INFANT TEMPERAMENT AND THE MOTHER'S EVALUATION OF THE INFANT

by

Catherine E. Burns, R.N., B.S.

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APPROVED:

[redacted]

Julia S. Brown, Ph.D., Professor, Thesis Advisor

[redacted]

Marie Berger, M.S., Associate Professor, First Reader

[redacted]

Patricia S. Tomlinson, M.N., Associate Professor, Second Reader

[redacted]

John H. Brockhart, Ph.D., Chairman of Graduate Council

DEDICATION

To Jerry

For his never-ending

support and encouragement.

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CHAPTER I

INTRODUCTION

Maternal attachment has been an area of great interest and study for child psychologists at least since the 1950's when Bowlby brought public attention to the research noting that institutionalized children lacking maternal stimulation failed to thrive (Bowlby, 1951). Following his lead, the early theories focused almost entirely on the role of the mother in the attachment process and the effects her stimulation had on the baby's development (Bell, 1971).

More recent theories propose that attachment arises out of a process of interaction between the mother and child; each elicits and reinforces the responses of the other. Perception of appearance and behavior of the other modifies the way each reacts to the other (Sugarman, 1977; Lozoff, Brittenham, Trause, Kennell & Klaus, 1971). When such a viewpoint is taken, then the mother's perception of the characteristics of the infant must be considered for an understanding of the maternal attachment process.

Among the characteristics of the infant to which the mother responds are its temperament characteristics. These "patterns of reactivity" (Thomas, Chess & Birch, 1963) describe the infant's style rather than content of behavior, and have been shown to be relatively stable over time.

Different temperament characteristics have been shown to affect the maternal attachment process through differential reinforcement of maternal actions (Korner & Grobstein, 1967). For example, the child with predominantly negative moods of high intensity will evoke a different response from his mother than the child with positive moods of low intensity provided that the mothers perceive the individual differences of their children.

The relationship of infant temperament characteristics to maternal attachment has been studied and described in some detail in the literature. Less clearly described has been the relationship between a mother's evaluation of her infant and his temperament characteristics as she perceives them. Can it then be assumed that extreme temperament characteristics will result in a negative evaluation of the child by the mother, or will these sometimes be related to a positive evaluation? Is it possible for average characteristics to be negatively evaluated too? Are some characteristics more likely to be negatively evaluated than others? It is important to explicate this relation between temperament and evaluation since attachment depends upon a positive evaluation of the child by the mother. The present study will seek to add to the knowledge of the relationship between a mother's evaluation of her infant and his temperament characteristics as she perceives them.

In the review of the literature,first the nature of attachment will be considered. There will follow an examination of the relations between attachment and maternal perceptions and attitudes, between attachment and infant temperament characteristics, and between infant temperament and maternal evaluation of the infant.

Review of the Literature

The Nature of Attachment

Maternal attachment is the product of interaction between mother and child. The process can be analyzed from at least two viewpoints -- from a systems viewpoint in which the ongoing process itself is examined, or from an actor-participant viewpoint in which the impact of each character on the other is analyzed. Different authors have addressed the topic from these two positions.

Lewis and Lee-Painter (1974) looked at attachment from the systems approach. They developed a model which illustrates how specific types of behavioral responses by either mother or child stimulate or check the homeostatic, dyadic attachment interchange. Either party can initiate or stop the circular, constantly reverberating system of interactional behaviors at any time.

Bell (1971) added to the Lewis and Lee-Painter model by suggesting that the maternal and infant behaviors contributing to the interactional systems should be looked at in terms of their regulatory functions. Different individuals can be assumed to have different repertoires of behaviors and each participant has upper and lower limits of tolerance relative to the intensity, frequency, and situational appropriateness of the behaviors shown by the other. Bell (1971, pp. 66-67) theorized that "when the upper limit is reached, the reaction of the other is of a kind likely to redirect or reduce the excessive or inappropriate behavior (upper limit control reaction). When the lower limit is reached, the reaction is to stimulate, prime, or in other ways increase the insufficient or nonexistent behavior (lower limit control reaction)."

From the actor-participant viewpoint, Greenberg (1971) studied the mother's role in the system. He described the mother as the major stimulant in the infant's environment. She selects specific stimuli to present to the baby, raises and lowers his level of alertness, and stimulates the baby directly through infant care activities such as feeding.

Bell (1968) described the child's contribution to the mother-child system as activating parental repertoires, affecting the parent's level of response, and differentially reinforcing parental behaviors. In a later paper (1974), Bell added that the child encourages life support and

protective parental behaviors in his behalf. The infant's crying, for example, alerts the mother to his need for food.

In the above discussion some concepts about the nature of attachment and the roles of mother and infant in this dynamic homeostatic, interactional system have been identified. There are, of course, many factors which need to be considered before the complexity of this system can be appreciated. The perceptions and attitudes of the mother toward her infant are two factors which will influence her participation in this interaction-attachment process.

Attachment and Maternal Perceptions and Attitudes

Through perception, stimuli from the environment are screened, interpreted, and evaluated. It is to such processed stimuli that the individual responds, not to the "raw" stimuli. The mother's behavior is responsive to infant behavior as she perceives it. Her perception may or may not accord with behavior as "objectively" assessed by others. However, it is important to understand how she perceives her infant for unless her perception is positive, her response will not be positive. Since she is the primary nurturing figure for the infant, the effects of her responses are thought to be especially significant, having long-lasting effects. It has been amply documented in the child abuse and "failure to thrive" pediatrics literature strongly that negative maternal responses may be devastating to infants.

Maternal perceptions, attitudes which affect perceptions or derive from perceptions, and the effects of these on maternal behavior and child development have been studied to some extent. Robson and Moss (1970) illuminated the effects of maternal attitudes and perceptions on the initial development of attachment bonds of a mother for her new infant. They

found that maternal positive bonds developed with eye contact and reciprocating behavior by the infant; and negative bonds developed when mothers had ambivalent attitudes towards a child prenatally. Negative bonds were also directly related to infant behaviors perceived by the mother as rejecting. Most mothers had strong positive feelings toward the new infant by 12 weeks.

In another paper, Moss (1967) supported the idea that maternal attitudes are important to the attachment process. In observing mother-infant interactions from 0 to 3 months, he found that mothers who had positive feelings about their babies tended to be more responsive to their babies than mothers with negative attitudes. Additionally, he found that positive attitudes toward the infant prenatally were predictive of positive maternal responses postnatally. Such infant-responsive behavior is attachment behavior.

Bowlby noted the direct relationship between attachment and child development. Bayley and Schaefer (1972), acknowledging the relationship between maternal attitudes and attachment, evaluated the relationship between maternal attitudes and child development. For boys, they found a direct relationship between mothers' attitudes toward the children and their later IQ's. This relationship did not hold for girls.

Greenberg (1971), too, studied the effects of maternal attitudes and behavior on infant development. He found significant differences in the interaction patterns of mothers and infants with atypical developmental behavior as compared with the interaction patterns of mothers and infants with normal developmental behavior. He noted that the mothers of the atypical infants were frequently disturbed and withdrawn, with a variety of family stress influences. He concluded that atypical maternal behaviors and attitudes induced the atypical infant development.

Bayley and Schaefer (1972) demonstrated the usefulness of maternal attitudes in predicting cognitive development. Similarly, Broussard and Hartner (1970) demonstrated the predictive value of maternal perceptions of the 30-day old infant on later emotional and social development. Arguing that great emphasis is placed on being "better than average" in the United States, Broussard and Hartner used this concept as a baseline for measuring the primipara's perceptions of her infant's behaviors. The mother's attitudes, understanding, and perception of her infant's development relative to that of the average baby were assessed and then related to the child's subsequent development. Behaviors assessed in this Neonatal Perception Inventory included crying, spitting, eliminating, sleeping and predictability.

By use of this instrument, Broussard and Hartner (1970) identified 318 infants at one month of age as "high-risk" or "low-risk" with regard to later development. Infants at high risk were <u>not</u> rated "better than average" by their mothers; infants at low risk were rated "better than average". When 120 of the children were between 54 and 57 months old, they were evaluated by two psychiatrists with no information regarding their previous risk rating. The data were collected from the mother in the home and in a clinic visit which included both interview and free-play observations. The children were also rated developmentally. The psychistrists determined the need for therapeutic intervention for each child. The results demonstrated a significant relationship between the mother's perception and the child's development. Of the 36 children rated as high-risk, two-thirds were judged to need intervention. Of the 49 low-risk children, only one-quarter were deemed to need intervention at the later rating. The relationship was maintained in a further follow-up study done

when the children were 9 to 11 years old. (Broussard, in press). The mother's perceptions of the infant on the first or second day postpartum were unrelated to the child's later development. Probably this was due to the mother's fantasies about what her infant should be like, the lack of time for her perceptions to develop, and/or the instability of the infant physiologically at this time. Neither were the mother's perceptions related to the educational level of the parents, the father's income and occupation, changes in income since delivery, the mother's age, her religious preference, family moves, or the infant's sex.

The mother's perceptions at one month were predictive of the child's development. This would suggest that a mother-infant interaction system had been established by this time which in some way influenced the development four and one-half years later. The authors offer two alternative interpretations: either the infant's unique characteristics determined both the mother's perceptions and the infant's development, or the mother's perceptions influenced her maternal behaviors toward the infant and thereby affected the child's later development.

The question of whether the mother's perception of the infant is "true" or not is important to answer. If the mother's perception is an accurate reflection of the child's behavior, then it alone can be used to describe the child's influence on the mother-child interactional system of attachment. If, however, the child's input into the system is distinct from the mother's perception, then this input must be analyzed as another variable affecting the interaction. Further, if the mother's perception is inaccurate and yet acts as a self-fulfilling prophesy to the child's detriment, then professional efforts to modify the perception in a positive direction will be most useful in positively influencing the child's development.

Attachment and Temperament

The proposition that infants are born with temperament characteristics that persistently describe their behavioral style has been advanced by Thomas, Chess and Birch (1963, 1968). These investigators sought to identify temperament characteristics in early infancy to determine the stability of these characteristics over time, and to determine their relationship to the development of behavior disorders in later childhood. Focusing on the manner in which the child responded rather than the content of the behavior or its motivating forces, Thomas et al. identified the following "patterns of reactivity": activity level, rhythmicity, adaptability, level of intensity, positive or negative mood, approach/withdrawal responses, threshold of responsiveness, attention span/persistence, and distractibility.

In their so-called New York Longitudinal Study, Thomas et al. (1963) studied 137 children from infancy. In 78% of the cases, the parents were Jewish. Beginning at age 3 months and every three months thereafter until age 1 and then every six months through age 5, each parent was interviewed about the child's behaviors in certain common situations -- feeding, bathing, sleeping, playing, facing new situations, et cetera. From these reported behaviors, judges rated each "pattern of reactivity" without other information about each child. As the children grew, they also were rated by direct observation and by interviews of their teachers. There was reliable agreement between ratings derived from the different sets of observations, including those of the parents.

The research led to three conclusions. First, the majority of characteristics were stable over time. Even the children with atypical characteristics remained unique rather than becoming more "average" over time as might have occurred if some of the measurements were spurious.

Second, certain clusters of behaviors were predictive of later psychological difficulties. Ten per cent of the children were "difficult children" (those with a specific cluster of traits including irregularity, low adaptability, initial withdrawal responses, intense responses and negative mood). Of these, 75% developed behavior problems later. Third, the original parenting of the problem-behavior children was apparently no different from that of other children, but the child's responses made parenting stressful. The parents developed significant feelings of guilt, helplessness, and anxiety. The major importance of the work was the demonstration that the child has innate personality traits which he brings to early parent-child interactions. Thus, the child is not purely the product of parenting techniques; the parent is not solely responsible for the behavioral development of the child.

The major limitation of their work was the lack of external validity due to the homogeneous population. In recognition of this limitation, Graham, Rutter, and George (1973) replicated the Thomas, et al. study in a modified design primarily to determine if the results could be generalized to another population. They obtained a sample of 60 children aged 3.3 to 7.11 years, from working class families in England, in which one parent was registered as having a psychiatric problem. They chose this highrisk sample to increase the chances of locating children with behavior problems.

Their data collection techniques replicated those of Thomas, et al., although the time period was only one year. The characteristics that they assessed were similar, although they omitted "threshold of responsiveness" and "persistence", added "fastidiousness", and renamed the category of "adaptability" to "malleability".

Results of their study confirmed the finding that characteristics of behavioral style remained stable. In addition, certain characteristics were predictive of later behavior problems, the best predictors being low malleability, low fastidiousness, low regularity, and high negative mood. All of these were included in the "difficult child" syndrome characteristics of Thomas, et al. (1970), except for the new fastidiousness item. They found also that mothers were most critical of children who rated low on the fastidiousness item (55.9%) and low on the regularity item (35.2%).

Still another study used the conceptual framework of Thomas, et al. to relate temperaments of children to later personality problems. William Carey (1970, 1972, 1974) developed a 70 item questionnaire using the same questions that Thomas and associates had asked in their interview to simplify data gathering and scoring. After first standardizing the questionnaire and checking its reliability with the Thomas, et al. interview on four patients, Carey administered the instrument to all mothers of 4 to 8 month old infants in his private pediatrics medical practice (N = 200). His sample was middle class, 96% Caucasian, with 83% first-borns. Sixty-four per cent of the fathers and 41% of the mothers were college graduates. The purpose of Carey's study was to examine the relation of specific infant characteristics to the emergence of various problems in infancy and childhood.

The items that mothers responded to were specific descriptions of behavior they observed which were then categorized and rated under the appropriate temperament characteristic (see Appendix D). The modal description was: active, regular, adaptable, high in initial approach, low sensory threshold, mild in intensity of reactions, positive in mood, distractible, and persistent. Fourteen percent were classified as "difficult children".

In relating the temperament characteristics to common problems of childhood, Carey made the following observations: (a) eleven of the 13 colicky infants he identified had a low sensory threshold, (b) more active babies walked earlier, (c) more persistent infants talked earlier, (d) thirteen of fifteen babies who awakened at night had a low sensory threshold, and finally (e) thirty-one percent of the "difficult children" required suturing for injuries before age 2 compared to only 4.8 percent of the "easy children".

Sameroff and Kelly using Carey's tool, (cited in Thomas & Chess, 1977) clarified the effects of demographic factors on infant temperament of the 4-month old. For a sample of 220, including 150 whites and 70 blacks, they found significant differences by race, especially for the rhythmicity, adaptability, and approach/withdrawal items. They found no temperament differences by sex. They also found that first-borns were more active and adaptable than later-borns. Mothers from lower socio-economic levels reported increased intensity levels and decreased thresholds among their infants.

The research of Thomas, et al. (1970, 1971, 1977), Graham, et al. (1973), and Carey (1970, 1972, 1974), are cumulative in that they all use the same instruments and the same conceptual framework. Collectively they demonstrate that at three months of age the temperament characteristics of the child can be identified; that a child's characteristics remain relatively stable to age five; and that certain characteristics are predictive of later behavior problems.

Throughout the literature, temperament has been variously defined. The variations hinder the development of a firm body of knowledge because of the constant inferences that need to be made about the structural and functional equivalencies of characteristics. Keeping these methodological

problems in mind, consideration will now be given to the dimensions of temperament identified in the literature and the significance of these for the caregiver.

1. Activity level: This is defined as the amount of motor activity. Thomas, et al. (1970) found this characteristic to be stable over time. Korner (1971) using the term "postural adjustment" to contrast noncuddly babies (restless, highly aroused, active babies) with cuddly babies (placid with increased sleep patterns), found that the cuddly babies had more intense attachments to their mothers. Buss and Plomin (1975) and Brazelton (1975) view activity level as a basic temperament characteristic.
2. Rhythmicity: Rhythmicity is defined by Thomas, et al. (1970) as the predictability of bodily functions, such as bowel patterns, sleep-wake cycles, and appetite. They found it stable over time as did Wilson, Brown, and Matheny (1971). Graham et al. (1973) found a lack of predictability to be stressful to parents.
3. Adaptability: Adaptability refers to the ease with which habit patterns can be changed. Thomas et al. (1971) found that parents of children who were not adaptable had difficulty helping the child learn more mature behaviors such as drinking from a cup. Brazelton (1975) evaluated this characteristic by watching the infant adapt his response to a repeated stimulus.
4. Approach/Withdrawal: The tendency of the infant to approach or withdraw upon first presentation of a stimulus is considered stable over time by Thomas, et al. (1970). Brazelton (1975) and Korner (1971) also consider this characteristic as important. Infants who withdraw from new situations make parenting difficult

because they are exposed so frequently to new experiences from which they will consistently negatively respond.

5. Threshold of Stimulation: Korner (1971) and Brazelton (1975) both indicate that this is a significant parameter for differentiating neonates. Further, there is a high correlation across visual and auditory modalities (Korner, 1971). There is some evidence that hyperactive children have a low sensory threshold and Carey (1972) has found that low sensory threshold is a common characteristic of infants with colic and night waking. Korner notes that the mother of a child with a low threshold infant must act as a "sensory shield" for him while the child with a high sensory threshold may require extra stimulation if he is to be responsive to mothering actions. Korner's interpretation resembles that of Bell (1971) in his theory of upper and lower limit controls described earlier.

6. Intensity of Response: Thomas, et al. (1970) define this as the energy content of the response. Their study reports that high intensity levels remain stable and low intensity levels increase somewhat. Brazelton (1975) evaluates the vigor of response of neonates. Wilson et al. consider intensity of temper outbursts. Buss and Plomin (1975) include this in their basic "emotionality" characteristic. Bell (1971) evaluates the "assertiveness" of the child. Assertive children, according to his theory, are more likely to evoke "upper limit controls" by parents. (There is evidence that abused children are viewed as different by parents and that they may evoke abusive behavior by their parents. Miloue (1964) pointed out that abused children placed in quality

foster homes may be abused there too and speculates that they may be temperamentally assertive children who evoke upper limit control behavior by caretakers.)

7. Mood: A continuum of mood from negative to positive is operationalized in terms of the amount of crying and smiling behavior of infants. Moss and Robson (1970) found that attachment behavior decreases if crying doesn't decrease by one month post partum. Bell and Ainsworth (1972) noted that crying increases if the mother ignores it, and that the increased crying will lead the mother to withdraw still further. Wilson, et al. (1971) and Bell (1971) also viewed crying as an indicator of the mood temperament characteristic. Korner (1971) suggested that not only is it a potent initiator of interaction but is also a communication medium for the infant. Smiling, happy behavior of infants evokes verbal responses and positive attitudes in mothers (Bell, 1971).

8. Distractibility: Distractibility is the ease with which a behavior can be changed by a new stimulus. Brazelton (1975) evaluates this characteristic in neonates as he notes their state changes and controls. Korner (1971) evaluates soothability of infants and comments that mothers who cannot sooth their infants lose self-confidence in their mothering ability and may withdraw from the infant. In some studies this characteristic is operationalized in terms of how easy it is to stop the crying. Buss and Plomin (1975) consider this characteristic within their Impulsivity category.

9. Persistence/Attention Span: This is the ability of the child to

maintain a behavior over time. This characteristic was stable over time according to Thomas, et al. Wilson, et al. (1971) and Brazelton (1975) evaluated this variable in their studies. Other investigators seem not to have considered this characteristic.

The evidence supports the view that infant temperament characteristics do affect maternal responsiveness toward the infant through differential reinforcement of maternal behaviors and through stimulating approach or withdrawal responses by the mother.

Infant Temperament and Maternal Attitudes Toward the Infant

The literature reviewed thus far has related first attachment and maternal attitudes and then attachment and infant temperament. Finally, a few studies have related infant temperament to maternal attitudes and perceptions of the infant.

The Carey Temperament Survey (1970) discussed earlier addressed this issue. Not only did Carey ask the mother to describe her infant's behaviors to ascertain the infant's temperament, but he also asked each mother to evaluate her infant's temperament directly. Approximately 25 percent of the mothers stated that their infants' characteristics were different than they had just described them (i.e. a mother might describe active infant behaviors and then say that her child was not active). Brown (1976) and Barnard (1977) replicated Carey's study with similar results.

In 1977, Barnard reported the first results of a longitudinal study seeking to determine what factors are predictive of later child development and health status.

Among these factors, Barnard considered the infant's temperament and

the mother's perception of the infant. At 1 month, she had 24 mothers evaluate the child's temperament using the complete Carey scale. A modified, abbreviated version was used in a home interview for the remaining 169 mothers in her sample. In addition, she had mothers rate their infant's temperaments directly and had observers rate the infants' behavioral styles. She found no significant correlations among the three measures and therefore concluded that each method measured a different dimension. She did find a positive relation between the mother's rating of her own temperament and that of her baby.

Barnard also used the Broussard NPI scale to evaluate the mother's perception of her baby at 2 days and 1 month. At 1 month, 77 percent rated their infants as "better than average". As had Broussard (1970), Barnard found no associations between the NPI score and mother's education, family income, or infant sex. There were moderate correlations between the NPI score and a perinatal risk score, between the NPI and "psycho-social assets" of the mother (including feelings about mothering, marriage, and her role in the family), and between the NPI and positive infant temperaments.

She divided the mothers into 4 groups based on the direction of change in NPI scores at the two time points. Of the 193 mothers, 115 rated their infants positively at both 2 days and 1 month, 31 changed from positive to negative, 11 maintained negative perceptions, and 26 changed from negative to positive attitudes. Through discriminant analysis, she ascertained that the mothers who did not change their ratings and those who changed the rating from negative to positive evaluated the infants' temperaments as "easy". The fourth group, mothers who changed the rating from positive to negative evaluated their infants' temperaments as

the most difficult. They also had the fewest "psycho-social assets".

Though the findings would suggest that the infants' difficult temperament affected the ratings, Barnard could not find supporting evidence from observer ratings, and so concluded that the lack of psycho-social assets was the crucial variable affecting the mother's perception of the infants. The discriminant analysis explained only 12% of the variance and the significant variables classified only 28% of the mothers into the 4 groups.

Barnard's work certainly adds to the knowledge about maternal attitudes, to the relation of maternal attitudes to the infants' temperament, and to other influencing variables. The problems of temperament measurement which she encountered, however, leave the issue of relation of mothers' attitudes to infants' temperament unresolved.

These interesting data lend credence to the notion that the mother's attitude toward her infant's behavior and her description of it may not be related in the expected manner. Therefore each factor, the behavior and her perception of it, needs to be evaluated separately. Brazelton (1975) and Ryan (1973) have each taken this line of reasoning one step further by demonstrating that if the infant's temperament characteristics are described to the mother,then her attitudes about the infant may change in a positive direction and her attachment behaviors toward the infant increase.

Brazelton (1975) studied the temperament characteristics of neonates. Using an observation technique, he measured lability and direction of state changes, responsiveness, vigor, attentional excitement, motor activity and tone. He believes that interpretation of the infant's behavioral style to the parents helps them cope more effectively with their babies

(1975). In support of this view, his data demonstrate that infants whose behaviors have been interpreted to the parents develop more rapidly than infants whose characteristics have not been described for the parents (1976). Evidently this information changes the parents' perceptions and their parenting responses to the benefit of the child's development.

Ryan (1973) showed the traits of the infant, using a modified Brazelton instrument, to the parents in the first three days of life. At 30 days, she evaluated both the babies' behaviors, and the mothers' perceptions using the Broussard Neonatal Perception Inventory II. She found no differences in baby behaviors and mothers' perceptions of their babies between mothers in the experimental group and the control group, however, mothers in the experimental group did report fewer infant sleep and feeding problems. Labeling the infant's behavior for the mother changed the mother's view of problematic infant behaviors in a positive direction.

Additionally,Bromwich (1976) reported using interpretation of infant temperament behavior as one technique to help mothers become more sensitive to their babies. She believes that the mother will gain competence as she senses her infant's responsiveness to her mothering efforts. The positive feelings derived from a mutually satisfying mother-infant relationship is a "prime requisite for infant development". (Bromwich, 1976, p. 439).

Conceptual Framework

The following conceptual framework has been derived from the data in the review of the literature. It provides the rationale for investigating the relationship between infant temperament and the mother's evaluation of her infant.

1. Strong mother-child attachment bonds are necessary for optimal child development.
2. Attachment arises during and from the interaction between mother and child.
3. Infant temperament characteristics affect attachment through differential reinforcement of maternal responses toward the infant.
4. Certain infant temperament characteristics are predictive of later child development problems.
5. The mother's positive evaluation of her infant is directly related to the extent of her attachment to him.
6. The mother's negative evaluation of her infant is predictive of later child development problems.
7. Interpretation of the infant's temperament to the mother may (1) positively affect her evaluation of the infant, and (2) positively affect the child's later development.

The relationship between these two attachment variables, infant's temperament and the mother's evaluation of the infant, have not been clearly analyzed in the literature. The present study will describe this relation and try to answer the following questions: Will extreme temperament characteristics result in a negative evaluation of the child by the mother? Can average temperament characteristics be rated negatively too? Are some characteristics more likely to be rated negatively than others?

It is important for the professional to understand the relationship between these two attachment variables so that assessment and intervention to promote strong attachment will be functionally appropriate to the situation.

CHAPTER II

METHODOLOGY

Subjects

The subjects for this study were 50 primiparous mothers with infants three to five weeks of age. They were selected from well-child and post-partum clinics from the metropolitan Portland area. The subjects were contacted personally by the investigator and asked to participate in the study.

The following criteria were used in the selection of subjects: the mother should be 18 to 35 years of age, with a three to five week old infant; she should have a tenth grade education or better; English should be her native language; she should be married. Both she and the infant should be in good health and have had no separations from each other longer than 24 hours. The mother should be the major caretaker of the infant. These criteria duplicate, in part, those of a larger study in progress so that the data may be useful to that research also (Tomlinson, 1976). In both studies, these criteria control for factors (marital state, health, continuity of contact) which might affect the relations between perceived temperament and the mother's evaluation of her child. Other factors -- age, education, etc. were also analyzed in terms of their effects on attitudes.

Data Gathering and Data Gathering Instruments

The major data for this study were gathered through the use of three questionnaires, Broussard's (1970) Neonatal Perception Inventory II (NPI), Broussard's Degree of Bother Inventory (DB), and a modified version of

Carey's (1970) Infant Temperament Scale. Background data were also obtained (See Appendix B).

Measurement of the Dependent Variable

The dependent variable of this study is the mother's evaluation of her infant at 28 days. Broussard's (1970) Neonatal Perception Inventory II and Degree of Bother Inventory yield two measures of this variable, the former a cognitive statement and the latter an affective statement. Broussard, claiming that being "above average" seems to be a current value in this society, designed the instrument so that the mother rates her baby against an "average baby" baseline thus yielding richer data about how this infant is regarded and measures up to maternal expectations than if the data about this infant stood alone.

Broussard's Neonatal Perception Inventory II was designed to measure a mother's perception of her infant at 28 days of age. The Inventory consists of two sections. In the first section, the mother is asked to describe the "average baby" on six items using a 5-point scale ranging from "a great deal" (5) to "none" (1). The items include questions about the extent of crying, feeding problems, spitting up, sleep problems, bowel movement difficulty and predictability. In the second section, the mother is asked to rate her own infant using the same scales.

A total score ranging from 6 to 30 for each section is obtained by adding the values on the six items. The total score for "Your Baby" is then subtracted from the "Average Baby" score and the discrepancy is the Neonatal Perception Inventory (NPI) score. This NPI score may, in principle, vary from -24 to +24. Infants with positive scores are considered "low risk" for later developmental difficulties. Infants with zero or

negative scores are considered "high risk" for later developmental difficulties.

While the authors have not cited studies supporting the reliability or validity of the Inventory, they do state that the instrument has criterion and content validity. Criterion validity is demonstrated because the test is predictive of an external variable, namely child behavior at 4.5 years and at 10 or 11. The content validity is claimed because the questions are representative of the universe of content being considered. In fact, the questions define the universe being measured.

The Broussard Degree of Bother Inventory yields a statement of the mother's affective evaluation of her infant. For the same six items used in the Neonatal Perception Inventory II, the mother is asked to indicate on a 4-point scale how much she is bothered by that behavior. Scores range from "a great deal" (4) to "none" (1). An additional item is included for the mother to identify other behaviors that bother her. Values of 1 to 4 are assigned to each item. These are totaled to give a Degree of Bother (DB) score, which may vary from +6 to +24 (or more if the mother adds other items).

Broussard states that the instrument has high face validity. No other data on validity or reliability are available. There is a high correlation (χ^2 at $p < .001$) between the NPI score and the DB score.

Measurement of the Independent Variable

The independent variable for this study is infant temperament. The Carey Infant Temperament Scale was designed to assess the temperament of the 4 to 8 month old infant by means of a simple questionnaire to be completed by the mother.

The questionnaire consists of 70 statements about the baby's behavior,

each with three choices. Each choice describes a different strength of temperament response by the infant. "A" choices describe intense reactivity, "B" choices describe variable or moderate reactivity, and "C" choices describe mild reactivity patterns. The items are grouped into nine temperament dimensions, each with three levels (the A, B, and C choices). Within each category, the total A, B, and C responses are multiplied by 0, 1, and 2 respectively. These products are added and the sum divided by the total number of completed items in the dimension. The mean score result, ranging between 0 and 2, represents the infant's typical reaction for that dimension. Each infant receives nine such scores to describe all the temperament dimensions. Scores on the dimensions provide a profile for each child.

Thomas, et al. (1963) identified the "difficult child" as a child with a specific set of temperament characteristics including: irregularity, slow adaptability, initial withdrawal, intensity, and negative mood. Carey redefined the difficult baby as "one having 4 to 5 difficult category ratings, 2 or more of which were greater than one standard deviation from the mean" (1970, p.191). The easy baby was defined as one having 0 to 2 such ratings, but none as large as one standard deviation. Intermediate babies fell in between. Thus, infants can be identified as "easy" or "difficult" using clusters of characteristics.

The Carey Infant Temperament Scale is a questionnaire which is based directly on the description of the interview of Thomas and associates in their book Behavioral Individuality in Early Childhood (1963). Because the items are identical except for the method in which they are communicated to the patient, i.e. verbally versus written, the Carey Scale benefits directly from the validity and reliability studies carried out by Thomas

et al. This work will be described here, followed by the supplemental studies Carey used to be sure his questionnaire was comparable to the Thomas interview.

The Thomas study (1963) used a number of methods to maximize objectivity in the evaluation of each of the nine temperament categories. Each category was clearly defined and illustrative examples given. To minimize intercategory halo effects, each protocol was analyzed for each category independently.

The reliability of the scoring was verified by having two independent judges score 22 consecutive cases. Ninety percent of the cases were identically rated. Thomas et al. also state that the intrarater reliability was also high.

The parents were also used as observers. Interviews were used to collect the data from them. To determine the validity of these parental observations, the scores derived from parent interviews were compared with those from direct behavioral observations of the child made by two independent observers. These two scores agreed at the .01 level of confidence. Thomas felt that this concurrence was achieved because (1) the parents were asked to describe current behaviors rather than recalling events from the past, and (2) because the questions asked were specific and objective in nature.

The Carey questionnaire maintains these features of the Thomas (1970) work. Only present behaviors are considered and the behaviors are described specifically. The situations on the questionnaire duplicate those used by Thomas in the interview method of data-gathering.

Carey evaluated the validity of his instrument by comparing findings from it to those from the Thomas scale. First, the average scores for

infants 4 to 8 months old were compared. By both methods, the average baby was found to be active, regular, adaptable, high in initial approach, mild in intensity of responses, positive in mood, distractible, and persistent.

Second, Carey compared the incidence of the difficult child syndrome as detected by use of the two tools and found the incidence approximately the same.

The reliability of the Carey instrument was tested by mailing the questionnaire to a subsample of three mothers two weeks after they initially completed the form. There was agreement in the ratings of these mothers.

For this study, the scale had to be modified to make it appropriate for the 3 to 5 week developmental level. To do this, first the questionnaire was given to four experts in child development. Each of these experts identified items which included behaviors inappropriate for this age range. Eighteen items of the original 70 were eliminated because they described situations not faced by the neonate. These included the total "Play" section (9 items), the "Response to Illness" section (1 item), 6 items dealing with solid foods in the "Feeding" section, and 2 items from the "Response to People" section. Three new items were added to augment the items describing Persistence since 4 of the original 5 items had been eliminated.

Each inappropriate item was then revised to include only behaviors standardly ascribed to the 4-week infant. The temperament characteristic being described was not altered for each item except for the Mood category items. Because smiling and laughing are not consistent 4-week behaviors, these positive mood responses were changed to "content" or "quiet", more neutral behaviors. The crying and fussing behaviors were

not altered. Thus, the continuum for this category was modified from positive through negative mood to neutral through negative mood. In total then, the modified scale contains 38 original items, 14 modified items, and 3 new items.

The modified scale was then administered on a trial basis to three mothers of 3 to 5 week old infants to verify its appropriateness. No difficulties were encountered by these mothers in answering the scale.

Design and Procedure

This study used a cross-sectional, correlational design to relate mothers' cognitive and affective evaluations of their babies to their infants' nine temperament dimensions. To do this, fifty women completed the Broussard Neonatal Perception Inventory II, the Broussard Degree of Bother Inventory, and the modified Carey Infant Temperament Scale.

Married women, 18 to 35 years of age with infants between 3 and 5 weeks of age were identified for the investigator by clinic personnel. These women were personally approached by the investigator or her trained assistant, given the information on the Informed Consent Form (see AppendixA) and asked to participate in the study. If written consent was obtained, then the Background Data Sheet (Appendix B) was administered. If the criteria for subjects were met through appropriate responses to Background Data Sheet items, then the three Inventories (Appendices C & D) were administered in a pre-set, rotating order to avoid systematic reactive effects of the testing. Verbal instructions, as well as written instructions for completion of each Inventory were given before test administration. The Inventories were each given a code number which corresponded to the code number assigned to the subject on the Informed Consent Form to preserve anonymity of subjects.

Because of time limitations during clinics, 15 questionnaires were sent home with the mothers who had partially completed them. Eleven of these were returned. Seven mothers were initially contacted by phone and the questionnaire mailed to them. Six returned the completed questionnaires. The remaining 34 questionnaires were completed during the clinic visit.

CHAPTER III

FINDINGS AND INTERPRETATIONS

In this chapter, first the sample will be described. Next, the findings with regard to mothers' attitudes will be presented, followed by the findings concerning the temperamental characteristics of the infants. Finally, the relations between the mothers' attitudes and infants' temperaments will be analyzed.

The Sample

Subjects meeting the criteria for inclusion in this study were selected over a 5-month period from mothers attending a university hospital outpatient clinic (n=24) or attending the newborn clinic of a prepaid health insurance health maintenance organization (n=21). An additional five mothers who received health care from private physicians brought the total to the desired sample size of 50. In all, 58 mothers were approached and agreed to participate, but 6 questionnaires were not returned, and two were incomplete. The response rate was, then, 87%.

As may be seen in Table 1, the mean age for the mothers was 24.2 years, the mean number of years of formal education was 13.7 years, and the median family income was $9500. Mothers from the university clinic tended to be younger, less educated, and have lower incomes than mothers in the other two categories. The private practice group of mothers reported more education but lower family incomes than did the women in the HMO group. All mothers were Caucasian.

Mean age of the infants was 28 days and median birthweight was 3430 grams. The babies from the university clinic were the oldest but the lightest in weight. The babies from the HMO clinic were the youngest but

TABLE 1

CHARACTERISTICS OF THE MOTHERS AND INFANTS

Characteristics	Source of Subjects: University clinic (n=24)	HMO (n=21)	Private practice (N=5)	Total (n=50)
Mothers				
Age (years)				
range	18-33	18-30	23-28	18-33
mean	22.7	25.3	25.8	24.2
median				25.0
Education (years)				
range	10-16	12-18	14-19	10-19
mean	13.2	14.9	16.4	13.7
median				13.0
Income				
range	$6500-$18500	$6500-$18500	$6500-$18500	$6500-$18500
median	$6500	$11500	$10500	$9500
Infants				
Age (days)				
range	22-40	21-35	21-35	21-40
mean	30.4	25.8	28.3	28
Birthweight (grams)				
range	2610-4396	2496-4595	2922-4169	2422-4595
median	3205	3404	3461	3418
Sex				
male	12	13	3	28 (54.9%)
female	12	8	2	28 (45.1%)

weighed midway between the babies from the university clinic and babies from private practice.

The sample mothers appeared to be somewhat younger than the average primiparous mother in Oregon in 1976 whose median age was 25.0 years (Oregon Office of Vital Statistics, 1977). Further, the level of education of the sample mothers was quite similar to that of the average American white female, 25 years and older. In 1975, the median education for such women was 12.3 years (Statistical Abstract of the United States, 1976). However, household income was lower for this sample ($9500) than for the average American family with head of household 25 to 34 years (median income of $13,959). The infants were slightly heavier than the average 3333 gram birthweight for all infants (ibid.). This finding was not unexpected in that only well, full-term infants were included in this study.

Broussard's (1971) primiparous, Caucasian sample of 318 mothers included persons from a broad spectrum of socio-economic backgrounds as measured by education and occupation. The median age of the mothers was 21.8 years at the time of delivery. The data on her infants when they were 1 month old are used for comparisons in this study. Mothers in the present sample were somewhat older and came from a narrower range of socio-economic backgrounds than mothers in Broussard's study. The infants are the same age. The small differences in the results between this study and Broussard's, then, may be attributed to the small differences between the mothers.

Greater sample differences are found between the Carey study (1970) and the present one. Carey's sample of 200 mothers from his private practice included 41% college graduates whereas the present sample included 32% college graduates. It is presumed that the incomes of the mothers of this

sample were lower because they came from outpatient clinics. Carey's sample included 83% primiparous mothers, 96% of whom were Caucasian. The factor which may most significantly account for differences in findings is the infant's age. Carey's infants were 4 to 8 months old while those in this study were 1 month old. The age difference could mean that the infants are developmentally different temperament-wise and/or the mothers have different experiences from which to draw as they selectively respond to the temperament questionnaires.

Barnard's sample (1977) was remarkably similar to the present one except for its greater size (n=193). The mothers were primiparous. Eighty-five percent were Caucasian. Their mean age was 24.9 years, their mean educational level was 13.9 years, and their median income was in the range of $11,000 to $12,000. Barnard's data on infants at 1 month of age are compared with the data of the present study. Any differences in outcomes between these two studies cannot, therefore, be attributed to sample variations.

In summary, the differences among the samples are not great, except for the older age of infants in Carey's sample. Hence, comparisons of the data may be legitimately be made, keeping in mind that age difference.

Findings Relating to Mothers' Attitudes Toward Their Infants

The attitudes of the mothers in this study will be described in the following order; first the cognitive aspects, next the affective aspects, and then the relations of the two attitudinal components. Finally, the effect of selected demographic factors on these attitudes will be indicated.

Cognitive Aspects

The cognitive component of a mother's attitude toward her infant

was assessed by her responses to Broussard's Neonatal Perception Inventory (NPI). It may be recalled that the NPI consists of two subscales labeled "Average Baby" and "Your Baby". On each subscale the mother estimated the amount of difficulty the baby has with six behaviors: crying, feeding, sleeping, spitting up, bowel movements, and predictability, In Table 2, the mean scores of mothers on the two scales are presented. For all items, the mean "Average Baby" score equalled or exceeded the mean "Your Baby" score. In short, mothers viewed average babies as presenting more difficulty with the designated behaviors than did their own babies.

The behaviors may be ranked with respect to perceived difficulty as follows:

Average Baby	Your Baby
crying	crying
spitting up	predictability
predictability	spitting up
feeding	bowel movements
bowel movements	sleeping
sleeping	feeding

For both scales, crying topped the list as most problematic. The present results are similar to Barnard's (1977) in that she also found mothers perceived the greatest difficulties with regard to babies' crying and predictability.

The NPI score is calculated by subtracting the "Your Baby" score from the "Average Baby" score. Babies receiving a NPI score of +1 or more are judged by their mothers as being "better than average". Babies with a score of 0 or less are judged "not better than average". According to Broussard, the "not better than average" babies are at higher risk for later developmental problems than the "better than average" babies.

In the present study, 72% of the mothers rated their infants as

TABLE 2

MEAN SCORES OF 50 MOTHERS ON BROUSSARD'S NEONATAL PERCEPTION INVENTORY II

	Neonatal Perception Inventory[a]					
Behavior	"Average Baby" Score Mean	S.D.	"Your Baby" Score Mean	S.D.	NPI Score Mean	S.D.
Crying	3.5	.54	3.0	.97		
Spitting Up	3.0	.58	2.3	.80		
Predictability	2.8	.81	2.7	.98		
Feeding	2.4	.50	2.0	.73		
Bowel Movements	2.3	.66	2.3	1.10		
Sleeping	2.2	.67	2.2	.84		
TOTAL SCORES*	16.8	4.8	14.6	3.37	1.7	2.95

[a]NPI Scale

5 = a great deal
4 = a good bit
3 = moderate
2 = very little
1 = none

*Columns do not add up perfectly to Total Scores due to rounding.

"better than average". The mean NPI score was 1.7 with a range of -6 to +9, and a standard deviation of 2.95. These results are roughly similar to those of Broussard and of Barnard. Broussard found in a 1963 study that 61% of the mothers rated their babies as "better than average" and in a 1971 study (cited in Barnard, 1977, p.5.42) that 73% rated their infants positively. Seventy-nine percent of Barnard's Seattle sample (1977) rated their infants as "better than average".

The 36 "better than average" babies included a slightly larger proportion of male babies (22 of the total 28) than of the female babies (14 of 22). Their mean age was 28 days, identical with the mean age of the total sample. Their median weight was 3416 grams. (See Table 3).

The remaining 14 "not better than average" babies included 6 males and 8 females, also 28 days of age with a median birth weight of 3515 grams. Their mothers, with a mean age of 22.3 years, were younger than those of the "better than average" as a group and slightly less educated (12.8 years of school completed). Data in Table 4 demonstrate that mothers of "not better than average"babies ascribed a slightly lower score to hypothetical average babies than mothers of "better than average" babies did (15.7 vs. 16.3). However, they rated their own babies higher in all areas of behavior difficulty than did the mothers of "better than average" babies.

In sum, while all mothers had similar expectations of the average baby, it was their own baby's behavior difficulties which resulted in the positive or negative rating. Barnard, too, noted similar "average baby" ratings but divergent "Your Baby" scores.

Affective Aspects

The affective component of the mother's attitude toward her infant

TABLE 3

CHARACTERISTICS OF "BETTER THAN AVERAGE" AND "NOT BETTER THAN AVERAGE" INFANTS AND THEIR MOTHERS

	"Better Than Average" (n = 36)	"Not Better Than Average" (n = 14)
Infants		
Sex (% male)	61%	42.8%
Age (days)	28	28
Weight (grams)	3416	3515
Mothers		
Age (years)	24.9	22.3
Education (years)	14.0	12.8

TABLE 4

COMPARISON OF "AVERAGE BABY" AND "YOUR BABY" MEAN SCORES BY MOTHERS OF "BETTER THAN AVERAGE" BABIES AND MOTHERS OF "NOT BETTER THAN AVERAGE" BABIES

"Average Baby" Characteristics	"Better Than Average" Babies (n = 36)	"Not Better Than Average" Babies (n = 14)
Crying	3.5	3.5
Feeding	2.4	2.5
Spitting Up	3.0	3.1
Sleeping	2.3	1.9
Bowel Movements	2.3	1.7
Predictability	2.8	3.0
"Average Baby" TOTAL SCORE:	16.3	15.7
"Your Baby" Characteristics		
Crying	2.6	4.1
Feeding	1.8	2.5
Spitting Up	2.0	2.9
Sleeping	2.0	2.9
Bowel Movements	2.1	2.7
Predictability	2.6	3.2
"Your Baby" TOTAL SCORE	13.1	18.3

was measured by Broussard's Degree of Bother (DB) scale, which requires the mother to estimate the extent to which she "feels bothered" by her own baby's crying, predictability, spitting up, feeding, bowel movements and sleeping. Table 5 presents the mean scores of mothers in this sample on the DB scale. The mean DB score was 13.7. It may be noted for this scale, as for the NPI subscales, crying tops the list, followed by predictability. It may also be noted that the mothers as a group claimed they were bothered very little by the remaining behaviors.

Relation of Cognitive and Affective Components of Mothers' Attitudes

The NPI score, reflecting the total difference perceived by the mother between her own and the average baby on the six behaviors, and the DB scores were correlated strongly (r=-.46). The correlation indicates that mothers who believe their babies are better than average are less bothered by their babies behaviors than are mothers who do not perceive their own babies as better than average. However, the magnitude of the correlation is not so large as to suggest that a mother's cognitive evaluation of her baby is synonymous with her affective state. It would appear that a mother's emotional reaction to her infant is affected not only by her cognitive comparison of the infant vis-a-vis other infants, but by other factors as well. The mother might report being bothered by behaviors which she admits are less present in her child than in other children - or conversely, she might report no bother with behaviors she sees as more prominent in her own than in other infants. In short, mothers may accept behaviors in their own offspring they evaluate negatively in others and may not accept behaviors in their own children that they tolerate in others.

TABLE 5

MEAN SCORES OF 50 MOTHERS ON BROUSSARD'S DEGREE OF BOTHER SCALE

Behavior	Degree of Bother Scale[a] mean	s.d.
Crying	2.9	.76
Feeding	2.0	.85
Spitting Up	2.1	.82
Sleeping	2.0	.84
Bowel Movements	1.7	1.00
Predictability	2.4	.90
TOTAL SCORE	13.7	3.4

[a]DB Scale

4 = a great deal
3 = moderate
2 = little
1 = none

Relation of Selected Demographic Characteristics to Mothers' Attitudes

Broussard (1971) and Barnard (1977) reported that NPI scores were not correlated with demographic variables. However, in this study, significant though small correlations were obtained between the NPI scores and mother's age, mother's education, and family income. (See Table 6). Women who were older, more educated, and with higher family incomes perceived their infants somewhat more positively. No relation was found between the DB scores and the selected demographic variables.

There seems to be no clear reason for these relationships to occur in this study but not in those of Broussard and Barnard, particularly in view of the similarity of the samples in respect to other than size. Perhaps the present results are spurious due to the smaller sample size in this study although they appear again later when the relationships between temperament of the infant and maternal attitudes are discussed.

Findings Relating to Infant Temperament

As stated earlier, scores on the Carey Temperament scale may range from 0 to 2, with higher scores denoting lesser activity, greater irregularity, less adaptability, greater withdrawal from new stimuli, a lower threshold, a more negative mood, nondistractibility, and nonpersistence. Mean scores obtained by the babies of the present sample on the nine temperament scales are presented in Table 7. It may be concluded that the mothers in this study viewed their infants as active, regular, adaptable, high in initial approach, mild in intensity, positive in mood, distractible and persistent, a description which closely approximates those reported for other samples in previous investigations (Carey, 1970; Barnard, 1977).

It may be recalled that the Carey instrument was slightly modified for use with younger infants. How then, do the scores obtained in this

TABLE 6

RELATION OF DEMOGRAPHIC VARIABLES TO NPI AND DB TOTAL SCORES

Demographic Characteristic	Pearsonian Correlations With NPI Score	DB Total Score
Mothers Age	.28*	-.02
Mothers Education	.31*	-.08
Family Income	.24*	-.06
Infant Sex	.20	-.01
Infant Age	-.09	-.19

* $p < .05$

study compare with those reported by Carey for his original scale? Table 7 provides an answer to this question. The scores received by the present sample of 1 month old infants were consistently higher with the exception of persistence than those of the 4 to 8 month old infants in Carey's study. The differences were significant. Barnard, using the unmodified Carey on 24 1-month old infants, also reports higher scores except for the threshold item.

One cannot attribute these differences to the modification of the scale since the sections modified (viz., mood and persistence) showed no greater differences than the unmodified sections of the questionnaire and because Barnard's results using an unmodified tool differed significantly in the same direction for most characteristics. It is more likely that the differences are due to age-related developmental differences between the two groups of infants, or to socio-economic differences between the samples. Carey's mothers, being drawn from his private practice, may be presumed more affluent than the mothers included in the present study and in Barnard's.

Difficult Children

The central tendencies of the total sample with regard to temperament characteristics have been described above. Now attention may be turned to a subgroup of "difficult children" identified according to the criteria set forth by Thomas et al. (1963) and operationalized by Carey (1970). Thomas et al. describe the "difficult child" as exhibiting a temperament profile of irregularity, lack of adaptability, withdrawal responses to new stimuli, intense reactions, and predominantly negative moods. In his opinion, activity, threshold of responsiveness, distractibility, and persistence did not differentiate the "difficult" from

TABLE 7

COMPARISON OF SCORES OF PRESENT SAMPLE ON CAREY INFANT TEMPERAMENT SCALES: MEAN SCORES AND STANDARD DEVIATIONS OF COMPONENT FACTORS

Temperament Characteristic	Present Sample Modified Scale		Carey Sample Original Scale		
	Mean	S.D.	Mean	S.D.	t
Activity	.77	.23	.52	.32	6.25*
Rhythmicity	.90	.49	.53	.46	4.77*
Adaptability	.46	.36	.35	.26	2.04*
Approach/Withdrawal	.56	.39	.48	.35	1.32
Threshold of Responsiveness	1.10	.39	1.08	.39	.32
Intensity of Responses	1.10	.34	1.05	.32	.93
Mood	.70	.31	.40	.25	6.30*
Distractibility	.89	.30	.57	.30	6.63*
Persistence	.56	.26	.69	.38	2.85*

*$p < .05$

nondifficult children. Carey (1970, p. 191) operationalized the concept of the "difficult child" as a child with "4 or 5 difficult category ratings, 2 or more of which were greater than one standard deviation from the mean". Using this definition, seven babies (13.7%) in the present study were identified as "difficult". Of these, five were females. The proportion of "difficult" children in this sample is, then, intermediate between the proportion (5.5%) reported by Carey (1970) and the proportion (16.7%) reported by Barnard (1977). Barnard's sample came from a poorer socio-economic level, as did the present sample, than Carey's sample. Again, sample characteristics may account for the similarity between Barnard and current study figures and the difference of both from Carey rates.

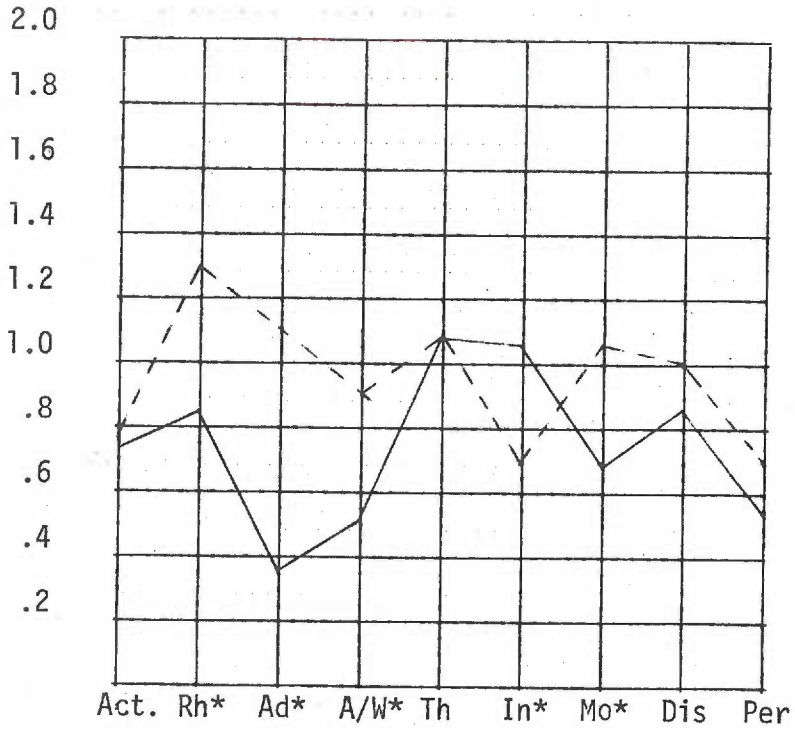
The profiles of these children are presented in Figure 1, along with the profiles of the nondifficult group in order to permit comparisons. It can be seen that the differences occur primarily in the rhythmicity, adaptability, withdrawal, intensity, and mood items - the items used to define the difficult child. Scores for the remaining 4 items are very similar, not adding to the differentiation of these two groups.

Variations in Temperament by Demographic Variables

Only two of the infant temperament characteristics were related to any of the demographic variables. The infant's approach/withdrawal was significantly ($p < .05$) related to mother's age ($r=-.36$), to mother's education ($r=.37$), and infant's sex ($r=.31$). The infant's threshold was correlated with mother's education ($r=.24$) and infant's sex ($r=.35$).

In other words, the infants of older mothers tended to demonstrate lesser withdrawal from new stimuli, the infants of better educated mothers tended to withdraw more and to have a lower threshold, and male infants

COMPARISON OF MEAN TEMPERAMENT SCORES FOR 7 "DIFFICULT" CHILDREN AND 43 "NONDIFFICULT" CHILDREN



* = Criterion for "Difficult Child" Identification
- - - = Difficult Children (n=7)
——— = Nondifficult Children (n=43)

Figure 1.

tended to withdraw more and exhibit lower thresholds.

Barnard (1977) found low level correlations of various temperament characteristics with demographic variables but considered them unimportant since there was no stability to the relationships over time.

Relation of Infant Temperament to Maternal Attitudes

It is the purpose of this study to ascertain how the mother's attitudes in both cognitive and affective dimensions are influenced by the infant's temperament as measured by the Carey Infant Temperament Scale. Questions previously raised about the interrelationships between these variables included the following: (a) Are certain temperament characteristics more strongly associated with negative maternal attitudes than others? (b) Will extreme infant temperament profiles result in negative attitudinal responses by the mother? (c) Can infants with average temperament characteristics be negatively rated on the maternal attitude scales?

Effect of Infant Temperament on Maternal Attitudes

Stepwise multiple regression analysis was the technique employed to assess the relative strength of the effects of the various temperament characteristics on maternal attitudes. In the first analysis, only the nine temperament characteristics were entered into the equation. In a second analysis, selected demographic variables were added to the equation, namely mother's age, mother's education, infant's age, and infant's sex.

Infant Temperament and Mothers' Cognitive Attitudes Toward Infants

Table 8 presents the order in which the nine temperament factors emerged as predictors of the NPI scores. It may be noted that intensity of reactions is the single most important temperament characteristic directly related to negative maternal attitudes, followed by irregularity,

TABLE 8

MULTIPLE REGRESSION OF SELECTED TEMPERAMENT CHARACTERISTICS ON MOTHERS' COGNITIVE ATTITUDES TOWARDS THEIR INFANTS (NPI SCORES)

Variable	Multiple R	R^2	Beta Coefficient
Intensity	.3151	.0993	.3150
Rhythmicity	.3642	.1327	-.1846
Activity	.3905	.1525	-.1420
Mood	.4210	.1772	-.1807
Adaptability	.4358	.1900	.1417
Distractibility	.4388	.1926	.0535
Persistence	.4398	.1934	.0305
Threshold	.4404	.1940	.0260
Withdrawal	.4408	.1943	.0221

decreased activity levels, negative moods and lack of adaptability. The remaining characteristics are not influencing maternal attitudes. Taken altogether, the nine factors explained 19.4% of the variance in mothers' attitudes.

Table 9 presents the results of the regression analysis in which the demographic variables as well as the temperament factors were entered. The most important temperament variable would again appear to be intensity which alone accounted for approximately 9% of the variation in mothers' NPI scores. Other temperament factors affecting this score were withdrawal, mood, and activity. Mother's age and infant's sex also demonstrated stronger influences than the remaining variables. Taken altogether, these 8 variables accounted for 32% of the variation with a multiple R = .568. The remaining variables added very little to the understanding of mother's cognitive attitudes toward their infants.

It may be concluded that infants' more intense reactions, irregularity, withdrawal responses, negative moods and lesser activity levels are temperament characteristics which are more strongly associated with negative attitudes of mothers in the cognitive dimension than the remaining 3 temperament characteristics. Younger mothers rated babies negatively more often; female babies were more often viewed negatively.

Perhaps younger mothers are less experienced, less mature, and more impatient than older mothers, finding the characteristics of their babies more difficult to accept.

Infant Temperament and Mothers' Affective Attitudes Toward Infants

The effect of the temperament characteristics on the affective measure of the mother's attitudes (the DB score) was also determined by a stepwise multiple regression analysis. Table 10 presents the results of

TABLE 9

MULTIPLE REGRESSION OF SELECTED TEMPERAMENT AND DEMOGRAPHIC FACTORS ON MOTHERS' COGNITIVE ATTITUDES TOWARD THEIR INFANTS

Variable	Multiple R	R^2	Beta Coefficient
Intensity	.3151	.0993	.2714
Age Mother	.4776	.2281	.2995
Infant Sex	.4987	.2487	.1137
Withdrawal	.5149	.2652	.2094
Mood	.5365	.2878	-.2429
Activity	.5527	.3054	-.1673
Rhythmicity	.5610	.3147	-.1067
Education	.5677	.3223	.1043
Infant Age	.5720	.3272	.0843
Distractibility	.5749	.3306	-.0569
Threshold	.5763	.3321	.0429
Persistence	.5764	.3323	.0124
Adaptability	.5765	.3324	.0176

TABLE 10

MULTIPLE REGRESSION OF SELECTED TEMPERAMENT FACTORS ON MOTHERS' AFFECTIVE ATTITUDES TOWARDS THEIR INFANTS (DB SCORE)

Variable	Multiple R	R^2	Beta Coefficient
Rhythmicity	.3949	.1560	.3487
Intensity	.4566	.2085	.2290
Activity	.4928	.2429	.2051
Withdrawal	.4968	.2468	.0754
Adaptability	.4991	.2491	.0914
Distractibility	.5016	.2516	.0550
Mood	.5035	.2535	.0667
Persistence	.5056	.2556	.0482

the nine temperament characteristics on the mother's affective attitude toward her infant. Rhythmicity, intensity, and activity are the three major temperament characteristics affecting the mothers' feelings of bother. Together they account for 24% of the variance. The remaining six characteristics contribute almost nothing additional to the explanation of degree of bother.

Table 11 presents the results of the regression analysis including the demographic variables. Again it may be seen that irregularity, intensity, low activity level and withdrawal responses directly relate to greater feelings of bother by mothers. Among the demographic characteristics, mother's education and infant's sex were related to mother's "bother" scores. Although the order is considerably different, 7 of the top 8 items are identical with those which emerged as most predictive in the multiple regression on NPI.

Distractibility, persistence, threshold of responsiveness, and infant age were not important predictors of NPI or DB. Mood contributed a minimal 2% to the variance for the NPI score and less to the DB regression. The lack of importance of the infant's age was an expected finding since the 21 to 40 day range within the sample was maintained to restrict variability of results due to this factor. The minimal importance of mood is somewhat surprising in light of its effect on maternal attachment as reported by Bell and Ainsworth (1972) and Moss and Robson (1969). Perhaps the present modification of the temperament questionnaire interfered with measurement of this characteristic.

These findings relating the specific temperament characteristics to maternal attitudes are unique since other investigators have not related these variables in this way. However, Barnard (1977) combined five of

TABLE 11

MULTIPLE REGRESSION OF SELECTED TEMPERAMENT AND DEMOGRAPHIC FACTORS ON MOTHERS' AFFECTIVE ATTITUDES TOWARDS THEIR INFANTS

Variable	Multiple R	R^2	Beta Coefficient
Rhythmicity	.3949	.1560	.3681
Intensity	.4566	.2085	.3114
Activity	.4928	.2429	.2008
Education	.5162	.2665	.3640
Withdrawal	.5318	.2828	.1795
Infant Sex	.5418	.2935	.0603
Mothers Age	.5507	.3033	-.1628
Distractibility	.5601	.3137	.1142
Adaptability	.5636	.3176	-.1258
Persistence	.5677	.3223	.0656
Infant Age	.5695	.3244	-.0403
Threshold	.5705	.3254	.0408
Mood	.5707	.3257	.0234

the Carey temperament scores into one score. Relating this overall score to maternal attitudes, she found that more extreme temperaments were viewed less favorably by mothers. The present study has broken down this association identifying the most significant temperament elements of the relationship.

Broussard (1977) questioned whether the predictive value of her questionnaire for child development was due to the effect of a self-fulfilling prophesy or to the effect of infant individual differences. In other words, did differences in mother's attitudes toward their children at one month of age affect their treatment of the children or did differences among the infants account for differences in the mother's attitudes. The results from the present study offer some support for the latter possibility. Specific temperament characteristics - intensity, rhythmicity, activity level, mood, and approach/withdrawal responses - accounted for about 20% of the variance in maternal attitudes. The basic demographic variables of mothers' age, education, and infant sex accounted for another 10%. Part of the remaining 70% of the variance may be attributable to the psycho-social assets of the mother identified by Barnard (1977).

Extreme Temperament Profiles and Extreme Negative Maternal Attitudes

The question regarding the relations between extreme temperament profiles and extreme negative maternal attitudes can be answered by cross classifying the sample into subgroups according to temperament profiles and according to NPI maternal attitude ratings.

Carey's "difficult" children have been already described. These were the children at "high risk" psychologically, who were difficult to parent. Seven such "difficult" children have been identified in this study. The

remaining 43 were "not difficult".

On the basis of mothers' negative perceptions of their infants as evidenced by NPI scores of 0 or less, Broussard identified a "not better than average" group of children. In the present study 14 such children have been identified. The remaining 36 are "better than average".

From Table 12, it can be seen that the question, "Will extreme infant temperament profiles result in negative attitudinal responses by the mother?" must be answered "not always". Only 4 of the 7 "difficult" children - those with extreme temperament profiles - were also rated as "not better than average". The probability of obtaining the particular distribution presented in Table 12 was determined by Fisher's Exact Test. This test is appropriately substituted for χ^2 when any of the expected cell frequencies in the contingency table is less than 5. According to this test, the relationship between mother's perceptions of children as "not better than average" and "difficult" is not significant ($p > .07$).

The DB scores were highest for the latter group (19.3) indicating that on an affective level too, that mothers felt negatively about these infants. (See Table 13). The other three difficult children had NPI and DB scores which indicated that mothers' attitudes towards these children were very positive; they overlooked the extreme aspects of these children's temperaments for some reason. Both Carey (1970) and Brown (1976) found that about 25% of mothers with "difficult" children believed their children were quite average in temperament. Here 3 of 7 mothers responded in much the same manner. Perhaps the psycho-social assets of these mothers were better than those of mothers who responded to their difficult children negatively. Or, perhaps their attitudes would convert from positive to negative within 10 days (the "difficult" - "not better

TABLE 12

DISTRIBUTION OF INFANT SAMPLE BY "NOT BETTER THAN AVERAGE" AND "DIFFICULT CHILD" RATINGS BY MOTHERS

	Temperament Characteristics	
Maternal Attitudes	"Not Difficult" (n = 43)	"Difficult" (n =7)
"Better Than Average" (n = 36)		
N	33	3
"Not Better Than Average" (n = 14)		
N	10	4

*Fishers Exact Test $p < .07$

TABLE 13

MEAN NPI AND DB SCORES OF INFANT SAMPLE GROUPED BY "NOT BETTER THAN AVERAGE" AND "DIFFICULT CHILD"RATINGS BY MOTHERS

Maternal Attitudes	Temperament Characteristics "Not Difficult" (n = 43)	"Difficult" (n = 7)
"Better Than Average" (n = 36)		
Mean NPI Score	3.1	3.0
Mean DB Score	13.0	11.3
"Not Better Than Average" (n = 14)		
Mean NPI Score	-1.4	-3.5
Mean DB Score	14.7	19.3

than average" infants have a mean age which is 10 days older than the "difficult" - "better than average" children). In support of this interpretation, Barnard (1977) has observed that mothers of infants with extreme temperaments sometimes changed their attitudes from positive to negative during the first month.

A third question was: "Can infants with average temperament characteristics be negatively rated on the maternal attitude scales?" Table 13 leads to the conclusion that the answer must be "yes" because 10 of the 33 "not difficult" infants were rated as "not better than average". For these at-risk infants, temperament seems to give no clue as to the etiology of the mothers' attitudes. The psycho-social assets stressed by Barnard (1977) may be important here. Since not all of Broussard's at-risk children developed psychological problems later, it would be interesting to see if their temperament differences accounted in part for the appearance of later developmental problems. If temperament is important, then these ten should have a lesser tendency toward developmental problems than the children with extreme temperaments.

When the demographic characteristics of each subgroup are considered (see Table 14), the relative importance of these variables becomes more apparent. The "better than average" - "not difficult" group has the oldest, best educated mothers and the next-to-youngest infants, 63% of whom are males; whereas, the "not better than average" - "difficult" group includes the youngest, least educated mothers, with the oldest infants, 25% of whom are males. The remaining two groups are most similar to the other group having the same "better than average" or "not better than average" description. It would seem then, that mothers' age, mothers' education, infant's age and infant's sex are important characteristics

TABLE 14

DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE GROUPED BY "NOT BETTER THAN AVERAGE" AND "DIFFICULT CHILD" RATINGS BY MOTHERS

Demographic Characteristics	"Not Difficult" "Better Than Average" (n = 33)	"Difficult" "Better Than Average" (n = 3)
Mothers Age (years)	24.8	24
Mothers Education (years)	14.1	13.3
Infants Age (days)	27.	23.3
Percentage Male Infants	63%	33%

	"Not Difficult" "Not Better Than Average" (n = 10)	"Difficult" "Not Better Than Average" (n = 4)
Mothers Age (years)	22.4	22
Mothers Education (years)	13.0	12.5
Infants Age	28.5	33.25
Percentage Male Infants	50%	25%

to consider in predicting whether a baby with more extreme temperament characteristics will be responded to with negative maternal attitudes.

CHAPTER IV

SUMMARY AND CONCLUSIONS

Maternal attachment bonds, which arise out of a process of interaction between mother and infant, are necessary for optimal child development. It is known that the infant's temperament characteristics affect the attachment process through differential reinforcement of maternal responses toward the infant. Further, it is known that positive maternal attitudes toward the infant are important prerequisites to her attachment to him. Less clearly described in the literature is the relationship between the mother's attitudes toward her child and his temperament characteristics as she perceives them. The present study was undertaken to further explore the relationship between these two variables. Specific questions raised included the following: (a) Can it be assumed that extreme temperament characteristics will result in a negative evaluation of the infant? (b) Is it possible for average temperament characteristics to be negatively evaluated? (c) Are some characteristics more likely to be associated with negative infant evaluations than others?

The study subjects included 50 primiparous mothers with well, full-term, infants, 3 to 5 weeks of age. Mothers were married, 18 to 35 years old, healthy, with a minimum of 10 years of education.

Data were obtained via questionnaires administered to the mothers in well-baby or postpartum clinics. The instrument used to measure the infant's temperament was a modified version of the Carey Infant Temperament scale. The mother's cognitive attitude toward her infant was measured by the Broussard Neonatal Perception Inventory II while her affective attitude toward the infant was measured by Broussard's Degree of Bother

scale. Correlations were determined between the infant temperament data and the data from the two attitude scales.

The major findings of the study regarding the mother's attitudes indicate that it is primarily the mother's estimate of her own baby and not her estimate of the average baby which influences her attitudes toward her baby, both on a cognitive level and on an affective level. The infant's intensity of reactions, rhythmicity, and activity level and, to a lesser extent, adaptability and withdrawal responses are the temperament characteristics which are most closely related to the mother's attitudes. Three of the 7 infants with extreme temperament profiles were viewed positively by their mothers and 10 of the 43 average temperament infants were viewed negatively by their mothers. This indicates the lack of a direct one-to-one relationship between infant temperament and maternal attitudes toward the infant.

Demographic variables including maternal age, maternal education, and infant sex were significantly related to both the dependent and independent variables.

The findings and problems encountered during the course of the investigation suggest a number of possibilities for future research. First, measurement of the infant's temperament at one month is problematic, as outlined well by Barnard (1977). The modification of the temperament instrument used in this study was designed to make it more appropriate for the 1 month old infant than the original tool was. However, in most cases, the scores from the modified scale were closer to those of Barnard's using the unmodified scale on one-month-olds than they were to Carey's for 4-month-olds. The questions then, are: (a) did the modification produce a more valid measure of infant temperament than the unmodified

version? (b) were the similarities between Barnard's results and those of the present study and the differences of both from Carey's results due to the like ages of infants and/or the similar maternal samples? Finally, four of the temperament characteristics - distractibility, persistence, threshold, and mood did not discriminate among the infants well and did not predict attitudes. Can they be eliminated as variables in further research on young infants because they are not well developed characteristics or was the instrument not sensitive enough? Further investigation into the measurement of infant temperament is needed to answer these questions.

Second, in this study the demographic variables of maternal age and education, and infant sex were significant factors influencing the Broussard scales. While these variables affect many psychological attitudes, their effects on maternal attitudes were reported as not significant by both Broussard (1971) and Barnard (1977). Since the samples were all quite similar, there seems to be no readily apparent explanation for these discrepant findings. Researchers using the Broussard scales in the future might clarify this issue.

Third, as shown in this study, certain infant temperament characteristics, namely, intensity, rhythmicity and activity level are related to maternal attitudes about the infant. But it is not clear from this correlational study whether infant temperament influences maternal attitudes or whether both factors are influenced by another unidentified variable such as the mothers' psychological state. A study using an observer evaluation of infant temperament would eliminate any influence of the mother's bias, providing a better answer to the question of whether the infants are indeed different.

Fourth, the multiple regressions demonstrated that the temperament and demographic variables accounted for about 30% of the maternal attitudes variance. What variables account for the remaining 70% variance? Barnard (1977) claimed that the mothers' psycho-social assets are related to maternal attitudes. Broussard (1970) noted a relationship between certain psychological states of the mothers and their attitudes. These variables as well as others may contribute to the remaining variance. Further research should include these factors and assess the relative influence of each on maternal attitudes and thereby on maternal-infant attachment.

Implications for Practice

"Too many children reach school age with developmental/psychological problems no one had diagnosed or been able to remedy." (Barnard, 1977, p. 1.1). Since maternal attachment difficulties are known to result in child development problems, factual knowledge about the maternal-infant interaction system and the earliest beginnings of system dysfunction is needed in order to prevent associated developmental problems. "Such knowledge must be firm enough to show us what to assess, what findings prevent potential problems, and what can be done to help" (ibid, p. 1.1). The present study has attempted to add to the knowledge base about the interaction of certain attachment variables - namely infant temperament characteristics and maternal attitudes. Although more basic research is still essential, this information should be useful to the health care practitioner in the assessment process and in identifying some pivotal points for intervention.

More specifically, first the infant's temperament should be evaluated as one variable affecting the mother's attitudes about her child. Focusing

on the baby's intensity of reactions, rhythmicity, and activity levels should be particularly fruitful. Second, since the mother's attitudes about her baby were significantly related to her evaluation of it rather than the "average baby", interventions to make her attitude more positive, should focus on her own baby. Teaching the mother about her baby, for instance, should be more effective than teaching her about normal infant behavior.

The maternal attachment process is doubtless affected by many characteristics of mother, infant, and of the environment in which they interact. The relationship between two of these variables -- infant temperament and maternal attitudes toward the infant -- have been explored in this study. Certainly more basic research is needed to focus on other characteristics of the mother, infant, and environment for a fuller knowledge of the attachment phenomenon and to provide a better base for prevention of developmental problems.

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APPENDICES

APPENDIX A

Consent Form for Human Research

Code Number: _____

INFORMED CONSENT FORM

I, _____, herewith agree to serve
(First Name) Middle Name) Last Name)
as a subject in the investigation named "Infant Temperament and Maternal Evaluation of the Infant" by Catherine Burns, R.N., B.S. under the supervision of Julia Brown, Ph.D.

The investigation aims at relating infant temperament characteristics to the concerns that mothers have about their babies.

The procedure to which I will be subjected will be to complete a questionnaire consisting of four parts. The first part deals with background data about the mother and baby, the second part deals with descriptions of the baby's behavior, the third and fourth parts deal with the mother's concerns about the baby. The total time required to complete the forms will be about 15 to 30 minutes. My participation in this study will help nurses learn more about the specific temperament characteristics of infants that are of special concern to mothers so that improved, individualized nursing care can be given to mothers and babies.

The information obtained will be kept confidential. My name will not appear on the records and anonymity will be insured by use of code numbers. I understand I am free to refuse to participate or to withdraw from participation in the study at any time without effect on my relationship with or treatment at _____.
Name of Institution

I have read the foregoing.

Date: _____ Subject's Signature: _____

Witness' Signature: _____

APPENDIX B

Background Data Sheet

code no. ____

Date of Interview:_____

BACKGROUND DATA SHEET

A. Mother's birthdate _____

B. Mother's education: Circle the number of the highest level of education attained.
Grade school: 1 2 3 4 5 6 7 8
High School: 1 2 3 4
College: 1 2 3 4
Post graduate: 1 2 3 Highest degree: _____

C. Mother married, living with spouse.
Yes ____
No ____

D. Family income level: Please check one.
Less than $6000 ____
$6001 to $7000 ____
$7001 to $8000 ____
$8001 to $9000 ____
$9001 to $10000 ____
$10,001 to $11,000 ____
$11,001 to $12,000 ____
$12,001 to $13,000 ____
$13,001 to $14,000 ____
$14,001 to $15,000 ____
$15,001 to $16,000 ____
$16,001 to $17,000 ____
$17,001 to $18,000 ____
more than $18,001 ____

E. Infant Sex:
Male: ____
Female: ____

F. Infant Birthdate: _____

G. Infant Birthweight: _____

Code No._____

Date: _____

Please answer the following questions by placing an 'X' in the appropriate column.

		YES	NO
1.	This is my first full term pregnancy.	___	___
2.	I have been physically healthy since the birth of my baby.	___	___
3.	The baby receives the majority of its care from me.	___	___
4.	English is my basic language.	___	___
5.	I have been with my baby with no interruptions of 24 hours or more since its birth.	___	___
6.	I saw my baby regularly while in the hospital.	___	___
7.	The baby came within 2 weeks of my due date.	___	___
8.	The baby went home from the hospital with me.	___	___
9.	The baby has been healthy since birth.	___	___
10.	I have had prior experience caring for a baby.	___	___
11.	Have you ever been told by a doctor that you had a serious mental problem?	___	___

APPENDIX C

Neonatal Perception Inventory II

(Broussard, 1970)

Code # _____

NEONATAL PERCEPTION INVENTORY II

A V E R A G E B A B Y

Although this is your first baby, you probably have some ideas of what most little babies are like. Please check the blank you think best describes the AVERAGE baby.

How much crying do you think the average baby does?

_____ a great deal _____ a good bit _____ moderate amount _____ very little _____ none

How much trouble do you think the average baby has in feeding?

_____ a great deal _____ a good bit _____ moderate amount _____ very little _____ none

How much spitting up or vomiting do you think the average baby does?

_____ a great deal _____ a good bit _____ moderate amount _____ very little _____ none

How Much difficulty do you think the average baby has in sleeping?

_____ a great deal _____ a good bit _____ moderate amount _____ very little _____ none

How much difficulty does the average baby have with bowel movements?

_____ a great deal _____ a good bit _____ moderate amount _____ very little _____ none

How much trouble do you think the average baby has in settling down to a predictable pattern of eating and sleeping?

_____ a great deal _____ a good bit _____ moderate amount _____ very little _____ none

Code # _____

NEONATAL PERCEPTION INVENTORY II

Y O U R B A B Y

You have had a chance to live with your baby for a month now. Please check the blank you think best describes your baby.

How much crying has your baby done?

_____ a great deal _____ a good bit _____ moderate amount _____ very little _____ none

How much trouble has your baby had feeding?

_____ a great deal _____ a good bit _____ moderate amount _____ very little _____ none

How much spitting up or vomiting has your baby done?

_____ a great deal _____ a good bit _____ moderate amount _____ very little _____ none

How much difficulty has your baby had in sleeping?

_____ a great deal _____ a good bit _____ moderate amount _____ very little _____ none

How much difficulty has your baby had with bowel movements?

_____ a great deal _____ a good bit _____ moderate amount _____ very little _____ none

How much trouble has your baby had in settling down to a predictable pattern of eating and sleeping?

_____ a great deal _____ a good bit _____ moderate amount _____ very little _____ none

code no. _____

DEGREE OF BOTHER INVENTORY

Listed below are some of the things that have sometimes bothered other mothers in caring for their babies. We would like to know if you were bothered about any of these. Please place a check in the blank that best describes how much you were bothered by your baby's behavior in regard to these.

Crying:	a great deal	somewhat	very little	none
Spitting up or vomitting:	a great deal	somewhat	very little	none
Sleeping:	a great deal	somewhat	very little	none
Feeding:	a great deal	somewhat	very little	none
Elimination:	a great deal	somewhat	very little	none
Lack of a predictable schedule:	a great deal	somewhat	very little	none

Other: (specify)

_____	a great deal	somewhat	very little	none
_____	a great deal	somewhat	very little	none
_____	a great deal	somewhat	very little	none

APPENDIX D

Carey Infant Temperament Scale (modified)

(Carey, 1970)

Carey Infant Temperment Scale
(modified)

Verbal Instructions to the Mother:

Most mothers know that babies differ in the style or quality of their reactions right from the beginning. Little research has been done to measure these differences and their significance.

The purpose of this questionnaire is to determine your baby's reaction to its environment by getting specific information about many areas of functioning. Please answer the questions in order without skipping about.

The temperament questionnaire itself consists of 55 statements about the baby, each with 3 choices. Please circle the letter "a", "b", or "c" before the choice that properly describes the baby. If none of the 3 possibilities is truly suitable, please do not circle any letter. If there has been a change in the baby, the answer should be what applies most recently. There are no good and bad or right and wrong answers, only descriptions of what the baby does. It will probably take 15 to 20 minutes.

code no._____

CAREY INFANT TEMPERAMENT SURVEY
(modified)

Sleep

1. a) Generally goes to sleep at about same time (within ½ hour).
   b) Partly the same times, partly not.
   c) No regular pattern at all. Times vary 1-2 hours or more.

2. a) Generally wakes up at about same time, night and naps.
   b) Partly the same times, partly not.
   c) No regular pattern at all. Times vary 1-2 hours or more.

3. a) Generally content on waking up.
   b) Variable mood at this time.
   c) Generally fussy on waking up.

4. a) Moves about crib much (such as from one end to other) during sleep.
   b) Moves a little (a few inches).
   c) Lies fairly still. Usually in same position when awakens.

5. With change in time, place, or state of health:
   a) Adjusts easily and sleeps fairly well within 1-2 days.
   b) Variable pattern
   c) Bothered considerably. Takes at least 3 days to readjust sleeping routine.

Feeding

6. a) Generally wants and takes milk at about same time. Not over 1 hour variation.
   b) Sometimes same, sometimes different times.
   c) Hungry times quite unpredictable.

7. a) Generally takes about same amount of milk, not over 2 oz. difference (or nurses about the same length of time if breast fed).
   b) Sometimes same, sometimes different amounts or times.
   c) Amounts taken quite unpredictable.

8. a) Easily distracted from milk feedings by noises, changes in place, or routine.
   b) Sometimes distracted, sometimes not.
   c) Usually goes right on sucking in spite of distractions.

9. a) Easily adjusts to parents' efforts to change feeding schedule within 1-2 tries.
   b) Slowly adjusts (after several tries) or variable.
   c) Adjusts not at all to changes after several tries.

code no. _____

10. a) If hungry and wants milk,will keep refusing substitutes (water, pacifier) for many minutes.
    b) Intermediate or variable.
    c) Gives up within a few minutes and takes what is offered.

11. a) With interruptions of milk, as for burping, is generally content.
    b) Variable response.
    c) Generally cries with these interruptions.

12. a) Always reacts to change in temperature or type of milk.
    b) Variable reaction.
    c) Rarely seems to notice (and react to) such changes.

13. a) Suck generally vigorous.
    b) Intermediate
    c) Suck generally mild and intermittant.

14. a) Activity during feedings - constant squirming, kicking, etc.
    b) Some motion - intermediate.
    c) Lies quietly throughout.

15. a) Always cries loudly when hungry.
    b) Cries somewhat but only occassionally hard or for many minutes.
    c) Usually just whimpers when hungry, but doesn't cry loudly.

16. a) Hunger cry usually stopped for at least a minute by picking up, pacifier, putting on bib, etc.
    b) Sometimes can be distracted when hungry.
    c) Nothing stops hunger cry.

17. a) Initial reaction to new foods (water, juices, vitamins) is acceptance. Swallows promptly without fussing.
    b) Variable response.
    c) Usually rejects new foods. Makes face, fusses, slow to swallow, etc.

18. a) Initial reaction to new foods is pleasant, whether accepts or not.
    b) Variable or intermediate reaction.
    c) Response unpleasant (cries, etc.), whether accepts or not.

19. a) After several feedings of any new food, accepts it.
    b) Accepts some, not others.
    c) Continues to reject most new foods after several tries.

Soiling and Wetting

20. a) When having bowel movement, generally cries.
    b) Sometimes cries.
    c) Rarely cries though may get red in face. Generally content in spite of having b.m.

code no. ____

21. a) Bowel movements generally at same time of day (usually within 1 hour of same time).
    b) Sometimes at same time, sometimes not.
    c) No real pattern. Usually not same time.

22. a) Generally indicates somehow that is soiled with b.m.
    b) Sometimes indicates.
    c) Seldom or never indicates.

23. a) Usually fusses when diaper is soiled with b.m.
    b) Sometimes fusses.
    c) Usually does not fuss.

24. a) Generally indicates somehow that is wet (no b.m.).
    b) Sometimes indicates.
    c) Seldom or never indicates.

25. a) Usually fusses when diaper wet (no b.m.).
    b) Sometimes fusses.
    c) Usually does not fuss.

26. a) When fussing about diaper, does so loudly, a real cry.
    b) Variable.
    c) Usually just a little whimpering.

27. a) If fussing about diaper, can easily be distracted for at least a few minutes by being picked up, etc.
    b) Variable.
    c) Nothing distracts baby from fussing.

Diapering and Dressing

28. a) Squirms and kicks much at these times.
    b) Moves some.
    c) Generally lies still during these procedures.

29. a) Generally pleasant (no fussing) during diapering and dressing.
    b) Varied.
    c) Generally fussy during these times.

30. a) These feelings usually intense: vigorous excitement or crying.
    b) Varied.
    c) Mildly expressed usually. Little excitement or fussing.

Bathing

31. a) Usual reaction to bath - content, no fussing.
    b) Variable.
    c) Usually cries or fusses.

code no. ____

32. a) Like or dislike of bath is intense. Excited.
    b) Variable or intermediate.
    c) Like or dislike is mild. Not very excited.

33. a) Kicks, splashes and wiggles throughout.
    b) Intermediate - moves moderate amount.
    c) Lies quietly or moves little.

34. a) Reaction to very first tub (or basin) bath - seemed to accept it right away.
    b) At first, protested against bath.

35. a) If protested at first, accepted it after 2 or 3 times.
    b) Sometimes accepted, sometimes not.
    c) Continued to object even after two weeks.

36. a) If bath given by different person or in different place, readily accepts change first or second time.
    b) May or may not accept.
    c) Objects consistently to such changes.

Procedures -- nail cutting, hair brushing, washing face and hair, medicines.

37. a) Initial reaction to any procedure - generally acceptance.
    b) Variable.
    c) Generally objects; fusses or cries.

38. a) If initial objection, accepts after 2 or 3 times.
    b) Variable acceptance. Sometimes does, sometimes does not.
    c) Continues to object even after several times.

39. a) Generally pleasant during procedures once established - no fussing.
    b) Variable.
    c) Generally fussy or crying during procedures.

40. a) If fussy with procedures, easily distracted by game, toy, singing, etc. - and stops fussing.
    b) Variable response to distractions.
    c) Not distracted, goes on fussing.

Visits to Doctor

41. a) With physical exam, when well, generally pleasant - no fussing.
    b) Variable.
    c) Fusses most of time.

code no. _____

42. a) With painful procedures (heel stick, shot, etc), cries for several minutes or more.
    b) Variable.
    c) Cry over in less than a minute.

43. a) When crying from painful procedure, easily distracted by milk, pacifier, etc.
    b) Sometimes distracted, sometimes not.
    c) Goes right on crying, no matter what is done.

Sensory - reactions to sounds, light, touch

44. a) Reacts little or not at all to unusual loud sound or bright light.
    b) Intermediate or variable.
    c) Reacts to almost any change in sound or light.

45. a) This reaction to light or sound is intense - startles or cries loudly.
    b) Intermediate - sometimes does, sometimes not.
    c) Mild reaction - little or no crying.

46. a) On repeated exposure to these same lights or sounds, does not react much any more.
    b) Variable response.
    c) No change from inital negative reaction.

47. a) If already crying about something else, light or sound makes crying stop briefly at least.
    b) Variable response.
    c) Makes no difference.

Responses to People Holding the Baby

48. a) Definitely reacts to differences in holding by different people.
    b) Variable reaction to differences.
    c) Similar reactions to most people.

49. a) Initial reaction to being held by strangers is positive - no fussing.
    b) Variable reaction.
    c) Initial rejection or withdrawal - fusses or cries.

50. a) This initial reaction to strangers is intense: crying or excited.
    b) Variable.
    c) Mild reaction - fusses or quiet.

code no. ____

Reaction to New Places and Situations

51. a) Initial reaction acceptance - tolerates or enjoys them within a few minutes.
    b) Variable.
    c) Initial reaction rejection - does not tolerate or enjoy them within a few minutes.

52. a) After continues exposure (several minutes) accepts these changes easily
    b) Variable.
    c) Even after continued exposure, accepts changes poorly.

Miscellaneous

53. a) In crib or infant seat, will remain content for 10 minutes or more.
    b) Variable.
    c) Indicates need for attention or new occupation after 3-4 minutes.

54. a) Maintains activity, alertness, or crying for 15 minutes or more when placed in the crib while awake.
    b) Variable.
    c) Settles down quickly when placed in the crib.

55. a) When given a pacifier, bottle, or breast for soothing, sucks it it for many minutes.
    b) Variable.
    c) Stops sucking after a short time.

	ACTIVITY			RHYTHMICITY			ADAPT-ABILITY			APPROACH/ WITHDRAWAL			THRESHOLD			INTENSITY			MOOD			DISTRACT-IBILITY			PERSIS-TENCE		
	H	M	L	H	V	I	A	V	No	A	V	W	H	L	I	I	V	M	+	V	-	D	V	No	P	V	No
0	4a	b	c	1a	b	c	5a	b	c										3a	b	c	8a	b	c			
				2a	b	c	9a	b	c																		
				6a	b	c																					
				7a	b	c																					
10	13a	b	c				19a	b	c	17a	b	c	12a	b	c	15a	b	c	11a	b	c	16a	b	c	10a	b	c
	14a	b	c																18a	b	c						
20	28a	b	c	21a	b	c							22a	b	c	20*a	b	c	20*c	b	a	27a	b	c			
													24a	b	c	26a	b	c	23 c	b	a						
																			25 c	b	a						
																			29a	b	c						
30	33a	b	c				35a	b	c	34a		b	36 a*	b	c	30a	b	c	31a	b	c						
							36a*	b	c	37a	b	c				32a	b	c	39a	b	c						
							38a	b	c																		
							46a	b	c				44a	b	c	42a	b	c	41a	b	c	40a	b	c			
40													48a	b	c	45a	b	c	49a	b	c	43a	b	c			
																						47a	b	c			
50							52a	b	c	51a	b	c				50a	b	c							53a	b	c
																									54a	b	c
																									55a	b	c
	SUMS																										

X = No Score

* = Score in 2 Categories

DISTRIBUTION OF RESPONSES TO THE MODIFIED CAREY INFANT TEMPERAMENT SCALE

Question	Choice a	b	c	total
Activity				
4	11	32	8	51
13	29	18	2	49
14	2	37	12	51
28	31	18	2	51
33	13	32	6	51
Rhythmicity				
1	11	22	17	50
2	14	22	14	50
6	19	21	9	49
7*	29	17	2	48
21	8	18	24	50
Adaptability				
5	20	10	3	43
9	18	13	3	34
19	12	2	3	17
35+	10	10	4	24
36	10	12	1	23
38+	10	14	2	26
46	26	15	3	44
52	30	9	2	41
Approach/Withdrawal				
17*	16	11	9	36
34	26	20		46
37	32	16	3	51
51	35	13	1	49
Threshold				
12	9	6	15	30
22	21	14	14	49
24	17	19	15	51
36	10	12	1	23
44	6	19	26	51
48*	10	18	18	46

Question	Choice a	b	c	total
Intensity				
15	28	16	6	50
20	7	7	36	50
26	8	16	18	42
30*	9	28	12	49
32	24	16	11	51
42*	21	5	7	33
45	10	18	19	47
50*	2	14	25	41
Mood				
3*	15	18	17	50
11*	28	16	6	50
18*	9	11	2	22
20*	7	8	35	50
23	17	20	13	50
25	14	18	16	48
29*	14	21	13	48
31*	30	11	11	52
39*	24	23	2	49
41*	18	15	5	38
49*	27	16	3	46
Distractibility				
8	-	10	41	51
16	27	16	8	51
27	28	13	-	41
40+	8	18	7	33
43*	14	9	7	30
47	24	12	7	43
Persistence				
10	28	11	6	45
53*	27	16	8	51
54*	21	23	4	48
55*	32	10	5	47

* = modified item
\+ = Subquestion of another choice

AN ABSTRACT OF THE THESIS OF

CATHERINE E. BURNS

For the MASTER OF NURSING

Date of Receiving this Degree: June 9, 1978

Title: INFANT TEMPERAMENT AND THE MOTHER'S EVALUATION OF THE INFANT

Approved: Julia S. Brown
Julia S. Brown, Ph.D., Thesis Advisor

Maternal attachment bonds, which arise out of a process of interaction between mother and infant, are necessary for optimal child development. It is known that the infant's temperament characteristics affect the attachment process through differential reinforcement of maternal responses toward the infant. Further, it is known that positive maternal attitudes toward the infant are important prerequisites to her attachment to him. Less clearly described in the literature is the relationship between the mother's attitudes toward her child and his temperament characteristics as she perceives them. The present study was undertaken to further explore the relationship between these two variables. Specific questions raised included the following: (a) Can it be assumed that extreme temperament characteristics will result in a negative evaluation of the infant? (b) Is it possible for average temperament characteristics to be negatively evaluated? (c) Are some characteristics more likely to be associated with negative infant evaluations than others?

The study subjects included 50 primiparous mothers with well, full-term infants, 3 to 5 weeks of age. Mothers were married, 18 to 35 years old, healthy, with a minimum of 10 years of education.

Data were obtained via questionnaires administered to the mothers in well-baby or post-partum clinics. The instrument used to measure the infant's temperament was a modified version of the Carey Infant Temperament Scale. The mother's cognitive attitude toward her infant was measured by the Broussard Neonatal Perception Inventory II, while her affective attitude toward the infant was measured by Broussard's Degree of Bother Scale. Correlations were determined between the infant temperament data and the data from the two attitude scales.

The major findings of the study regarding the mother's attitudes indicate that it is primarily the mother's estimate of her own baby and not her estimate of the average baby which influences her attitudes toward her baby, both on a cognitive level and on an affective level. Multiple regression analysis demonstrated that the infant's intensity of reactions, rhythmicity, and activity level, and, to a lesser extent, adaptability and withdrawal responses are the temperament characteristics which are most closely related to the mother's attitudes. Three of the seven infants with extreme temperament profiles were viewed positively by their mothers. This indicates the lack of a direct one-to-one relationship between infant temperament and maternal attitudes toward the infant.

Demographic variables including maternal age, maternal education, and infant sex were significantly related to both the dependent and independent variables. Older, more educated mothers viewed their infants more positively than did younger, less educated mothers. Male infants were viewed more positively than female infants.

Further research strategies were suggested to clarifly issues raised by the study including (1) determination of the causal sequence

of the effects of the variables, (2) reliability and validity study of the temperament scale as modified for this work, (3) identification of the unnamed variables accounting for 70% of the variance between the infant temperament profile and maternal attitudes, (4) elucidation of the effects of the demographic variables on the outcomes. Finally, implications of the findings for health care delivery were indicated.