group (pp. 20-21).

The follow-up study at four and one-half years was designed to test the hypothesis "...that the maternal perception of her neonate would be related to the child's subsequent psychosocial development" (Broussard, 1980, p. 252). In the follow-up study, each of the 120 children were clinically evaluated in a "blind" manner by Broussard and Hartner without prior knowledge of the risk categories of the children. The children were diagnosed "using the classification proposed by the G.A.P. Committee on Child Psychiatry" (Broussard & Hartner, 1971, p. 436). The analysis for the follow-up study was restricted to 85 children who were judged as either having a degree of psychopathology

sufficient to warrant therapeutic intervention (34 children) or as being healthy (51 children). The remainder of the children were either judged to need additional clinical study to establish a diagnosis (28 children) or judged as needing intervention, but on a basis different from those 34 children judged to need intervention, e.g., possible brain damage with established etiology (Broussard & Hartner, 1970). A chi-square test was completed to determine the relationship between the risk score developed on the basis of the mother's response to the NPI at one month and the judged need for intervention at four and one-half years of age.

A statistically significant association was evident between the one-month score and the need for intervention at four-and-one-half years of age, $X^2 = 16.432$, $p \leq .001$. More infants in the High Risk group were judged to need therapeutic intervention at this age than did those in the Low Risk group. The mother's perception of the newborn as measured by the NPI on the first or second day after delivery did not prove to be related to the subsequent development of the child at age four and one-half years (Broussard & Hartner, 1971). Broussard and Hartner (1970) note that:

> Our research did not establish the basis on which the mothers rated their infant's behavior as better than or not better than average. It can be postulated on one hand that the unique personality characteristics of the neonate, or innate genetic characteristics, are detected very early by the mother and that her rating represents a "true" picture of the child. On the other hand, it can be postulated that her expectations may influence the child's behavior to the extent that they exert a self-fulfilling prophecy (p. 24).

To determine the extent that the mother's perception of her infant at one month continues to be predictive of the child's emotional development up to the preadolescent phase, 104 of the children from the

original population were evaluated when they ranged in age from 10 years, 3 months to 11 years, 9 months (Broussard, 1976). This group (again with no black subjects but comparable with the original population on all other demographic data) were clinically evaluated during a single office visit by one of three psychiatrists who had not previously evaluated the children and had no knowledge of each child's risk rating or results of the 4 1/2 year psychiatric evaluation. The children were rated according to the Probability of Mental Disorder (Leighton, Harding, Macklin, et al., 1963). This is a four-point confidence scale defined as: (A) High Confidence Mental Disorder, (B) Probable But Less Certain, (C) Doubtful But Suspicious, and (D) High Confidence No Mental Disorder.

The data analysis for the children at 10-11 years of age was restricted to the A and D rating categories. Groups B and C were not included in the analysis "...since these groups have the potential to blur the statistical effect of the extremes, the data were analyzed using only the 62 children in groups A and D for whom there was high confidence regarding the presence or absence of mental disorder" (Broussard, 1976, p. 89). A statistically significant association (X^2= 4.09, $p \leq 0.05$) was again found between the mother's rating of her first-born infant at one month of age and the child's subsequent emotional development at age 10-11 years. No statistical association was found between the mother's perception of her newborn at one or two days after delivery and the child's subsequent psychiatric evaluation.

A mother's positive perception of her infant at one month does not guarantee that there will be no difficulty in the child's later

development, nor can a negative maternal perception predict absolutely that there will be subsequent psychosocial disorder. The complexity of human development makes any such absolute prediction impossible. Broussard (1980) notes that "the NPI can serve to screen for potential failures in psychosocial adaptation stemming from disorders in the earliest mother-infant relationship, disorders that may exist undetected at an early age" (p. 256).

The apparent predictive power of the NPI and the ease with which it can be administered makes it an ideal instrument of choice for early screening and prevention programs. For these reasons, Palisin (1980) reports that it was used in the Nursing Child Assessment Project. This project, based in Seattle, Washington, was a longitudinal study designed to assess factors in infancy which could be predictive of health and developmental outcomes. Since the Seattle mothers completed the NPI at the same points in time as the mothers in Broussard's study, Palisin undertook a replication of the psychiatric assessment when the children were 4 1/2 years old. The purpose of this study, Palisin (1980) states "...was to establish whether the relationship between risk ratings at one-month and social-emotional development at 4 1/2 years reported in the Pittsburgh population could be demonstrated in the Seattle population" (p. 738).

The subjects which Palisin used to conduct the psychiatric assessment at age 4 1/2 years were 50 Caucasian families, out of the original sample of 183 families who began participating in the Nursing Child Assessment Project in 1973. These families were the first 50 who responded to letters inviting them to participate and could bring their children in at a time that was mutually convenient.

The evaluations of the Seattle children were conducted by one female child psychiatrist who was not involved with the longitudinal project. She also had no knowlege of the one-month NPI score. The children were evaluated in the same manner and with the same toys as the children in the Pittsburgh study. In addition, the Seattle children were asked to respond to the Complete-a-Man from the Stanford-Binet Intelligence Test, the information subtest of the Wechsler Preschool and Primary Scale of Intelligence, and some questions aimed at eliciting fantasy (Palisin, 1980).

Palisin analyzed the results of the psychiatric assessment in three ways, with the third way approximating the method used by Broussard. This method involved placing the children in one of four groups as Broussard did: (A) need for intervention, (B) healthy, (C) more information needed to make a diagnosis, and (D) intervention for other reasons. "As in the Pittsburg study, the analysis between the risk index and need for intervention was limited to groups A and B" (Palisin, 1980, p. 739). A chi-square analysis of the relationship between risk and the need for intervention was not significant. Thus, the results from the Seattle sample did not demonstrate the same relationship between maternal perception of her one month old child and the child's subsequent psychosocial status at four and one-half years of age.

The inability of Palisin (1980) to replicate Broussard and Hartner's results is difficult to explain. One explanation could be that there were differences in the two samples studied. A plausible difference could be the possibility of long-term treatment effects in the Seattle sample. Palisin (1980) notes that "...the Seattle design

called for interviews at 4, 8, and 12 months and annually thereafter at ages 2, 3, and 4. The purpose of these home visits was to collect standardized interview material in as much of a naturalistic setting as possible with no attempts at intervention" (p. 740). In the Pittsburg study, "...individual cases were not studied. The principal investigator had no further contact (after one month) with the study population until contact for the follow-up study" (Broussard & Hartner, 1970, p. 17). Other possible differences between the two samples studied include geography (Seattle and Pittsburg) and history (one study began in 1963 and the other in 1973). The relationship between these and other unknown factors and their influence on maternal perception at one month and subsequent development of the child at 4 1/2 years can only be speculative. However, as Palisin (1980) states, "...if a replication of the results can only be obtained by more constraints than was possible in this study, then the question is how generalizable those results are to other places, times, and people" (p. 742).

Parent Education

> If one were to inquire of any student of social progress, "What is the newest development in the educational world?" the answer would almost surely be, "Schools for infants and a constructive program of education for parents" (NSSE, 1929, p. 7).

The above quotation is from the annual yearbook of the National Society for the Study of Education. It accurately reflects current thinking about parent education and how the education of parents can influence the growth and development of their children. While this

quotation is most relevant today, it was written over half a century ago.

Many people involved in the area of parent education see themselves as pioneers who are blazing new trails after having discovered that parental influence is a significant factor in the eventual outcome of children. Parent education, however, is not a new idea, but one which has been re-discovered with fresh hopes for the optimal development of every child.

Since the time that the first Europeans came over to North America, parents have sought to prepare their children to become productive and responsible members of society. In an historical review of parenthood in America, Abramovitz (1976) argues that different child-rearing attitudes and practices have paralleled the development of the American economy, from home-based, hand-made production, to mechanized, factory-based production. During the early colonial period, from 1600 to 1775, parents expected their children to devote themselves to hard manual labor. Children were a valuable assest because their labor contributed to survival. Abramovitz (1976) notes that "The work of women and children was accorded a status within the family on a par with the work of men because it made a valuable contribution to family survival" (p. 44). Ministers were the source of child-rearing advice during this time.

The next economic period (1790-1850) saw the advent of cash crop farming and cottage industries. The labor of women and children was not needed as vitally in the field with the mechanization of farm production. John Locke replaced Calvin with regard to child-rearing methods. From 1860 to 1940 industrialization overtook farming as this

country's economic base, with the majority of the population moving to the city. Education became thought of as an important means of upward mobility. Children of immigrants, though, were unable to take advantage of public education, as they were sought as cheap labor in the growing capitalist economy.

Our current economy (1940-present) is technologically complex and highly industrialized. This economic evolution has brought concomitant changes to the family. Today's family is no longer self-sufficient; its members are now consumers, not producers. Today's family is small, mobile, often isolated with few if any roots; and its members spend more time away from each other than together. Abramovitz (1976) notes that:

> The many child-rearing tasks and the fact that children draw on family finances rather than contribute to them has made modern parenthood a difficult and anxiety producing job...Unlike past generations where survival needs dictated what future plans should be, today the...mainstream middleclass parents (are) comfortable materially, but lacking in confidence to nurture and prepare their children for the future (p. 46).

Parenthood is a highly responsible role, yet it is a role for which little in the way of preparation is done. Salk (1975) agrees with only slight tongue-in-cheek when he states, "I would say more people spend more time finding an authorized mechanic for their car than they do finding a qualified person to take care of their child" (p. 23). Parents are daily confronted with problems in raising their children and at the same time they have less experience and time to spend with their children and less informal advice and daily life demonstrations of child-rearing practices. Blehar (1980) reports that "Many young men and women embark on parenthood without ever having

cared for young children or held a baby" (p. 50). What are the consequences when the expectations of these young parents for their "ideal baby" clash greatly with the realities of their infant?

While classes in childbirth preparation generally equip parents to handle relatively well the physical and emotional demands of labor and delivery, there is some indication that expectant couples tend to resist receiving information about baby care, despite their inexperience with infants, and to focus on the birth experience (Doering and Entwisle, 1977). Such resistence is unfortunate in light of findings by Epstein (1979) who observed that pregnant teenage mothers often hold inappropriate notions about the characteristics of infants, for example, that they require little more than physical care until about one year of age. An absence of knowledge about infant development can be overcome by actual experience, but would this be the method of choice to foster the optimal development of the infant?

Parents receive advice and guidance on child rearing from two sources: informal or popular sources and professional sources. The informal or popular sources include aunts, uncles, in-laws, neighbors or friends, as well as the popular literature, including newspaper columns, pamphlets, magazines and books. Clarke-Stewart (1978) estimated the combined monthly circulation of the three most popular women's magazines to be in excess of 26 million and assessed the number of child care books sold in the United States in the past five years to be approximately 23 million. What is the value of all these books and articles?

> These books and articles have seldom (never) been written with a scientific purpose. Each represents the distilled wisdom of some eminent authority who believes he/she has

> the answers and is willing to offer them in written form for the edification of any parent willing to pay the $6.95. Links between parental knowledge gained from such edification and the parent's behavior toward her child have often been assumed (Clark-Stewart, 1980, p. 34).

Likewise, the child rearing advice garnered from relatives, friends or neighbors may be offered with utmost sincerity but lack any basis in scientific fact. As Salk (1975) notes, "Parents are highly receptive to all kinds of information, true or not, if they feel that what is offered will help them help their children" (p. 23).

The advice and guidance that parents receive from professional sources usually centers around teaching parents specific skills or providing general information about infant capabilities or behavior. Professional advice and guidance about child rearing can begin during the prenatal period or after the baby is born. However, beginning parent education in the prenatal period may face resistence during this period. Kruse, in a study reported by Joy, Davidson, Williams and Painter (1980) concluded that "...to be effective, teaching (parent education) should be conducted postnatally, since labor and delivery were the parent's main concerns in the prenatal period" (p. 215).

Hospital personnel often play an important role in parent education, usually beginning soon after the baby is born. Maternal-child health nurses help mothers learn basic infant care such as bathing, feeding, burping, and care of a circumcision, but seldom is there any teaching or discussion of child development or child rearing. The traditional emphasis of hospital personnel has been to provide the mother with as much rest as possible during her hospital stay and to assume the responsibility for most of the caretaking required by the infant. This has left mothers, and fathers to a much greater degree,

with little actual experience in meeting the needs of their infant before taking them home. Joy, Davidson, Williams, & Painter (1980) point out that this emphasis is changing in hospitals which are adopting a Family Centered Maternity Care (FCMC) system. FCMC stresses teaching both mothers and fathers care-giving skills and providing them with time to practice these skills and learn about their infants while still within the supportive environment of the hospital.

Broussard (1976) used three half-hour, televised, anticipatory guidance programs to teach mothers about basic infant care and feeding while the mothers were still in the hospital following the birth of their children. Topics covered in Broussard's videotapes included mothers talking about their labor and delivery and their feelings during this period, variations in infant behavior and techniques of infant care, and the importance of confidence in meeting the needs of an infant.

Using the Neonatal Perception Inventory at one-month to gauge the effect of the video programs on maternal attitudes, Broussard found that,

> "Statistically significant changes were demonstrated within the E group (mother who saw all three videotapes) (X^2=7.34, $p \leq .01$) and the E_2 group (mothers who saw two of the three videotapes) (X^2=7.47, $p \leq .01$). This was not so for the E_3 group (mothers who saw only one of the three videotapes) and the control group (mothers who saw none of the videotapes) (X^2=.20, $p \leq .70$)" (p. 207).

Once discharged from the hospital, new parents sources of professional advice are mainly from the family doctor or the pediatrician, the office nurse, and public health nurses. It is clear that hospital, medical, and other professional personnel can play a

important role in parent education during the period of time surrounding the birth of the child. Professionals can teach parents about basic infant care and help them gain confidence in their ability to meet the needs of their infants. Unfortunately, not all professionals who come into contact with parents are sensitive to the needs of the parents or have the skills to effectively help them assume their new role. Time and the financial resources for parents to receive education from professionals is also often lacking.

The need for parent education and support can be seen in the number of informal programs (Detroit Free Press, May 30, 1982) that have been established in recent years. Some of these programs are highly structured, but more often the content and format of these programs are determined by the parents themselves as the program progresses. These programs for parents with young infants usually vary their format with group discussions, lectures by invited professionals, peer modeling or modeling by experienced parents, and role playing.

Parent education raises more questions than it answers. It is not known if feelings of confidence in the parental role or general self-esteem are crucial for parental competence. It is not known what the relationship between self-report and behavior is. Is it more effective to teach parents about child development in the abstract or through demonstration? When is it most effective to initiate parent education and how long should it be maintained? These and other questions must be systematically addressed and answered by parent education in the years to come.

Primary Prevention

> Every child has the privilege and the right to develop to the limits of his capacity. It is the responsiblity of physicians, parents, educators, public health and social services workers to see that the child is given the best opportunity to carry this privilege and this right through to completion (Lowery, 1978, p. 15).

Harrison and Delano (1980), however, argue that "Problem solving generally appears to be less risky than planning; thus we find greater security in the easier task of defining what to treat than in what to prevent" (p. 4). This quote aptly describes the state of primary prevention as it exists today. Through the use of a medical model, physicians and other professionals dealing with parents and their children have isolated symptoms and applied their cures while often ignoring the etiology of symptoms and consequences of behavior. Even the federal government, as Lee and Franks (1977) note, has lacked a coherent national policy in the area of primary prevention.

The purpose of primary prevention "is to reduce the rate at which new cases of a disorder develop. This approach seeks to reduce prevalence by reducing incidence...the disorder is actually prevented from occurring, or the likelihood of its occurrence in a population is reduced" (Bloom, 1979, p.180). Because primary prevention can be aimed at an entire population or it can be aimed at only a specific segment of the population, and since primary prevention is aimed at reducing the incidence of disorder before it occurs, parent education can be safely placed under the rubric of primary prevention.

If parent education is an attempt to prevent the breakdown of the parent-child relationship, with child abuse and/or removal of the child

from the home as extreme examples, why has there not been greater emphasis placed upon these programs? The answer to this question is complex and can best be answered in terms of obstacles facing the broader area of primary prevention. The ethical issues involved in this question are pervasive. Education, exhortation, and other relatively mild measures may not always be effective in inducing people to change their behavior. If not, then attention could be changed by other means, which, though possibly more effective, might also be intrusive or otherwise objectionable. How far can we, as a society, go in shaping people and telling them how to live their lives? Wikler (1978) notes that there are a number of reasons to question the general argument of paternalism in the coercive eradication of personal behavior practices. First, paternalistic intervention would deny individuals the right to control their own destinies. When the "behavior" harms only the individual involved, can we justify intervention? Second, the notion of harm is very subjective. The same experience may be seen as harmful by one individual and as beneficial by another. It is common to feel that one's own preferences reflect values that any reasonable person would adopt. Third, the notion of a person being competent or incompetent in the area of decision-making is vague. The danger of disregarding an individual's personal values and in erroneously labeling the individual's behavior as involuntary are closely related.

Wikler (1978) sees three problems in the practical application of any attempt by society to put into operation a social rationale for paternalism:

> First, there is the distinct possibility that the government that takes over decision-making power from

> partially-incompetent individuals may prove even less adept at securing their interests than they would have been if left alone...Second, there is some possibility that what would be advertised as concern for the individual's welfare (as that person defines it) would turn out to be simple legal moralism, i.e., an attempt to impose the society's or authority's moral prescriptions upon those not following them... A third problem is that the involuntariness of some self-destructive behavior may make paternalistic reform effort ineffective (pp. 315-316).

In addition to the ethical issues which can inhibit efforts in primary prevention, other obstacles also stand in the way. Bloom (1979) notes that there is difficulty in extending our knowledge regarding effective approaches to primary prevention. This is seen in the attitude held toward treatment and prevention. Treatment efforts are mandated even when there is little evidence of their effectiveness, whereas prevention efforts are often discouraged because of the same lack of data. Bloom (1979), in specifically addressing prevention efforts in the mental health field, points out a barrier which "lives in our failure to accept the consequences of the growing realization that monoetiological theories are not viable with regard to the understanding of the development of most forms of psychiatric disorders" (p. 189).

There are other identifiable obstacles facing primary prevention. Morgan (1980) suggests that the treatment of acute episodes is a forceful priority which can preempt the time and energy required to develop effective prevention programs. He also feels that this is tied to the unwillingness of third party paymasters (insurance companies) to invest in primary prevention.

Finally, without the means to secure diet, education, or healthy workplace, those in our society who are vulnerable in the areas of physical and mental health will continue to remain at-risk. The

expansion of efforts in primary prevention will be achieved when longitudinal data are obtained which points out the cost benefits to be derived from this approach.

Birth Weight

The first World Health Assembly in 1948 proposed that prematurity be defined as birth weight less that 2500 gr. (Abramowicz and Kass, 1966, p. 880). Low birth weight is relevant to the medical and psychological communities as well as to public health, social services, and education. This is especially so in view of the recent advances in medical science which have significantly increased the survival rate for low birth weight infants. In the period from 1933 to 1955, for example, mortality among such infants was reduced 55% in the United States (Computo & Mandell, 1970, p. 363).

Numerous studies conducted in the 1950's and early 1960's demonstrated that premature, low birth weight infants were "at high risks" for neurological, developmental, emotional, and intellectual impairment in later life (Schaefer, Hatcher, & Barglow, 1980). The current prognosis for low birth weight infants has become more favorable. Advances in neonatal medical care such as regional Neonatal Intensive Care Centers and the widespread use of new and improved medical techniques and equipment are attributed key responsibility for these improvements. Despite the progress that has been made, the infant with a low birth weight remains at higher than normal risk medically, emotionally, and developmentally.

Low birth weight is the most frequently recurring factor involved in infant death and morbidity, and as such, it has been labelled by Abramowicz and Kass (1966) as "the largest single problem in pediatrics and obstetrics, as well as one of the major public health problems of the present time" (p. 878). This is especially tragic in light of the 1979 Surgeon General's Report on Health Promotion and Disease Prevention, Healthy People, which states that:

> About eighty percent of women at high risk of having a low birth weight infant can be identified in the first prenatal visit, and action can be taken to reduce the risk. Without such care, an expectant mother is three times as likely to have a low birth weight child... Here, again, we need intensified educational efforts by schools, health providers, and the media (pp. 8-9 and 8-11).

What are the potential consequences of being a low birth weight infant for the child as he or she matures? Ausubel (1958) remarks that low birth weight infants tend to overcome their initial immaturity and to catch up gradually to their normal weight contemporaries, but that by the time they enter pre-school, "these children (low birth weight) manifest more behavior problems than full-term children" (p. 200). This tendency is confirmed by Schaefer, Hatcher, and Barglow (1980) who report that "numerous other studies (have) found consistently lower IQ scores, more perceptual and motor problems, poorer language development, poorer school progress, and a higher incidence of emotional and behavioral problems among children who had been low birth weight infants" (p. 199).

Caputo and Mandell (1970) report on the Baltimore Study, "one of the most important studies of later intellectual development of low birth weight infants" (p. 365). When the children were 6-7 years of age, the Standford-Binet (Form L) significantly discriminated among the

three birth weight groups (less than 1501 grams, 1501 gram to 2500 grams, and more than 2,500 grams) and between the total premature group and full sized subjects when race and sex were controlled.

Similar results are reported by Bakeman and Brown (1980) who measured cognitive and social outcomes for a group of black pre-term and full-term infants over three years. These researchers administered the Bayley to the two groups at 12 and 24 months and the Stanford-Binet at 36 months. They found that cognitive ability declined significantly over the three years, more so for pre-terms than full-terms, so that at 3 years pre-terms scored significantly lower than full-terms.

> In other words, in our sample the infant's birth status was a significant predictor of Stanford-Binet scores at 3 years (point-biserial r =.41, $p \leq .01$). Knowing whether a baby was pre- or full-term let us account for 14.7% of the variance (Bakeman & Brown, 1980, p. 443).

Kitchen, Ryan, Richards, McDougall, Billson, Keir, and Naylor (1980) followed up a group of 158 low birth weight and 75 normal weight infants with psychological and pediatric assessments at two, six and eight years. The low birth weight infants had a significantly lower performance on all scales of the WISC-R than that of the normal birth weight children. This discrepancy was more pronounced as the weight of the infant decreased. The families of the normal birth weight infants in the control group tended to be lower social-class and the performance of the children on the three scales of the WISC-R was close to 100.

> This supports the conclusion that poor socio-economic status alone was not primarly responsible for the relatively poor outcome of the low birth weight infants. However, 11.6 percent of the normal birth weight children were at least 18 months retarded in reading accuracy, a figure almost identical with that for the low birth weight children (Kitchen et al., 1980, p. 184).

In another follow-up of low birth weight children at early school age, Drillien, Thompson and Burgoyne (1980) report that both low birth weight and control groups showed a marked decline in intelligence and educational achievement when comparisons between children from high SES and low SES were made. However, the authors found that low birth weight children scored consistently lower on these measures when compared to control children of the same social grade. Drillien, Thompson and Burgoyne (1980) note that:

> In general the disadvantage of low birth weight as compared with controls was more obvious in children from middle-class homes than it was in children from poor working-class homes, where presumably the effect of low birth weight itself was diluted by the effect of environmental disadvantages common to both LBW and control children (p. 30).

Finally, in a preliminary report on the psychogenic etiology of factors differentiating women delivering prematurely and women delivering at full term, Blau, Slaff, Easston, Welkowitz, Springarn and Cohen (1963) found several differences. The women in this study had no obstetric or other organic factor which contributed to their delivering prematurely. The 30 women who delivered early were matched for age, race, socio-economic class, education and parity with mothers of term infants. The main finding was that premature mothers seemed to have negative attitudes to their pregnancy beyond the common ambivalence found in most pregnant women.

> To a significantly greater extent, they became pregnant unwillingly, reacted with conscious feelings of hostility and rejection of the pregnancy, and had made attempts to induce abortion. They also presented the clinical impression of greater emotional immaturity and arrested narcissistic levels of personality. In contrast, the control mothers in general showed either a positive desire for the pregnancy (with corresponding affects and

> attitudes) or ambivalence in both wanting and rejecting the pregnancy (Blau et al., 1963, p. 203).

APGAR Scores

Dr. Virginia Apgar, an obstetrical anesthesiologist, was concerned with possible adverse effects on the fetus of anesthesia-analgesia administered during labor and delivery (Broman, Nichols, & Kennedy, 1975). To measure neonatal well-being and to direct the attention of the physician immediately to the child at the moment of birth, she introduced the APGAR score (Apgar, 1953), a numerical rating of the condition of the newborn infant which summarizes heart rate, respiratory effort, muscle tone, reflex irritability, and color. The APGAR score has since become routine in most hospitals in the United States.

The APGAR is usually administered to the newborn twice, once at one minute and again at five minutes. The examination is scored by assigning a value of 0, 1, or 2 to each of the five physiological parameters. The lower the total score the greater the psysiological derangement of the infant. According to Apgar (1953) the score should be calculated twice, but the one-minute score "is not at all easy because of all the other things which have to be given attention" (Holt, 1977, p. 54).

"It is absolutely imperative that the baby be examined and evaluated at birth" (Shepard, 1968, p. 99). A score of seven or more at one minute indicates a good prognosis for the baby with respect to mortality and subsequent neurological abnormality. Holt (1977) notes that:

> Low scores at one-minute are associated with a high mortality (8 per cent for scores of 2-3 and 23 percent for scores of 0-1) and a high risk of neurological abnormality at 1 year in the survivors (3.6 per cent for scores of 0-3). Low scores persisting to the 5th minute are even more ominous, scores of 2-3, mortality 30 percent; 0-1, mortality 49 percent; and 0-3, neurological abnormality at 1 year of 7.4 percent (p. 55).

Dr. Pearce Bailey from the National Institute of Neurological Diseases and Blindness began in 1950 to plan research into the etiology of brain damage in childhood. In 1953 Dr. Bailey and other experts testified before Congress that maternal infections, toxins, nutritional deficiencies, anoxia, and blood incompatibilities between mother and infant could account for certain forms of cerebral palsy and malformations in offspring. During 1955 Bailey proposed setting up a collaborative study involving various institutions throughout the United States to provide an opportunity to correlate the clinical manifestations of different types of cerebral palsy with the underlying neuroanatomical damage in the brain. In 1957 Bailey proposed, in addition to the clinical-pathological study of cerebral palsy, a longitudinal investigation of pregnant women and their children in various medical centers throughout the country by obstetricians, pediatricians, neurologists, neuropathologists, and other specialists (Broman, Nichols, & Kennedy, 1975). Thus, the National Collaborative Perinatal Project (NCCP) of the National Institute of Neurological and Communicative Disorders and Stroke was begun.

Hardy, Drage, and Jackson (1979) state that the NCPP "was designed to establish leads to the development of strategies for prevention and

intervention by providing a frame of reference for the identification of factors associated with adverse pregnancy outcomes and subsequent abnormalities of survivors" (p. 2). In all, the NCPP followd 53,043 women who delivered at the participating medical centers[3] between January, 1959, and September 1966. In adddition to the collection of prenatal and neonatal data, the NCPP followed up each child with a general pediatric examination at four months, an assessment of mental and motor development at eight months, a neurological examination at one year, and a psychological evaluation at four years.

Hardy, Drage, and Jackson (1979), in an analysis of the data collected through the first year of the NCPP found a suggested relationship between the one-minute APGAR score and neurological findings at one year. An analysis of the NCPP data at four years was conducted by Broman, Nichols, and Kennedy (1975) which looked at 169 demographic, genetic, obstetric, pediatric, neurological, and psychological variables as possible predictors of intellectual performance at age four. The 1960 revision of the Stanford-Binet Intelligence Scale, Form L-M, was used as the outcome variable. Race, sex and socioeconomic status were used as controls or stratification variables.

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[3]Participating medical centers included: Boston Lying-In Hospital, Providence Lying-In Hospital, Children's Hospital of Buffalo, Columbia-Presbyterian Medical Center, New York Medical College, Pennsylvania Hospital, John Hopkins Hospital, Medical College of Virginia, University of Tennessee College of Medicine, Charity Hospital of New Orleans, University of Minnesota Hospital, and the University of Oregon Medical School.

Broman, Nichols, and Kennedy (1975) found a small positive correlation between one-minute APGAR scores and IQ among whites (r = .04). Thirteen of the 42 prenatal and neonatal variables made significant independent contributions to IQ variance for white males, including the neonatal variables of brain abnormality, head circumference at birth, and one-minute APGAR score. They also found that the one-minute APGAR score discriminated between low and normal IQ white male groups, as well as low and normal IQ groups for black females and black males.

Maternal Age

A look at the literature concerning the relationship between maternal age and child outcomes can be disheartening. In the Background Papers to the Surgeon General's Report on Health Promotion and Disease Prevention, Healthy People (1979) it is reported that in 1977, 17.2% of all live births were to teenage mothers and that in 1976, 12,000 births and 13,000 abortions were reported for females under fifteen years of age. Of all the births to teenage mothers, only 15-30% of the pregnancies are planned (Levenson & Atkinson, 1978). Eighty-five percent of teen mothers are not married, and of those who do marry, nearly half the marriages end in divorce (Levenson & Atkinson, 1978).

Healthy People (1979), notes that the incidence of teen mothers delivering a low birth weigh infant is one and one-half times greater than the national average. What are the consequences for the young mother and her infant? Sosa, Kennell, Klaus, Robertson, and Urrutia

(1980) suggest that low-income, single, or teenage mothers may face obstacles from the start because "...(they) may not receive positive support from their families during labor and delivery and may have had no formal or strong cultural preparation for childbirth" (p. 600). This can compound problems for the young mother who, once she discovers that she is pregnant, may try to conceal the obvious from family and friends until that time when it is no longer possible.

The young mother is, in many ways, a child attempting to raise a child. She is faced with all of the issues that must be resolved in adolescence, and on top of this she is forced to assume the responsibilities of parenthood. Little wonder that the young mother can often have unrealistic expectations for her child. Levenson and Atkinson (1978) note that young mothers more often than older mothers view infant stimulation and play activities between themselves and their infants as likely to spoil their babies. This reluctance to engage in such activities can lead to nurturing and developmental deficits in their children.

Deutsch (1945) reports that young or unmarried mothers often accuse themselves of "not feeling anything for the child" (p. 329). She feels that this is brought about by the pressures of reality which become unbearable in a conflict between self-preservation and motherhood. The mother, in order to spare herself, often renounces a love relationship with her child and prefers to reject him/her. Deutsch notes though "much oftener, the emotional relation to the child remains suspended in thwarting and isolating the emotional experience before it has a chance to fully develop" (p. 329).

Reed and Stanley (1977) in their work on the epidemiology of prematurity note several adverse affects for the child born to the young mother. They indicate that "age is an established risk factor" (Reed and Stanley, 1977, p. 340). It is also pointed out that maternal age less than 20 and over 40 is not only associated with low birth weight, but also women in these categories tend to have less prenatal care in terms of the number of their prenatal visits and they tend to have their first prenatal medical contact much later than is desirable.

Results are reported by Broman, Nichols, and Kennedy (1975) that extend the consequences of mother's age at delivery when comparisons are generated with IQ score for the child at four years. Predictor variables (prenatal, perinatal, and status) which made the largest contribution to IQ variance, based on the standard regression coefficients, were maternal education, SES index, Bayley Motor Scale Score, maternal age, Bayley Mental Scale Score, number of prenatal visits, and gravida. Another interesting finding was that,

> "In three of the four groups (white females) the mother's reported age at menarche was negatively related to IQ in the first and final analyses, a possible indication of the beneficial effects of the general state of health of the mother on her child's intellectual performance" (Browman, Nichols, & Kennedy, 1975, p. 211).

Finally, these researchers in a stepwise multiple regression analysis entered the following five variables first: SES index, maternal education, number of prenatal visits, maternal age at registration for prenatal care, and maternal age at menarche. In all of the groups, except for white males, the first four variables accounted for a sizeable proportion of the explained variance in IQ. As an example, for black females, SES index and maternal education

accounted for 72% of the explained variance, and adding the number of prenatal visits and age of mother at registration for prenatal care boosted the explained variance to 91%. Again, in all four groups (white females excepted) the mother's reported age at menarche was negatively related to IQ.

The literature is sparse in studies of interventions which attempt to control for low birth weight or prematurity. A possible explanation for this could be that established risk factors, such as maternal age, birth order, or SES index are very general in nature. Without knowledge of the specific physiological/biological/environmental significance of factors such as these, it is very difficult to devise specific interventions. This is not to say that intervention programs should be discontinued. Rather, intervention must search for etiological factors and mechanisms that will work toward developing programs that solve problems and contribute to the optimal functioning of children and those responsible for their care.

Physical Contact

The term maternal-infant physical contact in this study refers to the opportunity for the mother and infant to have physical contact while they are still in the delivery room. The popular term "bonding" describes this phenomena (Klaus, Jerauld, Kreger, McAlpine, Steffa & Kennell, 1972). Bonding has often been confused with the concept of attachment (Ainsworth, et al., 1978; Bowloy, 1969).

> While attachment may well be a necessary condition for normal child development, early contact is not. Attachment results from a long process of mutual investment, "bonding" from a brief encounter. Indeed, one "danger" of the early contact-bonding movement is that parents will emphasize "bonding" in place of "attachment." The former can be

> "done" quickly and with a burst of enthusiasm. The latter requires a lengthy investment, patience and a rich diversity of experiences" (Garbarino, 1979, p. 2).

Bowlby (1951) claimed that early life experiences may have serious effects on later intellectual and psychosocial development. This claim was highly controversial in 1951, but no longer so today. There is much solid evidence to show that, in some circumstances, early experiences can and do have important effects (Rutter, 1972). On the other hand, Bowlby's view that permanent damage is inevitable after severe maternal deprivation in the first two years has proven to be mistaken (Rutter, 1980). Children are much more resilient than was appreciated at first, and substantial recovery after early adverse experiences is not only possible but common. The argument now centers on the more interesting question of just what are the factors in the child and in his/her environment which make persisting impairment more or less likely. It must also be noted that different early life experiences have different effects on development. The focus needs to be on the particularity of the specific early experiences so that we may understand better the various mechanisms by which they operate.

Ainsworth, Blehar, Waters, and Wall (1978) have made the point that attachment theory may be described as "programmatic" and open-ended, and that it is not a network of rigid propositions, which investigations which can validate or invalidate. It is, rather, an explanatory theory, a guide, or a construct which can be elaborated and refined through research. Heard (1981) makes the point that a major stumbling block to research on Bowlby's theory is the difficulty in making, outside of infancy, an operational definition of attachment

behavior which "mediates the maintenance of proximity to an attachment figure" (p. 90).

The prototype of the studies which have shown the benefits of physical contact between mother and infant in the period immediately following birth was conducted by Klaus and his associates (1972) in the United States. At the time of this study the usual hospital routine provided for a glimpse of the baby while mother and infant were still in the delivery room. After this, the mother and infant were separated for a six to twelve hour period. Twenty to thirty minute periods were provided for feeding every four hours for the remainder of the hospital stay. Klaus et al., (1972) gave first-time mothers extra-contact with their infant--one hour with their nude infant in the first three hours after birth and an additional five hours of contact on each subsequent day of hospitalization. When the behavior of the mothers with the extra-contact was compared with the behavior of mothers who received the routine care, several differences were observed. The extra-contact mothers were significantly more soothing, they fondled their infants more, and there was more eye-to-eye contact during feeding at one month. When the infants were one year, the extra-contact mothers soothed their infants more during a pediatric examination (Kennell, Jerauld, Wolfe, Chesler, Kreger, McAlpine, Steffa, & Klaus, 1974). At two years mothers who had extra-contact spoke to their children with fewer commands, more questions, and more words per proposition (Ringler, Kennell, Jarvella, Navojosky, & Klaus (1975).

In another study (O'Connor, Vietze, Hopkins, & Altemeier, 1977), 301 low-income, first-time mothers were randomly assigned to different postpartum experiences. One group received the regular hospital

routine (contact every four hours for feeding), and the other group was given up to eight hours of additional contact during the day. During a 12-to 21-month follow-up, only one of 134 infants who had extra contact required hospitalization because of a parenting failure. In the group which received routine care, nine of 143 infants (6.3%) were subsequently admitted for such disorders (i.e, non-organic failure to thrive, abuse, neglect, or abandonment). This study suggests that extra contact, even if not immediately after birth, may improve later mother and child health. O'Connor[4] is currently conducting research to determine if contact immediately after birth, both with and without extra contact during the remainder of the hospital stay, would be of even greater benefit.

A study reported by Seashore, Leifer, Barnett, and Leiderman (1973) reported less self-confidence among mothers of prematuare infants who were denied physical interaction while their infants were in the hospital nursery than mothers who were allowed to care for their infants. The effect was most pronounced for first-time mothers and mothers who were initially low in self-confidence. This finding takes on added significance when the suggestion is made that premature infants demonstrate psychological attachment and dependence on the equipment to which they have been attached (Harrison and Delano, 1976).

The question of when contact must be initiated, what form it should take, and how long it must be maintained remains unanswered. The persistence of any ill effects from lack of mother-infant contact

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[4]Personal communication with Dr. Susan O'Connor.

is heavily dependent upon how long and for what reasons such contact is not possible. It is clear that the lack of such contact will have different effects on different mothers and infants. Likewise, maximum contact between mother and infant immediately after birth and in the postpartum period does not ensure lasting beneficial effects. No mother should be led to believe that if she has no opportunity for early physical contact with her infant, she will never attach to her infant. Early contact is only the beginning of a process that starts at birth--a life-long process of getting to know, to understand, and to love another human being.

Summary

Chapter II reviewed the literature concerning the conceptual framework of attitudes. This was followed by a general discussion of parental attitudes. The Neonatal Perception Inventory was dealt with next. The history of parent education and the area of primary prevention also were reviewed. The final section dealt with a consideration of the known effects of birth weight, one-minute APGAR scores, maternal age, and mother-infant physical contact in the immediate postpartum period on child outcome measures.

The conceptual framework of attitudes was discussed as being either multi-dimensional or unidimensional. The multidimensional view defines attitude as including cognitive, conative, and affective components. Attitudes are seen as empirically reflected in all three components, and any one component alone does not necessarily reflect the totality of attitude toward an object. The unidimensional notion of attitude was first expoused by Thurston (1931). Fishbein (1967a,

1967b), a contemporary supporter of the unidimensional framework, argues that attitudes should be considered as a phenomen conceptually distinct from, but related to, concepts such as beliefs, behavioral intentions, and overt behavior. Thus, Fishbein (1975) defines attitude as "...the amount of affect for or against some object" (p. 11).

Taking a unidimensional view of attitude does not imply that one should ignore the dimensions of cognition and conation. Rather, the interrelation among these concepts needs further investigation. Fishbein (1967c) explains the ability to predict an individual's intention to perform any behavior (and his/her actual performance of the behavior) as a function of "(1) his attitude toward performing the behavior in a given situation, and (2) the norms governing that behavior in that situation and his motivation to comply with those norms" (p. 489). This is expressed algebraically as follows:

$$B \simeq BI = A_{act}\ w_0 + (NB_p)(Mc_p)\ w_1 + (NB_s)(Mc_s)\ w_2$$

This theory is an attempt to show that beliefs (cognitions) and behavioral intentions (conations) can be viewed as determinants or consequences of behavior. Rather than being viewed as parts of attitude, these variables should be viewed as independent phenomena that are related to, and serve as indicants of, an individual's attitude.

Parental influences are seen as crucial and pervasive. A psychoanalytic understanding of parental attitudes interprets this phenomena as having its natural center in the unconscious meaning which having children or a specific child has for a parent and factors of reality that dominate the picture. Unconscious meaning or "unconscious fantasies" are also associated and referred to the revival of the past

that is operative for parents and constitutes a central point in their experience of parenthood. Coleman, Kris, and Provence (1953) state that "the relation to one's own parents is repeatedly reenacted by repetition or avoidance. In parenthood the psychological life cycles of two generations overlap and a third one is regularly involved" (p. 23).

Ausubel (1958) delineates four categories of determinates in the formation of parental attitudes: the wider culture, the parent's own family and childhood experiences, the parent's personality structure, and various situational variables. Davids and Holden (1970), in an investigation of the stability of maternal attitudes expressed before childbirth and sometime afterwards, found product moment correlations of .54 ($p \leq .01$) on the PARI Hostility factor, .80 ($p \leq .01$) for the Control factor, and .72 ($p \leq .01$) for total negative attitudes.

Can parental attitudes be modified to enhance the parent-child relationship? Bruce (1967) feels that a meaningful supportive relationship of trust can help new parents overcome handicapping fears or attitudes. An obvious point to prepare individuals for parenthood would be before the baby is born. However, prenatal classes and researchers who have looked at prenatal classes (i.e., Halstead & Fredrickson, 1978; Shapero & Schnitt, 1973) have primarily concentrated on labor and delivery outcomes.

The Neonatal Perception Inventory (Broussard & Hartner, 1970) was developed to measure a mother's perception of her newborn as compared to the mother's concept of the average infant. The NPI is a projective measure of ambiguous stimuli--the "average baby" and "your baby"--upon which the mother projects her concepts of what most babies are like and

her expectations of what her newborn is or will be like. The items covered in the NPI include: crying, feeding, spitting up, sleeping, elimination, and predictability. The predictive validity of the NPI was established through a longitudinal follow-up of the original sample at four and one-half years and again when the children were between 10 and 11 years old. A positive maternal perception of her infant on the NPI does not guarantee that there will be no difficulty in the child's subsequent development, nor does a negative maternal perception predict absolutely that there will be later psychosocial disorders. The complexity of human development makes such absolute prediction impossible. Broussard (1980) notes that "the NPI can serve to screen for potential failures in psychosocial adaptation stemming from disorders in the earliest mother-infant relationship, disorders that may exist undetected at an early age" (p. 256).

Parent education is not a new phenomena, but rather one that can be traced back to the time that the first Europeans came over to North America. Parenthood is probably one of the most responsible roles that an individual can assume, yet it is a role for which little in the way of preparation is made. Expectant couples tend to resist receiving information about baby care, despite their inexperience with infants, and to focus on the birth experience (Doering & Entwisle, 1977). Parents receive advice from informal and professional sources and they "are highly receptive to all kinds of information, true or not, if they feel it will help them with their children" (Salk, 1975, p. 23). Hospitals which are adopting a Family Centered Maternity Care (FCMC) system are attempting to teach both mothers and fathers caregiving skills. The apparent need for parent education is great, but parent

education itself raises more questions than it answers.

The purpose of primary prevention "is to reduce the rate at which new cases of a disorder develop. This approach seeks to reduce prevalence by reducing incidence..." (Bloom, 1979, p. 180). Parent education is a form of primary prevention since it is an attempt to prevent the breakdown of the parent-child relationship. When prevention attempts to change behavior, one must be careful to avoid projecting one's own values and preferences. Such actions could turn out to be simple legal moralism.

Low birth weight (LBW) is usually defined as weight less than 2500 grams (Abramowicz & Kass, 1966). The low birth weight infant currently has a more favorable prognosis than ten years ago, but LBW infants remain at higher than normal risk medically, emotionally, and developmentally. Schaefer, Hatcher, and Barglow (1980) report that "numerous studies (have) found consistently lower IQ scores, more perceptual and motor problems, poorer language development, poorer school progress, and a higher incidence of emotional and behavioral problems among children who had been low birth weight infants" (p. 199).

Dr. Virginia Apgar (1953) introduced the APGAR scale to measure neonatal well-being and to direct the attention of the physician immediately to the child at the moment of birth. The scale consists of a summary numerical rating of 0, 1, or 2 on the physiological parameters of heart rate, respiratory effort, muscle tone, reflex irritability, and color. The National Collaborative Perinatal Project found a suggested relationship between the one-minute APGAR and neurological findings at one year (Hardy, Drage, & Jackson, 1979) and a

small positive correlation (r = .04) between the one-minute APGAR score and IQ among whites at four years (Broman, Nichols, & Kennedy, 1975). The analysis at four years also found that the one-minute APGAR discriminated between low and normal IQ groups for white males, black males, and black females.

The incidence of teenage mothers delivering a low birth weight infant is one and one-half times greater than the national average (Healthy People, 1979). Teenage mothers face other obstacles as well. They may find no positive support coming from their families, and they probably have not had any formal preparation for childbirth. The lack of a support system and planning is compounded for the young mother who conceals her pregnancy from family and friends until it is no longer possible to do so. The young mother is really a child attempting to raise a child while facing all of the issues that must be resolved during adolescence. Young mothers often accuse themselves of "not feeling anything for the child." Deutsch (1945) explains this situation as being brought about by a conflict between motherhood and self-preservation; and that in order to spare herself, the young mother renounces a love relationship with her child and prefers to reject him/her.

Physical contact in this study refers to maternal-infant physical contact while still in the delivery room. This is often referred to by the popular term "bonding" which is often confused with the concept of attachment. "Bonding" is a brief encounter between mother and child, while attachment is a long process of investment, patience, and experience--the way parent and child get to know and to love one another. The danger in a parent's confusing the terms is that bonding

will be emphasized in place of attachment. Early, first experiences are important, but we now know that children are much more resilient than previously thought. They are usually able to recover, even after early adverse experiences. Klaus and his associates (1972) were the first to demonstrate the benefits of physical contact between mother and child in the immediate postpartum period. They found that mothers who had such contact, in contrast with mothers who did not, were more soothing, fondled their infants more, and had more eye-to-eye contact during feeding. O'Connor et al. (1977), reported that mothers who received additional contact with their infants throughout their hospital stay had fewer infants hospitalized for parenting disorders during a 12 to 21 month follow-up than infants of mothers who did not receive additional contact time. It is imperative, however, that no parent be lead to believe that if he/she does not have the opportunity for physical contact, that he/she will never be attached to his/her child.

CHAPTER III

METHODOLOGY

An Overview of the Research Design and Analysis

The design of this exploratory investigation was a Posttest-Only Control Group design. Campbell and Stanley (1963) state that while the pretest is thought to be essential to true experimental designs, "...the most adequate all-purpose assurance of lack of initial biases between groups is randomization. Within the limits of confidence stated by the tests of significance, randomization can suffice without the pretest" (p. 25). The design employed in this investigation included five independent variables and one dependent variable, with random assignment to the experimental status (treatment or control).

The five independent variables employed were: experimental status of subject, age of subject at last birthday, weight of the infant at birth, one-minute APGAR score assigned the infant, and opportunity for mother-infant physical contact while in the delivery room. The dependent or criterion variable was the subject's score on the Neonatal Perception Inventory which was administered during a structured telephone interview conducted one month after the infant was born.

The analysis of the data was accomplished through the use of five t-tests and a multiple linear regression model. The multiple linear regression analysis involved an investigation of the combined effect of experimental status, maternal age, birth weight, one-minute APGAR score, and opportunity for maternal-infant physical contact while still in the delivery room to predict the dependence of the criterion variable (maternal perception score) over and above the separate mean effects of experimental status, maternal age, birth weight, one-minute APGAR score, and opportunity for maternal-infant physical contact in the delivery room.

The comparison of the combined effects is made possible by a computer-assisted least squares method generated through a Statistical Package for the Social Science program, (1975) by which the error sum of squares for a full and restricted model are determined and compared through the use of a decision rule, the F-Statistic.

Sample Description

The subjects involved in this investigation were women (primiparas) who gave birth to their first child at the William Beaumont Hospital in Royal Oak, Michigan. All of the subjects were involved in the larger primary prevention demonstration project Perinatal Positive Parenting (Boger, Andrews, & Richter, 1979). This larger program was developed and implemented through the Institute for Family and Child Study at Michigan State University. The funding agency for this program was the Office of Human Development Services, DEPARTMENT OF HEALTH AND HUMAN SERVICES (Grant No. 90-CA-2137).

The 193 subjects who make up the subsample for this exploratory investigation were selected from the sample of the larger PPP program on the basis of having data available for all of the independent variables and having responded to the telephone-administered Neonatal Perception Inventory at one month.

The distribution of the subsample by experimental status is given in Table 3.1. The mean age of the control group was 26.4 years (s.d.= 4.2 years). The mean age of the treatment group was 25.8 years (s.d.= 4.3 years). The mean birth weight for the control group was 3551 grams (s.d.= 443 grams). The mean birth weight for the treatment group was 3363 grams (s.d.= 542 grams).

TABLE 3.1.

Distribution of the Subsample

by Experimental Status.

	Number	Percentage
Control	69	35.8
Treatment	124	64.2
Total	193	100.0

Sample Selection

The William Beaumont Hospital in Royal Oak, Michigan, had over 5,200 live births in 1981. Because of such a large number of live births annually, before implementing the project, PPP negotiated with

the Chief of Pediatric Services at the hospital to determine who would be eligible for inclusion in the program. Based upon these negotiations, the following criteria were established: (a) that this be the first live birth for the subject, (b) that the subject family be the patient of a pediatric group assigned by the Chief of Pediatric Services or be the patient of the staff pediatrician, (c) that the infant be free of major anomaly, and (d) that the subject family live within a specified geographic area.

Based upon these criteria, the project received a daily list of potential subjects from the hospital's nursing staff. When this list was received, each subject was rechecked for eligibility. Once this was completed, each subject was randomly assigned to either treatment or control status. The number of subjects who could receive the program in any one day was limited by the number of project volunteers scheduled to be in the hospital on that particular day.

Procedure and Operational Definitions of the Independent Variables Data

The independent variables in this exploratory investigation were collected while the subjects were hospitalized at the William Beaumont Hospital in Royal Oak, Michigan, following the birth of their first children. The experimental status of the subjects was the first independent variable for which comparison was sought. When a project volunteer came to the hospital, she approached potential treatment subjects, explained the program, and asked if they would like to participate. If a subject agreed to participate, she was asked to sign a consent form which was required before any information could be

collected. Once a treatment subject signed the consent form, the project volunteer began to collect the required information from her and to administer the program.

The potential control subjects were approached by project volunteers and told that a study currently being conducted in the hospital was looking at early parent-infant interactions. The subject was told that all she would have to do was answer a few questions now and that she would receive a few questions in the mail in a couple of weeks. She was also informed that a researcher from Michigan State University would call her in one month. If the subject agreed to participate, she was also asked to sign a consent form. When this was signed, the project volunteer proceeded to collect the required information from her.

The second independent variable compared was the age of the subject. This information was collected by a project volunteer on the Perinatal Positive Parenting Family Profile form. This form provided space for the volunteer to record the subject's response to the question "age at last birthday." Appendix A contains a copy of the complete Family Profile form.

The weight of the infant at birth was another independent variable. This information was obtained from the Perinatal Positive Parenting Delivery Room History form, and recorded by a Transition Nursery nurse at the William Beaumont Hospital after weighing the infant. This provided the raw data necessary to include this dimension as a independent variable. If the weight given by the hospital was recored in pounds, it was converted into grams by means of a pound-to-gram conversion table. The weight of the infant in grams was entered

as experimental data in intervals of one-hundred gram units, i.e., 2501 grams to 2600 grams, 2601 grams to 2700 grams, 2701 grams to 2800 grams, etc. Appendix B contains a copy of the complete Delivery Room History Form.

The one-minute APGAR score of the infant was another controlled independent variable. The Perinatal Positive Parenting Delivery Room History form provided the data for this independent variable. This form provided space to record the first (one-minute) APGAR score of the infant. This information was registered by a Delivery Room Nurse at the William Beaumont Hospital. Appendix B contains a complete copy of the Delivery Room History form.

The last independent variable tested in this study was the opportunity for the mother and the infant to have physical contact in the delivery room. This information was obtained from a delivery room nurse at the William Beaumont Hospital who answered the following question on the Perinatal Positive Parenting Delivery Room History form, "Did mother have physical contact with infant in the delivery room?" The possible responses to this question were: (1) yes, (2) no, (3) not available. Appendix B contains a complete copy of the Delivery Room History form.

Procedure and Operational Definition of the Dependent Variable Data

The dependent or criterion variable in this exploratory investigation was the Neonatal Perception Inventory. The NPI was administered to all subjects during a structured telephone interview. Appendix C contains a copy of the portion of the PPP Telephone

Follow-up Interview which includes the NPI questions asked. These interviews were conducted by trained telephone interviewers from the Institute for Family and Child Study at Michigan State University when the infant was one month of age. This procedure differs from that described by Broussard (1970) in which the NPI at one month was administered to mothers in their homes by a trained interviewer. However, in a study of the detection of dysfunctional parental adaptation in a private pediatric practice using the NPI, Harper, Smith, Dickey and Broussard (undated) reported that "similar results were obtained regardless of the method (home interview, telephone interview, or mailed questionnaire) of administration" (p. 5).

When the telephone interviewer from the Institute for Family and Child Study contacted a subject at one month, she began the administration of the NPI by reading:

> You have had a chance to live with your baby for about one month now. Although this is your first baby, you probably have some ideas of what most little babies are like. I am going to ask you a few questions and I would like you to tell me what you think best describes the <u>average</u> baby (Richter, O'Gara, Boger, undated, p. 3).

The interviewer then proceeded to read each of the six NPI "Average Baby" questions and responses to the subject. When these were completed, the interviewer read:

> Now I am going to ask you a few questions and I would like you to tell me what you think best describes <u>your</u> baby (Richter, O'Gara, Boger, undated, p. 5).

The subject's response to each question was recorded directly on the interview form. When each interview was completed, it was edited for accuracy by the interviewer. Edited interviews were coded on an 80 column coding sheet. One of every five coded interviews was randomly

verified by a research aide who was not involved in the original coding. The data from the coding sheets were then key punched on IBM cards. After the data were entered in the computer, a listing of all the cards was obtained, and one of every five cases listed was again randomly verified to ensure accuracy.

Hypotheses

The research hypotheses explored in this investigation were:

H_1: Mothers who participate in a program of primary prevention beginning in the immediate post-partum hospital period will have higher (positive) maternal perception scores of their infant at one month than mothers who do not participte in such a program.

H_2: Older mothers will have higher (positive) maternal perception scores of their infant at one month than younger mothers.

H_3: Mothers of heavier infants (birth weight in grams) will have higher (positive) maternal perception scores of their infant at one month than mothers of lighter infants (birth weight in grams).

H_4: Mothers of infants who score higher on the one-minute APGAR scale will have higher (positive) maternal perception scores of their infant at one month than mothers of infants who score lower on the one-minute APGAR scale.

H_5: Mothers who have the opportunity for physical contact with their infant in the delivery room will have higher (positive) maternal perception scores of their infant at one month than mothers who do not have the opportunity for physical contact with their infant in the delivery room.

H_6: The combined effect of experimental status, maternal age, birth weight, one-minute APGAR

score, and opportunity for physical contact is needed to predict the dependence of the criterion variable (maternal perception score) over and above the separate mean effects of experimental status, maternal age, birth weight, one-minute APGAR score, and opportunity for physical contact.

T-Test Analysis of Each Independent Variable

Campbell and Stanley (1963) note that the Posttest-Only Control Group Design "...is perhaps the only setting for which this test (*t*-test) is optimal" (p. 26). The *t*-test is most useful when the intent is to compare group means. To justify the use of this test involving a difference between means, two assumptions must be made: (a) the population samples are normal, and (b) the population variances are homogeneous. Hays (1973) points out that both of the assumptions become relatively unimportant if the samples are quite large.

A one-tailed *t*-test was used to analyze each of the first five hypotheses to determine if the mean of one group was significantly larger than the mean of the other group. This was necessary since the two-tailed probability is used for obtaining either a value larger than *t* or one smaller than minus *t*, and the hypotheses have assumed that the latter is not expected. The Statistical Package for the Social Science Manual (1975) points out that if *t* is negative and large in magnitude, this would be either an extremely unusual sample or the original set of hypotheses was wrong. If *t* is positive as expected, the one-tailed probability is used to test significance. The level of chance probability for this exploratory research was set at the $p \leq .10$ level.

This high level was chosen to avoid the serious possibility of committing a Type II Error (accepting H_0 when it is false).

In order to conduct the analysis for each of the first five hypotheses, each independent variable had to be dichotomized. An operational explanation as well as the null and alternative algebraic expressions for the first five research hypotheses were as follows:

Hypothesis I. The experimental status of the subjects was a natural dichotomy. Each subject was randomly assigned to either a treatment or control status. The null and alternative hypotheses were:

H_0: $u_1 = u_2$

H_1: $u_1 > u_2$

Hypotheses II. The ages of the subjects were dichotomized into two groups: mothers 26 years of age and older and mothers less than 26 years of age. The rationale for this arbitrary decision was to make both groups as nearly equal in cell size as possible and was based on the control group's having a mean age of 26.4 years (s.d.= 4.2 years) and the treatment group's having a mean age of 25.8 years (s.d.= 4.3 years). The null and alternative hypotheses were:

H_0: $u_1 = u_2$

H_1: $u_1 > u_2$

Hypothesis III. The birth weights of the infants were dichotomized into two groups: infants weighing 3401 grams and over, and infants weighing less than 3401 grams. The rationale for this arbitrary decision was to make both group's as nearly equal in cell size as possible and was based on the control group's having a mean

birth weight of 3551 grams (s.d.= 443 grams) and the treatment group's having a mean birth weight of 3363 grams (s.d.= 542 grams). The null and alternative hypotheses were:

H_0: $u_1 = u_2$

H_1: $u_1 > u_2$

Hypothesis IV. The one-minute APGAR scores of the infants were dichotomized into two groups: infants having a one-minute APGAR score of eight or more and infants having a one-minute APGAR score of less than eight. The rationale for this arbitrary decision was to make both groups as nearly equal in cell size as possible and was based on the control group's having a mean APGAR score of 7.9 (s.d.= 1.4) and the treatment group's have a mean APGAR score of 7.7 (s.d.= 1.5). The null and alternative hypotheses were:

H_0: $u_1 = u_2$

H_1: $u_1 > u_2$

Hypothesis V. The opportunity for mother-infant physical contact in the delivery room was a natural dichotomy. Each subject either had or did not have the opportunity for physical contact. The null and the alternative hypotheses were:

H_0: $u_1 = u_2$

H_1: $u_1 > u_2$

Multiple Linear Regression Analysis of the Independent Variables

Multiple Linear Regression is a statistical technique which can analyze the relationship between a dependent or criterion variable and

a set of independent or predictor variables. The focus of multiple linear regression is on the evaluation and measurement of overall dependence of a variable on a set of other variables.

The need for an analysis which looks simultaneously at the entire set of five independent variables in this exploratory investigation is necessary to extend the power and effectiveness of the t-test analysis of each independent variable. Hays (1973) notes that the use of multiple t-tests on a set of data "...cannot be regarded as independent, and the various tests themselves refer to redundant, overlapping aspects of the data...it becomes clear that a fairly complex pattern of dependency runs throughout the possible t-tests" (pp. 593-594). Thus, the multiple linear regression analysis allowed the evaluation of the overall dependence of the criterion variable on the entire set of independent variables.

The multiple linear regression full-rank model tested in this exploratory investigation was:

$$Y = B_0+B_1X_1+B_2X_2+B_3x_3+B_4X_4+B_5X_5+E.$$

Where:

Y = the dependent variable (Maternal Perception Score)

B_0 = a constant added to each case

X_1 = experimental status of mother

X_2 = age of mother

X_3 = birth weight of infant

X_4 = one-minute APGAR score of infant

X_5 = opportunity for physical contact

E = the error vector

B_1, B_2, B_3, B_4, B_5 = regression coefficients

The method of multiple linear regression used in this analysis was Backward Elimination (SPSS-6000 Supplement, 1981). This method of multiple linear regression analysis provided the opportunity to enter all of the independent variables into the regression equation and then to test the adequacy or fit of the proposed full-rank model to the actual data. Entering all of the independent variables into the full rank model allows for the identification of all the statistically significant variables. Consequently, it may also revise the model.

The first step of the Backward Elimination method enters all of the independent variables into the equation. On each succeeding step, those independent variables which do not provide a significant contribution to the equation are removed. The SPSS-6000 Supplement (1981) notes that this decision rule or default value is expressed as a FOUT, which is a F-value and not a probability level. The FOUT level of 2.71 was used. This represents the F-value at the .10 level of chance probability with 1 and 188 degrees of freedom. This high level was chosen because this was an exploratory investigation and to avoid the possibility of committing a Type II Error (accepting H_0 when it is false).

The operationalization of the Multiple Linear Regression Backward Elimination model for each independent variable and the null and alternative hypothesis for Hypothesis VI follows.

Hypothesis VI. The experimental status of each subject was entered as either treatment or control. The actual reported age of the subject was entered. The actual birth weight of the infant was entered as a unit of one hundred gram intervals, i.e., an actual birth weight

of 2543 grams was entered as a unit of interval 2501 grams to 2600 grams; an actual birth weight of 3766 grams was entered as a unit of the interval 3701 grams to 3800 grams. The actual one-minute APGAR score reported for the infant was recorded. The opportunity for physical contact in the delivery room was entered as either yes or no.

The null and alternative algebraic statements of hypothesis six were:

H_0: $B = 0$

H_1: $B \neq 0$

Summary

The research design employed in this investigation was a Posttest-Only Control Group Design. Five independent variables were examined: experimental status of the mother, age of the mother at last birthday, weight of the infant at birth, one-minute APGAR score assigned to the infant, and opportunity for mother-infant physical contact while still in the delivery room. The dependent or criterion variable was the subject's score on the Neonatal Perception Inventory which was administered during a structured telephone interview when the infant was one month of age.

The subjects involved in this investigation were first-time mothers who delivered at the William Beaumont Hospital in Royal Oak, Michigan. All subjects were participants in a larger program of primary prevention--Preinatal Positive Parenting (Boger, Andrews, & Richter, 1979). The 193 subjects were selected on the basis of criteria negotiated with the Chief of Pediatric Services at the hospital and having data available for all of the independent variables

and the dependent variable. The subjects were randomly assigned to either the treatment or control condition.

The first five research hypotheses explored in this investigation were tests for mean differences on arbitrarily defined groups within each independent variable. The dependent variable was the subject's NPI score at one month. The statistical technique used to test for the mean differences between the groups was the t-test.

The sixth research hypothesis tested was an analysis of a full-rank Multiple Linear Regression Model, which included all five of the independent variables, to predict the dependent or criterion variable (the subject's one-month NPI score). The statistical method employed to test the model was a Backward Elimination Multiple Linear Regression technique.

CHAPTER IV

ANALYSIS OF RESULTS

Introduction

This chapter is divided into two major sections. The first section will look at each of the first five research hypotheses, and the second section will examine the sixth research hypothesis. For clarity in reading, each research hypothesis will be restated, followed by its statistical representation. The latter will be followed by the statistical adjudication of the related null hypothesis. This, in turn, will be followed by an elucidation of the results.

First Five Research Hypotheses

Research hypothesis one. The first research hypothesis posed in this exploratory investigation was:

> Mothers who participate in a program of primary prevention beginning in the immediate post-partum hospital period will have higher (positive) maternal perception scores of their infant at one month than mothers who do not participte in such a program.

The statistical representation of this research hypothesis was:

H_0: $u_1 = u_2$

H_1: $u_1 > u_2$, where u_1 represents the mean Neonatal Perception Inventory score for treatment mothers at one month and u_2 represents the mean Neonatal Perception Inventory score for control mothers at one month. The statistical adjudication of the null hypothesis for this research question is presented in Table 4.1.

Table 4.1

Mean NPI Scores at One Month for Control Mothers and Treatment Mothers When Classified by Experimental Status

	n	Mean	Standard Deviation	t	Chance Probability
Control Mothers	69	2.07	2.70		
				-.16	Not Significant
Treatment Mothers	124	2.15	3.08		

Table 4.1 shows the results of the t-test conducted to test the first research hypothesis. The t-value found was -.16. The negative sign in this table is a function of the arithmetic necessary for the calculation of the t-statistic. The minus sign derives from the fact

that the Treatment Group mean on the NPI at one month was subtracted from the Control Group mean. In this instance the research hypothesis suggested that the Treatment Group would have a higher (positive) mean NPI score at one month than the Control Group. The critical value necessary (1.282) to reject the null hypothesis was not obtained. Consequently, one tentatively accepts the null hypothesis and assumes that Control and Treatment mothers do not differ on their mean NPI score at one month.

Research hypothesis two. The second research hypothesis posed was:

> Older mothers will have higher (positive) maternal perception scores of their infant at one-month than younger mothers.

The statistical representation of the second research hypothesis was:

H_0: $u_1 = u_2$

H_1: $u_1 > u_2$, where u_1 represents the mean Neonatal Perception Inventory score at one month for older mothers (mothers 26 years of age and older) and u_2 represents the mean NPI score at one month for younger mothers (less than 26 years of age). The statistical adjudication of the null hypothesis for this research question is presented in Table 4.2.

Table 4.2

Mean NPI Scores at One Month for Older Mothers and Younger Mothers When Classified by Age

	n	Mean	Standard Deviation	t	Chance Probability
Mothers 26 and over	91	2.35	2.67		
				1.04	Not Significant
Mothers less than 26	102	1.91	3.17		

Table 4.2 shows the results of the t-test conducted to test the second research hypothesis. The t-value found was 1.04. In this instance the research hypothesis suggested that the older mothers would have a higher (positive) mean NPI score at one month than the younger mothers. However, the t-value found (1.04) was not large enough to be statistically significant. The critical value (1.282) necessary to reject the null hypothesis was not obtained. Consequently, one tentatively accepts the null hypothesis and assumes that older and younger mothers do not differ on their mean NPI scores at one month.

Research hypothesis three. The third research hypothesis posed in this exploratory investigation was:

Mothers of heavier infants (birth weight in grams) will have higher (positive) maternal perception scores of their infants at one month than mothers of lighter infants (birth weight in grams).

The statistical representation of the third research hypothesis was:

H_0: $u_1 = u_2$

H_1: $u_1 > u_2$, where u_1 represents the mean Neonatal Perception Score at one month for mothers who delivered heavier infants (birth weight of 3401 grams or more) and u_2 represents the mean NPI score at one month for mothers who delivered lighter infants (birth weight less than 3401 grams). The statistical adjudication for this research question is presented in Table 4.3.

Table 4.3

Mean NPI Scores at One Month for Mothers of Lighter Infants and Mothers of Heavier Infants When Classified by Weight

	n	Mean	Standard Deviation	t	Chance Probability
Mothers of Lighter Infants	102	1.90	3.00	-1.08	Not Significant
Mothers of Heavier Infants	91	2.36	2.87		

Table 4.3 shows the results of the t-Test conducted to test this hypothesis. The t-value found was -1.08. The negative sign in this table was a function of the arithmetic necessary for the calculation of the t-statistic. The minus sign derives from the fact that the mean for the mothers of the heavier infants on the NPI at one month was subtracted from the one-month NPI mean for the mothers of the lighter infants. The research hypothesis suggested that the mothers of the heavier infants would have a higher (positive) mean NPI score than the mothers of the lighter infants. The critical value necessary (1.282) to reject the null hypothesis was not obtained. Consequently, one tentatively accepts the null hypothesis and assumes that mothers who deliver heavier or lighter infants do not differ on their mean NPI score at one month.

Reserch hypothesis four. The fourth research hypothesis posed in this exploratory investigation was:

> Mothers of infants who score higher on the one-minute APGAR scale will have higher (positive) maternal perception scores of their infant at one month than mothers of infants who score lower on the one-minute APGAR scale.

The statistical representation of the fourth research question was:

H_0: $u_1 = u_2$

H_1: $u_1 > u_2$, where u_1 represents the mean Neonatal Perception Score at one month for mothers who delivered infants who scored higher on the one-minute APGAR scale (8 or more) and u_2 represents the mean NPI score for mothers whose infants scored lower (less than 8). The

statistical adjudication for this research question is presented in Table 4.4.

Table 4.4

Mean NPI Scores at One Month for Mothers of Infants with Low and High One-Minute APGAR Scores

	n	Mean	Standard Deviation	t	Chance Probability
Low One-Minute APGAR Scores	38	1.42	3.29		
				-1.64	.05
High One-Minute APGAR Scores	155	2.29	2.84		

Table 4.4 shows the results of the t-Test conducted to test the fourth research hypothesis. The t-value found was -1.64. The negative sign in this table is a function of the arithmetic necessary for the calculation of the t-statistic. The minus sign derives from the fact that the mean NPI score at one month for mothers who delivered infants with a higher one-minute APGAR was subtracted from the mean NPI score at one month for mothers who delivered infants with lower one-minute APGAR scores. The t-value obtained (-1.64) reached the critical value (1.645) significant at the $p \leq .05$ level of chance probability. Consequently, one tentatively rejects the null hypothesis and assumes that higher (8 and above) and lower (less than 8) one-minute APGAR scores characterize the mothers mean score on the NPI at one month.

One further assumes that such results are significantly ($p \leq .05$) different.

Research hypothesis five. The fifth research hypothesis posed was:

> Mothers who have the opportunity for physical contact with their infants in the delivery room will have higher (positive) maternal perception scores of their infants at one month than mothers who do not have the opportunity for physical contact with their infants in the delivery room

The statistical representation of the fifth research question was:

$H_0 : u_1 = u_2$

$H_1 : u_1 > u_2$, where u_1 represents the mean Neonatal Perception Score at one month for mothers who had physical contact with their infants while in the delivery room and u represents the mean NPI score at one month for mothers who did not have physical contact with their infants while still in the delivery room. The statistical adjudication for this research question is presented in Table 4.5.

Table 4.5 shows the results of the t-Test conducted to test the fifth research hypothesis. The t-value found was .63. In this instance the research hypothesis suggested that mothers who had physical contact with their infants while still in the delivery room would have higher (positive) NPI scores at one month than mothers who did not have physical contact with their infants in the delivery room.

Table 4.5

Mean NPI Scores at One Month for Mothers Who Did Have and Did Not Have Physical Contact with Their Infants in the Delivery Room

	n	Mean	Standard Deviation	t	Chance Probability
No Physical Contact	101	2.25	2.63		
				.63	Not Significant
Physical Contact	92	1.98	3.27		

However, the t-value found was not large enough to be statistically significant. The critical value (1.282) necessary to reject the null hypothesis was not obtained. Consequently, one tentatively accepts the null hypothesis and assumes that mothers who have physical contact with their infants in the delivery room and mothers who do not have physical contact do not differ on their mean NPI scores at one month.

The Sixth Research Hypothesis

The primary concern of the first five research hypotheses was the comparison of group means. The comparison of two group means is really a comparison of sample means from which one hopes to be able to generalize and infer to the larger population. In contrast, the sixth research question employed a multiple linear regression statistic to analyze the relationship between an dependent variable (NPI score at

one month) and a set of independent variables (experimental status of mother, age of mother, weight of infant at birth, one-minute APGAR score, and opportunity for mother-infant contact in the delivery room). The focus of a Multiple Linear Regression analysis is on the evaluation and measurement of overall dependence of a variable on a set of other variables. The method of Multiple Linear Regression employed to test this research question was Backward Elimination.

Research hypothesis six. The sixth research hypothesis posed in the exploratory investigation was:

> The combined effect of experimental status, maternal age, birth weight, one-minute APGAR score, and opportunity for physical contact is needed to predict dependence of the criterion variable (maternal perception score) over and above the separate mean effects of experimental status, maternal age, birth weight, one-minute APGAR score, and opportunity for physical contact.

The statistical representation of the sixth research hypothesis was:

$H_0 : B = 0$

$H_1 : B \neq 0$, where B represents the regression coefficient determined in the multiple linear regression equation tested in this research hypothesis. The algebraic expression of the model tested was:

$$Y = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + B_5X_5 + E$$

where:

Y = the dependent variable (NPI score at one month)

B_0 = a constant added to each case

B_1 = experimental status regression coefficient

X_1 = experimental status of subject

B_2 = age regression coefficient

X_2 = age of subject

B_3 = birth weight regression coefficient

X_3 = birth weight of infant

B_4 = one-minute APGAR score regression coefficient

X_4 = one-minute APGAR score of infant

B_5 = physical contact regression coefficient

X_5 = opportunity for physical contact

E = the error vector

The statistical adjudication for this research hypothesis is presented in Table 4.6.

Table 4.6 presents the results of the Backward Elimination Multiple Linear Regressions conducted to test the sixth research hypothesis. In this instance, the hypothesis suggested that a full-rank model (all five independent variables) would predict the mother's NPI score at one month. This was not the case. The critical F-value (1.85) necessary to reject the null hypothesis was not reached. Likewise, on the second step, when the experimental status of the subject was removed from the model, the critical value was still not obtained. The third step removed the variable physical contact from the model. This left a restricted model with one-minute APGAR score, birth weight, and age of subject. This restricted model obtained an F-value of 2.37. Consequently, one assumes that this restricted model significantly ($p \leq .072$) predicts how the subject will score on the NPI at one month. The fourth step (one-minute APGAR removed) and the fifth step (birth weight removed) also obtained F-values ($F = 3.21$ and

Table 4.6

Backward Elimination Multiple Linear Regression on

One-Month NPI Scores by the Five Independent Variables

Step	Independent Variable Entered	Independent Variable Removed	R Square[1]	Overall F	Chance Probability
1	Status		.00014	1.47	.202
	Age		.02919		
	APGAR		.03273		
	Physical Contact		.03411		
	Birth Weight		.03781		
2		Status	.03742	1.83	.125
3		Physical Contact	.03629	2.37	.072
4		APGAR	.03270	3.21	.042
5		Birth Weight	.02919	5.74	.018

1 = Cumulative Values

F = 5.74 respectively) which significantly ($p \leq .042$ and $p \leq .018$) predicted how the subject would score on the NPI at one month.

Correlational Analysis

A correlation matrix was computed to assess the relationship among all of the variables utilized in the preceding analyses. In order to construct such a matrix, three different correlation coefficients had to be computed. For the correlation of the dichotomous variables (experimental status of subject and opportunity for physial contact while in the delivery room) a phi coefficient was computed. The correlation of the dichotomous variables (experimental status and opportunity for physical contact) with the continuous or interval variables (NPI score at one month, weight at birth, age of mother, and one-minute APGAR score) required the computation of a point-biserial correlation cofficient. The correlation of the continuous or interval variables (NPI score at one month, age of subject, weight at birth, and one-minute APGAR score) was computed by means of a Pearson product-moment correlation.

Table 4.7 shows the results of the correlation analyses conducted among all of the variables (regardless of status) previously employed in the research hypotheses. The correlation coefficients computed did not reveal any strong relationships between any variables nor was there any indication of common variance among the variables.

Table 4.7

Correlation Matrix of the Relationship

Among All of the Variables, Regardless of Status

	Experimental Status	Physical Contact	Age of Subject	Birth Weight	One-Minute APGAR	One-Month NPI
Experimental Status	1.0000	.1275	.0643	.1726	.0699	-.0119
Physical Contact	.1275	1.0000	-.0248	.0437	.0932	.0458
Age of Subject	.0643	-.0248	1.0000	.0551	-.0757	-.1708
Birth Weight	.1726	.0437	.0551	1.0000	-.0151	.0498
One-minute APGAR	.0699	.0932	-.0757	-.0151	1.0000	.0720
One-month NPI	-.0119	.0458	-.1708	.0498	.0720	1.0000

CHAPTER V

CONCLUSION

This chapter opens with an overview of the present study which is followed by a summary of the results. A discussion of the results comprises the third section. The limitations of the present study comes after this and the final section of the chapter provides implications and recommendations for future research.

Overview of the Study

The purpose of this exploratory study was to identify those selected factors which contribute to the positive and negative perceptions of mothers toward their infants at one month. The ability to accurately predict child outcomes during infancy would greatly enhance efforts by professionals to help assure optimal growth and development for every individual. This study assumed that an individual's educational experiences begin within the family and that the foundations of learning are laid during the very early months of life.

The specific factors examined in this investigation were: the treatment or control status of the mother, age of the mother at last

infant, and the opportunity for maternal-infant contact in the delivery room. The relationship of these variables to the mother's perception of her infant at one month was explored. This maternal perception of her infant has been shown to be associated with a probability of risk for the subsequent psychosocial outcome of the child (Broussard & Hartner, 1970, 1971).

The research design employed in this investigation was a Posttest-Only Control Group design. The subjects were first-time mothers who delivered at the William Beaumont Hospital in Royal Oak, Michigan. They were all participants in a larger program of primary prevention--Perinatal Positive Parenting (Boger, Andrews, & Richter, 1979). The 193 subjects were selected on the basis of criteria negotiated with the Chief of Pediatric Services at the hospital and that data were available on each subject for all of the independent variables and the dependent variable. Subjects were randomly assigned to either the treatment or control condition.

The first five research hypotheses explored in this study were tested for mean differences on arbitrarily defined groups within each independent variable. The dependent variable was the subject's one-month Neonatal Perception Inventory (NPI) score (Broussard & Hartner, 1970, 1971). The statistical technique used to test for the mean differences between the groups was the _t_-test.

The sixth research hypothesis tested involved a Multiple Linear Regression analysis of all five of the independent variables as predictors of the dependent or criterion variable--the subject's one-month NPI score. The statistical method employed to test the model was a Backward Elimination Multiple Linear Regression technique.

Summary of the Results

The results of the first hypothesis indicated that although there was a difference between the overall Neonatal Perception Inventory (NPI) mean score at one month for treatment and control mothers in the hypothesized direction, this difference was not large enough to imply significance at the $p \leq .10$ level of chance probability.

The comparison of mean one-month NPI scores of older and younger mothers in the second research question was also in the hypothesized direction but not significant at the $p \leq 1.0$ level.

The third hypothesis compared one-month NPI mean scores for mothers of heavier birth weight infants and mothers of lighter birth weight infants. The NPI mean score for the mothers of heavier birth weight infants was in the hypothesized direction, but again the difference was not large enough to be significant.

The one-month NPI mean score of mothers whose infants scored eight or more on the one-minute APGAR was significantly ($p \leq .05$) larger than the one-month NPI mean score of mothers whose infants scored less than eight on the one-minute APGAR. Consequently, the fourth null hypothesis was tentatively rejected and it was assumed that such differences would occur at the $p \leq .05$ level of chance probability.

The fifth hypothesis proposed differences on one-month NPI mean scores for mothers who had physical contact with their infants in the delivery room and mothers who had no such contact. Here again no significant differences were found.

The sixth hypothesis tested the ability of a full-rank Backward Elimination Multiple Linear Regression model to predict one-month NPI

scores. The first two steps of the Multiple Linear Regression, where all five of the independent variables were included and where the experimental status of the subject was removed, were not significant. On the third step, when opportunity for physical contact was removed, the variables remaining in the restricted model--one-minute APGAR score, birth weight, and age of subject--significantly predicted one-month NPI scores at the $p \leq .072$ level of chance probability. Likewise, step four with one-minute APGAR removed, and step five with birth weight removed, significantly predicted one-month NPI scores ($p < .042$ and $p \leq .018$ levels of chance probability respectively).

A correlation matrix was developed to assess the relationship among all of the variables utilized in the proceding analyses. The correlation coefficients computed did not reveal a strong relationship between any of the variables and disclosed no common variance among the variables.

Discussion of Results

Experimental status. The comparison between treatment and control mothers indicated that the mean NPI score for treatment subjects ($M=2.15$) was greater than the mean NPI score for control mothers ($M=2.07$), but the difference between the scores was not large enough to reject the proposition that they would have occurred at the $p \leq .10$ level of chance probability or less. There are two factors to consider when attempting to explain why there was not a significant difference. First, the population of mothers and infants from which the sample was drawn was very homogeneous. The sample did not include mothers or infants who were medically at "high risk." Very few single mothers

were involved. There were no black mothers in the sample, and very few low income individuals were included. In over 90% of the sample at least one adult was employed and there was a household income of $12,000 annually or more. While this severely limits the generalizability of the present study, Bakeman and Brown (1980) point out that, "it makes sense to look for a hypothesized relationship in a relatively homogeneous sample" (p.438), and this one was readily available.

Second, the amount of time between the birth of the child and the administration of the NPI was very short. By the time the infant was one month old, the treatment mothers had received only a portion of the program. Each mother had met with her project volunteer only once in the hospital. This same volunteer had maintained weekly telephone contact with her. The telephone contacts were "how is everything going" in nature. By the time that the mother was administered the NPI during the PPP Telephone Follow-Up Survey at one month, very few volunteers had made even one home visit. Additional home visits were possible if the volunteer saw a need to spend further time with the mother, or if the mother requested that the volunteer visit again. An important aspect of the home visit was to provide the family with an attractive, easy to use book of age appropriate parent-infant activities. The volunteer went over the book with the parent(s) and was available to demonstrate any of the activities. When the infant was one to three months of age, the parents were also invited to join project-run Parent Resource Groups. These groups provided the opportunity for the parent(s) to get out of the house and socialize with other new parents and their infants. Most importantly, these

groups gave the parent the opportunity to share needs, concerns, problems, helpful hints and sources of information within the structure of a group of peers who were experiencing similar, if not the same thoughts and feelings. Consequently, at one month, when the NPI was administered to the treatment mother, she had only received a small portion of the PPP program of primary prevention.

Another potential factor which may have contributed to the lack of significant differentiation between treatment and control subjects was the fact that in Broussard's original administration of the NPI at one month, it was given to the mother for her to fill out by a home interviewer (Broussard & Hartner, 1970). The effect of administering the one-month NPI to the mother over the telephone can only be speculated upon. However, Harper, Smith, Dickey and Broussard (undated), in a study of the detection of dysfunctional parent adaptation in a private pediatric practice using the NPI, report that "similar results were obtained regardless of the method (home interview, telephone interview, or mailed questionnaire) of administration" (p. 5).

Finally, Greenspan, Nover, Silver and Lourie (1979) in an article on methodological issues and assessment in infant programs note that:

> A most important problem (in the study of)...the relationship between early constitutional differences and later development is that they are assessed after a relatively short time...It may be that subtle constitutional differences or interventions in the first year of life will not be apparent until cognitive structures differentiate sufficiently. That is, differences may exist but may not show themselves... adequate follow-up is necessary in studying the relationship between early constitutional differences, intervention, and later development (p. 38).

Age of mother. The comparison between older and younger mothers indicated that the mean NPI score for mothers 26 and older ($\underline{M}$=2.35) was greater than the mean for mothers who were less than 26 ($\underline{M}$=1.91), but the difference was not large enough to be significant. The failure to achieve a significant difference between the older and younger mothers can be reasonably explained by the age range of the sample in this study. The youngest mother was 16 and the oldest mother 48. Of the total sample of 193, only 18 were age 20 or younger. There were only 8 mothers who were age 18 or younger. In the research that has examined the effect of mothers' age on the developmental outcomes of the child (for example, Healthy People, 1979, and Levenson & Atkinson, 1978), the age of the mother at childbirth has been 18 or younger. The population studied in this investigation did not provide the opportunity to study the very young mother. This investigation not only had very few young mothers, but many older mothers were included as well. Sixteen of the mothers in this sample were age 40 or older. The age (26) at which the mothers were arbitrarily divided in this study to make cell size appropriate may have made the two groups too similar for differences to be observed.

Birth weight. The comparison between mothers of heavier infants with mothers of lighter infants indicated that the mean NPI score of the mothers of the heavier infants ($\underline{M}$=2.36) was greater than the mean for the mothers of the lighter infants ($\underline{M}$=1.90), but the difference between the scores was not large enough to be significant. The probable cause for this outcome can be attributed to the samll number of low birth weight infants. Caputo and Mandell (1970) define the very low birth weight infant as under 1501 grams. There were no infants in

this study which fit this definition. The World Health Assembly has defined low birth weight as under 2500 grams. Forty-seven infants in the sample conformed to this definition. The arbitrary division of the sample at 3401 grams was again skewed high to make cell size appropriate. Even with such a high birth weight there was a difference, but not large enough to be significant.

One-minute APGAR score. The comparison between mothers of infants with high one-minute APGAR scores with mothers of infants with low APGAR scores indicated that the mean score of mothers whose infants scored eight or more (M=2.29) was significantly ($p \leq .05$) higher than the mean for mothers whose infants scored less than eight (M=1.42). The result suggests that the physiological parameters of heart rate, respiratory effort, muscle tone, reflex irritability, and color, as measured one minute after birth, offers an insight into aspects of the neurological functioning of the infant that will affect how the mother perceives her infant when the baby is one month old as compared to how the mother perceives the "average baby" at this age.

This finding is in line with research that has looked at the relationship between the one-minute APGAR score and later child outcome measures. Hardy, Drage, and Jackson (1979) found a suggested relationship between the one-minute APGAR score and neurological findings at one year. Broman, Nichols and Kennedy (1975) reported a small, positive correlation between the one-minute APGAR score and IQ among whites at four years (r=.04). They also found that the one-minute APGAR discriminated between low and high IQ groups for white males, black females, and black males. Apgar (1953) developed this scale to measure neonatal well being. The lower the score the greaters

the physiological derangement of the infant in the period immediately following birth. It is highly logical that this score characterizes how the infant projects him/herself to the mother at this age.

The last comparison conducted in the investigation was between mothers who had physical contact with their infant while in the delivery room an those mothers who had no such contact. The mean NPI score for the mothers who had physical contact was lower ($\underline{M}$=1.98) than mothers who did not have physical contact ($\underline{M}$=2.25). The results were contrary to the hypothesized outcome. This apparent lack of support for the notion of a rapid process of mother-infant "bonding" in a brief time interval shortly after birth--the maternal "sensitive period" (Klaus & Kennell, 1976) may be explained by several factors. The timing of such a "sensitive period" cannot be determined from the study by Klaus et al. (1972). The mothers in the Klaus study had contact soon after birth and they also received extra contact with their infant during their entire hospital stay. The present study looked soley at the time immediately following birth and this time may not prove to be as important as total time spent with the infant during the first few days. The mothers in the present investigation who had physical contact also experienced different contact conditions. Hospital policy allowed for such contact if the mother requested it, but the actual time that mother and infant could spend together was determined by the demands placed upon the delivery room. Some mothers who would have liked to have had such contact were denied on those occassions when the delivery room had to be prepared immediately for the next delivery. The results obtained in this study call into question the generality of the effect of mother-infant contact in the period immediately following

birth and point to the need to identify those contact conditions and time intervals (number of contacts and time spent at each contact) beginning in the delivery room and continuing through the first few days of life which may facilitate early bonding and subsequent attachment behavior in the mother.

Multiple linear regression. The first five research hypotheses were comparisons of group means. The sixth research hypothesis employed a Backward Elimination Multiple Linear Regression statistic to analyze the dependence of the NPI score at one month on the experimental status of the mother, age of the mother, weight of the infant at birth, one-minute APGAR score, and opportunity for mother-infant physical contact in the delivery room.

The Backward Elimination method of multiple linar regression provided the opportunity to enter all of the independent variables into the proposed full-rank model and to test the adequacy or fit of this model to the actual data. This was accomplished through the identification of all statistically significant variables. The decision rule was expressed as a FOUT, which is an F-value and not a probability level. This provided, on each succeeding step, the level at which the independent variables were removed if they did not provide a significant contribution to the equation. The FOUT level used was 2.71, which represented the F-value with a .10 level of chance probability with 1 and 188 degrees of freedom.

The first step of the Multiple Linear Regression, when all of the independent variables were entered into the equation, was not statistically significant at the .10 level or less of chance probability in predicting the NPI score at one month. Similarly, on

the second step, when the variable experimental status was removed from equation, the model was still unable to predict the NPI score at a significant level. The third step removed physical contact from the equation. This revised model with one-minute APGAR score, birth weight of the infant, and age of the mother proved to be significant in predicting the NPI at one month at the $p \leq .072$ level of chance probability. The fourth step removed the one-minute APGAR score from the equation. This revised model, with only birth weight and age of the mother, was significant at the $p \leq .042$ level of chance probability. Likewise, the fifth step, with only age of the mother remaining in the equation, was significant ($p \leq .018$) in predicting the one-month NPI score.

The results are in line with the results found in the first five comparisons of group means. The mean difference for experimental status was quite small. The mean difference for physical contact was in the direction opposite from that hypothesized. When the restricted model contained only those variables which were either variables with a chance probability close to the .10 level (birth weight and age of mother), or was significant (one-minute APGAR score) did the restricted Multiple Linear Regression model reach the predetermined level of chance probability or less.

Based upon these findings, it would appear that the one-minute APGAR score, birth weight of the infant, and age of the mother are variables which, when used together, offer the prospect of predicting how a mother will score on the NPI at one month.

When reviewing the results of this study, it is important to remember that the population from which this sample was drawn was

relatively homogeneous. A sample from a more diverse population would, in all likelihood, produce more variability. It can be reasonably assumed that this hetrogeneity of subjects would increase the mean differences between high and low categorizations within the parameters studied.

Neonatal perception inventory (NPI). The NPI is a measure of a mother's perception of her newborn as compared to her concept of the average infant on six behavioral items: crying, feeding, spitting up, sleeping, elimination, and predictability. These particular items were chosen because they are areas of concern that mothers have about their babies and they were seen as "...crucial areas that reflect the functioning of the mother-infant unit during the neonatal period" (Broussard, 1978, p. 47).

The lack of instrumentation to measure the adaptive potential of the mother-infant dyad during the first month of life, the apparent predictive power of the NPI, and the ease with which it can be administered make it an ideal instrument of choice for early screening and prevention programs. The face validity of the instrument is self-evident. The predictive validity of the NPI was established through the longitudinal study of a subsample of the 318 first-born, healthy, full-term neonates born in five Pittsburg, Pennsylvania hospitals during a 2 1/2 month period in 1963 (Broussard & Hartner, 1970). On the basis of the original NPI ratings, the children in the follow-up sample were placed into Low- and High-Risk groups. At 4 1/2 years and again when the children were 10-11 years of age, they were clinically evaluated to test the hypothesis "...that the maternal perception of her neonate would be related to the child's subsequent

psychosocial development" (Broussard, 1980, p. 252). The data analysis at both points in time found a statistically significant association between the mother's rating of her first-born infant and the child's later emotional development.

Broussard does not report any reliability estimates for the NPI in her writings. To estimate it's reliability, a coefficient of correlation (Pearson r) was computed on randomly selected treatment and control subjects from this study. The method used to determine this reliability coefficient was the test-retest. The computed Person r was .92. Assuming that the subjects who participated in the test-retest did not recall their original answers (the two administrations of the NPI were seven days apart) this inventory appears to be highly reliable.

A mother's positive perception of her infant at one month does not guarantee that there will be no difficulty in the child's later development, nor can a negative maternal perception predict absolutely that there will be subsequent psychosocial disorder. Perhaps the complexity of human development helps to explain why Broussard's results were not replicated by Palisin (1980).

The ability of the NPI to predict later psychosocial disorder is hard to explain. Broussard and Hartner (1970) note that:

> Our research did not establish the basis on which the mothers rated their infants behavior as better than or not better than average. It can be postulated on the one hand that the unique personality characteristics of the neonate or innate genetic characteristics, are detected very early by the mother and that her rating represents a "true" picture of the child. On the other hand, it can be postulated that her expectations may influence the child's behavior to the extent that they exert a self-fulfilling prophecy (p. 24).

Limitations

The results of this investigation should be considered with the following limitations in mind:

(a) The sample studied in this investigation was homogeneous and "normal" in the sense that it did not include mothers or infants in "high-risk" categories.

(b) The results of this investigation are generalizable to the present sample who were patients at the fifth largest private hospital in the United States. Given the possible similarities among large, private hospitals and the patients who utilize such institutions, discrete and tentative generalizations could potentially be made to other populations.

(c) Only one aspect (NPI score at one month) of the mother's sense of what her infant, as compared to other infants of a similar age are like, was measured in this investigation.

(d) The infant's behavior at one month was not assessed or compared to the mother's perception of her infant's actual behavior at one month.

(e) Variables other than those used in this investigation may be crucial for consideraton when attempting to understand a mother's perception of her infant.

(f) The NPI may not have been equally appropriate for all subjects due to individual differences in experience and sense of reality.

(g) Errors of measurement are inevitable and undoubtedly occurred in the collection and computation of these data.

Implications and Recommendations

This study was an exploratory investigation, and as such it raises many more questions than it answers. The primary importance of this study lies in the information which is provided for further investigations.

The preliminary results of this study suggest important considerations for the medical, educational, psychological, public health and social service communities. Since there does appear to be some differences in the ways in which mothers perceive their infants based upon factors which are identifiable at birth, there are obvious implications for professionals who work with new parents.

Information concerning those factors which predict how a mother will perceive her infant is important in planning programs for individuals or groups with a higher chance probability of possible dysfunction in adapting to the parental role. The results of this investigation suggest three groups of mothers who should be targeted: young mothers, mothers of light birth weight infants, and mothers whose infants score less than 8 on the one-minute APGAR scale. This is not to suggest that mothers who fall into any or all of these categories will absoutely suffer from subsequent parenting dysfunction, but rather that the complexity of human development warrants responsible follow-up to prevent possible problems before they arise.

The findings of this exploratory investigation also suggest a number of considerations for further research. In particular, the following are recommended:

(a) The present study should be replicated with a more heteogenerous and statistically represenative sample. Specifically, any replication should include a more diverse sample in terms of age, race, socioeconomic and marital status.

(b) A detailed investigation should be undertaken to determine why the factors identified in this study influence a mother's perception of her infant at one month. Specifically, the neurological status of the infant should be explored to determine its role in early behavior.

(c) The observation of the individual behavior of the mother and infant, as well as their interactions while in the hospital setting, should be investigated to determine what relationship, if any, exists between these first few days and later maternal perceptions of her infant.

(d) The behavior of the infant at one month should be observed for comparison with the mother's self-report of her infant's behavior.

(e) The role of the father in influencing the mother's perception of the infant should be investigated.

(f) Other factors than those included here (e.g., socioeconomic level, educational level, marital status, choice of feeding technique, availability of support systems, rooming-in, father's presence at

delivery, if and when mother is returning to work, and so on) should be investigated.

(g) The effect of early and/or extended contact between mother and infant should be investigated in a double-blind, random assignment to contact conditions manner.

(h) The sample studied here should be followed until the child is at least 4 1/2, and ideally, until the child is 10-11 years old. In this way subtle differences may become more apparent and allow for the study of the relationship between early constitutional differences, intervention, and later development.

APPENDICIES

APPENDIX A

PERINATAL POSITIVE PARENTING FAMILY PROFILE

PERINATAL POSITIVE PARENTING
FAMILY PROFILE

Col.

1-2 0 3 Card

3-4 __ Hospital

5 __ Group

6-14 I.D. _____

15-20 Date __ / __ / __
mo. day yr.

21-23 Volunteer I.D. ___

24 Is the mother a single parent?
__ 1. yes
__ 2. no

Mother's name

_____
Last First Middle

27-28 Age at last birthday __

Baby's name

_____
Last First Middle

Birthdate __ / __ / __
mo. day yr.

Baby's sex __ 1. male __ 2. female

Birth weight _____

Address: _____
Street Apt. #

_____
City Zip

Telephone: Home _____ Other _____

29 How do you plan to feed your baby when you go home? (Please check)
__ 1. breastfeed
__ 2. bottle feed
__ 3. undecided

30-32 Have you ever been responsible for the care of a new baby other than occasional babysitting?
__ 1. yes Under what circumstances: _____
_____
__ 2. no

33 Will you have any family or other adult help during the first week after discharge from the hospital?
__ 1. yes
__ 2. no

34 Have either you or the baby's father attended any classes on childbirth, child care, or parenting, during pregnancy?
__ 1. yes
__ 2. no

35 Type _____

36-37 Where _____

38-39 Number of sessions Mother attended? _____

40-41 Number of sessions Father attended? _____

42-43 How often did you go to a doctor or clinic during:

a. The fourth, fifth, and sixth month of pregnancy (please circle one):
zero 1 2 3 4 5 6 more

b. The seventh, eighth, and ninth month of pregnancy (please circle one):
zero 1 2 3 4 5 6 more

44-46 Where did you get your prenatal medical care?
__ 1. private physician/group practice
__ 2. public clinic
Clinic's name _____

47 How much discomfort (sickness, nausea, pain) did you experience during your pregnancy?
__ 1. less than I expected
__ 2. what I expected
__ 3. more than I expected

48 How much discomfort did you experience during your labor?
__ 1. less than I expected
__ 2. what I expected
__ 3. more than I expected

Please check which PPP videotapes parents were able to view in-hospital:

49-53 Mother—1st __ 2nd __ 3rd __ 4th __ 5th __

54-58 Father—1st __ 2nd __ 3rd __ 4th __ 5th __

Please check which Beaumont Hospital TV programs the mother and father saw during the hospital stay.

	Mother	Father	Title
59	____	____	Breast Feeding
60	____	____	Bottle Feeding
61	____	____	Meeting the Needs of the Infant
62	____	____	Health Care of the Normal Infant
63	____	____	Mother/Infant Health Care
64	____	____	Introduction to Infant Care
65	____	____	Growth and Development
66	____	____	Skin Care and Bath Preparation
67	____	____	Postpartum
68	____	____	Breast Feeding (movie)
69	____	____	The Amazing Newborn
70	____	____	Car Safety

Comments: _____
_____
_____

If we need to contact you in the future, who will know your new address if you have moved?

First person:
Name _____
Relationship _____
Street _____ Apt. # ___
City, State _____
Zip _____ Telephone _____

Second person:
Name _____
Relationship _____
Street _____ Apt. # ___
City, State _____
Zip _____ Telephone _____

Return this to the Site Coordinator when hospital visits are completed.

APPENDIX B

PERINATAL POSITIVE PARENTING DELIVERY ROOM HISTORY

PERINATAL POSITIVE PARENTING
DELIVERY ROOM HISTORY

Col.	
1-2	0 1 Card
3-4	__ Hospital
5	__ Group
6-14	I.D. _ _ _ _ _ _ _ _ _
15-20	Infant's Birth Date __ (mo.) / __ (day) / __ (yr.)
21-22	Gestational Age of Infant at Birth __ weeks
23-26	Weight at Birth __ gms.
27-28	Infant's sex __ 1. male __ 2. female
29	Length at Birth __ cm.
30-32	Length of Labor (e.g., 09.5 hrs.) __ . __ hrs.
33-34	First APGAR score __
35-36	Second APGAR score __
37	Type of delivery (please check one): __ 1. normal vaginal __ 2. forceps __ 3. abnormal presentation __ 4. Caesarean section __ 5. other
38	Did mother have physical contact with infant in delivery room? __ 1. yes __ 2. no __ 3. not available
39	Did the father accompany the mother in the delivery room? __ 1. yes __ 2. no __ 3. not available
40	Where was the baby born? __ 1. delivery room __ 2. labor bed __ 3. other
41-42	Comments: _____

APPENDIX C

PERINATAL POSITIVE PARENTING
TELEPHONE FOLLOW-UP SURVEY

I.D. ____ ____ ____ ____

FORM 3

INFANT'S DATE OF BIRTH ____/____/____

PERINATAL POSITIVE PARENTING
ONE MONTH
TELEPHONE FOLLOW-UP SURVEY

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PERINATAL POSITIVE PARENTING
TELEPHONE SURVEY

Column

Card __ __ 1

I.D. __ __ __ __ __ __ __ __ __ __ __ 2-10

Group ___ 11

Survey Form ___ 12

Name of Mother _____

Material Status of Mother: MARRIED SINGLE

Baby's Name _____ / / _____
(date of birth)

Sex of Baby: MALE FEMALE

Address _____
Street Apt. #

_____
City Zip

Telephone: Home_____

Other_____

Date	Time Start	Time End	Interviewer	Result

Abbreviations:

NA	= No Answer	IC	= Interview Completed (we like this one)
NH	= Not Home		
WR	= Will Return (when)	PIC	= Partially Completed
REF	= Refused (when, why, at what point, M or F)	WN	= Wrong Number
		DISC	= Disconnected

Column

Final Status of Interview:

_____1 = IC

_____2 = PIC

_____3 = REF

_____4 = DISC

_____5 = WN

_____6 = NA 13

_____7 = NES

_____8 = UCI

Column -

HELLO, MY NAME IS _____ FROM MICHIGAN STATE UNIVERSITY. IS (Name of Mother) IN?

(Name of Mother), MY NAME IS _____ AND I WORK WITH THE POSITIVE PARENTING PROGRAM AT MICHIGAN STATE UNIVERSITY. WHEN YOU HAD YOUR (SON/DAUGHTER) AT WILLIAM BEAUMONT HOSPITAL YOU WERE CONTAACTED BY SOMEONE FROM OUR PROGRAM. I WONDER IF THIS WOULD BE A CONVENIENT TIME TO ASK YOU A FEW QUESTIONS ABOUT YOUR EXPERIENCES WITH YOUR NEW BABY DURING THE TIME SINCE YOU DELIVERED? THIS SHOULD TAKE ABOUT TEN OR FIFTEEN MINUTES AND WILL HELP US TO LEARN MORE ABOUT MOTHERS AND THEIR BABIES SO THAT WE WILL BE ABLE TO HELP OTHER MOTHERS WITH THEIR BABIES. WE WOULD APPRECIATE IT IF YOU WOULD HELP US TO HELP OTHER MOTHERS BY ANSWERING THESE QUESTIONS.

(Instructions/Read)

If this is not a convenient time, ask mother when it would be convenient and tell her, "THANK YOU (Name of Mother). I LOOK FORWARD TO TALKING WITH YOU ON (date) AT (time). THANK YOU AGAIN. (Please note time above).

YOU HAVE HAD A CHANCE TO LIVE WITH YOUR BABY FOR ABOUT ONE MONTH NOW. ALTHOUGH THIS IS YOUR FIRST BABY, YOU PROBABLY HAVE SOME IDEAS OF WHAT MOST LITTLE BABIES ARE LIKE. I AM GOING TO ASK YOU A FEW QUESTIONS AND I WOULD LIKE YOU TO TELL ME WHAT YOU THINK BEST DESCRIBES THE AVERAGE BABY. REMEMBER, THIS IS THE AVERAGE BABY.

(Instructions)

Please read the question to the mother AND each of the responses. Remember, the mother should respond with what she thinks best describes the AVERAGE baby.

HOW MUCH CRYING DO YOU THINK THE AVERAGE BABY DOES?

5 A GREAT DEAL OF CRYING.
4 A GOOD BIT OF CRYING.
3 A MODERATE AMOUNT OF CRYING.
2 VERY LITTLE CRYING.
1 NONE AT ALL.

14

Column

HOW MUCH TROUBLE DO YOU THINK THE AVERAGE BABY HAS IN FEEDING?

5 A GREAT DEAL OF TROUBLE FEEDING.
4 A GOOD BIT OF TROUBLE FEEDING.
3 A MODERATE AMOUNT OF TROUBLE FEEDING.
2 VERY LITTLE TROUBLE FEEDING.
1 NONE AT ALL. 15

HOW MUCH SPITTING UP OR VOMITING DO YOU THINK THE AVERAGE BABY DOES?

5 A GREAT DEAL OF SPITTING UP OR VOMITING.
4 A GOOD BIT OF SPITTING UP OR VOMITING.
3 A MODERATE AMOUNT SPITTING UP OR VOMITING.
2 VERY LITTLE SPITTING UP OR VOMITING.
1 NONE AT ALL. 16

HOW MUCH DIFFICULTY DO YOU THINK THE AVERAGE BABY HAS IN SLEEPING?

5 A GREAT DEAL OF DIFFICULTY SLEEPING.
4 A GOOD BIT OF DIFFICULTY SLEEPING.
3 A MODERATE AMOUNT OF DIFFICULTY SLEEPING.
2 VERY LITTLE DIFFICULTY SLEEPING.
1 NONE AT ALL. 17

HOW MUCH DIFFICULTY DO YOU THINK THE AVERAGE BABY HAS WITH BOWEL MOVEMENTS?

5 A GREAT DEAL OF DIFFICULTY WITH BOWEL MOVEMENTS.
4 A GOOD BIT OF DIFFICULTY WITH BOWEL MOVEMENTS.
3 A MODERATE AMOUNT DIFFICULTY WITH BOWEL MOVEMENTS.
2 VERY LITTLE DIFFICULTY WITH BOWEL MOVEMENTS.
1 NONE AT ALL. 18

HOW MUCH TROUBLE DO YOU THINK THE AVERAGE BABY HAS IN SETTLING DOWN TO A PREDICTABLE PATTERN OF EATING AND SLEEPING?

5 A GREAT DEAL OF TROUBLE WITH SETTLING DOWN TO A PREDICTABLE PATTERN OF EATING AND SLEEPING.
4 A GOOD BIT TROUBLE WITH SETTLING DOWN TO A PREDICTABLE PATTERN OF EATING AND SLEEPING.
3 A MODERATE AMOUNT TROUBLE SETTLING DOWN TO A PREDICTABLE PATTERN OF EATING AND SLEEPING.
2 VERY LITTLE TROUBLE SETTLING DOWN TO A PREDICTABLE PATTERN OF EATING AND SLEEPING.
1 NONE AT ALL. 19

Column

(Read)

NOW I AM GOING TO ASK YOU A FEW QUESTIONS AND I WOULD LIKE YOU TO TELL ME WHAT YOU THINK BEST DESCRIBES YOUR BABY.

HOW MUCH CRYING HAS YOUR BABY DONE?

5 A GREAT DEAL OF CRYING.
4 A GOOD BIT OF CRYING.
3 A MODERATE AMOUNT OF CRYING.
2 VERY LITTLE CRYING.
1 NONE AT ALL. 20

HOW MUCH TROUBLE HAS YOUR BABY HAD FEEDING?

5 A GREAT DEAL OF TROUBLE FEEDING.
4 A GOOD BIT OF TROUBLE FEEDING.
3 A MODERATE AMOUNT OF TROUBLE FEEDING.
2 VERY LITTLE TROUBLE FEEDING.
1 NONE AT ALL. 21

HOW MUCH SPITTING UP OR VOMITING HAS YOUR BABY DONE?

5 A GREAT DEAL OF SPITTING UP OR VOMITING.
4 A GOOD BIT OF SPITTING UP OR VOMITING.
3 A MODERATE AMOUNT SPITTING UP OR VOMITING.
2 VERY LITTLE SPITTING UP OR VOMITING.
1 NONE AT ALL. 22

HOW MUCH DIFFICULTY HAS YOUR BABY HAD IN SLEEPING?

5 A GREAT DEAL OF DIFFICULTY SLEEPING.
4 A GOOD BIT OF DIFFICULTY SLEEPING.
3 A MODERATE AMOUNT OF DIFFICULTY SLEEPING.
2 VERY LITTLE DIFFICULTY SLEEPING.
1 NONE AT ALL. 23

HOW MUCH DIFFICULTY HAS YOUR BABY HAD WITH BOWEL MOVEMENTS?

5 A GREAT DEAL OF DIFFICULTY WITH BOWEL MOVEMENTS.
4 A GOOD BIT OF DIFFICULTY WITH BOWEL MOVEMENTS.
3 A MODERATE AMOUNT DIFFICULTY WITH BOWEL MOVEMENTS.
2 VERY LITTLE DIFFICULTY WITH BOWEL MOVEMENTS.
1 NONE AT ALL. 24

Column

HOW MUCH TROUBLE DO YOU THINK THAT YOUR BABY WILL HAVE IN SETTLING DOWN TO A PREDICTABLE PATTERN OF EATING AND SLEEPING?

__5__ A GREAT DEAL OF TROUBLE SETTLING DOWN TO A PREDICTABLE PATTERN OF EATING AND SLEEPING.
__4__ A GOOD BIT TROUBLE SETTLING DOWN TO A PREDICTABLE PATTERN OF EATING AND SLEEPING.
__3__ A MODERATE AMOUNT TROUBLE SETTLING DOWN TO A PREDICTABLE PATTERN OF EATING AND SLEEPING.
__2__ VERY LITTLE TROUBLE SETTLING DOWN TO A PREDICTABLE PATTERN OF EATING AND SLEEPING.
__1__ NONE AT ALL.

25

Skip

26-28

(Instructions)

Turn to the next page and continue interview

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