RISK COMPONENTS AND SECURITY OF MOTHER-INFANT ATTACHMENT AT TWELVE MONTHS

A Dissertation

Presented to

the Faculty of the Department of Psychology

University of Houston

In Partial Fulfillment

of the Requirements for the Degree

Doctor of Philosophy

By

Ruth K. Wetherford

December, 1977

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ABSTRACT

The study of the first formation by human infants of social relationships is now in its own infancy. "Attachment" is a central concept chiefly because in observations of twelve month old babies it can be seen that maintaining closeness to and involvement with a primary adult is a central activity.

One early discovery has been three molar distinctions in the way babies form attachments to their primary caretakers. The securely attached infants make use of the attachment figure to reduce stress and restore a positive equilibrium in which another central activity, exploration, is heightened. Avoidant and resistant or ambivalent babies ignore her and get angry with her, respectively, which, however adaptive such responses may be to the infants' specific environments, likely hamper optimal social and perhaps cognitive and physical development as well. These latter patterns are considered to be reflective of insecure attachment.

The present study was an examination of the extent to which securely and insecurely attached infants could be distinguished on the basis of psychogenic, biogenic, and sociogenic risk factors present at birth. Also the relationships between mental and psychomotor development, maternal perceptions of their infants, aspects of the home environment, and general infant security and security of attachment were examined.

It was hypothesized that emotional disturbance in the primary or other caretaker, family conflict, prenatal or

delivery complications, low birth weight, mother's age of 15 or younger or education less than the eleventh grade, and Aid to Families with Dependent Children as primary financial support would predict insecure attachment at 12 months. It was further hypothesized that insecurely attached infants would have slower development, less responsive and supportive home environments, more distorted maternal perceptions, and less general security than would securely attached infants.

Subjects were 40 mother-infant pairs who were participants in the Birth to Three Project for Infants at High Risk for the Development of Emotional Disorder and/or Developmental Delay. No control group was obtained due to the service orientation of the referral project, and all mothers and infants received the services of a home visitor. After the infants were three months but before they were six months of age, they were assessed on a risk profile, along with the Bayley Scales of Infant Development, the Flint Infant Security Scale, the Caldwell Home Environment Inventory, and the Neonatal Perception Inventory. These tests were readministered at 12 months, at which time the infant's security of attachment to a primary caretaker was also examined with the Ainsworth (1969) strange situation technique. In this method, infant proximity seeking, contact maintenance,avoidance, or resistance, and distance interaction with the primary caretaker were videotaped during a 20-minute laboratory situation in which each mother separated from and

reunited with her infant twice, once with a stranger present and once when the infant was left alone. Videotapes were then coded and the infants given an attachment rating.

It was found that the attachment categories accurately described the interactive patterns of the present high risk sample. Discriminant function analyses were performed to see if secure and insecure groups could be distinguished by their risk components, mental and psychomotor development, infant security scores, home environments, and maternal perceptions. Also, multiple regression analyses examined (1) the contributions of risk components to the strange situation interactive behaviors and to mental and psychomotor indices, and (2) contributions of the home environment scales to strange situation behaviors.

Support for the hypotheses was significant. Insecure babies were found to more often have mothers who have eleventh grade educations or less, prenatal complications, conflictful families, and babies with low birthweights, and they less often have complications during delivery. Mothers of secure infants tended to avoid restriction and punishment and to organize the environment so as to provide stability, predictability, and breadth of experience. Secure and insecure infants were not distinguished on the basis of general security scores, maternal perceptions, or mental and psychomotor development.

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"These findings suggest that stable, interlocking patterns of mother and infant behavior tend to become established by the second quarter of the first year."

Ainsworth, Bell, and Stayton, 1972

"We are molded and remolded by those who have loved us; and though the love may pass, we are nevertheless their work, for good or ill."

Francois Mauriac

CHAPTER 1

INTRODUCTION

"Attachment" has become a major construct in the organization of infant development. This is not surprising, since the preferred nature of the infant's relationship with his/her primary caretaker[1] is so striking in most babies by nine to 12 months. Being able to move around independently now, the 12-month-old can more actively demonstrate his preferences: with the caretaker, more than with any other, baby smiles, hugs, babbles, and explores the world. He protests when caretaker leaves, if only for a short time. He complains if she leaves the room, doesn't want other people taking care of him, and objects to bed-time, nap-time, and other inevitable times of separation (Fraiberg, 1959).

Another reason for the growing clinical interest in attachment is that it may provide a more reliable tool for predicting aspects of the infant's later development than is currently available. Though patterns of normal development from birth throughout childhood have been successfully described by developmental research, little is known about the processes which foster and maintain normalcy or deviance. One reason for this lack of understanding of the processes of developmental changes accompanying maturation is that too often constitutional and environmental influences are studied as if they are independent of each other. As a result, attempts

to find cause-effect links between discrete variables (various types of reproductive and caretaking trauma) and later disorders have been largely unsuccessful. Further, attempts to find interactions between such variables have not provided etiological understandings of later disorders, mainly because changes in environmental or constitutional variables over time are not taken into account (Sameroff and Chandler, 1975).

As a result of the predictive inefficiency of most measures of infancy, a shift has occurred in the assumption of the consistency of behaviors, that new developmental levels of functioning are built on previous ones. As expressed by Sameroff (1975), much failure in prediction is due to the discontinuous nature of development, qualitative changes in functioning which seem to be independent of previous levels. More recently Sroufe and his associates (1977) have argued that continuity in adaptation can be demonstrated if the "deep structure" or meaning of behavior is examined, that it is the organization of behavior rather than discrete behaviors which change predictably. Attachment, as an organizational construct, may prove to be a step toward the resolution of the continuity-discontinuity controversy.

All current and previous studies known to this author of the various parameters of attachment have utilized normative data collected on babies of white, middle-class families who

experienced no pre- or perinatal complications. The purpose of the present study is to extend the exploration of attachment to a population of high risk infants, and to examine the various influences of risk factors on attachment patterns.

Historical Foundations

The belief that a child's tie to his mother is important perhaps existed even before the concept of "belief" existed. It's just the way it has always been: in every species in which the newborn is not self-sufficient, the mother, or in some species in the absence of the mother, another adult animal cares for it or it dies. The importance of the human adult-infant bond has been recorded in the Old and New Testaments, in histories and mythologies of ancient civilizations, in the literature of such widely separated places as Siberia and South America, and in the folklore of every primitive society. By now the articles and books written about the range and nature of the phenomenon, the reported descriptions of its occurrence, and the theories and speculations as to its mechanism and purpose in nature number into the thousands. But despite this historically and geographically tremendous association with and interest in mother-infant relationships, today very little is known about their nature, the conditions fostering and influencing them, and their temporal effects on the later functioning of the child as adult. Indeed, this is perhaps as puzzling as the phenomenon itself.

This lack of knowledge about one of the oldest happenings known attests as much to the unusual and sometimes distorted approaches toward it as to the difficulty of the inquiry. In fact, beyond infancy, childhood was not regarded as a special phase of the life cycle until the relatively recent 17th century, when, for the first time, distinctions between children and adults began to be made in clothing, play, work, exposure to sexual and other adult experiences, and approaches to learning (Mussen, Conger, Kagan, 1969). The importance of infancy was viewed chiefly in biological terms, with the main developmental task that of avoiding death. Then, with the developments of the germ theory and the sterilization of obstetrical equipment, of antibiotics and infant immunizations, and, most importantly, an adequate food supply for large numbers of people--all riding on the waves of the industrial revolution--infant mortality ceased to be the biggest concern of families about the early years of their children. Attention could be turned to other aspects.

Psychological approaches to the infant's social relations have similarly evolved in a cultural and philosophical context. Though current theoretical and empirical studies of infants with only rare exception use an interactional frame of reference and urge the integration of biological, maturational, and learning concepts, this is a recent development. The major impetus for the early study of infants in Western Europe and

the United States came in the aftermath of World War II when large numbers of babies lost their families and a startling phenomenon occurred: though the orphanages and institutions set up to care for the infants met all the known requirements for life, large numbers of babies failed to develop or died. The first investigator, Spitz (1946), described the puzzling "infant marasmus" (which means a withering away) sparking a flurry of interest in "maternal deprivation" which dominated child psychology through the 1950's. It was viewed rather like a vitamin deficiency in the diet of a person who is not starving to death (e.g.: "primary affect hunger", Levy, 1937), and the area became differentiated into studies of the effects of institutionalization, of maternal separations, and of multiple mothering. Much evidence was gathered to document the ill effects of these deviating conditions of maternal care and they were associated with mental retardation and psychomotor development in infancy (Skodak and Skeels, 1949), intellectual growth (Hunt, 1964), and with school achievement, foster home adjustment, and delinquency in adolescence (Skodak and Skeels, 1949), psychopathology (Skeels, 1966) in adulthood, etc. (see Yarrow, 1961, for a thorough review). This trend, which germinated and spread the idea that social events in infancy have influences bearing on adult functioning, began a major medical, judicial, governmental, educational, and social re-orientation to infancy of dramatic and far-reaching importance.

What is significant in this early development of child psychology is that for the first time, emphasis was placed on the infant's development within a social milieu, rather than on his development in isolation.

Previously, separations from the mother were not viewed as important because easy mitigation of effects was assumed. Now this assumption could be revised, laying the groundwork necessary to approach the newly raised question: By what processes are the ill effects of maternal deprivation brought into being? It is interesting that this entry into the general area of the social relations of infancy is an approach through the back door: positive effects and health have been inferred form the study of negative effects and ill health. It was assumed that inadequate maternal care is a necessary concomitant of situations in which a child is separated from its mother or has more than one mother figure. As recently as 1973 it was remarked (by Streissguth and Bee, 1973) that more is known about the effects of the mother's absence than about her presence or about the nature of mother-child interactions in general.

This back-door approach continued as the study of maternal care in infancy in the 1960's became further differentiated to consider quality of mothering as an important variable. Mainly, mothering was viewed in terms of its functions in the socialization process. Research was dominated by issues such as feeding schedules, weaning, toilet training, and

impulse control; theoretical frames of reference became dominated by concepts of disorder or pathology in the mother. As a way of approaching the issue of optimal conditions for infant development, this is not dissimilar to the notion that a knowledge of a wholesome diet can be based upon the identification of poisonous foods.

Thus the field was ripe for Jean Piaget's reformulations of the processes of cognitive development based on careful observations of the day to day confluence of his own children. Together with advances in learning processes, communications systems, and ethology, developmental theory has formed the backdrop for most infant research in the past decade. Two main areas of study now dominate the field: perceptual and cognitive skills in young babies, and mother-infant relations. These two directions of study are certainly not in competition, but must be studied together. For as Stroufe (1976) has summarized,

> "We are now moving away from interest in the capacities of the infant toward the goal of understanding the organization of infant development that is built on these capacities" (p.27).

The mother-infant relationship, as the chief integrative force in the young child's life, is the primary interest of the present study.

The Mother-Infant Relationship

Of the many terms in the literature on the origins and

development of mother-infant relations, three are most common: object relations, dependency, and attachment. Object relations has its roots in psychoanalytic thoery which regards the object as the agent through which a genetically determined instinctual aim is achieved (Freud, 1915). Mother's breast was specified as the child's first love object, with this early suckling relationship, essentially oral in nature, seen as the prototype of all later love relationships. Object relations develop from the helpless infant's growing awareness of his dependence for relief of tension on an object outside himself to the focus of positive feelings on this object (Ainsworth, 1969). Implicitly, this incorporates a secondary drive model, in the view that the infant acquires the mother as object through the need-gratification that she provides (the "cupboard love" model, Anna Freud, 1945). Since this would require cognitive structures not present at the beginning, there was much room for controversy leading to the theoretical divisions of "ego psychology" and "object relations theory", which views the mother-infant relationship as primary, not acquired, and as social in nature (Robson, 1972; Bowlby, 1958; Yarrow and Goodwin, 1965). Generally, though, the psychoanalytic model focuses on reconstructions of the infant's inner experiences, views him as passive in relation to the environment, and attributes individual differences as due primarily to differences

in constitution.

Dependency is used as a social learning theory construct and has been distinguished into two types. Instrumental dependency regards the infant's relatedness to the mother as an acquired drive, reinforced by her feeding and other caretaking activities (Sears, 1966). This view, based on a Hullian behavior theory model, regards the mother's face, presence and other aspects as conditioned stimuli, signalling gratification to come, and it suggests that all other relationships are founded on a generalized dependency drive. Emotional dependency, derived from Murray's 1938 motivational construct "succorance", is a lable for certain types of learned behavior, specifically those which obtain reassurance, attention, or approval from another person. Based on a Skinnerian operant conditioning model, this view emphasizes the examination of environmental stimuli which control behavior (Gewirtz, 1972). According to Bijou and Baer (1965),

> "The essential function of the mother is to provide positive reinforcers to the infant and to remove negative ones...In doing these things, the mother herself, will, as the stimulus object, become discriminative...for the two reinforcement procedures which strengthen operant behavior. Thereby, she acquires positive reinforcing functions, and lays the foundation for the further social development of her infant" (p.57).

In both these views of dependency, what is sought and received is significant, not the person from whom it is sought or received.

Attachment refers to an affectional tie that one person forms to another specific individual, which is discriminating, specific, and tends to endure. First used by Bowlby (1958), attachment is seen as originating in a number of species-characteristic behavior systems, which are at first independent and arise at different times. They become organized around the primary caretaker and function so as to maintain proximity between infant and caretaker.

In his original theory of "component instinctual responses", Bowlby (1958) enunciated five behavioral systems contributing to attachment--sucking, clinging, following, crying, and smiling--which become integrated through the relationship with the mother and form the basis of "attachment behavior."[2] In a 1969 reformulation of his theory, renamed "A Control Theory of Attachment Behavior", Bowlby recognized the very sophisticated forms that the five basic behavioral systems can take and shifted emphasis to the ways they become organized and to the conditions that activate and terminate the display of attachment behavior.

Though originating in psychoanalytic theory (instincts), the control theory of attachment diverges from object relations theory with its crucial assumption that feeding gratification does not form the essential basis for attachment of infant to mother. There is evidence that attachment behaviors are exhibited toward more than one figure (Schaffer and Emerson,

1964), toward siblings (Tiegel, 1973; Wahl, Johnson, Johanson, and Martin, 1974), fathers who did little caretaking (Cohen, 1973; Pederson and Robson, 1964), inanimate objects (Bowlby, 1969), and towards other adults who do not provide nurturance (Schaffer and Emerson, 1964).

Rather, "attachment" implies an intraorganismic structure, a genetically determined propensity to develop behavioral systems, "both the nature and forms of which differ in some measure according to the particular environment in which development takes place" (Bowlby, 1969). Drawing heavily from ethological observations of attachment behaviors in the mothers and infants of other species, particularly primates, Bowlby (1969) and Ainsworth (1973) describe human attachment behavior as "instinctive". (This is an unfortunate term, because, even though it is used only for descriptive purposes, the historical connotations of causality are difficult to dissociate from this usage.) Attachment behaviors are seen as instinctive because they follow similar and predictable patterns in most members of the species, because they are a sequence of behaviors which run a predictable course, because they contribute to the preservation of the individual and thus the continuity of the species, and because many examples develop even when all ordinary opportunities for learning them are absent.

Further, control systems theory of mother-infant relations

utilizes concepts from evolutionary theory in its view that behaviors mediated by morphological structures evolve within an "environment of adaptedness" which provides a limited number of fairly reliable external influences, such as the presence of a mother. Bowlby (1969) is emphatic on this point:

> "The recognition that behavioral equipment, can contribute to survival and propagation, only when it develops and operates within an environment that falls within prescribed limits is crucial to an understanding of both instinctive behavior and psychopathology" (Bowlby, 1969, p.95).

And also

> "Not a single feature of a species' morphology, physiology, or behavior can be understood or even discussed intelligently except in relation to that species' environment of evolutionary adaptedness." (p.99)

Two assumptions of control systems theory are that behavior is purposive and that it is directed by feedback. This suggests a model in which actual effects of performance are continuously monitored by a "central regulating apparatus" and are used to modify subsequent behavior. This is different from the concept of contingency reinforcement essential to social learning theory in that feedback implies an active testing out of behaviors to see what the consequences may be. Further included is the notion that the infant is especially "programmed" to receive input relevant to the outcome of the test (Ainsworth, 1969). That is,

> "The achievement of any set-goal then, requires that an animal is equipped so that it is able to perceive certain special parts of the environment and to use that knowledge to build up a map of the environment that, whether it be primitive or sophisticated, can predict events relevant to any of its set-goals within a reasonable degree of reliability. It requires, in addition, that the animal is possessed of much effector equipment."

Thus, attachment is a metaphor for an intrapsychic structure which has the status of an intervening variable based on a diversity of behaviors which promote proximity, contact and communication with the attachment figure. It is conceptualized as a control system in which reciprocity is central. This interactional model, in which the system of infant and its social environment are in a constant jockeying to find a "matched fit" (Yarrow, 1963), emphasizes the infant's capacity for adaptation, the importance of exchange between individual and environment, and the critical nature of environmental accomodation (Casto, 1976). It is this view which dominates the study of mother-infant relationships today, and which is adopted by the present author.

The Development of Attachment

What are the phases of the development of attachment behaviors? Though points of emphasis vary from one author to another, there is fair consensus that at least four phases in the development of attachment behaviors may be distinguished with some overlapping and no sharp boundaries. The main

organizational theme or principle guiding this development is the repeated emergence of new levels of organizations, or "intersystemic reorganization"(Sroufe, 1976). Phase one, spanning about the first three months of life, is characterized by "orientation and signals without discrimination of figure" (Bowlby, 1969), also termed the "phase of undiscriminating social responsiveness" by Ainsworth (1973), and the "asocial" phase by Schaffer and Emerson (1964). Schaffter and Emerson described the infant during this early period as being aroused equally from all aspects of the environment. Later Bowlby (1969) incorporated the voluminous evidence of infant functioning compiled during the 1960's suggesting that the infant is capable of orienting to salient features of his environment, especially people, by such behaviors as visual fixation and following, listening, rooting, and postural adjustments when held. He can mobilize the adults around him into proximity or contact by special signalling behaviors of smiling, crying, and other vocalizations. And he actively seeks and maintains contact by primitive sucking and grasping reflexes.

A major task of this period is the establishing of regularity in physiological cycles (Sroufe, 1976). All rudimentary attachment behaviors seen during the first 12 weeks are strongly influenced by the neonate's neurophysiological state as manifest in activity level, reactivity, ability to settle, sleep-wake cycles, and crying time, all with wide individual variation.

Experiments on neonat vision (Fantz, 1966), audition (Wolff, 1963), taste, and smell (Rheingold, 1968) have established that at birth or very soon afterwards babies have efficient sensory systems. Also, by their differential responses to various sensory stimuli, babies demonstrate their ability to discriminate and to have preferences. Through these preferences. Through these preferences--such as the tendency to attend to human voices, to look at contours resembling human faces, and to prefer a moving object to a static one--opportunities for contact with people are maximized. "Again and again, it is found, these inbuilt biases favor the development of social interaction." (Bowlby, 1969, p. 269).

Phase two is characterized by "Orientation and Signals Directed towards One (or more) Discriminated Figure(s) (Bowlby, 1969), also called the "Phase of Discriminating Social Responsiveness" by Ains (1973) and the "Presocial stage" by Schaffer and Emerson (1963). According to circumstances, this phase occurs between the third and sixth months, and marks the beginnings of differential responsiveness to familiar people, especially to the primary caretaker.[3] This requires the memory function of recognition, the beginning of forming inner representations of external events. The affective side of this cognitive coin is the child's beginning distinction of self from nont-self, experiencing "in-here" sensations as different from "out-there", marked by the social smile. There is much

indiscriminate positive social interaction with familiar people, and the baby generously supplies them all with smiles, hugs, babblings, and other signalling and proximity seeking behaviors (Caplan, 1973). In the presence of strangers, however, the preference for mother becomes obvious. In her observations of Ganda infants, for example, Ainsworth (1964) noted that by about eighteen weeks, "The baby, when apart from his mother but able to see her, keeps his eyes more or less continuously oriented towards her. He may look away for a few moments, but he repeatedly glances towards her. When held by someone else, he can be sensed to be maintaining a motor orientation towards his mother, for he is ready neither to interact with the adult holding him nor to relax in her arms." (p.38)

Ainsworth (1967) distinguished two parts of this phase: in the first, discrimination and differential responsiveness are shown to people who are close to the infant, and differential crying, smiling, and vocalizations are directed to them. Later, discriminations can be made between more distant people and, thus, differential crying and greetings occur when preferred figures come and go from the room.

During this first half-year of life, several organizational principles or processes can be delineated, in addition to themes of the predominate importance of the physiological context of behavior already mentioned. Sroufe (1976) has also

elaborated the infant's trend toward greater involvement in producing stimulation, in which "arousal becomes more a function of the infant's transactions with external events, less correspondence to quantity of stimulation." This involves a change from merely attending to stimuli to processing the content of stimuli. Bowlby's (1969) "principle of ontogeny" corresponding to this theme is "a tendency for the range of effective stimuli to become restricted." (p. 268) This is evident, for example in the ontogenesis of negative reactions, which occur first in response to painful enteroceptive stimuli, then to noxious external stimulation, then to the cessation of pleasurable interaction, then to stimulation with a specific negative meaning, such as incongruity (Sroufe, 1976).[4]

A second principle applicable to these rapid early changes is that motoric actions become increasingly specific and coordinated from originally global and diffuse action patterns. Bowlby (1969) describes this as "a tendency for primitive behavior systems to become elaborated and to be superceded by more sophisticated ones". This is illustrated in the baby's reaction to the universally noxious experience of having one's nose wiped: a general body shudder/cringe evolves into coordinated arm movements which push the intruding hand away and which at about eight months can be counted on for anticipatory blocking movements (Charlotte Buhler, 1930, cited by

Sroufe, 1976). Such specific reactions which are evident in smiling, crying, looking, listening, tasting, and touching, as well, reveal the child's growing capacity to interact meaningfully with objects and events, to anticipate, expect, predict.

A final principle of ontogeny to be mentioned at this point is the tendency toward greater ordering (control) of experience through the integration of sensory, sensori-motor, and sensory-affective systems (Sroufe, 1976). This corresponds to Bowlby's (1969) principle of "a tendency for behavioral systems to start by being nonfunctional and later to become integrated into functional wholes." This includes for example the child's increasing ability to modulate its own arousal, as in the ability to ignore stimulation, or to increase its attention span by alternating visual fixation with gaze aversion.[5]

With the onset of independent locomotion, the infant's repertoire of responses greatly expands to include following and explorations, ushering in the third phase in the attachment process. It has been called the phase of "Maintenance of Proximity to a Discriminated Figure by Means of Locomotion as well as Signals" by Bowlby (1969), the "Phase of Active Initiation in Seeking Proximity and Contact" by Ainsworth (1973), and the "social" phase by Schaffer and Emerson (1963). It begins around 6 or 7 months and continues into the third year,

and it is during this phase that a child's attachment is usually first described or assessed. This is due to the highly preferred nature of the child's relationship with his mother, in which all his attachment behaviors become activated and terminated most potently in relation to her. The baby's initiative in seeking nearness and contact with her increases strikingly, as do caution, alarm, and withdrawal from strangers. Though some other figures may become objects of the baby's attachment, the previous friendly and other nondiscriminating responses to familiar figures decline.

The main cognitive feature marking the onset of this period and coinciding with Piaget's fourth stage of sensorimotor development is that the child begins to search for hidden objects and thus manifests the beginnings of object permanence--the concept that an object exists independent of one's perception of it. Recognition memory has led to recall memory, enabling current events to be connected to previous events. In an ingenious study of "horizontal decalage"--the Piagetian concept that babies are more advanced in person permanence than in object permanence--Bell (1970) found that 23 of 24 securely attached infants had positive decalage (discrepancy between object and person permanence in favor of the latter) and all but one of the insecurely attached group had negative decalage (object permanence more advanced than

person permanence.) Bell (1970) hypothesized that "a harmonious relationship between mother and infant seems to be a precondition for eliciting the type of interest in the baby which Piaget hypothesized so pervasively affects the development of sensori-motor intelligence." (p. 309)

Affective concomitants of this process are the emotional reactions which now occur in connections with events. This is viewed by Sroufe (1976) as a major reorganization in affective development and is marked by stranger anxiety, "the failure of the strnger's face to match the stored image of the mother." Also "me feelings" versus "not me" feelings become gradually consolidated into the child's discovery of himself as a separate being, an autonomous self no longer joined to mother. This emerging learning that he is an individual creates the first human interpersonal conflicts: to gain himself the child must lose the person who has always provided his greatest pleasures, and he wants both (Fraiberg, 1959). In summary, then, it is in the context of the child's lack of a firm concept of object permanence and his beginning to cut loose the mooring of his body to his mother's body, that separation and attachment become a heightened conflict in the young child's life.

This conflict is manifested by "separation anxiety" as described above and by very strong, directed attempts to stay near her. But if the ties to mother are so strong, if

anxiety to separation is so pronounced during this phase, how can we account for his paradoxical behavior? Which is that he does not spend most of his time in the close intimate circle of mother's arms. He is gleefully charging into adventure with the cabinet door or television knobs on all fours, leaving mother and seeking the world outside of their relatedness. The paradox is that the baby moves toward the mother and away from her in the same period of development.

The Attachment-Exploration Balance

Ainsworth and her colleagues have focussed on this paradox and the child's management of it and have suggested the paradigm of an "Attachment-Exploration Balance" for understanding the processes involved (Ainsworth & Wittig, 1969). They emphasized as an index of attachment the child's use of the mother as a "secure base" from which to explore the world. It is not itself a pattern of attachment behavior; it is an index which considers exploratory and attachment behaviors as being in some kind of balance.

At the fulcrum of this balance is the mother who seems to provide a secure base from which the child can make exploratory excursions without anxiety. The baby keeps track of her whereabouts, however, and is likely to return to her from time to time before venturing off again. In their mother's presence, many children will explore objects or environments whose novelty might frighten them in the absence of their

attachment figures. One example of this secure base phenomenon is the contrast which can be seen between the confident manner in which a baby might leave the room on his own initiative versus the consternation he may show when his secure base gets up and moves off on her own initiative (Ainsworth, 1973).

In order to determine whether it is the child's mother who is providing the secure base or the whole familiar context of the child's home, Ainsworth & Wittig (1969) introduced infant and mother to a controlled "strange situation in the lab, for the purpose of observing the balance between exploratory and attachment behavior in an unfamiliar environment with mother alternately present and absent. The situation consists of seven three-minute episodes. In the first episode, with mother and baby alone in the room, it is expected that the balance will be tipped toward exploration by the presence of several attractive toys. In subsequent episodes, it is expected that increasing stress will tip the balance from exploration to attachment behavior. The subsequent episodes are: a stranger enters and eventually approaches the baby; mother leaves the baby with the stranger; mother returns and stranger departs; mother leaves baby alone; stranger returns; mother returns again.

In Ainsworth & Wittig's (1969) study and in several other studies using similar separation episodes, the results have been significant and consistent, and can be summarized as

follows: most babies, when left alone with mother move away from her to the toys and played with them. Exploration slowed down when the stranger entered and declined further when mother left the room. It revived slightly when she returned, but declined to a new low when she left again, and did not subsequently revive. Attachment behavior was clearly activated in the brief separation episodes: both crying and search behavior were frequent, more so in the second separation than in the first. In the reunion episodes, proximity- and contact-seeking and contact maintaining behaviors were conspicuous. Thus, it has been demonstrated that for most of the samples of one-year-olds, the mother's presence was necessary for the maintenance of exploratory behavior in an unfamiliar situation, and that her departure tipped the balance from exploratory to attachment behavior.

During the second year, the child's use of the mother as a secure base and his increasing mobility, capacities for internal representation and object mastery skills converge to support the formation of the autonomous self and to maintain this new self concept in the face of anxiety over separation and the recognition of limited powers (Sroufe, 1976).

Then another major restructuring of attachment behaviors occurs, marking the onset of phase four: Although the baby in phase 3 can partially predict mother's movements and/or other

behaviors and adjust his own to them in the interest of maintaining proximity, he cannot plan ways of changing her behavior because of his lack of understanding of her goals or other factors influencing her. Gradually, though, he comes to infer her goals and plans for achieving them. This allows a true "partnership" between child and attachment figure to be formed and characterizes the "Phase of Goal-corrected Partnership" (Bowlby, 1969; Ainsworth, 1973). As the child loses his egocentricity and is able to perceive things from his mother's point of view, the partnership becomes increasingly complex. Though taking various forms this partnership is believed to extend throughout life, and new figures may be selected. Since most research into the development has focussed on the first three phases, particularly phase 3, the knowledge about later attachments remains sketchy, and will not be an issue for consideration in the present study.

Thus it is established that attachment is a powerful organizational construct. As early as 1958, Bowlby recognized that "the integrating function of the unique mother figure is one the importance of which I believe can hardly be exaggerated" (p205). As Sroufe (1976) has more recently summarized:

> "Because it lies at the intersection of the cognitive, social, and affective domains, attachment is a key construct in the organization of infant development. Its centrality in the study of infant emotional development is readily apparent. Not only

> can affective development and expression be organized with respect to consequences for the formation and functioning of attachment, the affective bond itself has consequences for social/emotional and cognitive development as well. Moreover the adaptation represented by the attachment relationship has important consequences for later adaptations" (p.59).

Indices of Attachment

There is little consensus of opinion about which infant responses should be viewed as more or less indicative of the infant's attachment to the mother, nor is there consensus on how to classify them. The issue is clouded by the diversity of attachment concepts, such as underlying structural entities, need, or stimulus control, and by the total lack of uniformity of research methods. There are widely varying sample sizes, ages, and conditions under which the behaviors in question are elicited, and data replications are few. Also the limitations of the interview method have only recently been incorporated in the growing use of observational research designs.[6] Even so, perhaps there is one commonly accepted guideline, that no behavior can serve as a criterion that a baby has become attached to a specific figure unless it is demonstrated at least that the behavior is evoked more frequently by that figure than by others (Yarrow, 1967; Ainsworth, 1973; Stayton & Ainsworth, 1973).

Since many of the attachment researchers came to the area through their earlier interest in maternal deprivation and the effects of mother-child separation, e.g., Ainsworth,

Yarrow, and Schaffer, the early trend was to use the infant's response to everyday separations as an operational definition of attachment on the assumption that the magnitude of protest would index the infant's need for proximity. Schaffer and Emerson (1964), for example, charted the developmental course of the "intensity of attachments", age of onset, and "breadth of attachment" (number of attachments) by interviewing the mothers of 60 infants once a month from the third to the 12th month regarding their children's reactions to being left alone or with other people, put down after being held, left in stroller outside, and passed while in a chair. They confirmed the onset of separation protest at around seven months and found intensity to vary with internal and external conditions. Most subjects formed one initial attachment, with a subsequent increase in the number of attachment objects. A major finding was that drive gratification was associated with neither onset, intensity, nor breadth of attachment, and in fact, some subjects were attached solely to someone who never performed the usual caretaking functions. This led Schaffer and Emerson (1964) to postulate a primary "attachment need" as the motivational force behind proximity seeking.

In her first study of mother-infant attachment, Ainsworth (1963) also began with the assumption that separation anxiety was the main criterion for an infant's attachment. She observed 28 unweaned Ugandan infants during a two-hour

visit/interview with the mothers at two-week intervals when most of the subjects were between two and ten months old. However, she began to doubt the usefulness of the criterion through such observations as that

> "Some of the infants who seemed most solidly attached to their mothers displayed little protest behavior or separation anxiety, but rather showed the strength of their attachment to the mother through their readiness to use her as a secure base from which they could both explore the world and expand their horizons to include other attachments. The anxious, insecure child may appear to be more strongly attached to his mother than does the happy, secure child who seems to take her more for granted. But is the child who clings to his mother--who is afraid of the world and the people in it, and who will not move off to explore other things or other people--more strongly attached, or merely more insecure?"

Based on her observations of the active initiative, coinciding with the onset of locomotion, with which babies showed their attachment behaviors in the absence of anxiety or threat, Ainsworth (1967) hypothesized that a baby does not first become attached and then demonstrate it by proximity promoting behaviors, as suggested by Schaffer and Emerson, 1964, but that attachment grows through such patterns of behavior. This is consonant with Piaget's view of schemata as developing through transactions with the environment: Attachment behaviors develop through interactions with people in the environment.

> "Attachment originates in these patterns of behavior; later they mediate the child's attachment relationship to his mother and may be used as criteria

> of it, even though the attachment itself must eventually become largely internalized" (Streissguth and Bee, 1972, p. 35).

Bowlby (1969) incorporated Ainsworth's impressions in his position that the strength of attachment, as indicated by the intensity of a child's separation protest, is "too simple a concept to be useful (just as the concept of a unitary dependency drive has proved to be)." He suggested that new concepts be built on observations of five different forms of behavior: a) behavior which initiates interaction with the attachment figure, including smiling, greeting, talking, approaching, and touching; (b) behavior in response to mother's initiatives and that maintain interaction; (c) behavior aimed at avoiding separations, such as clinging, following, and crying; (d) exploratory behavior, with special reference to its orientation to the mother, and (e) withdrawal or fear behavior, also with special reference to the way it is oriented to the mother. These behaviors are emphasized for their interactional consequences and give an essential social meaning to the organization of discrete behaviors.

Most subsequent attachment studies have based the measure on infant attachment on some form of the behaviors Bowlby (1969) suggested. The only home observational study known to this author was conducted by Ainsworth who elaborated her Uganda findings with a sample of 26 white middle class mother-infant pairs, whom she observed in their homes for four hours

every three weeks from birth to 54 weeks (Ainsworth & Wittig, 1969). During the visits, detailed notes were taken by the observer and were later transcribed as a narrative record of the infants'behavior and of mother-infant interaction. Infant behaviors which were recorded included separation-related behaviors (frequency and duration of crying, following, greeting, and mixed greeting), and measures related to physical contact, such as the child's initiation of pick-ups or put-downs by mother, positive or negative responses to being held, and cessation of crying on pick-up. Mother behaviors that were recorded were number of times she left the room, maternal acknowledgement of baby when she returned, her ignoring of and duration of unresponsiveness to crying, number of pick-ups, and ratings on maternal sensitivity, acceptance, cooperation, and accessibility scales. Various analyses of this data have revealed individual differences in crying as related to maternal responsiveness (Ainsworth, Bell, and Stayton, 1972), onset and developmental course of separation-related behaviors and some influencing variables (Stayton, Ainsworth, and Main, 1973), and interrelations between infant separation and greeting behaviors and maternal behaviors (Stayton and Ainsworth, 1973).

Laboratory studies can be categorized as those which include measures of the effects of a stranger in indices of attachment and those

which do not. Of those studies in which no stranger is involved, the following provide a representative sample of indices of attachment and methods used. Coates, Anderson, and Hartup (1972 a and b) alternated separation and nonseparation episodes of a free play situation in a room of a mobile laboratory, with two observers dictating behavior descriptions into two tape recorders from behind one-way mirrors. Observers recorded the presence or absence of the infants' visual regard, vocalization, smiling, touching, and crying and the object toward which the behavior was directed. Correlational analyses of the relations among these behaviors provided support for the hypothesis that the patterning of infant social behavior is "sufficiently extensive to warrant the use of the attachment concept".

Then in a rash of 1973 doctoral dissertations, attachment was studied in relation to sex, separation from the mother, and type of reinforcement. Antonucci (Wayne State University) studied proximity and contact seeking, and proximity and contact maintenance behaviors as indices of attachment of 42 seven month old infants who were videotaped for 20 minutes in a waiting room. Attachment was not found to vary as a function of mothers' high or low contingency scores or mothers' locus of control. The main finding was that non-social reinforcement on a learning task was more effective than social reinforcement for insecurely attached infants.

Baecher (Purdue University) used touching, looking, smiling, talking, and separation protest as attachment indices in a study of sex differences in 16 pairs of fraternal twins: girls of opposite sexed pairs were nonsignificantly more reluctant than boys to leave mother and explore the room.

Carr (Georgia State) observed 20 male and 20 female 21-36 month old infants with their mothers in a 16 minute free play situation with mother far or near the toys and so that she was facing toward or away from them. Attachment was indexed by proximity seeking and maintenance scores and exploration scores. When mother faced away from the toys or sat far from them, the children stayed closer to her, especially the girls. Evangelista (Clark University) extended the concept of attachment behaviors to include not only those behaviors which maintain a spatiotemporal relationship between infant and mother but also those which result in their experiencing of one another's presence. As indices of attachment, she measured the proximity seeking responses and auditory, visual, and tactile contact behaviors. This supported the hypothesis that attachment is an outcome of interaction between age, mother's behavior (separation) and environmental context (familiar or novel, high or low illumination).

The Strange Situation

The "strange situation" designed by Ainsworth and described

above has provided the prototype for most studies in which the infant's reaction to a stranger is included as an index of attachment. By varying conditions of play with two preseparation episodes (with and without stranger), two separation episodes (with stranger and alone), and two reunions, the strange situation is seen as providing a microcosm of an infant's experience in which a wide range of behaviors pertinent to attachment may be elicited. Two types of measures are used: (1) frequency measure of three forms of exploratory behaviors--visual, locomotor, and manipulatory--which are not included in the present study, and (2) detailed coding of attachment behaviors in which some contingencies of the mother and the stranger are taken into consideration--proximity and contact seeking, contact maintaining, proximity and interaction avoiding, contact and interaction resisting, and search behavior. The avoiding and resisting behaviors were added to the scoring procedure as a result of obervations on Ugandan babies and on the first 26-subject sample that in some babies, the attachment behaviors seemed to be mixed with behaviors noncompatible with proximity and contact, such as approach mixed with pushing away, gaze aversion, squirming to get down, etc. This is the first attempt known by this author to include such behaviors in an assessment of attachment.

Behaviors at home during the first year have been compared to the subjects' strange situation behaviors at 12 months

(Ainsworth, 1973), and were found to be fairly predictive of strange situation behavior and thus a measure of the validity of the strange situation sampling of infant attachment behavior. "It is not a simple matter, though, of viewing behaviors in the strange situation as mirroring home behavior (Ainsworth, 1973, p.227) because infants behave differently in unfamiliar stressful circumstances than they do in the familiar home environment. "The point is that infants who can be grouped together on the basis of strange situation behavior tend also to be similar in terms of home behavior", (Ainsworth, 1973, p.229) Crying was one notable exception in that strange situation crying had no significant correlation with any of the behavior measures at home. Since most crying in the strange situation is related to separation distress, the implication is that the distress attributable to brief separations from the mother that occur in the strange situation is not significantly related to frequency or degree of distress experienced at home, either in relation to separations or otherwise. Those infants who are most frequently distressed by separations at home did not show the most distress in the strange situation. This further supports Ainsworth's argument that distress or separation protest in brief separations in an unfamiliar situation is not a dependable criterion of the quality of an infant's attachment relationship with his mother.

One advantage of the strange situation is that it can be used to examine individual differences in the quality of attachment relationships between infants and their mothers. The method of analyzing individual differences is classification of the subjects into groups A, B, and C, based on the nature of the babies' interactive behaviors with their mothers, particularly in the reunion episodes. The infant's use of the mother as a secure base from which to explore, responsiveness to the stranger, and response to the mother's absences are secondary to the reunion behaviors in the strange situation classification because the defining feature of attachment is the infant's ability to seek and obtain comfort when distressed.

Group B epitomizes the normative trend which has been described above, with the attachment behaviors sharply heightened by separation. B babies seek to gain and maintain contact, proximity, or interaction with their mothers with relatively little ambivalence or proximity avoidance in the reunion episodes. Group A babies show striking proximity-avoiding behaviors, ignoring the mother, or mingling some tendency to greet and approach her with moving away, or turning or looking away. Babies in Group C typically show great distress during separation, and though they show heightened attachment behavior in the reunion episodes, they are conspicuous for angry, resistant behavior and much ambivalence towards the mother.

In an attempt to distinguish the dimensions of the attachment relationship on which the A, B, and C groups differ, Stayton and Ainsworth (1973) factor analyzed the 13 infant variables provided by the strange situation. Two factors were obtained: Factor 1 was interpreted as representing the security-insecurity aspects of mother-infant attachment, which reflects a child' anxiety about the accessibility and responsiveness of the mother; Factor 2 referred to a child's response to physical contact, which reflects the degree of distress or ambivalence in contrast to enjoyment of and capacity to be soothed by physical contact with the mother. These findings supported the hypothesis that by the end of the first year, different infants have organized attachment behaviors toward the mother figure in different ways. Also the factors have provided concepts around which to organize variance in attachment behaviors.

In a combination of four samples totaling 106 subjects, Ainsworth (1973) found the B babies to differ significantly from the A and C babies on the variables which clustered together as reflecting security and insecurity. Thus, B babies were seen as securely attached and A and C babies as insecurely attached. The avoidant behaviors characteristic of A babies seem similar to the "detachment" behaviors shown by babies who have suffered long separations from their primary caretakers. Bowlby (1969) suggested that such

detachment is due to a repressive, defensive process against the anxiety which is implicit in an affective state of both wanting to be close to and being angry with a mother who has been seen as untrustworthy. Ainsworth and Bell (1970) suggested that avoidance of mothers in reunion episodes can be seen as detachment-in-the-making in the course of everyday mother-infant interaction, and thus it may be a "primitive kind of defense".

This is supported by the development of gaze aversion responses reported by Brackbill (1958) in his experiments on conditioning and extinction of attachment behaviors: Each time the baby smiled, a social response was given. During extinction, when each smile was met with an impassive face, the babies fussed and looked away, and it became increasingly difficult to catch the baby's eye. Similar results have been reported in experiments on babbling (Rheingold, Gewirtz, and Ross, 1959). These highlight the idea that in extinction there is an active process of blocking the response by another, antithetical behavior rather than or in addition to the weakening of the strength of smiling or babbling. The validity of this suggestion is further supported by measures of heart rate acceleration of infants in a modified strange situation (Waters, Matas, and Sroufe, 1975). Avoidant infants were not so out of indifference; indeed, their heart rates accelerated during and after separations from the mother, and play during

reunion episodes was not accompanied by heart rate decelerations as was the case with B babies.

Babies whose insecure attachment took the form of anger, ambivalence and resistance--the C group--were also very aroused by separations, and their heart rates remained high long into reunions. Anger resulting from separation from an attachment figure is very common and is widely documented both in infants (for example, Heinicke and Westheimer, 1966) and in adults (Kubler-Ross, 1969). In a recent volume devoted to the topic, Bowlby (1975) discusses functional and dysfunctional forms of separation anger:

> "In its functional form anger is expressed as reproachful and punishing behavior that has as its set-goal assisting a reunion and discouraging further separation. Therefore, although expressed towards a partner, such anger acts to promote and not to disrupt, the bond" (p. 248).

Anger becomes dysfunctional, however, when it is so intense or persistent that the bond between partners is weakened rather than strengthened and the partner is alienated. He suggests that repeated or prolonged separations or threats of separations foster dysfunctional anger in that they not only arouse anger but attenuate the attachment bond.

> "Instead of a strongly rooted affection laced occasionally with 'hot displeasure', such as develops in a child brought up by affectionate parents, there grows a deep-running resentment, held in check - only partially by an anxious uncertain affection" (Bowlby, 1975, p. 249).

Thus it appears that in the separation and reunion behaviors

of avoidant babies--who tentatively interact with the mother as if in an approach-avoidance conflict and mask their anger with a detached facade--and of resistant babies--whose intense attachment behaviors seem to be in competition with the anger and resistance which they express directly to the mother--some processes are at work which prevent the successful use of the mother as a calming agent in a stressful world.

Influences on Attachment Security

Why do such processes occur? What conditions foster the development of secure and insecure mother-infant attachments? Surely one reason why a solution to this most challenging question of infant social development is so elusive is that there is no one answer: rather, variations in the quality of mother-infant attachment must be seen as a "final common pathway" of interrelationships between a child's genetic and constitutional potentialities, general development--sensory, perceptual, cognitive, affective--as they interact with the social environment, particularly the primary caretaker. These interrelationships, with each component affecting the others in complex ways, forge the unique "matched fit" between mother and infant. How they interact is still largely a matter of speculation, although several clues point towards profitable avenues of inquiry.

In that any one child's particular display of attachment behaviors may vary from time to time, Bowlby (1969) has suggested

a profile of conditions in which the child's behavior is to be observed which may affect the particular display of attachment behaviors. At minimum, these conditions should include the state of the child, whether healthy, sick or in pain, fresh or tired, hungry or fed; the whereabouts of the mother--whether present or absent, departing or returning; the presence or absence of other people and whether they are familiar or strange; and the relative familiarity or strangeness of the non-human environment. A complimentary profile of the mother's behavior, her reactions to the child's attachment behaviors and initiations of interaction, also need to be included for an understanding of their pattern of interaction.

Though interactions shown at any one time are affected by immediate situational elements, they also reflect an historical context of mother's and child's getting to know one another over the span of the baby's life.

> "During the process, it is evident, each has changed in very many ways, small and large. With few exceptions, whatever child has brought in the way of behavior, mother has come to expect and to respond to in a typical way; conversely, whatever mother provides, child has come to expect and to respond to, usually also in a typical way. Each has shaped the other" (Bowlby, 1969, p. 333).

This is the essence of reciprocity, and it points to the thorny problem of determining the extent to which each partner's behavior is elicited by influences of the other in combination

with his/her own initial biases.

Infant Effects on the Caretaker. Even though as early as 1950 Erikson observed that "a family brings up a baby by being brought up by him" and ethologists have for years regarded neonate behaviors as "releasers" of parental responses, infant effects on the mother's behavior have only recently begun to be recognized as an important contributor to their subsequent interactional patterns. Data discordant with a unidirectional model of parents effecting baby is too voluminous to ignore. Physicians now consider the disappointment and helplessness experienced by mothers of premature infants as a risk factor (Bibring, 1957, and Kaplan and Mason, 1960), and Klause (1970, 1972) has established the importance of immediate tactile and eye contact on "maternal attachment,

Bell (1968) has proposed a model of the child's effect on his caretaker which states that parental behaviors in the area of social responsiveness and control are organized into hierarchical repertoires and that there are congenital contributors to the child's behavior which a) activate these repertoires, b) affect the level of parental response within the hierarchies, and c) differentially reinforce the parental behavior which has been evoked. Much evidence supports this view: For example, differences have been observed in newborn infants' activity levels (Province, 1974, and Chess, 1970), responsiveness to visual, auditory, textural, and tactile stimulation (Escalona, Kener, and Grobstein, 1974), in the

clarity with which babies communicate they are hungry or tired, and manner of defending against overstimulation, such as by diffuse motor discharge or inhibition (Stroufe, 1976, Korner and Grobstein, 1967). That such aspects of infant behavior influence caretaking responses has been reported by Prechtl (1963), who observed that hypokinetic, apathetic babies whose weak responses and cries initiate little interaction with many of their mothers and do not reward them are often neglected. Also, Moss (1967) showed that higher levels of sleeping and crying (found to be more characteristic of boys than girls) tended to elicit higher levels of social interaction and contact from caretakers. Similar results are reported by Harper (1969), Sears (1972), Yarrow and Goodwin (1972), and Rheingold (1966). Of course some mothers seem to have endless reserves of patience and do not become rejecting towards their congenitally over-reactive, irritable babies; others provide much social stimulation for their passive, relatively non stimulus-seeking infants. Thus the infant's role in the formation of attachment is unclear, and there has been no direct attempt to study it.

Indirect evidence is provided by Yarrow (1963) who showed that babies with different activity levels elicited different responses from the same adults. Also Ainsworth (1967) found that insecurely attached infants received less social stimulation than those who were securely attached. Since it has been shown that infants tend to receive (elicit) more or

less social interaction as a function of their activity types, it seems likely that congenital conditions of hypo- or hyperactivity or other deviations which may interfere with the achievement of physiological regularity will be more often associated with insecure attachment.

Maternal Contributions to Attachment. Such a view attests to the important role of the mother as a provider of stimulation in the formation of her baby's attachment, for just as the initial characteristics of a baby can influence the way his mother cares for him, so the initial characteristics of a mother can influence the way her baby responds to her. Because the mother's behavior is so complex, arising from her own development--her genetic and constitutional endowments, the history of her interpersonal relations, and the influences and values of her culture--it is seen as more plastic than the infant's and as playing a much larger part in determining the quality of their interaction (Bowlby, 1969). Mothers, for example, have been shown to be much more variable than their infants in responsiveness to the others' initiatives, with infants responding to almost every social overture made by mother, but with mothers ignoring many of their infants' initiations (David and Appel, cited by Bowlby, 1969).

Stimulation. What aspects of maternal behavior are most important for secure attachment? Stimulation has long been

associated with the development of individual attachment behaviors in a variety of ways. Promulgated by studies of the ill effects of stimulus deprivation experienced by institutionalized children, the assumption guiding most of the early empirical work is that lowered levels of stimulation tend to retard many aspects of development and results in permanent deficits (Moss, Robson, and Pederson, 1968).[7]

Stimulation is a broad concept, however, and Yarrow (1961) was one of the first to suggest that a more meaningful approach would be to study the effects of specifc types of stimulation on particular developmental skills. With this approach, evidence began to link the facilitation of behaviors involving a sensory modality with earlier stimulation of that modality: Visual regard and visually directed reaching were enhanced by visual stimulation (White, Castle, and Held, 1964), and stimulation of distance receptors (visual, auditory) was found to facilitate social responsiveness, thus suggesting the relevance of visual and auditory stimulation for attachment. Also, Moss, Robson, and Pederson (1968) showed that the mother's own activity level, expressiveness, and disposition (as determined by their Mother as a Source of Stimulation Scale) influenced the type and amount of stimulation she provided the infant, and that it was significantly negatively correlated with fear of strangers and gaze aversion. They suggested that "perhaps children who are accustomed to experiencing novel

auditory and visual stimulation may have a better set for coping with and assimilating strangeness...and more resources for integrating unfamiliar stimuli" (p.245).[8]

One hypothesis particularly relevant to the problem of the relation between stimulation and attachment is that stimulation facilitates attachment through the process of fostering object permanence. For example, increased maternal stimulation has been associated with IQ increases from 6-12 months (Escalona, 1968), with reticular activating system development, which mediates social behaviors (Thompson, 1965), and with general cognitive development (Robson, 1972, Yarrow and Goodwin, 1972).

In that an over-stimulating home environment in terms of noise and activity has also been associated with poor cognitive development (Streissguth and Bee, 1972), stimulation cannot be seen as a unitary concept. Still more refined concepts of stimulation are required, including not only receptor modes stimulated or the frequency and intensity of stimulation, but also the relationships between these aspects and the infant's signals and timing with infant responses.

Sensitivity. Ainsworth's combination of strange situation assessments of 12 month attachment with the longitudinal study of mother-infant interaction at home during the first year provides an excellent paradign for examining the issue. Measures of maternal behavior when the infants were 39, 42, 45,

and 48 weeks old and ratings on a 9-point sensitivity scale revealed the following: in comparison to mothers of insecurely attached subjects (groups A and C), the mothers of securely attached infants were nonsignificantly more prompt in their responses to the infants crying and ignored fewer crying episodes and acknowledged their infants significantly more when they entered the room. They were significantly less abrupt and interfering in the way they picked their babies up, were much more affectionate while holding them, and held them more at times other than during routine caretaking activities. As revealed on the sensitivity scale, B mothers were significantly more sensitive to the baby's cues and geared their interventions thereby, more accepting of the limitations place on them by maternal responsibilities and more skillful at mood setting so as to minimize the use of interference with the baby's activities (Ainsworth, 1970).

Stayton and Ainsworth (1973) extended this analysis to include both third and fourth quarter measures of mother-infant home interactions as they relate to strange situation attachment behaviors. Focussing mainly on the relationships between infant's separation and greeting behavior and mother's behavior, they found that positive greetings were significantly negatively correlated with maternal ignoring of and unresponsiveness to crying in general, though separation crying was significantly positively correlated with maternal unresponsiveness. This contradicts the notion held by learning theorists that

responsiveness to crying serves as a reinforcement and therefore leads to increased crying.

Finally, Ainsworth (1970) compared strange situation behavior to mother-infant interaction during feeding and in face-to-face situations, both during the baby's first three months of life. Mothers of B babies were found to be significantly more sensitive to the babies' cues in that they fed the babies promptly after hunger was signalled, fed them until they had enough, considered the babies' food preferences, and allowed them to eat at a comfortable rate.[9] During face-to-face situations, mothers of securely attached infants significantly more often smiled and talked to their infants, responded to their initiatives, had longer encounters, and persisted in their initiations of interaction long enough to give the baby time to mobilize a response.

As a result, Ainsworth has offered an hypothesis of several maternal behaviors which she believes to be important contributors to secure infant attachment: a) frequent physical contact with the infant in which mother holds him long enough or in such a way that if distressed, he can be soothed; b) sensitivity to and ability to time interventions according to the baby's signals; and c) responsiveness to the baby which allows him to develop a sense of the consequences of his actions. These three general requirements are similar in that they are interactional concepts: the mother holds baby-

baby is soothed-this soothes mother. Thus a) appears to be one form of b), in that sensitive holding is both a response to and elicitor of baby's signals. Indeed, Stayton and Ainsworth (1973) found that the form of the mothers' physical contacts and the infants' responses to it is the single best predictor of strange situation behavior. One component of this was the baby's willingness to be put down; that is, one component is that mother holds baby long enough for the soothing to be complete ("well-rounded"). This also refers to the mother's responsiveness to baby's signals in that she allows him to signal, at least in some instances, when he is ready to get down. Both a) and b) seem to be two modes by which c) comes about: by mother's sensitive responsiveness to signal, baby learns that signals have effect, that by his actions, he can have impact upon and, therefore, control of his experiences.

These requirements for a child's developing attachment with special emphasis on the importance of fostering the child's emerging sense of control, has been stated in many forms by many clinicians and researchers alike. Erikson (1950) is most eloquent:

> "Combining sensitive care of a baby's individual needs and firm sense of personal trustworthiness... lead to a child's sense of being "all right", of being oneself, and of becoming what others expect one to become. This sense of trust is required for a child to make it through the period of muscle maturation and the stage of experimentation...The child is learning

> to make choices, to discriminate, to manipulate...The point is that even if frustrated in some ways, the child will have an increasing sense of self-trust, if frustrations have some meaning. That is, as the environment encourages him to "stand on his own feet", it must protect him against meaningless and arbitrary failures and confusion" (p.191).

Attitudes. But can a mother's sensitivity to her child, her responsiveness, foster his sense of being "all right" without her feeling that he is "all right"? Can mother-infant interaction and its culmination in secure attachment be perceived without taking into account how the mother feels about her infant in the context of her physical state and her personal and social life with its economic and cultural constraints. Such an approach is obviously untenable. Witness, for example, the sensitivity of a mother to her baby's cues when she is drunk or otherwise physically or emotionally depressed, when she is very anxious or angry and fighting with her husband, or trying to meet the demands of several other small children, and part of her wishes she didn't have her baby, etc., etc. Several attempts have been made to understand the relationship between maternal attitudes and various aspects of her caretaking practices. For example, mothers who had positive attitudes toward childrearing two years before they had their first child were found to be nurturant and sensitive after their babies' births (Bowlby, 1969). Also, anxiety during pregnancy has been found to be significantly associated with hostility and control towards the baby

eight months after birth, but was even more strongly related to irritability and marital conflict and with dissatisfaction with the role of being a mother (Davids, Holden, and Gray, 1963). See the work of Broussard and Hartner, 1970, below.

It is the purpose of the present study to add to this cumulative understanding of the conditions contributing to variations in 12-month old mother-infant attachment relationships. Conditions of the baby's environment during the first year and the security of the attachment at 12 months will be approached using a risk-vulnerability model adopted from that proposed by Anthony (1974b). According to this model, risk is defined as anything that may impede the normal course of the infant's development (Desmond, 1976), and vulnerability refers to those aspects of the child's functioning which render him more likely to suffer ill effects thereof. Anthony has offered the analogy of three dolls--one glass, one plastic, and one steel--which each receive an equal blow from a hammer. Though exposed to the same risk, they sustain different damage based on their different vulnerabilities (Anthony, 1974a).

According to this model, Anthony suggests that different types of behaviors can be sampled to lead to concepts of measureable vulnerability, the indices of which very with reference to the particular conditions of risk. In order to

facilitate such measure, he has devised a formula for total risk assessment by combining such genetic, reproductive, constitutional, developmental, physical, environmental, and traumatic components.

In the present study, security of attachment will be seen as an index of vulnerability, and variations in attachment will be examined in terms of various conditions which are likely to hinder or facilitate the formation of secure attachment.

Indices of Risk

Developmental research has focused intensely during the past decade on attempts to identify very early those factors in childhood which increase the risk of later disease or disorder. Such attempts to propectively identify processes which will later culminate in disorder are (a) a response to the failure of retrospective studies to explain various disturbance etiologies, and (b) reflect the increasing attention given to the public service needs of socially disadvantaged groups (Sameroff and Chandler, 1975). Sameroff and Chandler (1975) have offered a classification of various types of risk components, consisting of a continuum of reproductive risk--all prenatal and perinatal complications, such as prematurity, low birth weight, anoxia, neurological malfunctioning, etc.--and a continuum of caretaking risk, including all failures of the supportive environment to provide conditions necessary

for healthy development, such as physical abuse, malnutrition, negligence, etc. These components are, of course, interrelated and emphasize an approach to various disorders which does not view each as a separate disorder with a unique etiology. Risk components to be examined in the present study include biogenic, psychogenic, and sociogenic information.

Biogenic Risk. When the delivery and birth records of children with a variety of disorders have been retrospectively studied, delivery complications, prematurity, and low birth weight have been implicated as related to subsequent disorder (Pasamanick and Knoblock, 1966; Sameroff and Chandler, 1975). When prospective, or longitudinal,studies followed infants who had the most feared delivery complication, anoxia, however, these infants could not be differentiated from control subjects on the basis of intellectual, perceptual, or motor tasks (Corah, Anthony, Painter, Stern, and Thurston, 1965). Similarly, though premature infants have been consistently associated with IQ deficit between birth and two years (Wiener, 1962), long term effects are much less conclusive Sameroff and Chandler, 1975). One additional factor of premature babies, their frequent low birth weight, has been more strongly associated with developmental deficit than prematurity: the lighter the weight, the greater the disadvantage in physical development (Drillen, 1965). Sameroff

and Chandler (1975) have suggested that a possible confounding variable may be the influence toward deviant development of the parents' perception of the child, who, because of his prematurity is easily recognized and labelled as "sick".

It is clear that biogenic variables taken alone do not predict deviant outcomes and are not necessarily risk factors by themselves. However, when combined, pregnancy and delivery difficulties do increase the likelihood of immediate damage and later disorder. As summarized by Sameroff and Chandler (1975), "The most successful prediction of later deviance would then appear to result from a combined criterion of prenatal, postnatal, and perinatal events" (p. 202). Risk variables to be included in the present study are prenatal complications in the mother or infant, complications in delivery, including the Apgar score, and birth weight.

Psychogenic Risk. Psychogenic risk is defined in the present study as resulting from a history of pathology in either the primary caretaker or other caretakers and a history of conflict in the family. This risk category is loosely designed so as to include both the more severe psychological disturbances, such as psychosis or other emotional disturbance requiring hospitalization or outpatient psychiatric care, as well as the less reliable, "soft" predictors, maternal anxiety or depression. Though the specific way that maternal/caretaker emotional disturbance contributes to offspring

disorder is not at all clear, some evidence has been provided as indicating a relationship between maternal personality and labor complications, spontaneous abortions, and prematurity (Sameroff and Chandler, 1975). The mother's own endocrine changes during times of emotional stress have been shown to have effects on the intrauterine environment and the fetus (McDonald, 1968). And the incidence of childhood schizophrenia in the offspring of schizophrenic mothers is consistently greater than for control subjects (Garmezy, 1974). Whether this is due to reproductive or caretaking risk is a muddled issue, though, since schizophrenic mothers generally have more perinatal complications. "It would appear that emotional problems of the mother can create a disturbed physical climate for the child before and during birth" (Sameroff and Chandler, 1975, p. 218). That caretaker personality can be a risk to the child's later development is suggested by Leonard, et al, (1966, cited by Sameroff and Chandler, 1975), who found that many "failure to thrive" infants either were irritable, active and difficult to comfort and had mothers who were tense and aggressive, or both babies and mothers tended to be passive and quiet.

In a study of the relation between parental mental illness and behavior deviance in children under 15 years, Rutter (1974) found many fewer behavior problems in the control group. One mitigating factor associated with children of disturbed parents

who did not exhibit behavior problems was the existence of a good relationship with one parent. In a subsequent inquiry into the damaging effects of family discord and conflict, Rutter (1974) found that unhappy marriages which had open quarreling were more associated with child disorder than unhappy marriages which were unloving and cold but without open fighting.

Sociogenic Risk. Indices of sociogenic risk to be used in the present study will include age and education of the primary caretaker and family income. Though an adolescent girl gives birth to one of every four or five babies born in the United States, very little is written about adolescent parents. Even though little evidence can be offered as support, having a mother who is 15 years or younger is defined in the present study as placing a baby at risk for developmental disorders. In a society which aims most social and educational services toward the prevention of adolescent pregnancy, most teen-aged girls are ill-equipped for parenting tasks. Also, their own developmental tasks are interrupted, as they are often suddenly expected to function as adults. This in turn often sets up a diffiult "double-bind" situation in that they are also expected to fail as adults (Brady, 1977). This study is the first attempt known by the author to examine attachment in terms of the mother's age.

Education of the mother has been found to be associated

with 12 month neurological examinations, which were more abnormal in children of less educated mothers (Niswander and Gordon, 1971). Mothers' educational levels and socioeconomic status were much more predictive of four year functioning than low birth rate or Apgar scores (Samaroff and Chandler, 1975). And, in an attempt to relate mother's education with childrearing practices, Moss, Robson, Pederson (1969) found that "less well educated" mothers gave as much attention to their infants as did better educated mothers, but the mode of interaction was much more physical, involving motor stimulation rather than verbalization in the less well educated group.

Of all predictors of later developmental deviance, socioeconomic status based on income, is the most reliable (Escolona, 1974; Sameroff, 1975). In a study of psychological disorders among urban children, Langner, Gersten, Greene, Eisenberg, Herson, and McCarthy, 1974) found that the proportion of severe emotional disorders in a sample of welfare subjects was twice the proportion in a random cross section of subjects. In their summary of socioeconomic influences on reproductive risk, Samaroff and Chandler, (1975), concluded that "The data from these various longitudinal studies of prenatal and perinatal complications have yet to produce a single predictive variable more potent than the familial and socioeconomic characteristics of the caretaking environment" (p. 208).

Hypotheses

In the present study, it is hypothesized that biogenic, sociogenic, and psychogenic risk components of the child's first year are important factors in the quality of his attachment to a primary caretaker. More specifically, it is hypothesized that infants whose environments encompass more risk factors are at higher risk for the development of insecure attachments. Though such an approach adds little to an understanding of how environmental conditions affect the formation of attachment, it is hoped that this will lead to greater understanding of which conditions are more relevant for secure attachment.

Secondly, the relationship between the infants' general security, measured between three and six months, and the security of the twelve month attachments was examined. The dimension of security in infancy in relation to the mother is not new and has been referred to as a "relationship of confidence" (Benedek, 1938, cited by Bowlby, 1969) in which a child has developed specific expectations toward his mother, as an "introjection of the good object" in which the child's sense of "good me" comes about through relations with a "good mother" (Klein, 1948), and as "basic trust" (Erikson, 1950), which comes about through the consistency, continuity, and sameness of experiences of reciprocity between the baby's capacities and mother's nurturance.

As used in the present study, "security" refers to the child's ability to establish, maintain, and regain homeostasis, a state generally characterized by freedom from significant anxiety or fear (L. se-, free from + cura, care). Originally this comes about throught the regulation of physiological functions, since anxiety is primarily aroused during the first half year by discomforts in these functions. An infant demonstrates security by "the ease of his feeding, the depth of his sleep, the relaxation of his bowels" (Erikson, 1963, p. 247). The index of three to six month security used here describes such behaviors: eating, sleeping, elimination, play, and reactions to new environments and situations (see FISS below, p.72).

By twelve months, however, security looks different. The child is now a complicated social being, in the sense that he is sensitive to the peculiarities of events and to situational contexts of behavior, and he now attributes meaning to his own organized reaction patterns. His behavior is more psychologically regulated; anxiety is connected much more frequently and potently to other persons than to interoceptive discomforts. Thus the child's ability to reduce anxiety through proximity to and/or contact with an attachment figure is considered here to be the best index of security at twelve months currently available.

For purposes of inquiry, it was hypothesized that security at three months will provide a means by which security

at one year can be predicted, even though, phenotypically, security is different at the two ages. This is similar to Ainsworth's (1970) hypothesis that differences in the quality of attachment at twelve months are foreshadowed during the first half-year of the infant's life.

Thirdly, the relationship between risk factors and developmental delay was described in an attempt to examine the assumption that psychogenic, biogenic, and sociogenic-risk as currently defined increase the likelihood that a child's development will be delayed during the first year. The hypothesis was that risk components contribute significantly to developmental delay at twelve months. Also, the relationship between mental and psychomotor development and attachment was examined, with the hypothesis that developmental delay is an important component of insecure attachment.

Finally, relationships between the quality of twelve month attachment and the maternal perception of, general sensitivity and responsivity to, and provision of stimulation for her baby were examined. It was hypothesized that these factors will covary positively, that is, that maternal perception, sensitivity, responsivity, and provision of stimulation for the baby are discriminating predictors of attachment.

This study is believed to conform to Garmezy's (1974) suggestion of the proper strategy for risk research, the goal of which is to locate specific biological, sociological, and

psychological differentiators which separate those who are not. The first stage is to establish the criteria of secure attachment. Stage two is to search for differentiating variables, which then lead to studies examining the various modes of influences and weightings of importance of the variables (stage 3), and finally to the development of intervention strategies which incorporate the findings. It is hoped this study will be a step towards the more important practical task ahead of improving conditions under which early development takes place.

CHAPTER II

METHOD

Subjects.

Subjects were 40 12-month-old family-reared babies and their primary caretakers, who live in Houston and who are receiving the services of the Birth to Three Project for Infants at High Risk for Emotional Disorder and/or Developmental Delay. Referrals to the project were made by staff of high risk nurseries at Jefferson Davis Hospital and Hermann Hospital and of other maternity and infant programs at Jefferson Davis and Ben Taub Hospitals and various public health clinics. Referral sources screened mothers in their well-baby and high risk nurseries, usually immediately after the baby's birth, and made referrals to the project on the basis of the mother's emotional problems such as discord between the baby's mother and father or between mother and grandmother. Because the high risk sample was obtained by referral to a service project, a control group was not obtained. Effects of the home visitations by project staff are not considered as strong confounding variables, since intervention effects are assumed to be normally distributed among the sample.

Six Anglo, 11 Black, and two Mexican-American girls and four Anglo, 13 Black, and 4 Mexican-American boys made up the sample, for a total of 19 girls (47.5%) and 21 boys (52.5%). Twenty-four of the infants were the only child in the family age three or under, being either the first-born and only child or having siblings age four or older. Ten had an older sibling

three or younger, five had two siblings under age three, and one was the third of three children under age three.

Since three sets of twins were included in the sample, the number of primary caregivers who participated was 37. Of these, 33 were the infants' natural mothers, with two maternal grandmothers, one aunt, and one adoptive mother assuming primary caretaking responsibility. Their ages ranged from 13 to 36, with seven mothers age 13 to 15, 11 age 16 to 18, 12 age 19 to 25, 4 age 26 to 30, and 3 age 31 or over. Twenty-one mothers were Black, eight Anglo, and eight Mexican-American. Of the 13 mothers who were married, only three were separated or otherwise not living with their husbands. The remaining 24 mothers were single and living either alone or with their families of origin and the fathers were seldom involved. Twenty of the mothers received AFDC payments, 17 did not. Though actual standard of living was difficult to assess, it was estimated that 14 of the mothers were very poor (lower class), 18 were marginally poor (lower middle), four were middle class, and one upper middle class (the adoptive mother). Finally, of the sample of primary caretakers here reported, 21 were assisted by another caretaker who was either a regular babysitter, day care center, or close relative, usually the maternal grandmother.

Procedure.

Baseline evaluations were made of each infant and family immediately after referral to the project was accepted. Thus

all infants were between three and six months old when the baseline evaluations were completed. Instruments used were the Bayley Scales of Infant Development, the Flint Infant Security Scale, the Home Observations for the Measurement of the Environment Inventory, and the Neonatal Perception Inventory (descriptions are below). Reassessments using these scales were made when the infant became twelve months old.

A profile of several conditions of each infant's first year, which are considered to place the child "at risk" for the development of emotional disorder and/or developmental delay, was compiled. Risk components were categorized as a)psychogenic risk, which was indicated by a history of pathology in the primary caretaker, a history of pathology in other caretakers, and/or a history of conflict in the family; b) biogenic risk, including prenatal complications in either mother or infant, complications in delivery, and birthweight less than 2500 grams; and c) sociogenic risk, which is considered to increase if the age of the primary caretaker is 15 years or less, if his/her educational level is eleventh grade or less, and if the baby's family is financially supported primarily by public assistance. The Risk Assessment Scoring Sheet, Appendix A, was used to summarize risk components for each subject. Each of these nine risk variables was scored as a yes-no binary variable, indicating whether or not the specific risk variable was present. The total risk score could, therefore, range from zero to nine, with high scores indicating greater risk.

In addition, a strange situation procedure, modelled after that of Ainsworth and Wittig (1969) was presented to all subjects during the twelfth month, providing a measure of the infant's attachment. This was done in an experimental room at the Children's Mental Health Services, 3214 Austin Street, Houston, providing enough novelty to elicit exploratory behavior but not immediate fear and heightened attachment behavior, such as might be aroused by a visit to a doctor's office.

The experimental room was a 15' X 13' carpeted area with one complete wall composed of a large one-way mirror window and one wall a large window facing an outdoors grassy area. Behind the one-way mirror in an adjacent observation room, a half-inch reel-to-reel black and white videotape recorder, focused through the one-way window, unobtrusively recorded the activities of mother and baby during the strange situation. A row of chairs placed along one wall of the experimental room, prevented the baby from moving out of the range of the camera. To the left of the observation window, a door led to the hallway.

A pile of toys, books, puzzles, and stuffed animals was placed in the middle of the floor. Behind this pile there was a chair for the mother and about four feet to the left of the mother's chair there was a chair for the stranger, forming a triangle between the toys and the two chairs. Several magazines and an ashtray were placed near the mother's chair for her convenience. The only other objects in the room were a telephone, blackboard, and decorative wall hanging. A micro-

phone hanging from the ceiling directly over the spot where the toys were placed was used to transmit the sound into the observation room to be picked up on the videotape recorder.

The eight strange situation episodes were as follows: Episode 1: the mother (M) and baby (B) are escorted into the room by an experimenter (E) who leaves immediately. Episode 2: M puts B down near the toys and then sits in her chair, participating with B in any way she feels comfortable. Duration is three minutes. Episode 3: A stranger (S) whom the baby has never seen enters, sits quietly for one minute, converses with M for one minute, then gradually approaches B, showing him a toy. One minute later, E knocks on the window from the observation room, signalling M to leave the room as unobtrusively as possible. Episode 4: for three minutes, S and B are together and their interaction depends on B's reaction to M's departure. If B is distressed, S will try to comfort him or interest him in the toys, his mirror image, etc. If B is not distressed but is merely inactive or happily playing, S returns to her chair and sits quietly, smiling, talking, or otherwise interacting with B only in response to his initiatives. Episode 5: M enters and S exits unobtrusively, giving B an opportunity to respond to M without the interference of S's presence. M's behavior is unspecified, as she is instructed to greet B in her normal way and then sit in her chair. Duration is three minutes. Episode 6: E knocks on the window

signalling M to leave. B is left alone for three minutes unless he becomes so distressed that the episode has to be curtailed. Episode 7: S enters and behaves as in episode 4 for three minutes, unless B's distress again prompts curtailment. Episode 8: S leaves as unobtrusively as possible when M walks into the room. M is instructed to pause near the door and hold her arms out to B and then to return to her chair if B does not want to be picked up. After three minutes, E terminates the situation. See Table 1 for a summary of the episodes.

Before the strange situation, the project staff person who had been working with the mother and baby gave some points of general information about the strange situation to the mother while requesting her participation. See Appendix B for a summary of the general information and specific instructions to the mother during the strange situation.

This procedure differs from that used by Ainsworth chiefly in that the data are recorded on videotape which can be reviewed several times during the scoring of attachment behaviors, while the original strange situation obtained data from two observers looking through a one-way window who dictated continuous narrative accounts into a tape recorder which were transcribed, consolidated, and then coded. Another change in the present study from the original strange situation was the instruction to the mother that she hold

TABLE 1

The Strange Situation

Episode	Present	Time	Entrances/Exits
1	E, M, B	30 sec	E leaves
2	M, B	3 min	S enters
3	S, M, B	3 min	M leaves
4	S, B	3 min	M enters
5	M, B	3 min	M leaves
6	B	3 min*	S enters
7	S, B	3 min*	S leaves M enters
8	M, B	3 min	

*Episode can be curtailed if necessary

out her arms in episode 8, which was added to give B an opportunity to mobilize a spontaneous response to the mother's interaction. This is seen as eliciting a clearer distinction between positive, avoidant, resistant, and/or mixed greetings by B.

A measure of the reliability of the strange situation behaviors was provided by a repetition of the strange situation at 52 weeks by the original 26-S sample who had first been tested at 50 weeks (Ainsworth, 1974). Though there were increases in proximity-seeking, and contact-seeking behaviors in preseparation and reunion episodes, contact maintenance in reunions, and crying in general--interpreted by Ainsworth as a clear indication that behavior in the session was affected by the first experience--patterns of attachment behaviors were stable. Test-retest correlation coefficients, though not reported, were described as "very high", indicating the reliability of the 12-month-old attachment behaviors in the strange situation.

Following Ainsworth's procedure (Ainsworth and Bell, 1970), the measure of attachment is based on detailed codings of the baby's behaviors in the strange situation, taking into consideration the mother's and stranger's behavior. Codings refer to the position on a 7-point scale for each of five different classes of behavior: this allows for a measure of the intensity of the behavior and also the different

behaviors which can serve the same end under different intensities of activation. The five classes of behavior which were scored are: a) proximity-and contact-seeking behaviors, which include active behaviors such as full or partial approaching, climbing up on the mother, gestures such as reaching or leaning, and vocal signals; b) contact-maintaining behaviors refer to the baby's response to being touched or held whether or not contact was established by his own initiatives. These include clinging, hugging, and holding on; resisting release, such as by intensified clutching or verbally protesting, and if contact is lost, by turning back, reaching, or attempting to climb back up; c) proximity- and interaction-avoiding behaviors include ignoring the mother or stranger, avoiding looking at her by looking away, turning away, or moving away in those situations which usually elicit some sort of interaction, such as when mother enters the room or initiates interaction; d) contact- and interaction-resisting behaviors include angry, ambivalent attempts to push away, hit, or kick an adult who is seeking contact, to escape if picked up, or to negate play interaction by pushing or throwing down toys offered. This can be less directly expressed through kicking the floor, pouting, fussing, or throwing oneself around and screaming; and e) distance interaction behaviors which indicate that the baby is aware of and interested in the adult while not in close proximity or contact. These include smiling, vocalizing,

looking, showing toys, and other interactions across a distance. Search behaviors in the separation episodes were deemed unnecessary for the classification of the infants and were not scored.

These five classes of behavior were scored according to their strength, frequency, duration and latency, as well as the type of behavior itself. Appendix C contains the detailed coding instructions.

The quality of each subject's attachment behaviors in the strange situation was then classified independently by three judges, with special emphasis on behavior upon reunion with the mother. The classification system is identical upon reunion with the mother. The classification system is idential to that formulated by Ainsworth and Bell (1970), who distinguished three groups and eight subgroups. Since subgroup distinctions are nonessential for the present purpose of determining security versus insecurity of attachment, only the criteria for clasifying the subjects into three main groups are reported here. Following Bell (1970), the characteristics of these groups may be summarized as follows:

Group A infants show relatively little proximity-seeking or contact-maintaining behavior and tend to show little differential responsiveness to mother and stranger, except for less avoidance of the stranger. These strikingly avoidant infants ignore the mother's return in reunion episodes, and

despite her efforts to attract his attention, the group A baby shows little interest in interactions with mother. Group B babies approach, seek proximity and contact, and have heightened interest in mother, especially during reunion. Group C show ambivalence during reunions with their mothers, and typically do not explore the strange environment in preseparation episodes as actively as infants in the other two groups. Heightened attachment behaviors mixed with angry resistance of her responses to his attachment behaviors characterize the C group. See Appendix D for a more detailed description of the criteria for classifying the A, B, and C groups.

Instruments

All subjects were administered the following test battery by a home visitor during the twelfth month or as soon thereafter as can be conveniently scheduled. The Bayley Scales were an exception in that they were in most cases administered following the strange situation in a testing room at the Children's Mental Health Services.

The measure of infant mental and psychomotor development was provided by the Bayley Scales of Infant Development (Bayley, 1969), a comprehensive measure of infant development from two months to 2½ years. It consists of three parts--a mental scale, motor scale, and infant behavior record, the first two of which were included here. The Mental Scale,

composed of 163 items, measures responses to visual and auditory stimuli, manipulation of objects, and social interaction such as imitation and verbalization. It also samples level of object constancy, discrimination of shapes, simple problem solving, and early abstract abilities. The 81 items of the Motor Scale measure the development of gross and fine motor abilities and coordination.

Bayley (1969) states that the Mental Development Index (MDI) and the Psychomotor Development Index (PDI) derived from these scales "have limited value as predictors of later abilities, since rates of development for any given child in the first year or two of life may be highly variable over the course of a few months." Instead, "the primary value of the development indices is that they provide the basis for establishing a child's current status, and thus the extent of any deviation from normal expectancy." The BSID is seen as a useful clinical and research tool in the recognition and diagnosis of sensory, neurological, and emotional defects, pointing to possible areas of environmental deficit.

The BSID is well standardized and this is its major advantage over other infant development scales. A stratified sample design was used, sampling 1,262 infants and children, who were evenly distributed between 14 groups ranging from 2 to 30 months. Selection of the sample was controlled "for sex and color within each age group, with further controls related to residence (urban-rural) and to education of the

head of the household." See Appendix E for copies of the scoring sheets of the Mental and Motor scales.

A measure of the infant's general mental health, based on the concept of security, was provided by the Flint Infant Security Scale (1974). Assumptions underlying the construction of this scale are that beginning immediately after birth, an infant begins to develop a "dependent trust"--that his needs and discomforts will be cared for and relieved by a successfully nuturant world--and a "self trust"--that he is a valuable person--which grow out of positive exchanges with a primary caregiver. When stressful circumstances undermine the infant's dependent and self trust, regression to earlier developmental levels or refusal of care or of the opportunity to care for himself may be demonstrated. Chronic anxiety and uneasiness characterize an infant who has not developed these foundations of mental health.

The FISS was administered to each of 19 infants while they were in foster care, immediately after they were placed in adoptive homes, and after 5-6 months residence in their adoptive homes. The resulting pattern of scores, in which the second score dropped and later returned to the original higher level, is offered as a measure of the validity of the FISS. No test reliability is offerred, though reliability between two raters was described as an unspecified "extremely high".

The 72 items of the FISS are descriptive of 8 general areas of infant behavior: eating, sleeping, responses to unfamiliar situations, toileting and bathing, physical experiences, responses to a changing environment, social behaviors, and playing. Each item is scored as indicating either secure or regressive/refusal adjustments to activities in these 8 areas, and these scores are then combined to obtain a general security score. Based on a distribution sample of 890 FISS scores administered to 318 infants, scores falling between +.35 and +.44 indicate a normal degree of infant security, with those falling below +.35 suggesting increasing sign of poor mental health.

The FISS is administered through an interview with the primary caregiver, while the baby is playing nearby. As a way of avoiding biased interview data, objective descriptions of the child's actual behaviors are sought by the interviewer, who also attempts to informally substantiate mother's reports by observing the interactions. In the present study, this method is additionally reliable in the fact that the professional staff who administered the test had been working with the families in their homes for a number of months.

The FISS was standardized on a combined sample of 318 children consisting of three groups of infants who were given a total of 890 tests over a nine year period. Ages ranged from 2 to 24 months, and subjects were seen as representative of the general population, with socially and culturally deprived

children excluded. A copy of the FISS scoring book can be found in Appendix F.

The Home Observation for Measurement of the Environment Inventory (HOME) (Caldwell, 1970) was used to assess the level of social, emotional, and cognitive support available within the home environment of a child during the first year. The 45 items on the HOME were derived by a factor analysis of a previously standardized 72-item version, and they are grouped according to 6 primary factors: 1) the emotional and verbal responsivity of the mother, 2) the mother's avoidance of restriction and punishment, 3) organization of the environment, 4) provision of appropriate play materials, 5) maternal involvement with the child, and 6) opportunities for variety in daily routine. These factors are combined for a total score.

The HOME was administered by direct observation of the mother-child interaction during an observation/interview period of approximately one hour, with one third of the items based on interview data. Items are answered yes-no, and the total number of "yes" items is converted into stanine scores. The conversion table also contains means and standard deviations for raw factor and total scores, which are based on a standardization sample of 124 families of children aged 8 to 13 months. See Appendix G for the HOME inventory and scoring sheet.

A measure of the mother's perception of her infant

relative to the "average" infant was provided by the Neonatal Perception Inventory (Broussard and Hartner, 1971). This short screening test was developed from the assumption that the mother's perception of her infant will influence her responsiveness to and nurturing support of her baby and will affect the child's emotional development. In a validation study, mothers of 120 full term first-born infants compared their infants to their perceptions of the average infant, and it was predicted that infants seen as deviating from the average perception would be at higher risk for emotional disorder. When the infants were given an extensive psychiatric examination at 4½ years of age by two child psychologists who had no knowledge of the children's predictive risk rating, a statistically significant association between prediction and outcome was found (Broussard and Hartner, 1970). NPI scores were also significantly correlated with Schefer's maternal attitude scales and the Degree of Bother Inventory. On this basis, the NPI is believed to aid in the early identification of children who are vulnerable to emotional disturbance because of their mothers' perceptions of them as being generally more difficult than average.

Mothers were asked to complete the Your Baby and Average Baby Inventories, which each include the following behavioral items: crying, spitting up, feeding, elimination, sleeping, and predictability. Each of these was rated on a 5-point

scale, labelled "a great deal, a good bit, a moderate amount, very little, and none", with lower scores representing the more desireable maternal perception. Discrepancy was calculated between the scores on each item for the two inventories, and a total discrepancy score is obtained, with negative discrepancy scores indicating that the mother perceived her baby as more difficult than the average baby. See Appendix H for the Your Baby and Average Baby Perception Inventories.

Analyses

The following variables were scored and entered on computer cards for all subjects: Discrete variables were:

Sex

Ethnicity

Psychogenic Risk 1--a history of emotional disturbance in the primary caretaker

Psychogenic Risk 2--a history of emotional disturbance in other caretakers

Psychogenic Risk 3--a history of conflict in the family

Biogenic Risk 1--prenatal complications in the mother or infant

Biogenic Risk 2--complications in delivery

Biogenic Risk 3--birth weight less than 2500 grams

Sociogenic Risk 1--age of primary caretaker 15 years or less

Sociogenic Risk 2--education of primary caretaker eleventh grade or less

Sociogenic Risk 3--family receives Aid to Families with Dependent Children

Continuous variables were:

Strange situation proximity seeking,episode 5 (PS1)

Strange situation proximity seeking, episode 8 (PS2)

Strange situation contact maintenance, episode 5 (CM1)

Strange situation contact maintenance, episode 8 (CM2)

Strange situation contact resistance, episode 5 (CR1)

Strange situation contact resistance, episode 8 (CR2)

Strange situation proximity avoidance, episode 5 (PA1)

Strange situation proximity avoidance, episode 8 (PA2)

Strange situation distance interaction, episode 5 (DI1)

Strange situation distance interaction, episode 8 (DI2)

Bayley Mental Development Index at 3 to 6 months

Bayley Mental Development Index at 12 months

Bayley Psychomotor Development Index at 3 to 6 months

Bayley Psychomotor Development Index at 12 months

FISS security index at 3 to 6 months

FISS security index at 12 months

HOME subscale 1: Emotional and verbal responsivity of the Mother, at 3 to 6 months (HOME1-3) and at 12 months (HOME1-12)

HOME subscale 2: Avoidance of restriction and punishment, at 3 to 6 months (HOME2-3) and at 12 months (HOME2-12)

HOME subscale 3: Organization of the Physical and Temporal Environment, at 3 to 6 months (HOME 3-3) and at 12 months (HOME 3-12)

HOME subscale 4: Provision of appropriate Play Materials, at 3 to 6 months (HOME4-3), and at 12 months (HOME4-12)

HOME subscale 5: Maternal Involvement with the Child, at 3 to 6 months (HOME 5-3), and at 12 months (HOME5-12)

HOME subscale 6:Opportunities for Variety in Daily Stimulation, at 3 to 6 months (HOME6-3) and at 12 months (HOME6-12)

HOME total score at 3 to 6 months (HOME7-3) and at 12 months (HOME7-12)

NPI score at 3 to 6 months

NPI score at 12 months

These 44 variables were submitted to the University of Houston computing center Univac 4700 computer and a correlation matrix was obtained. The intercorrelations of all variables are presented in Table 2. A correlation coefficient of r = .312 was considered to indicate a significant correlation between two variables, df = 38, p .05.

In addition, variable Y was computed, forming two groups on the basis of the strange situation classification: group 1 includes all B subcategories and is considered to be the secure group, in contrast to the "insecure" A and C babies who make up group 2. The Y security variable was also correlated with all variables and is included in the intercorrelation matrix.

To test hypothesis 1, a discriminant function analysis was used to determine whether the insecure babies could be differentiated from the secure babies in terms of their risk scores. To assess the contribution of risk components to the specific interactional behaviors in the strange situation

TABLE 2

Table of Intercorrelations[1]

Variable	1	2	3	4	5	6	7	8	9	10
sex 1										
Anglo 2	-14									
Black 3	04	00								
Mex-Amer 4	12	00	00							
PS1 5	26	-13	-13	33						
CM1 6	25	-18	-11	37	76					
CR1 7	02	04	07	15	-08	09				
PA1 8	-17	02	-20	-29	-46	-40	07			
DI1 9	-12	-01	-02	06	-08	-34	-07	-23		
PS2 10	06	-19	13	07	57	45	15	-39	20	
CM2 11	-09	-15	04	15	43	46	29	-46	-18	47
CR2 12	-04	14	-23	14	11	23	52	-24	03	35
PA2 13	-12	16	-09	-05	33	-15	-10	73	-33	-65
DI2 14	06	06	-08	04	11	-01	-27	-13	56	23
Psy 1 15	-28	00	02	-04	04	07	-18	-11	36	-02
Psy 2 16	-25	13	00	-16	-05	-22	-14	-22	20	-11
Psy 3 17	-19	-25	47	-34	-03	06	00	43	-24	11
Bio 1 18	09	20	-12	03	03	06	-21	-03	14	-18
Bio 2 19	-01	14	-19	08	05	-15	09	-24	41	09
Bio 3 20	-15	17	02	-24	-13	-18	04	15	-04	-16
Soc 1 21	39	-31	32	-06	16	24	-19	23	-33	01
Soc 2 22	09	-22	20	-01	-12	-15	17	35	19	-10
Soc 3 23	05	-35	41	-14	-29	-34	00	10	23	-01
MDI 3-6 24	-04	11	-18	12	22	-05	-01	-04	20	29
PDI 3-6 25	-14	05	-13	12	23	26	-07	07	05	42
MDI 12 26	-26	17	-03	-17	14	17	06	10	-11	21
PDI 12 27	-05	-06	13	-10	15	15	-15	14	-19	24

[1] decimal points omitted

TABLE 2

Table of Intercorrelations, continued

Variable	1	2	3	4	5	6	7	8	9	10
FISS 3 28	-05	09	-14	08	-33	-35	-18	17	07	-17
FISS 12 29	01	08	-19	17	05	-03	08	07	20	27
HOME 1-3 30	-13	34	-37	08	15	00	-10	-19	09	12
HOME 2-3 31	12	06	00	-08	-19	-34	-25	-17	35	-01
HOME 3-3 32	07	37	-35	03	09	00	-05	-18	-22	03
HOME 4-3 33	14	65	-39	-29	-02	01	-13	-26	02	02
HOME 5-3 34	05	35	-23	-12	-12	-34	-14	-10	18	-04
HOME 6-3 35	-09	23	-25	07	17	12	-16	-16	-08	-05
HOME 7-3 36	12	53	-41	-09	04	-14	-18	-17	-04	-02
HOME 1-12 37	-14	19	-32	21	08	02	10	-21	12	23
HOME 2-12 38	09	-01	-06	08	-10	-14	25	-23	27	11
HOME 3-12 39	-08	36	-36	05	-10	-14	11	-11	03	11
HOME 4-12 40	04	47	-35	-09	14	04	12	-08	-12	18
HOME 5-12 41	-01	36	-23	-11	08	10	-04	-10	-15	02
HOME 6-12 42	03	40	-35	00	23	14	-25	-30	00	06
HOME 7-12 43	00	40	-35	00	11	07	-01	-28	05	22
NPI 3 44	12	-36	27	08	-10	-02	20	36	-34	02
NPI 12 45	18	-49	30	16	07	01	-10	14	16	-04
Mo's age 46	-04	26	-40	23	06	11	10	-21	18	21
No. sibs. 47	08	08	-27	29	17	23	36	-06	-03	22
Other caret.48	-20	-14	35	-30	-02	-11	-02	09	-14	13
Insec=A+C 49	-09	04	-05	-33	-07	-28	-02	07	-14	-49
Insec=A,B4,+C 50	07	06	-15	13	-07	28	11	42	-42	-42

TABLE 2

Table of Intercorrelations, continued

Variable	11	12	13	14	15	16	17	18	19	20
12	41									
13	-45	-32								
14	-35	-15	-18							
15	-04	01	07	38						
16	06	25	-02	-13	19					
17	07	-11	16	-13	-08	-25				
18	-18	-07	18	-01	43	13	-25			
19	-21	09	-35	22	-08	17	-23	-03		
20	-31	03	04	00	-07	11	04	06	47	
21	-11	-20	23	-34	-26	-20	23	-03	-26	-13
22	-39	08	17	-07	-06	-06	13	03	05	09
23	00	-21	-03	-16	-13	08	00	21	-15	-40
24	29	11	06	-07	19	04	-04	16	-47	-72
25	24	15	01	14	18	-08	-07	06	-39	-53
26	20	06	13	03	24	14	07	15	-42	-56
27	22	-01	08	-12	18	02	23	10	-55	-65
28	-35	-14	27	18	02	00	-24	-20	-15	-06
29	02	-04	07	23	16	-23	-10	-12	-03	02
30	28	-05	-11	01	-08	-05	-10	-05	15	-07
31	04	-05	-28	23	-04	06	-20	-01	04	-10
32	01	11	-15	-17	-20	03	-18	-08	09	-10
33	02	13	-07	-09	-18	14	-13	06	07	21
34	00	-06	-09	12	-13	07	-14	-16	16	10
35	03	04	01	-01	09	12	-17	03	-08	23
36	03	-05	-12	00	-20	-02	-16	-03	14	02
37	22	13	-13	27	04	-06	-05	-39	19	01
38	02	-27	-18	16	02	-02	-21	-36	19	01
39	13	22	-34	-14	-02	-11	-07	-11	20	10
40	05	14	-08	14	04	01	-06	12	00	06
41	04	03	10	13	11	15	-15	09	-01	09
42	-05	09	-10	34	12	24	-07	11	23	29

TABLE 2

Table of Intercorrelations, continued

Variable	21	22	23	24	25	26	27	28	29	30
22	37									
23	18	27								
24	14	-11	27							
25	11	-20	05	81						
26	-02	-19	14	67	66					
27	17	-03	19	75	68	79				
28	16	23	-09	06	02	-12	01			
29	-11	-06	-16	24	25	-11	05	35		
30	-29	-54	-39	01	19	17	05	00	12	
31	-30	-37	-07	-04	02	01	-03	01	03	66
32	-01	-06	-21	17	05	07	11	22	-10	36
33	-02	-13	-32	05	-02	08	-03	05	00	24
34	-25	-28	-18	-13	-05	-06	-11	20	21	70
35	17	-10	-52	-03	-02	-22	-07	33	21	26
36	-14	-33	-30	-03	03	007	02	08	05	76
37	-39	-46	-46	03	19	00	-03	12	38	65
38	-07	-39	-04	-16	01	15	-17	07	20	59
39	-29	-11	-47	-10	-12	-12	-22	13	-10	32
40	-14	-04	-25	12	09	23	14	08	-09	22
41	-28	-37	-31	25	21	21	17	08	19	35
42	-32	-41	-65	-15	-09	10	-05	03	-04	38
43	-29	-43	-43	07	15	10	04	18	21	58
44	04	09	06	08	15	21	37	02	-01	-26
45	10	02	16	35	24	05	38	07	21	-23
46	-44	-51	-20	00	11	-02	-16	-02	27	31
47	-21	-09	-18	-26	-05	-22	-36	-31	11	01
48	27	09	15	12	00	04	12	22	-07	-31
49	14	37	06	-05	-11	-02	-02	04	-01	-35
50	23	29	-10	20	12	08	15	-01	-09	-33

TABLE 2

Table of Intercorrelations, continued

Variable	31	32	33	34	35	36	37	38	39	40
32	09									
33	-05	55								
34	62	44	49							
35	00	31	34	26						
36	52	71	66	84	41					
37	42	23	13	53	16	48				
38	68	05	-05	48	23	46	53			
39	17	55	38	22	31	44	37	15		
40	05	27	55	10	29	39	27	15	47	
41	35	26	32	29	21	41	60	24	37	56
42	27	29	45	41	36	48	43	13	46	34
43	44	33	38	44	36	58	78	53	60	67
44	-14	-11	-22	-17	-07	-27	-08	-09	-41	-26
45	10	-27	-37	-15	06	-26	-05	01	01	-25
46	15	-09	03	12	11	11	34	28	03	18
47	-29	-30	06	-10	-33	-19	13	-12	-12	-03
48	-34	25	-05	-18	16	-15	-05	-21	00	-04
49	-42	-01	05	-20	-13	-17	-41	-45	-31	-16
50	-47	14	02	-36	-03	-19	-34	-48	-07	-07

TABLE 2

Table of Intercorrelations, continued

Variable	11	12	13	14	15	16	17	18	19	20
43	13	05	-15	26	04	01	-12	-09	13	06
44	-01	13	30	-21	-13	06	13	-14	-39	-19
45	01	-23	-05	02	10	01	-08	-10	-45	-27
46	13	25	-06	29	22	10	-19	26	17	04
47	13	28	-13	08	-29	-19	-06	-21	38	21
48	04	-06	-07	-02	10	05	25	-37	-10	-04
49	-57	-11	69	-23	03	-03	22	24	-14	23
50	-23	04	67	-33	02	-12	14	30	-32	-03

TABLE 2

Table of Intercorrelations, continued

Variable	41	42	43	44	45	46	47	48	49	50
42	56									
43	82	64								
44	-03	-12	-19							
45	03	-18	-16	64						
46	22	23	34	-04	-27					
47	-19	-11	-11	-02	-29	37				
48	-05	-13	-07	05	05	-23	-37			
49	-15	-23	-42	17	-16	-06	-02	03		
50	01	-13	-28	29	-03	-03	-04	-14		

(PS1 to DI2), ten multiple regression analyses were obtained, five for behaviors in episode five and five for episode eight.

Hypothesis two, regarding the power of the FISS to predict security in the strange situation, was tested by a discriminant function analysis which examined the extent to which secure and insecure subjects could be discriminated by their FISS scores at three and at 12 months.

The third hypothesis, stating that developmental delay is increased as risk factors increase, was examined by two multiple regression analyses of the contributions of specific risk components to development. One regression was computed of the 12 month Bayley MDI on the nine risk variables and their totals, and one of the 12 month PDI on the risk variables. The contribution of delay to insecure attachment was assessed by a discriminant function analysis of the extent to which 3 to 6 month and 12 month MDI's and PDI's discriminate secure from insecure infants.

To see if maternal perception of her baby between 3 and 6 months and at 12 months could predict security of 12 month attachment, a discriminant function analysis of the 3-6 month and 12 month NPI scores was obtained. The relationship of maternal sensitivity, responsivity, and stimulation of the baby to 12 month attachment was examined by a discriminant function analysis of the extent to which the 3-6 month and 12 month HOME scales discriminate the secure from insecure groups. These analyses provided a test of Hypothesis 4.

In addition, in order to examine contributions of the HOME scales at 12 months to the interactive behaviors in the strange situation, ten multiple regression analyses were computed, of PSI to DI 2 on the HOME subscales.

In addition to the above analyses which tested specific hypotheses, statistical procedures were performed to further examine characteristics of the subsample of B4 babies. This was due to the considerations that security of attachment refers to the child's ability to reduce stress and regain equilibrium in the attachment-exploration balance by getting comfort from the attachment figure. Avoidance of and resistance to the mother as an attachment figure are seen as maladaptive responses in stressful situations. Infants in subclassification B4 typically became very upset during separations from the mother, and approached and clinged to her without ambivalence. In these areas, they are accurately regarded as security attached. However, the B4 babies in the present sample not only intensely protested when their mothers left the room, remained inconsolable during the stranger's efforts to soothe them, and collapsed into screaming paralysis when left alone, but they also continued crying long into episode 8 while in their mother's arms. They did not recover. Their crying often intensified when their mothers shifted them, as if they dreaded being put down, and interest in exploring the toys had vanished completely. For these reasons a question about the "security" of B4 babies

was raised: were the five subjects in this group more like the A and C babies on the other measures than like the B1, 2, and 3 babies? In order to examine this, all means, standard deviations, crosstabs, and discriminant analyses were obtained two ways. First, the secure babies were defined as B1, 2, 3, and 4, and A and C were considered insecure; then babies who were classified as B1, 2, and 3 were assigned to the secure group and A, B4, and C subjects to the insecure group.

CHAPTER III

RESULTS

Risk Variables

Frequencies and percentages of each risk variable along with means of the psychogenic, biogenic, and sociogenic risk subtotals and the overall mean risk totals are summarized in Table 3. Psychogenic risk was least prevalent, even though more babies were born into families in conflict (70%) than were at risk for any other variable; for 52% of the sample, family conflict was the only psychogenic risk. This relatively small group psychogenic risk apparently reflects the fact that emotionally disturbed mothers and mothers who would take their babies into families where emotionally disturbed others would also care for them were least often the sources of risk prompting referral to the Birth to Three Project.[10] The least frequent risk variable, history of pathology in other caretakers, is confounded by the fact mentioned above that only 21 babies had caretakers other than their primary one, as informally reported by the case workers who were familiar with daily caretaking arrangements. Of these, five or 19% had a history of pathology, eight of the total sample were not at risk on any of the psychogenic variables, 23 were at risk on only one (none of these were at risk for family conflict only), nine were at risk on two psychogenic variables, and none on all three.

TABLE 3

Frequencies of Infants With and Without Psychogenic, Biogenic, and Sociogenic Risk Components[1]

Psychogenic		
With	Without	Type
32	8	History of pathology, primary caretaker (8)
35	5	History of pathology, other caretaker (9)
12	28	Family conflict
8		No psychogenic risk

Biogenic		
With	Without	Type
30	10	Prenatal complications (6)
17	23	Delivery complications (3)
22	18	Low birth weight (5)
11		No Biogenic Risk

Sociogenic		
With	Without	Type
31	9	Mother age 15 or younger (7)
13	27	Mother's education 11th grade or less (2)
9		No sociogenic risk

[1]Numbers in parentheses refer to the variables' rank in order of descending prevalence.

Eleven subjects had no biogenic risk (27.5%) at all, while four had all three--both prenatal and delivery complications and weighed less than 2500 grams (two of these were A babies). Only two of the 18 low birth weight babies had no other biogenic risk. Eleven babies had both delivery complications and low birth weight, and these are clearly not independent, since several conditions which constitute complications in delivery also contribute to premature labor and birth.

The most common source of risk is sociogenic, not surprising since most of the sample were referred from a county hospital, which has a large proportion of low income clients. Though nine subjects (22.5%) had no sociogenic risk, there were 27 (67.5%) whose mothers had no more than an eleventh grade education. Mother's education is obviously confounded by her age, since a 15-year old would have to be accelerated to be in the eleventh grade. In fact, all nine of the 15-year old and younger mothers were also educated at below the eleventh grade level. The mean age of the mothers was 20.5 (range 13 to 36), with half the sample age 19 and under and half 20 or over. Frequencies, means, and standard deviations of risk variables, as well as Bayley, FISS, HOME, and NPI scores, are presented in Table 4.

Strange Situation Interactive Behaviors

Table 5 summarizes the frequencies, means, and standard deviations of the proximity seeking, contact maintenance,

TABLE 4

Frequencies, Means, Standard Deviations, Risk Variables, Bayley, FISS, HOME, and NPI Scores at 3 to 6 Months and at 12 Months

Variable[1]	Frequency	Mean	Standard Deviation
Psychogenic Risk 1	40	.20	.41
Psychogenic Risk 2	40	.13	.33
Psychogenic Risk 3	40	.70	.48
Biogenic Risk 1	40	.25	.44
Biogenic Risk 2	40	.58	.50
Biogenic Risk 3	40	.45	.50
Sociogenic Risk 1	40	.23	.42
Sociogenic Risk 2	40	.68	.47
Sociogenic Risk 3	40	.50	.51
MDI-3 to 6 Months	39	95.10	23.90
PDI-3 to 6 Months	39	101.26	26.30
MDI-12 Months	40	103.95	14.93
PDI-12 Months	40	98.30	17.38
FISS-3 to 6 Months	37	32.11	10.04
FISS-12 Months	39	33.03	8.32
HOME 1-3 to 6 Months	37	5.84	1.74
HOME 2-3 to 6 Months	37	5.73	1.76
HOME 3-3 to 6 Months	37	4.65	1.93
HOME 4-3 to 6 Months	37	3.49	2.09
HOME 5-3 to 6 Months	37	4.84	2.08
HOME 6-3 to 6 Months	37	3.14	1.53
HOME 7-3 to 6 Months	37	4.30	2.11
HOME 1-12 Months	39	6.87	1.64
HOME 2-12 Months	39	4.92	2.12
HOME 3-12 Months	39	4.95	1.88
HOME 4-12 Months	39	5.36	1.68
HOME 5-12 Months	39	5.21	2.00
HOME 6-12 Months	39	4.00	1.61
HOME 7-12 Months	39	5.33	1.90
NPI-3 to 6 Months	37	2.49	4.63
NPI-12 Months	38	3.08	3.40

[1]See list of variable names on page 76.

TABLE 5

Frequencies, Means, and Standard Deviations, Strange Situation Interactive Behaviors

Interactive Behaviors	Frequency	$\bar{X}$	S.D.
Proximity Seeking, Episode 5	40	3.48	2.15
Contact Maintenance, Episode 5	40	2.50	1.92
Contact Resistance, Episode 5	40	1.25	.71
Proximity Avoidance, Episode 5	39	2.48	1.87
Distance Interaction, Episode 5	38	2.71	1.96
Proximity Seeking, Episode 8	38	4.68	1.82
Contact Maintenance, Episode 8	38	4.10	2.41
Proximity Avoidance, Episode 8	37	1.84	1.52
Distance Interaction, Episode 8	37	2.54	2.21

contact resistance, proximity avoidance, and distance interaction behaviors in the fifth and eighth episodes of the strange situation. A majority showed an increase in proximity seeking, contact maintenance, and contact resistance and a decrease in proximity avoidance and distance interaction in episode eight as compared to episode five.

Missing Values

In several cases episode six, in which mother makes her second exit leaving baby alone, was curtailed due to the baby's distress, and the stranger reentered before three minutes had elapsed. Two of the babies, both of whom were in the B4 group, became so upset that the strange situation had to be discontinued during episode six. Technical videotape difficulties resulted in partially missing episode five data for one subject and episode eight data for another, both of whom could nonetheless be classified. Baseline scores in the Bayley, FISS, HOME, and NPI for one subject and on the FISS, HOME , and NPI for a second subject were not obtained because they were referred to the Birth to Three Project after age six months. Other missing data include the FISS, HOME, and NPI at 12 months for one subject, a three to six month FISS for another, and a three to six month NPI for another.

Reliabilities

Each videotaped strange situation was observed simultaneously by three raters. After episodes five and eight, the

tape was stopped and each rater coded the five interactive behaviors. Before coding, the tape was rerun as often as needed for each rater to feel confident about having gathered the required information. One rater timed the mother-infant contact with a stopwatch for both episodes. No comments or discussion about the strange situation was made until after each rater had assigned the scores for the episode being coded. Then scores were compared and rationales for the ratings discussed until all three raters agreed on a score. This procedure was repeated for the assigning of classification for each subject, so as to minimize the effects of experimenter bias. All three raters were staff of the Birth to Three Project, and one rater had primary case responsibility for 16 of the subjects, one rater was project coordinator and had some knowledge of all subjects, and one rater (the author) had some knowledge of a few of the cases. This prior knowledge was a possible influence on the codings, in that expectations regarding which babies would be avoidant or resistant could have been operating from knowledge of a rejecting or ambivalent mother, home observations, etc. However, coding procedures adhered very strictly to the specific behaviors in the strange situations, and reliabilities between the raters with the most and the least knowledge were high, thus suggesting that bias was minimal.

Raters were trained in the scoring technique by careful study of the coding system presented in Appendix C, by training sessions with pre-coded "practice" strange situation tapes

sent by Alan Sroufe and Everett Waters of the University of Minnesota, and by several consultations with and reliability checks by Sroufe. It is felt that these training preparations and consultations provided a highly reliable understanding of and accuracy in coding the strange situation behaviors that are consonant with the original intent and rationale of the strange situation technique.

Measures of reliability have supported this impression. An Ebel's Interclass Correlation Coefficient was calculated for each interactive behavior for both episodes five and eight. These were used to obtain a Spearman-Brown estimate of reliability for each variable. In addition, a percentage of agreements test provided a measure of reliability of the classification of subjects into the subcategories (A1, A2, B1, B2, B3, B4, C1, and C2) and into the general A, B, and C categories. Table 6 provides a summary of the Spearman-Brown coefficients and the percentage of agreement reliabilities.

Groups

Of the 40 subjects, 31 were judged by the raters to be secure, or B babies (4 B1, 10 B2, 12 B3, 5 B4), and nine were categorized as insecure, being scored as either A(5 A1, 3 A2) or C (1 C1, no C2). When B4 babies are classed as insecure, this group has a total of 14, with 26 considered to be secure. A cross-tabulation of frequencies in the secure and insecure groups by sex, race, and risk components is presented in Table 7. Means and standard deviations of the secure and insecure groups on the Bayley, FISS, HOME,

TABLE 6

Mean Reliabilities Between Attachment Raters

N = 3

Interactive Behavior	Spearman-Brown Coefficients Episode 5	Episode 8
Proximity Seeking	.98	.91
Contact Maintenance	.98	.96
Contact Resistance	.85	.91
Proximity Avoidance	.95	.70
Distance Interaction	.88	.92

	Percentage of Agreement
Classification	.975
Subclassification	.80

TABLE 7

Frequencies of Secure and Insecure Infants on Sex, Ethnicity, and Risk Components

Variable		Secure	Insecure
Sex	Girls	14	5
	Boys	17	4
Ethnicity	Black	19	5
	Anglo	6	4
	Mex-Amer	6	0
At Risk	Emotional Disturbance Mother	6	2
	Emotional Disturbance Other Caretaker	4	1
	Family Conflict	20	8
	Prenatal Complications	6	4
	Complications During Delivery	19	4
	Low Birth Weight	12	6
	Mother Age 15 or Younger	6	3
	Mother Education 11th Grade	18	9
	AFDC Supported	15	5

and NPI scores are presented in Table 8.

Analyses

Hypothesis 1. A discriminant function analysis was used to predict security or insecurity of attachment from the nine risk variables and their totals. The analysis used a stepwise procedure to select the best set of predictor variables. Table 9 presents the stepwise summary table and prediction results. When A and C versus B discriminations were made, the group centroids were secure=.125 and insecure= -.431, and the Wilks' lambda test of the equality of group centroids yielded a Wilks' λ of .663. The resulting X^2 was 14.60, which is significant at p=.012. When B4 subjects were moved to the insecure group, the resulting centroids were .323 for the secure group and -.5997 for the insecure group, X^2=18.59, significant at p=.002. See Table 10 for this discriminant function analysis and prediction results. These results support the hypothesis that risk components at birth can be used to predict security of attachment.

A second discriminant analysis was computed, using only the nine risk variables and omitting their totals. Table 11 summarizes the discriminant function analysis and the prediction results. When all B categories made up the secure group and the A and C babies the insecure group, neither the Wilks' lambda and significance level of the discriminant function nor the percentage of correctly grouped cases changed. The

TABLE 8

Secure and Insecure Group Means and Standard Deviations on Bayley Mental and Psychomotor Development Indices, FISS, HOME, NPI, at Three to Six Months and at Twelve Months

Variable[a]	Secure		Insecure		Total	
	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.
MDI-3 to 6 Months	95.7	25.4	93.0	19.2	95.1	23.9
PDI-3 to 6 Months	102.8	28.1	96.1	19.6	101.3	26.3
MDI-12 Months	103.7	15.2	103.4	15.1	103.6	15.0
PDI-12 Months	98.1	18.8	97.7	13.3	98.0	17.5
FISS-3 to 6 Months	31.4	9.1	32.9	12.8	31.9	9.9
FISS-12 Months	32.6	9.2	31.6	4.2	32.4	8.3
HOME 1-3 to 6 Months	6.1	1.7	4.8	1.6	5.8	1.7
HOME 2-3 to 6 Months	6.2	1.5	4.4	2.1	5.7	1.8
HOME 3-3 to 6 Months	4.5	2.0	4.7	1.8	4.6	2.0
HOME 4-3 to 6 Months	3.5	2.2	3.7	1.9	3.6	2.1
HOME 5-3 to 6 Months	5.1	2.2	4.1	1.7	4.8	2.1
HOME 6-3 to 6 Months	3.2	1.6	2.8	1.2	3.1	1.5
HOME 7-3 to 6 Months	4.5	2.2	3.7	1.9	4.3	2.1
HOME 1-12 Months	7.3	1.4	5.7	1.9	8.9	1.7
HOME 2-12 Months	5.5	1.9	3.2	2.2	4.9	2.2
HOME 3-12 Months	5.4	1.7	3.9	2.3	5.0	1.9
HOME 4-12 Months	5.4	1.6	4.9	2.1	5.3	1.7
HOME 5-12 Months	5.4	2.1	4.7	1.7	5.3	2.0
HOME 6-12 Months	4.2	1.7	3.3	1.3	4.0	1.6
HOME 7-12 Months	5.9	1.8	3.9	1.8	5.4	2.0
NPI-3 to 6 Months	2.3	4.5	2.7	4.7	2.5	4.6
NPI-12 Months	3.0	3.2	3.3	3.5	3.1	3.4

[a] See page 76 for Variable Names

TABLE 9

Summary of Stepwise Discriminant Function Analysis, Secure (B Group) Versus Insecure (A and C Groups) Infants on Risk Components and Risk Totals, Prediction Results

Step Number	Variable Entered	F to Enter or Remove	Significance
1	Mother's Educ.	6.18	.017
2	Prenatal Complics.	2.44	.019
3	Family Conflict	2.85	.014
4	Low Birth Weight	1.54	.017
5	Total Biogenic Risk	2.75	.012

Prediction Results

Actual Group	Number Cases	Predicted Secure	Predicted Insecure
Secure	31	20 64.5%	11 35.5%
Insecure	9	0 0%	9 100%

Percent of 'grouped' cases correctly classified: 72.5%

TABLE 10

Summary of Stepwise Discriminant Function Analysis, Secure (B1, B2, B3 Subgroups) and Insecure (A, B4, C Subgroups) Infants on Risk Components and Risk Totals, Prediction Results

Step Number	Variable Entered	F to Enter or Remove	Significance
1	Delivery Complics.	4.44	.039
2	Prenatal Complics.	4.52	.015
3	Mother's Education	4.35	.006
4	AFDC Assistance	4.60	.003
5	Family Conflict	2.12	.003

Prediction Results

Actual Group	Number Cases	Predicted Secure	Predicted Insecure
Secure	26	21 80.8%	5 19.2%
Insecure	14	4 28.6%	10 71.4%

Percent of 'grouped' cases correctly classified: 77.5%

TABLE 11

Summary of Stepwise Discriminant Function Analysis, Secure Versus Insecure on Risk Components, Totals Excluded, Prediction Results

Step Number	Variable Entered	F to Enter or Remove	Significance
1	Mother's Educ.	6.17	.017
2	Prenatal Complics.	2.43	.019
3	Family Conflict	2.85	.014
4	Low Birth Weight	1.53	.017
5	Delivery Complics.	2.74	.012

Prediction Results

Actual Group	Number Cases	Predicted Secure	Predicted Insecure
Secure	31	20 64.5%	11 35.5%
Insecure	9	0 0%	9 100%

Percent of 'grouped' cases correctly classified: 72.5%

centroids were pushed farther apart, however, to .258 for the secure group and -.888 for the insecure group, indicating that the total psychogenic, biogenic, and sociogenic risk scores did not add to the distinction between groups. This was not the case when B4 subjects were classed as insecure, in that the centroids as well as all other measures remained the same.

Results of the multiple regression analysis of the risk variables' contributions to each of the strange situation interactive behaviors are summarized in Table 12. It is surprising that so much variation in the interactive behaviors can be attributed to variations in risk scores. In the fifth episode, the highest multiple R was that of distance interaction (R=.74), the lowest, contact resistance (R=.46), with proximity seeking (R=.51), contact maintenance (R=.61), and proximity avoidance (R=.63) clustered in between. Multiple R's for episode 8 behaviors were proximity seeking R=.37, contact maintenance R=.53, proximity avoidance R=.51, contact resistance R=.50, and distance interaction R=.61.

Hypothesis 2. When FISS-3 to 6 months and FISS 12 months scores provided the basis of the discriminant function analysis F ratios were below the F-to-enter level of 1.000, and so were insufficient for computation of a stepwise discriminant function analysis. This was true when B4 babies were included in the secure group (FISS 3 to 6 months F=.1438, p .05; FISS 12 months F=.922, p .05).

TABLE 12

Summary of Multiple Regression

Strange Situation Attachment Behaviors on

Risk Components, Episodes 5 and 8

Proximity Seeking, Episode 5

Variable	Multiple R	R Square	Simple R	Beta
Sociogenic Risk 3	.29	.09	-.29	-.47
Biogenic Risk 3	.40	.16	-.13	-.65
Sociogenic Risk 1	.44	.20	.16	.29
Total Biogenic Risk	.50	.25	-.03	.43

Proximity Seeking, Episode 8

Variable	Multiple R	R Square	Simple R	Beta
Biogenic Risk 1	.18	.03	-.18	-141
Biogenic Risk 3	.23	.05	-.16	-.59
Total Biogenic Risk	.30	.09	-.11	.59
Psychogenic Risk 3	.33	.12	.11	.14
Sociogenic Risk 2	.35	.12	-.09	-.06

Contact Maintenance, Episode 5

Variable	Multiple R	R Square	Simple R	Beta
Sociogenic Risk 3	.34	.12	-.34	-.59
Biogenic Risk 3	.49	.24	-.19	-.44
Sociogenic Risk 1	.57	.32	.23	.26
Biogenic Risk 1	.58	.34	.06	.12

TABLE 12, continued

Summary of Multiple Regression

Strange Situation Attachment Behaviors on

Risk Components, Episodes 5 and 8

Contact Maintenance, Episode 8

Variable	Multiple R	R Square	Simple R	Beta
Sociogenic Risk 2	.39	.15	-.39	-.28
Total Biogenic Risk	.49	.24	-.33	-.09
Psychogenic Risk 2	.51	.26	.008	.16

Proximity Avoidance, Episode 5

Variable	Multiple R	R Square	Simple R	Beta
Psychogenic Risk 3	.43	.18	.43	.15
Sociogenic Risk 2	.52	.27	.334	.33
Biogenic Risk 2	.54	.30	-.24	-.49
Biogenic Risk 3	.59	.35	.15	.11

Proximity Avoidance, Episode 8

Variable	Multiple R	R Square	Simple R	Beta
Biogenic Risk 2	.35	.12	-.35	-.58
Total Biogenic Risk	.46	.20	-.08	.29
Sociogenic Risk 2	.49	.24	.17	.16
Sociogenic Risk 3	.50	.25	-.03	-.14

TABLE 12, continued

Summary of Multiple Regression

Strange Situation Attachment Behaviors on

Risk Components, Episodes 5 and 8

Contact Resistance, Episode 5

Variable	Multiple R	R Square	Simple R	Beta
Biogenic Risk 1	.21	.04	-.20	-.12
Sociogenic Risk 1	.29	.08	-.19	-.37
Sociogenic Risk 2	.40	.16	.17	.34
Total Psychogenic Risk	.44	.19	-.19	-.27

Contact Resistance, Episode 8

Variable	Multiple R	R Square	Simple R	Beta
Psychogenic Risk 2	.25	.06	.25	127
Sociogenic Risk 3	.34	.11	-.21	-.46
Sociogenic Risk 2	.37	.14	.07	.27
Total Risk	.45	.21	-.08	.16
Sociogenic Risk 1	.48	.23	-.22	-.37

TABLE 12, continued

Summary of Multiple Regression

Strange Situation Attachment Behaviors on

Risk Components, Episodes 5 and 8

Distance Interaction, Episode 5

Variable	Multiple R	R Square	Simple R	Beta
Biogenic Risk 2	.41	.17	.41	.50
Psychogenic Risk 1	.57	.32	.36	.57
Sociogenic Risk 3	.67	.45	.23	.39
Sociogenic Risk 1	.69	.48	-.33	-.16
Sociogenic Risk 2	.71	.51	.19	.29
Total Risk	.74	.54	.29	-.21

Distance Interaction, Episode 8

Variable	Multiple R	R Square	Simple R	Beta
Psychogenic Risk 1	.38	.14	.38	.42
Sociogenic Risk 1	.46	.21	-.34	-.27
Psychogenic Risk 2	.52	.27	-.13	-.35
Biogenic Risk 2	.57	.32	121	.33
Total Biogenic Risk	.59	.35	110	-.29

Hypothesis 3. Table 13 provides a summary of information yielded by the discriminant function analysis of the secure and insecure groups' developmental scores. When the Bayley MDI and PDI scores at 3 to 6 and at 12 months were used to discriminate A and C from B babies, the discriminant function analysis could not be computed because the F levels were below 1.000 (MDI 3 to 6 months F=.0884, p .05, MDI 12 months F=.4412, p .05; PDI 3 to 6 months F=.002, p .05; and PDI 12 months F= .0048, p .05). However, when B4 subjects were moved to the insecure group, a discriminant function was calculated for one step only, based on MDI 3 to 6 months F=1.48, MDI 12 F=.5429, PDI 3 to 6 months F=.3296, and PDI 12 months F=1.007. However, this was insignificant at p=.23.

Table 14 summarizes the multiple correlation of MDI 12 months and PDI 12 monthson the risk variables. When the 12 month MDI was predicted on the risk components, a multiple R of .694 was obtained, accounting for 48% of the variance in the MDI (R^2). When PDI 12 was predicted, R=.787, explaining 62% of the variance. Not surprisingly, low birthweight was the variable contributing most strongly to the measure of mental and psychomotor development.

Hypothesis 4. A discriminant function analysis of the HOME scale at 3 to 6 and at 12 months as a predictor of security and insecurity was computed. When B babies made up the secure group and A and C babies made up the insecure group,

TABLE 13

Summary of Stepwise Discriminant Function Analysis, Secure (B1, B2, B3 Subgroups) and Insecure (A, B4, C Subgroups) Infants on Bayley Mental and Psychomotor Development, Prediction Results

Step Number	Variable Entered	F to Enter or Remove	Significance
1	Mental Development Index, 3 to 6 Mos.	1.48	.230

Prediction Results

Actual Group	Number Cases	Predicted Secure	Predicted Insecure
Secure	25	25 100%	0 0%
Insecure	14	14 100%	0 0%

Percent of 'grouped cases correctly classified: 64.10%

TABLE 14

Summary of Multiple Regression

Bayley Mental and Psychomotor Development

Indices with Risk Components at Twelve Months

Mental Development Index, 12 Months

Variable	Multiple R	R Square	Simple R	Beta
Biogenic Risk 3	.56	.30	-.55	-.44
Total Psychogenic Risk	.63	.40	.27	.42
Sociogenic Risk 2	.65	.42	-.19	.01
Biogenic Risk 1	.66	.44	.15	.30
Biogenic Risk 2	.68	.46	-.42	-.08

Psychomotor Development Index, 12 Months

Variable	Multiple R	R Square	Simple R	Beta
Biogenic Risk 3	.65	.42	-.65	-.90
Total Psychogenic Risk	.72	.52	.28	.42
Biogenic Risk 2	.75	.57	-.55	-.48
Total Biogenic Risk	.76	.58	-.58	.48
Psychogenic Risk 1	.77	.59	.18	-.27

the analysis selected three variables--the avoidance of restriction and punishment at three months and the organization of the physical and temporal environment at 12 and at 3 to 6 months--as significantly distinguishing the attachment groups (p=.005). When B4 subjects were moved to the insecure group, however, eight HOME variables were included in the function, which was also significant at p=.003. These are presented in Tables 15 and 16 along with summaries and prediction results of both these analyses.

The influence of the HOME on the strange situation interactive behaviors was assessed using a multiple regression test, which is summarized for all variables in Table 17. Again multiple R's were unusually large, accounting for much of the variance of the interactive behaviors. The measure of the avoidance of restriction and punishment was most important for proximity seeking, contact maintenance, contact resistance, and distance interaction in the fifth episode, but no pattern was discernible for behavior on the eighth episode.

The final discriminant function analysis to be reported examined the power of the 3 to 6 month and 12 month NPI scores to discriminate secure from insecure groups. When A and C babies made up the insecure group, the F test of the Wilks' lambda was .6318, p .05, for NPI 12 months, both insufficient for further computation. When B4 was moved to the insecure group a discriminant function was calculated on both variables, based on NPI 3 to 6 months, F=1.976, p=.166, and NPI 12 months

TABLE 15

Summary of Stepwise Discriminant Function Analysis, Secure (B Group) Versus Insecure (A and C Groups) Infants on HOME Subscales, Prediction Results

Step Number	Variable Entered	F to Enter or Remove	Significance
1	Avoidance restriction/ punishment, 12 months	8.99	.005
2	Organization physical/ temporal environment, 12 months	3.35	.005
3			
3	Organization physical/ temporal environment, 3 months	2.14	.005

Prediction Results

Actual Group	Number Cases	Predicted Secure	Predicted Insecure
Secure	31	25 80.6%	6 19.4%
Insecure	9	2 22.2%	7 77.8%

Percent of 'grouped' cases correctly classified: 80.0%

TABLE 16

Summary of Stepwise Discriminant Function Analysis,

Secure (B1, B2, B3 Groups) Versus Insecure (A, B4, C Groups)
I
Infants on HOME Subscales, Prediction Results

Step Number	Variable Entered	F to Enter or Remove	Significance
1	Avoidance restriction and punishment	9.82	.004
2	Emotional and verbal responsivity of mother	2.12	.006
3	Maternal involvement	4.03	.003
4	Organization of physical/ temporal environment	1.91	.004
5	Provision of appropriate play materials	2.61	.003
6	Total HOME score	1.91	.003

Prediction Results

Actual Group	Number Cases	Predicted Secure	Predicted Insecure
Secure	26	21 80.8%	5 19.2%
Insecure	14	4 28.6%	10 71.4%

Percent of 'grouped' cases correctly classified: 77.50%

TABLE 17

Summary of Multiple Regression

Strange Situation Attachment Behaviors on

3 to 6 Month and 12 Month HOME Inventory[1]

Proximity Seeking, Episode 5

Variable	Multiple R	R Square	Simple R	Beta
HOME 2-3: Avoid. rest/pun.	.19	.03	-.19	-.14
HOME 1-3: Mo's responsivity	.35	.12	.17	1.57
HOME 6-12:Varied stimul.	.38	.14	.15	.56
HOME 7-3: Total	.42	.18	-.01	-4.19
HOME 1-12:Mo's responsivity	.46	.21	-.04	-1.05
HOME 4-3: Approp. play mats.	.49	.23	.10	.64
HOME 3-3: Organ. environ.	.51	.27	.04	1.50
HOME 3-12:Organ. environ.	.55	.31	-.01	-.33
HOME 4-12:Approp. play mats.	.57	.33	.15	.58
HOME 6-3:Varied stimul.	.62	.39	.08	.08
HOME 5-12:Maternal involvmt.	.63	.40	.02	.80
HOME 2-12:Avoid. rest/pun.	.66	.44	-.13	.68
HOME 7-12: Total	.67	.45	.05	-.69

Proximity Seeking, Episode 8

Variable	Multiple R	R Square	Simple R	Beta
HOME 1-12: Mo's responsivity	.17	.03	.17	-.65
HOME 2-3 : Avoid.restric/pun	.28	.08	-.10	.15
HOME 7-3:: Total	.31	.09	-.11	-4.22
HOME 4-3 : Approp.play mats.	.36	.13	.06	.96
HOME 3-3 : Organ. environ.	.42	.18	.03	1.73
HOME 1-3 Mo's responsivity	.51	.26	.02	1.02
HOME 3-12: Organ. environ.	.58	.33	.02	-.62
HOME 2-12: Avoid.restric/pun	.62	.38	.01	.53
HOME 6-12: Varied stimul.	.65	.43	.08	.29
HOME 5-3 : Maternal involvt.	.68	.47	-.06	1.36
HOME 4-12: Approp.play mats.	.73	.53	.14	.30

TABLE 17

Summary of Multiple Regression

Strange Situation Attachment Behaviors on

3 to 6 Month and 12 Month HOME Inventory

Contact Maintenance, Episode 5

Variable	Multiple R	R Square	Simple R	Beta
HOME 2-3: Avoid.restric/pun	.33	.11	-.33	-.63
HOME 3-1: Organ. environ.	.50	.25	.18	1.69
HOME 7-3: Total	.59	.35	-.15	-4.21
HOME 4-3: Approp.play mats.	.63	.40	.01	.60
HOME 5-12: Maternal involvmt.	.65	.42	.10	1.35
HOME 1-3: Mo's responsivity	.67	.45	.05	-.90
HOME 5-3: Maternal involvmt.	.68	.46	-.19	1.62
HOME 3-3: Organ. environmt.	.71	.50	-.12	-.25
HOME 2-12: Avoid.restric/pun	.74	.54	-.13	.91
HOME 6-12: Varied stimul.	.75	.57	.09	.52

Contact Maintenance, Episode 8

Variable	Multiple R	R Square	Simple R	Beta
HOME 1-3: Mo's responsivity	.21	.04	.21	1.16
HOME 7-3: Total	.36	.14	-.06	-2.37
HOME 4-3: Approp. play mats.	.45	.20	-.02	.79
HOME 3-3: Organiz. environ.	.51	.26	.02	.61
HOME 2-3: Avoid.rest/pun.	.55	.30	-.08	.36
HOME 6-3: Varied stimul.	.56	.31	-.01	.14
HOME 6-12: Varied stimul.	.57	.33	-.01	-.31

TABLE 17

Summary of Multiple Regression

Strange Situation Attachment Behaviors on

3 to 6 Month and 12 Month HOME Inventory

Variable	Multiple R	R Square	Simple R	Beta
Proximity Avoidance, Episode 5				
HOME 3-12: Organiz. environ.	.42	.17	-.41	-.21
HOME 2-12: Avoid.restric/pun	.47	.22	-.27	-.13
HOME 5-12: Maternal involvmt.	.51	.26	-.03	.47
HOME 7-12: Total	.53	.28	-.28	-.36
HOME 2-3 : Avoid.restric/pun	.54	.30	-.24	-.57
HOME 5-3 : Maternal involvmt.	.56	.31	-.15	.09
HOME 1-3 : Mo's responsivity	.57	.32	-.27	-.56
Proximity Avoidance, Episode 8				
HOME 3-12: Organiz. environ.	.31	.09	-.31	-.10
HOME 5-12: Maternal involvmt.	.43	.19	.14	.66
HOME 2-3 : Avoid.restric/pun	.49	.24	-.18	-.82
HOME 1-3 : Mo's responsivity	.53	.28	.04	-.32
HOME 7-12: Total	.57	.32	-.06	-.61
HOME 6-3 : Varied stimul.	.59	.35	.08	.08
HOME 3-3 : Organiz. environ.	.60	.36	-.13	-.77
HOME 7-3 : Total	.61	.37	.01	1.91
HOME 4-3 : Approp.play mats.	.68	.46	-.05	-.83

TABLE 17

Summary of Multiple Regression

Strange Situation Attachment Behaviors on

3 to 6 Month and 12 Month HOME Inventory

Contact Resistance, Episode 5

Variable	Multiple R	R Square	Simple R	Beta
HOME 2-3 : Avoid.rest/pun.	.34	.11	-.34	-.15
HOME 1-12: Mo's responsivity	.42	.18	.06	.31
HOME 6-12: Varied stimul.	.50	.25	-.27	-.72
HOME 3-12: Organ. environ.	.55	.30	.15	.16
HOME 2-12: Avoid.rest/pun.	.59	.34	-.25	-.71
HOME 4-12: Approp.play mats.	.50	.36	.17	.16
HOME 5-12: Maternal involvmt.	.63	.40	-.04	-.71
HOME 7-12: Total	.65	.42	-.01	1.03

Contact Resistance, Episode 8

Variable	Multiple R	R Square	Simple R	Beta
HOME 2-12: Avoid. rest/pun.	.36	.13	-.36	-.35
HOME 1-12: Mo's responsivity	.48	.23	.07	.97
HOME 3-12: Organ. environ.	.50	.25	.23	-.06
HOME 7-3 : Total	.53	.28	-.16	-2.15
HOME 3-3 : Organ. environ.	.55	.31	.10	.85
HOME 5-3 : Maternal involvmt.	.57	.33	-.13	.07
HOME 4-12: Approp. play mats.	.61	.37	.14	.69
HOME 6-3: Varied stimul.	.62	.39	.00	.44
HOME 2-3 : Avoid. rest/pun.	.64	.419	-.13	.88
HOME 5-12: Maternal involvmt.	.69	.48	-.01	-.19
HOME 4-3 : Approp. play mats.	.71	.50	.07	.79
HOME 7-12: Total	.72	552	.01	-1.18
HOME 1-3 : Mo's responsivity	.73	.54	-.16	.43

TABLE 17

Summary of Multiple Regression

Strange Situation Attachment Behaviors on

3 to 6 Month and 12 Month HOME Inventory

Distance Interaction, Episode 5

Variable	Multiple R	R Square	Simple R	Beta

Distance Interaction, Episode 8

Variable		Multiple R	R Square	Simple R	Beta
HOME 6-12:	Varied stimulation	.35	.12	.35	.34
HOME 3-3 :	Organiz. environmt.	.43	.18	-.17	-.38
HOME 1-12:	Mo's responsivity	.45	.20	.24	.42
HOME 5-12:	Maternal involvmt	.47	.22	.10	-.64
HOME 1-3 :	Mo's responsivity	.51	.26	.02	-.53
HOME 2-3 :	Avoid.restric/pun	.52	.28	.22	.05
HOME 4-12:	Approp.play mats.	.56	.30	.12	.41
HOME 2-12:	Avoid.restric/pun	.56	.31	.12	-.29
HOME 4-3 :	Approp.play-mats.	.57	.32	-.07	-.60

F=2.18, though this was insignificant at p=.137. Table 18 summarizes the discriminant function analysis and the prediction results of the discriminant function of NPI on security and insecurity of attachment.

TABLE 18

Summary of Stepwise Discriminant Function Analysis,

Secure (B1, B2, B3 Groups) Versus Insecure (A, B4, C Groups)

Infants on Neonatal Perception Inventory, Prediction Results

Step Number	Variable Entered	F to Enter or Remove	Significance
1	NPI, 3 to six months	1.98	.166
2	NPI, 12 months	2.18	.136

Prediction Results

Actual Group	Number Cases	Predicted Secure	Predicted Insecure
Secure	26	19 73.1%	7 26.9%
Insecure	14	6 42.9%	8 57.1%

Percent of 'grouped' cases correctly classified: 67.5%

CHAPTER IIII

DISCUSSION

Clearly, babies whose 12 month attachments to their primary caretakers are marked by avoidance and/or resistance can be distinguished at birth from those who seek comfort through nonambivalent proximity to the mother and/or contact with her. The results supporting this assertion will first be discussed in the context of the specific hypotheses which were proposed by this research. Since B4 babies were assumed from the beginning of the research to be securely attached (Ainsworth, 1970), findings are focused initially on secure-insecure group differences when insecurity included only the A and C babies.

Hypothesis 1

The question pursued was how well can 12 month security of attachment be predicted by certain physical and social aspects of the newborn which have been suggested as factors increasing the risk of later disorder. In this context, " "security" of attachment is seen as an index of how the child has mastered one of the first tasks of early social development, that is, the use of a human being, i.e., the attachment figure, to manage anxiety in stressful situations.

The results presented in Table 9 demonstrate that risk components do significantly distinguish secure from insecure babies. The hypothesis that more risk factors, regardless

of their specific types and combinations, increase the probability of 12 month insecurity of attachment was not supported, however, since the total number of risk variables was not selected as a discriminating variable nor was it strongly correlated with security or insecurity. When the total risk scores were removed from the discriminant function (Table 11)the results suggest that a) secure infants more frequently had complications during delivery and b) insecure infants more often had markedly conflictful families, pre-natal complications, low birth weight, and mothers who had no more than an eleventh grade education. The strength of this discrimination between secure and insecure babies based on their risk profiles is quite substantial. The combination of risk variables is correlated .58 ($p = .012$) with the criterion variable, and all nine members of the insecure group were accurately classified by the discriminant function equation. On the other hand, 11 (35.5%) of the secure subjects had risk configurations similar to the insecure group and were inaccurately classified. Thus, it is evident that though the two groups do differ widely, there is some overlap.

Risk. The results thus seem to partially confirm the hypothesis that 12 month security of attachment can be predicted from selected psychogenic, biogenic, and sociogenic risk components. This is a step toward a successful risk-assessment approach to prediction of later childhood disorders mentioned above (page 49). The "hammer blows" of family

conflict, prenatal complications, low birth weight, and mother's low educational level have contributed to the index of vulnerability, security of attachment. Yet the "hammer's" effects do not accumulate with successive blows, and the risk categories are not equal in their detrimental effects. There is no such thing as equal blows from the hammer of risk; single risk variables effect different children in different ways. Perhaps a more accurate analogy would be that the three dolls receive blows of different strength from three different sizes and types of hammers.

In any case, the current findings leave unanswered the questions of how risk components interactively effect each other and what are the mediating variables between risk conditions and security of attachment. Bronfenbrenner (1977) has offerred a model for designing experiments which would take into account such aspects of the "ecology of human development". Generally, he urges an expansion and convergence of theoretical conceptions of the "environment", which would focus on systems of relatedness between the four structures of the ecological environment: a) microsystems, or the relation between the developing person and the immediate setting containing the person; b) mesosystems, or interrelationships among major settings, such as between family, hospital, and day care center; c) exosystems, or major formal (laws) and informal (customs) societal institutions, such as neighborhoods, social agencies, transportation facilities, etc., which indirectly influence the relations in the micro-

and meso-systems; and d) macrosystems, or general prototypes of the culture or subculture, including social, legal, political, and economic systems which convey ideology and meaning to many activities in the other systems. For example,

> "what place or priority children and those responsible for their care have in such macrosystems is of special importance in determining how a child and his or her caretakers are treated and interact with each other in different types of settings" (Bronfenbrenner, 1977, p.515).

When the risk components of the present study are examined in terms of Bronfenbrenner's scheme of systems, we can see that they are conceptualized on different levels of the ecological environments of the developing infants. For example, psychogenic risk was found to be much less important in predicting 12 month insecurity than had been expected. This is due to the finding that the prior psychiatric hospitalization of either the primary or secondary caregivers did not contribute much to the between groups variance. However, this is not necessarily an indication that such variables do not influence the way infants negotiate their initial attachment relationships. Rather, it suggests that a closer look be taken of the ways the construct can be defined, i.e., at aspects of the micro- and mesosystems included in psychogenic risk.

Prior hospitalization as a way of measuring emotional disturbance is problematic, for example, in that it obscures degree and type of disturbance, previously existing social

influences of the caregiver's prior dysfunction, the resolution of contributing conflicts, and other aspects that may bear on the way the mother has reciprocated in the development of her infant's relations with her.

Bronfenbrenner (1977) urges that

> "the design of an ecological experiment must take into account the existence in the setting of systems that include more than two persons" (p.520).

This examination of one part of the microsystem, i.e., looking for the impact of conflictful families on the infant's relationship to the primary caretaker, is certainly a step in this direction. And even though this risk component was common to both secure (64%) and insecure (89%) groups (70% of all subjects), it did contribute the the significant discrimination of the secure from insecure babies.

Such a general description of family interaction as "conflict" however, again leaves much room for variation, and, hence, ambiguity in interpretation. How a mother's conflicts with other family members affect her relationship with her infant is an area laden with possible avenues of insight. For example, in a study of the effects exerted by each parent on the other's interactions with the newborn baby in the hospital, Parke (1976) found that in each case,

> "The presence of the spouse significantly altered the behavior of the other parent, specifically , both father and mother expressed more positive affect (smiling) toward their infant and showed a negative level of expectation when the other parent was present...These results indicate that parent-infant i nteraction patterns are modified by the presence

> of another adult; in turn, the implication is that we have assumed prematurely that parent-infant interaction can be understood by our sole focus on the parent-infant dyad alone" (p. 33).

Pederson (1975) has offered support of this position with a study even more germane to the issue of family conflict and infant security. He assessed husband-wife relations through interviews and mother-infant feeding interactions observed in their homes and found that,

> "The husband-wife relationship was linked to the mother-infant unit. When the father was supportive of the mother...she was more effective in feeding the baby...High tension and conflict in the marriage was associated with more inept feeding on the part of the mother" (p.315).

This is not to say necessarily that conflict causes inept feeding, since, as discussed above, the difficulty in feeding may contribute to frictions between parents. With the principle of reciprocity firmly in mind, however, such findings raise a host of other questions about the microsystem of the development of attachment: Do families of insecure babies differ from families of secure babies in the sources of conflict, in the way the babies are "triangled" (Bowen, 1970) in the conflicts between parents, in competition between caretakers for the infant's dependency and loyalty, etc.?

Biogenic risk components were most discriminating, with all three variables included in the discrimination function. That prenatal complications and low birth weight contribute to insecure attachment is supported by the results. The unexpected finding was that more secure babies had had complications during delivery. It is doubtful that this variable

in itself directly facilitates some characteristic in the infant which heightens attachment behaviors. Other medical variables, such as type and degree of complication and hospitalization for baby or mother, could have extraneous effects on the exosystem of the early attachment relationship. Also, the mother's concern about her infant who may have been injured during the birth process could influence her parenting practices which in turn impinge on the infant's attachment to her.

One major problem in discerning the differential effects of the risk components, particularly biogenic risk, on security of attachment is the confounding factor of the mother's participation in the Birth to Three Project. As described above, a home-visitor met with the sample mothers regularly, usually weekly or biweekly, and provided assistance in many areas related to child care: educational information, family relations, utilization of other community resources, etc. Because the design of the Birth to Three Project did not allow for a comparison group on whom risk assessments were made but who did not receive the support services, the risk components cannot be assessed independently. For purposes of inquiry, it has been assumed that the effects of the project participation would be evenly distributed. However, it is possible that for certain mothers and infants and home visitors, subsystems between them became strong, such as mother-home visitor, infant-home visitor, and mother-

infant-home visitor, the latter depending on the effect of the home visitor on the interaction of the mother with her baby. Though the subsystems created by the home visitors may have mediated the effects of all the risk components, it is conceivable that mothers who had had delivery complications were more receptive to and made better use of the support of the Birth to Three staff, and that this partially accounts for the security of infants who had had risky births.

The sociogenic risk variable which contributed most to the discrimination was mother's educational level. It was expected that women who had not passed the eleventh grade were more likely to have insecurely attached infants, and this was supported by the results. Since mother's age was not a significant risk component, and since age contributes to educational level, it is probable that the older mothers who had dropped out of school rather than who had not yet pursued it were more likely to have insecure babies. What mother's educational level had to do with her infant's attachment is not clear, however, as, again, the meso- and exosystems must be examined. Variables which probably contribute to both mother's educational level and the infant's attachment include her intelligence and aspirations, level of social conformity, the value of education held by her family, etc.

In summary, the results of the present research point to aspects of a developing infant's micro-, meso-, and exosystems which accurately predict later insecurity of

attachment. The ways these aspects interact with each other to heighten or dampen their effects remain to be seen. It is suggested that further considerations of the ecology of human development would be a most beneficial approach.

Hypothesis 2

A second concern was to examine the extent to which 12 month security, defined interpersonally, could be predicted by a measure of three to six month security, defined as the mother's perceptions of her baby's adaptation to eating and sleeping and other routine activities. The discriminant function analysis performed on the three to six month and 12 month Flint Infant Security Scores showed that the secure and insecure groups did not differ in terms of early security as measured by the FISS. Thus the results failed to support the hypothesis that babies who were insecure at three to six months would tend to be insecure at 12 months.

One plausible explanation for this failure is that due to intervening variables between three and 12 months, factors contributing to security improved and babies who had been insecure between three and six months gained in security by 12 months of age. Were this the case, it would follow that the improvement would be reflected in 12 month FISS scores as well as in strange situation security of attachment. An examination of the data reveal that this improvement did occur for five of the nine subjects who at three to six months

were considered to be insecure. However, these measures had little to do with 12 month security of attachment. For example, of the nine infants whose FISS scores were at an insecure level at three to six months, only two were insecure in their 12 month attachment. For one of these insecure subjects, the FISS did improve to a secure 12 month level; for the other it remained at a level of insecurity. Also, all three subjects whose FISS scores went from secure at three to six months to insecure at 12 months were rated as secure in strange situation attachment behavior.

This failure of the strange situation security measure to provide corroboration of the FISS security measures raises the question of the construct validity of the FISS much more than that of the strange situation. The original validation sample consisted of 19 infants in foster care who were awaiting transfer to permanent adoptive homes. They were given the FISS just before transfer, immediately after, and again after five or six months in the adoptive homes. Results had confirmed the expectation that the babies would have high scores in the foster homes, a drop in the second test "as a result of change to new homes," and scores similar to the first testing on the third test.

This validation procedure is questionable for several reasons. That the FISS measures "security" is based on the assumption that an infant loses security when changed from a foster to an adoptive home and then regains it. Though this is plausible, it is certainly not a given, an automatic

state of affairs. Conditions in the natural family which led up to the child's placement in the foster home and length of stay with the foster parents are likely to bear on the initial FISS score. Also, little is known about the change that would normally be expected from test-retest procedures, especially with two different caretakers. When the FISS was given to both caretakers (usually mother and grandmother) of infants in the present sample, for example, wide discrepancies were found. This illustrates the point that there is much room for distortion of the data by the mother who is being interviewed, based on her own motivated perception and reporting. An examination of the raw scores of the validation sample (Flint, 1974, p.11) reveals that even though scores did drop on the second testing, only four were low enough to be considered "insecure", while five subjects improved.

Also, the mean FISS scores of -.232 at three to six months and +.33 at 12 months, which were contained in the present sample, are low in comparison to Flint's (1974) sample. Rather than regarding this difference as indicative of greater insecurity of the present sample, it is more likely a reflection of the need for a wider data base to establish confidence in the FISS. This is especially likely since Flint's basis for assigning +.35 as the point determining adequate security was not based on some external criterion of infant security-but was a subjective judgement

of mental health based on changes assumed to accompany movement from a foster to an adoptive home.

Another possible source of error in applying FISS scores to the present sample is that the 318 subjects in the standardization sample were "representative of the general range of the population, excluding socially and culturally deprived children." This raises the possibility that even if security were being measured, the distribution of scores is not applicable to the sample of low income, i.e. "deprived" children.

In summary, the Flint Infant Security Scale does not distinguish during the first half-year of life those infants who will form secure 12 month attachments from those who will not. The most likely explanation is that the test itself lacks construct validity. Though it measures something of the caretaker's perceptions of the infant's physiological adaptation and regulation, how this defines "security" is questionable. Of course, the assumption here is that security is a genotypic trait which has precursors in early childhood, and though it may change in phenotype, there is continuity in its development. The problem remains, then, of conceptualizing and identifying (i.e., operationalizing) security in its early physiologically mediated forms as well as its later manifestations which are so embedded in social reciprocity.

Hypothesis 3

A third task of this research was to examine the impact of risk components on developmental delay. The results of the multiple regression analysis presented in Table 14 tend to support the hypothesis that risk components contribute significantly to developmental delay at 12 months. Biogenic risk, not surprisingly, had the most impact on development, with low birth weight accounting for 31% (Multiple R = -.56, p=.001) of the MDI variance and 42% of the PDI variance (Multiple R = -.65, p=.001). This is consistent with Drillen's (1965) finding that more developmental difficulties were associated with babies with lighter birth weights. Delivery complications were also important in accounting for variations in both 12 month MDI's (Pearson r = -.42, p=.003) and PDI's (Pearson r = -.55, p=.001), and added significantly to the regression equation. And prenatal complications were less important for psychomotor development (r=.10, p=.28; not included in regression analysis) than for mental development (r=.15, p=.17, Multiple R=.66). In general, biogenic risk seems to increase the probability of developmental delay during the first year. As was elaborated in the discussion of the relationship between risk and attachment above, however, the specific way that biogenic risk affects development depends on many aspects of the social systems impinging on the infants. Again, the principle of reciprocity prevents a unidirectional interpretation of these results.

This is particularly evident in the finding that total psychogenic risk was important in both MDI and PDI variations. A glance at Table 14 reveals that psychogenic risk added 8.5% and 9.5% to the amount of variance accounted for in the MDI and PDI, respectively.(MDI r=.27, p=.05; R=.63; PDI r=.28, p=.04, R=.72). Since family conflict contributed most to total psychogenic risk, these results seem to suggest that an increase of family conflict is associated with more advanced mental development and psychomotor development scores. There are any number of reasons why this might be so, including effects of the intervention program, the overinvestment in the child by one parent in the conflictful family, or the presence of other siblings or adults who may stimulate the child. One possibility is that the presence of fathers, which may be a condition for family conflict, may also facilitate the infant's development. This is not likely in the present sample, however, since 22 of the mothers whose families were in conflict were single, in comparison to six married mothers in conflictful families.

In addition, the current research examined the relationship between attachment and mental and psychomotor development. Secure and insecure group means were very similar on MDI and PDI scores (Table 8), and the results of the discriminant analysis of the three to six month MDI and PDI scores (Table 13) do not confirm the hypothesis that delay is an important component of insecure attachment.

These results are different from those obtained by Main (1974), who administered the strange situation to 40 infants at 12 months of age and the Bayley MDI at 20 months and found that the secure and insecure groups differed significantly (secure $\bar{X}$=111, insecure $\bar{X}$=96, p .02). They further differed in that insecurely attached babies did less exploring and interactive play during a one hour videotaped free play period. Upon further examination of the insecure infants' play, Main found that resistance in the strange situation was associated with heightened vigilance toward the mother at the expense of exploration, while avoidance of the mother was more strongly related to disturbances in affect and interactive play.

Several differences between the present sample and that used by Main may help to account for the present lack of association between attachment and developmental indices. For example, the high risk sample used here may have different patterns of association between development and security of attachment than the white middle class sample in Main's study. Also, Bayley administrations at 20 months as compared to 12 months are likely to yield different results in any sample, since so much rapid change occurs during this period. Finally, in the present study, Bayleys were administered after the infants had been stressed in the strange situation, which raises the possibility that the infants' cooperativeness, interest and energy may have been taxed. Since the more

securely attached infants seem likely to have been more stressed by the strange situation, this may have impeded their Bayley performances, reducing the secure-insecure group differences. This is especially plausible since eight of nine insecure subjects in the present study were avoidant infants, who, according to Main's (1974) observations, would be less likely than resistant subjects to be upset and disrupted by the strange situation.

Hypothesis 4

A final interest of the investigator was the relationship between several aspects of the mother's functioning and the infant's attachment to her. Since two measures were used, with a different analysis for each, they will be considered separately.

It was hypothesized that secure and insecure babies could be predicted on the basis of the mother's comparison of her baby to an imagined "average baby", as measured on the Neonatal Perception Inventory. This was based on the assumption that if a mother viewed her baby as generally more troublesome than average in establishing routines of eating, sleeping, eliminating, etc., this negative perception would place her baby "at risk" for later insecurity of attachment.

The results of the discriminant function analysis of the NPI scores at three to six and at 12 months reveal that no such relationship exists in the current sample. This is

not to suggest that maternal perception of the infant is not an important influence in her handling and care of the baby, which in cyclical fashion contributes to his or her attachment behavior. Rather, the failure of the results to support the hypothesized relation between NPI and attachment can probably be largely accounted for by deviations in the present application of the NPI from the original sample (Broussard and Hartner, 1970; see p. 75 , above). For example, all 120 subjects were Caucasian, and tests were administered when the baby was one month old. The mother's perception of the baby is notably fluid during the early neonatal period, and Broussard and Hartner (1970) found that administration of the NPI at two days of age was not as effective as administration at one month in predicting "emotional disturbance" at four and a half years of age. It is possible that maternal perception at three months has again changed, losing its predictive ability. According to some experts (Frances Kelly, 1975; Earladene Badger, 1975), for example, mothers at one month often have "postpartum blues", as the novelty of the baby has worn off and constant demands take their toll, but by three months, they have recovered.

Other differences possibly contributing to the NPI's failure to predict insecurity are 1) assessment of disturbance was at 12 months of age in the present study and at four and a half years by Broussard and Hartner (1970), and 2) the method of assessment was the strange situation in the

present study, while Broussard and Hartner (1970) used an unstructured play situation. Finally, the method of scoring in which "better than average" is considered a more positive indicator than "worse than average", ignores the fact that mothers can greatly overestimate the capacities of their infants and that a high maternal expectation can reflect blatant denial of negative feelings--both to the detriment of the attachment relationship. It is suggested that a more accurate assessment of maternal perception as a source of risk would view large deviations in either direction as potentially problematic.

The final hypothesis considered in the present research was that maternal sensitivity and responsivity to and provision of stimulation for the baby are important factors in the formation of the attachment relationship. A discriminant function analysis, summarized in Table 15, examined the extent to which secure and insecure groups could be distinguished by their scores on the six subscales of the HOME inventory (see page 113). The resulting discriminant function is very substantial ($p=.005$) and can be interpreted as offering partial support for the hypothesis that mothers of secure and insecure babies behave differently in ways that can be measured by the HOME. The specific subscales related to maternal responsivity and stimulation did not contribute to the discrimination. Instead, it was found that mothers who tended to avoid restriction and punishment (at least while

the home visitor was present) and who organized the environment so as to provide stability, predictability, and breadth of experience were strongly associated with the secure infants. Thus it seems that scales two and three of the HOME inventory can be used at 12 months to explore mother-infant interactions which might contribute to insecurity of attachment.

One unexpected finding of the present study was that of the nine subjects in the insecure group, eight were classified as avoidant and only one as resistant. This was surprising because the number of A and C babies in Ainsworth's (1973) combined sample were about equal. This raised the question as to what might account for the large proportion of A babies in the current sample.

One clinical observation that had often been made by the Birth to Three Project staff was that many mothers in the current sample had a special intolerance of expressions of anger by their children. A common attitude seemed to be that if one allowed such emotions in the child at an early age, this would be deemed by the child as winning the power struggle and would result in greater defiance and disrespect in the end. The power struggle--the issue of maintaining control in other areas as well as in the child's expression of negative affect--seemed to be an especially sensitive area of mothering. A logical extension of this assumption was that these mothers would also tend toward greater restriction and punishment, i.e., control. Thus, an hypothesis was formulated that proximity avoidance in the strange situation--

the single behavior which most distinguished A babies--would be strongly related to such attitudes reflected by the HOME, namely the "avoidance of restriction and punishment" subscale.

The multiple regression analysis of attachment behaviors on the HOME subscales (Table 17) partially supported this notion, since proximity avoidance did significantly increase as mother's punishment increased, particularly in episode B. However, the organization of the physical and temporal environment was even more strongly implicated in proximity avoidance, again suggesting the importance of the caretaker's p provision of an indoor and outdoor environment in which the child can experience routine, with predictable events which are safe and which offer varied stimulation. In episode 8, though, proximity avoidance was also positively associated with maternal involvement with the child. Thus it appears that insecure infants have mothers who do not provide much temporal and spacial organization for them and who, while highly involved, frequently restrict and punish.

Again, the importance of the child's early sense of gaining some control through a stable, predictable surround seems to be suggested by this finding, which offers supporting evidence to Ainsworth's hypothesis (see page 46) that maternal behaviors which most contribute to secure attachment are those which allow the infant to develop a sense of the consequences of his actions. Though she was referring to more

specific maternal behaviors, such as the form and timing of physical contact, it is conceivable that the maternal behaviors tapped by the HOME inventory are also particularly relevant for security in that they bear on the beginnings of self control and trust in a predictable world. It is further conceivable that the early disorganization of the home environment may have irreversible effects, in that there may be a critical period for the development of foundations of self control.

B4 babies: secure or insecure?

As described on page 87, the five subjects of subgroup B4 of the secure classification demonstrated nonambivalent attachment behaviors toward their mothers but were clearly distressed long after being reunited, thus raising the question as to how they should be classified. A comparison of Tables 9 and 10 reveals that when B4 subjects were defined as insecure, not only did the discriminating variables which were selected change, but the difference between secure and insecure groups was much greater ($p=.012$ versus $p=.002$). This suggests that in the present sample, B4 babies are more similar to A and C than to B1, B2, or B3 babies, at least in terms of risk characteristics.

When B4 subjects were defined as insecure, this group was distinguished from the secure infants in that their mothers had more prenatal complications and lower educations, while secure infants had mothers who had complications during delivery, receive AFDC, and are in conflictful families. Main

differences of B4 babies from other B subgroups is that their mothers had more prenatal complications, have less conflictful families, and do not receive AFDC. In addition, B4 infants contribute to distinctions between secure and insecure infants on the HOME scales in that their mothers score lower on the avoidance of restriction and punishment (Tables 15 and 16).

Though the main difference between B4 and other B subgroups is the amount and duration of distress in the strange situation, these other differences support this author's suggestion that B4 babies could perhaps be more accurately described as a separate category, neither secure nor avoidant or resistant. Behaviorally, they appear to be "dependent" infants, easily stressed and maintaining proximity to and contact with the mother at the expense of exploration and other social relations.

The strange situation

But what is the child's contribution to the behavior of the caretaker? According to Bell's model (see page 40), congenital characteristics of the child activate parental behaviors, especially in the areas of responsiveness and control. That low birth weight was significantly more common among the insecure babies in this study provides some support for this scheme of reciprocity in the formation of insecure attachments The resulting "matched fit" seems to be between the medically at risk baby whose caretakers, while highly involved, are punitive, restrictive, and disorganized.

In light of these findings, the assumption that the baby is maladaptive for avoiding a punitive, nonrewarding caretaker is obviously one to be questioned. The assumption, as earlier elaborated, has been that adaptation consists of making use of an attachment figure to seek relief from stress. For most children, the mother's absence in an unfamiliar place constitutes a very scary situation and is the basis for the perception of the strange situation as "stressful".

However, heeding Bronfenbrenner's dictum to "remember the microsystems", we immediatly recognize that what is and is not stressful varies with the history of pleasure and pain associated with the situation in question. If, indeed, interactions with the mother have been experienced by the infant as more stressful than rewarding (and, no doubt, in such case mother's interactions with baby have been no picnic for her), an opportunity to leave the room becomes relief, not increase, of stress. Little wonder these insecure babies do not follow, search, or protest her leavetaking.

Of course, the real picture is never so simple. As suggested by the current findings of the HOME's association with secure attachment, mothers are seldom completely punitive, but are more likely ambivalent, mixing positive and negative interactions with their children. Thus, anxiety and attachment become intrinsically coupled, and not only does anxiety or stress evoke the desire for closeness to the attachment figure,

but the desire for closeness evokes anxiety as well. Whether or not this barrier to anxiety-reducing interpersonal relations is maladaptive would depend, it seems, on the extent to which the child can discriminate those adults whose nurturance is not contaminated by stress-provocation versus the extent to which this association is generalized to other relations.

In any case, a conceptual dilemma remains: attachment has been elaborately described as a matched fit, a mutual accommodation, a cyclical, reciprocal process. Yet, this attachment relationship has not been the focus of study. Instead, only the infants' responses to the mothers have been assessed by the strange situation. Clearly the glaring omission of the strange situation is that nary a word is said about what the mothers are doing in the specific strange situation itself. True, mother's behavior in the strange situation is probably much more variable than the infant's and is thus much more difficult to validate. It is conceivable, nonetheless, that patterns of maternal strange situation behavior, including her behavior outside the room when she exits, are discernible and are predictive of infant patterns. The particular methodology required to maximally elicit patterns of mother-infant dyad interactions in stressful situations at different ages whets the imagination.

Directions

As mentioned above, a major problem of this study is the possibility that the obtained results were due not so much to the ability of risk variables to predict security of attachment but to the effects of the intervention program. This points immediately to the need for a cross-validation study, in which a no-intervention sample of infants with similar backgrounds of risk are given baseline and 12 month developmental assessments and are evaluated with the strange situation. Using a cross-validation framework, new hypotheses such as ones concerning the negotiation of control in the caretaker-infant relationship could be added, tested, confirmed, and replicated or revised to form an evolving model of the "progressive accommodation between the growing human organism and its environment" (Bronfenbrenner, 1977, p.513).

In his discussion of methods for ecological experimentation, Bronfenbrenner (1977) observed that,

> "To maximize one's sensitivity to phenomena through the juxtaposition of the similar but different constitutes the core of the experimental method and creates its magnifying power" (p. 518).

As a way of achieveing this juxtaposition, he suggests that "transforming experiments" be undertaken, that

> "Research on the ecology of human development should include experiments involving the innovative restructuring of prevailing ecological systems in ways that depart from existing institutional ideologies and structures by defining goals, roles, and activities and providing interconnections between systems previously isolated from each other" (p. 528).

Ways to apply this principle to the study of early attachment relationships are not difficult to imagine. Some questions which could be considered are:

a) How is the mother-infant relationship in the first year effected by the intrinsic definition by hospital-referred intervention programs of the mother as in need of help in some way, i.e., a "bad mother"? Could a change in this mesosystem effect the mother-infant microsystem? One approach could be to introduce an intervention program to mothers of biogenically high risk infants in a maternity hospital, billed as a "mothers as teachers" project. Psychogenically and/or sociogenically high risk mothers would be "selected" to have an opportunity to teach parenting to small groups of young mothers, mothers with babies with similar complications, etc. For $25 per weekly session, they give a "lesson" in some aspect of their mothering, with the aid of consultants.

b) How situation-specific are avoidant and resistant behaviors by babies toward their mothers? This could be examined with a sample of avoidant and resistant babies, to whom various structured mother-infant exercises would be given immediately before attachment assessment. Which conditions reduce and heighten avoidant behaviors would be observed. Prior conditions could include various mother-father interactions, mother-other sibling or other sibling-infant interactions, etc.

c) What is the effect on attachment of the infant's placement in day care? In what ways can the transition from home to day care be facilitated? Ways for families and day care workers to become acquainted and to share ideas about child care could be provided. Beginning well before the child enters day care, parents and children could participate in activities at the center. Attachment ratings of the "slide in" group could be readily compared with the many "plop in" groups now forming.

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FOOTNOTES

Footnotes

[1] "Caretaker" as used throughout this paper is a general term referring to the adult who is chiefly responsible for the welfare of the baby. In this study, the caretaker was usually the natural mother, so these terms are used interchangeably.

[2] Two years before Bowlby's elaboration of the attachment behavior, Robson (1967) proposed that eye-to-eye contact be added to Bowlby's list of innate releasers of maternal caretaking responses, but it is not mentioned by Bowlby. In her 400 hours of home observations of mother-infant pairs, Robson has come to believe that eye-to-eye contact is a primary mediator of non-verbal transactions between people and that variations in the infant's visual alertness, gaze aversion, and sensory modality preferences have important influences on the mother-infant relationship.

[3] In a 1972 University of Florida dissertation, Hulsebus found that mothers of infants elicited smiling and babbling from their babies more effectively than did female strangers, beginning at 12 weeks.

[4] Babies cried and visually avoided their mothers' faces seen through a hole much more than in response to a mannequin. (Carpenter, 1970, cited by Robson, 1972)

[5] Waters (1975) showed that gaze aversions occur at the peak of heart rate acceleration, which is associated with visual stimulation in young babies.

[6] Smith (1958) found the interview method to be preferable to observational in that it "allows coverage of a wider range of behavior", even though the observation technique revealed that many mothers gave misleading information.

[7] This has not always been the case, however. Watson, for example, believed: "There is a sensible way of treating children. Treat them as though they were young adults. Dress them, bathe them with care and circumspection. Let your behavior be objective and kindly firm. Never hug and kiss them, never let them sit on your lap." (1928, quoted by Caplan, 1973).

[8] Korner and Grobstein showed that such processes are set in motion very early: 88% of two day old infants who were picked up while crying (kinesthetic stimulation) not only stopped crying but also opened their eyes and alertly scanned the environment for about 30 seconds. When compared with other modes (Korner and Grobstein, 1970), the kinesthetic was most effective in eliciting visual alertness. In addition, maternal attentiveness is positively related to exploration (Rubenstein, 1967), with vocalization (Weisberg, 1973), and with smiling (Teele, 1973).

[9] It requires only one observation of an insensitive feeding of a small baby--whose mother holds him precariously, stuffs the food in either so fast the baby can barely catch a breath or so slowly that the baby cries between bites, who wipes his mouth mercilessly, and who jiggles him nonstop--to understand the great distress that can be inflicted during feeding.

[10] Funded by the Bureau of Education for the Handicapped, Office of Education, Department of Health, Education, and Welfare, grant number OEG-0-74-2663.

[11] Even though referral sources were encouraged to consider referring very depressed or anxious mothers to the Project, the history of pathology in the primary caretaker was considered to be a risk component only if she had been hospitalized for psychological reasons.

APPENDICES

Child's Name: _____

Date: _____

RISK ASSESSMENT

INSTRUCTIONS: The following items sample areas of "risk" which may affect an infant's development or mental health. Please indicate, by checking "yes" or "no", whether or not each area of risk is present in this infant and family.

PSYCHOGENIC RISK	Yes	No
History of pathology in primary caregiver	___	___
Specify: _____		
History of pathology in other caregivers	___	___
Specify: _____		
History of conflict in family	___	___
Specify: _____		

BIOGENIC RISK	Yes	No
Prenatal complications in mother/infant	___	___
Specify: _____		
Complications in delivery	___	___
Specify: _____		
Apgar: _____		
Birth weight less than 2500 gm (5.5 lb)	___	___
Specify: _____		

SOCIOGENIC RISK	Yes	No
Age of primary caregiver 15 years or less	___	___
Specify: _____		
Education of primary caregiver 11th grade or less	___	___
Specify: _____		
Family income primarily public assistance	___	___
Specify: _____		

STRANGE SITUATION:
INSTRUCTIONS TO MOTHER

GENERAL POINTS (to be initially presented to the mother by home visitor)

1. B-3 project is interested not only in working with families, but also in finding out new things about babies. One area of particular interest is the issue of how babies handle separations from their mothers for brief periods of time.

2. The data we are collecting will be used:
   a) to better understand the processes of separation,
   b) to give them feedback about their own child,
   c) in a dissertation by a staff member who is a graduate student at U.H.
   The data will be compiled into a group, so that no individual baby's scores will be used.

3. Explain to mother that after the testing, the research project will be explained to her in as great detail as she likes.

4. With Bayley and research participation, the total time required will be 2 - 2½ hours.

5. Do not offer any additional information other than above points (such as, that videotape will be used).
   - Avoid giving specific information about the strange situation technique;
   - Avoid use of word "attachment";
   - Answer questions about test in context of on-going evaluation;
   - Evade direct answer to specific questions, with reference to debriefing.

IN LOBBY OR WAITING ROOM:

"Before we do the Bayley with ____, we will be doing an activity in which we watch how the baby acts when he/she is separated from you for a short period of time. First we will watch what the baby does when he/she is in a room with someone he doesn't know. Second we'll watch how ____ acts when he is in the room by himself."

IN VIDEOTAPE ROOM:

"This is the room we'll be using to watch the baby. As you can see, there is a pile of toys and two chairs. In the first part I will take you and _____ into the room and then I'll leave. I'd like for you to take B over and put him down with the toys and then take a seat in the _____ chair.

"While you are sitting in the _____ chair act the way you normally do when he is playing near you. Just let B play freely, doing whatever he wants to do.

"In a short time, Stranger's name will come into the room and sit quietly in the other chair. After a short silence, she will explain

Do you have any questions?"

EPISODE 1: E escorts M and B into testing room :

"Remember, just put B down by the toys and take a seat in the ___ chair. In a few minutes S will come in and take a seat in the other chair."

EPISODE 2: M and B alone for three minutes.

EPISODE 3: S enters, sits quietly for one minute, gives M instructions during second minute, and engages B during third minute:

EPISODE 4: E knocks on window, M leaves and is met outside door by E. S remains in room with B:

"In a moment I want you to go back into the room with B. S will leave the two of you together. When you enter the room I want you to greet Your baby the way you normally do. Then go and take a seat in the _____ chair. Shortly, you will hear a knock on the window. When you hear the knock, get up and quietly leave the room. Your baby may become upset as you leave the room. Even so, I'd like you to go ahead and leave the room as quickly as possible. If B becomes very upset, you will be able to go back into the room right away."

EPISODE 5: M and B alone, S leaves.

"Go in now--remember, greet the baby as you normally do and then sit in the _____ chair."

EPISODE 6: E knocks on window, M leaves and is met outside by E. B in room alone.

EPISODE 7: S enters room and spends 3 minutes with B.

"When you go back in this time, hold your arms out to _____ like this (demonstration), so that she can show you if she wants to be picked up or not. If she does not want to be picked up, go ahead and sit in the ____ chair."

EPISODE 8: M enters, S leaves.

SCORING SYSTEM FOR INTERACTIVE BEHAVIORS IN THE STRANGE SITUATION

I. PROXIMITY-AND CONTACT-SEEKING BEHAVIOR

This variable deals with the intensity and persistence of the baby's efforts to gain (or to regain) contact--or, more weakly, proximity--with a person, with the highest scores reserved for behavior in which the baby both takes initiative in achieving contact and is effective in doing so on his own account. If an episode contains several instances of proximity-seeking behavior, the episode will be judged in terms of that instance which qualifies for the highest rating, unless otherwise specified below.

7 Very active effort and initiative in achieving physical contact
The baby purposively approaches the adult, creeping, crawling, or walking. He goes the whole way and actually achieves the contact through his own efforts, by clambering up on or grasping hold of the adult. The cooperation of the adult is not required. Contact is more than momentary; the baby does not turn away to other things within 15 seconds.
Note: In Episodes 5, 7, and 8 this top score cannot be used if the initial approach (even though it otherwise meets the above criteria) is delayed substantially (i.e., more than 30"). If, however, there is an initial approach or signal for contact without substantial delay, followed later by another approach meeting the above criteria, the episode may be coded 7, even though the initial bid for contact does not qualify for this coding.

6 Active effort and initiative in achieving physical contact. This coding will be used for an approach and/or clamber showing initiative and active effort that nearly, but not quite, fulfills the specifications for a coding of "7".

(a) The baby purposively approaches the adult (i. e., he does not merely happen to approach while pursuing a toy). He goes the whole way, and then signals by reaching or equivalent behavior that he wants to be picked up, but he does not clamber up or hold on to make contact entirely on his own initiative. He requires the cooperation of the adult in gaining contact.

(b) The baby purposively approaches the adult, going the whole way, and signals his desire to be picked up, but the adult does not cooperate; the adult does not pick him up or hold him, and contact is thus not achieved--provided that the baby make at least two other active bids for contact within the episode, whether these are successful or not.

(c) In Episode 5, 7, or 8 an approach that otherwise would be scored "7", except that it is substantially delayed, will be scored "6".

(d) The baby at least three times does a full approach with clamber and/or contact which is brief (held only 5 to 15")--any one of these instances being too brief to qualify for a coding of "6" or "7".

(e) The baby does not begin his approach purposively, but rather approaches in the course of exploration; finding himself close to the adult, he then completes his approach purposively, and clambers up or holds on, achieving contact (and holding it for more than 15") on his own initiative.

5 Some active effort to achieve physical contact. This score will be given to an active effort to achieve contact which in one respect or another does not quite fulfill the specifications of a coding of "6".

(a) The baby approaches purposefully and fully but does not end the approach even with a reach or other signal (except perhaps for a cry), but rather is picked up without any signal beyond the approach itself.

(b) The baby, being held by the stranger, cannot approach his mother through locomotion, but he does the best he can by actively and strongly straining toward her. This straining implies tension involving the whole body and goes beyond mere lifting of arms or a casual reach.

(c) The baby, either because he is at the door already or because he is put down by the stranger close to the mother, is too close to approach, but nevertheless he reaches strongly for the pick-up and/or tries to get up, and the mother completes the pick-up.

(d) In Episode 5, 7, or 8 the baby, having delayed substantially in making an active effort to regain contact, now makes a full approach ending with a signal that he wishes to be picked up (either a reach or a cry), but requires adult cooperation to achieve contact.

(e) The baby makes at least three active bids for contact (e.g., an approach, a reach, or a 'directed cry') at least one of which is a purposive reach; he may be scored "5" even though he doesn't complete contact in any of them, presumably because the adult does not cooperate.

4 Obvious desire to achieve physical contact, but with ineffective effort or lack of initiative OR active effort to gain proximity without persisting toward contact. This middle score, as the heading suggests, is for babies who obviously desire contact but show relatively little active effort or initiative in gaining it, and for babies who are competent and effective in their approach behavior but who are content with minimal contact or with mere proximity.

(a) The baby spontaneously (i.e., before the adult approaches and/or offers her hands or invites him) signals his desire to regain contact by a reach, lean or "directed cry", as though he expected the adult to pick him up. (A "directed cry" is a signal-like cry--either an isolated cry, or a distinct increase of intensity of crying--obviously directed toward the adult; it is to be distinguished from continuous or intermittent crying which expresses distress but which does not seem to be emitted as an attempt to communicate to the adult a specific desire to be picked up and to be picked up now.)

(b) The baby begins to approach the adult but goes only part of the distance, and either with or without a further signal waits for the adult, who completes the pick-up. (If, however, the baby goes a substantial part of the distance and presumably would have gone the whole way had he not been approached by the adult simultaneously, this will be counted as a full approach and given a higher score.)

(c) The baby makes repeated full approaches either without completing contact or with only momentary contact.

(d) The baby makes a full approach, obviously wanting contact, but the adult does not cooperate and does not pick him up.

(See, however, "6b" and "5e" for specifications of non-reciprocated approaches which may be given higher scores.)

(e) The baby makes a full approach which ends in contact (either on the baby's initiative or with the adult's cooperation) but he does so only after the adult has invited him to do so by offering her hands, or otherwise by coaxing him to come.

3 Weak effort to achieve physical contact OR moderately strong effort to gain proximity.

The baby may display a desire to gain contact but a relatively weak or ineffective effort to implement his desire. Or he may take initiative in approaching the adult in order to interact with her or merely to increase proximity. In the latter case it is quite obvious that the baby does not achieve contact because he does not especially seek it, and not because the adult disappoints him by her lack of cooperation.

(a) The baby is distressed, crying, and may be presumed to want contact because he stops crying or at least substantially lulls when he is given contact, but he does not give any specific signal that he wants contact--neither a reach nor an approach nor a directed cry.

(b) As above, the baby is distressed and crying, and does reach or lean or even slightly crawl indicating his wish for contact--but only after the adult has begun pick-up or has offered her hands, or after a long delay.

(c) The baby makes a spontaneous full approach but neither makes contact nor seems to want to do so. Instead he offers a toy or initiates some other kind of interaction, or he seems content with mere proximity.

(d) The baby makes a spontaneous full approach and either merely touches the adult in an exploratory way, or pulls himself into a standing position giving the clear impression that he is using the adult as he would a chair or other inanimate support and that sustained contact is not the goal. (If, however, the baby remains steadying himself against the adult, he will be assumed to desire contact eventhough he seems off-hand about it--and will be given a higher score. Category "3d" is only for momentary contact of this sort.)

(e) The baby spontaneously and deliberately signals his desire for contact with a reach (and with no cry) but, in the face of lack of response from the adult he does not persist in his bid for contact. (The absence of the cry implies a relatively weak desire for contact.)

(f) The baby, having been invited by the adult to approach across a distance, makes a full approach which ends neither in contact nor with a signal indicating a wish for contact.

2 Minimal effort to achieve physical contact or proximity.

(a) The baby begins to approach (in a sort of intention movement) but stops, having gone but a short way, and does not follow up this beginning with any further signals of a desire for contact.

(b) The baby seems to be making a full approach, but changes direction to approach something else, or passes beyond the adult, e.g., to go out of the door, to the door, or to explore something beyond the adult, without pause for any kind of interaction en route.

(c) After the adult offers her hands, the baby reaches in almost an automatic gesture. The weakness of desire for contact (with the mother) is underlined by the fact that the baby is not even crying when the invitation is given.

1 No effort to achieve physical contact or proximity.

Episodes will be scored "1" in which the baby is occupied with play and exploration--or with desperate crying--and pays little attention to the adult. In addition, episodes will be scored "1" in which are displayed the following behaviors which are considered to indicate no effort (and no real desire) to achieve contact or proximity.

(a) The baby merely looks, or smiles, or interacts across a distance without any increase of proximity or any signal indicating that contact is desired.

(b) The baby accepts contact, even being picked up, but merely accepts it. He did not indicate his wish for it by a cry, approach, or reach. Even though he had been crying, he shows that he had no particular desire for contact (and this occurs especially with the stranger) by the fact that he neither diminishes his crying nor hugs, clings, or holds on.

(c) The baby approaches accidentally in the course of exploration or pursuing a rolling toy, and neither makes contact with the adult nor pauses to interact with her when he comes near to her.

II. CONTACT-MAINTAINING BEHAVIOR

This score deals with the degree of activity and persistence in the baby's efforts to maintain contact with the adult once he has gained it, having either approached her to make contact himself, or having been picked up either with or without having signalled his desire to be picked up. The relevant episodes for interaction with the mother are 2, 3, 5, and 8. The relevant episodes for the stranger are 3, 4, and 7--and in a few instances also 8.

Although the baby's behavior is the focus of attention here, it must be viewed within the context of interaction with the adult. Since the adults, as well as the babies, differ in the extent to which they initiate or accept contact, each of the score points has several alternatives, in an attempt to encompass a variety of contingencies.

7 Very active and persisent effort to maintain physical contact.

(a) The baby, in the course of contact lasting over two minutes, shows at least two instances of active resistance to release or to cessation of contact--and indeed these efforts are in part responsible for the long period of contact. These efforts include clinging when the adult shifts his position in her arms or attempts to put him down, turning to clutch the adult or to clamber up on her again soon after having been put down, or turning to the adult to make closer contact.

(b) The adults holds the baby for two minutes or more, but does not attempt to release him. The baby, meanwhile, embraces the adult, or sinks in, or reclines against her in a relaxed manner, or otherwise clings to her.

(c) The baby initiates contact, and remains in contact (i.e., standing holding on to the mother's knee) for over two minutes and in addition shows at least two instances of active resistance to cessation of contact.

6 Active and fairly persistent effort to maintain physical contact.

(a) The baby, in the course of contact lasting between one and two minutes, shows at least one instance of active resistance to release (e.g., by clinging, clambering up, etc.) For the rest of the period of contact he may be more passive, but even then he shows his desire for contact by sinking in, holding on, or reclining against the adult.

(b) The baby, having spontaneously approached the adult, sustains contact for longer than one minute, and shows at least one active clambering or resisting cessation of contact after the initial behavior which made the contact.

(c) The baby, in the course of contact lasting longer than two minutes, clings or, if an attempt is made to release him, actively resists it, but when finally put down he merely cries and makes no active effort to regain contact.

5 Some active effort to maintain physical contact.

(a) The baby, in the course of contact lasting for less than a minute, shows one marked instance of resistance to release (clinging on attempted release, clambering up after having been put down, turning to the adult to make closer contact), which, as it turns out, does result in maintaining contact or at least in delaying the release.

(b) Or, he shows two instances of active behavior of this sort, neither of which result in more than brief contact.

(c) Or, having actively initiated contact by clambering up (or some similarly active behavior) he resists release once even though this may not be a marked instance of resistance.

(d) The baby is held by the mother for more than a minute; the baby may be crying and/or clinging, but he makes no active effort to resist release or to clamber up again having been put down--although he may perhaps reach a little. The point here is that the baby shows his desire for contact by clinging or by diminishing crying, but the adult's response to his behavior (continued holding) gives him no opportunity to demonstrate more active behavior in maintaining physical contact, at least not until after the contact has been long enough for him to be thoroughly comforted.

(e) Or, the baby is held for less than a minute, clinging markedly, and protests strongly when put down, even though he may not actively attempt to clamber up or to clutch at the adult in resistance to release.

4 Obvious desire to maintain physical contact but relatively little active effort to do so.

(a) The baby has been held, perhaps clinging a little, perhaps having diminished his crying when picked up; when put down he decisively protests, giving more than a brief cry.

(b) The baby was picked up when he was quite distressed; although he seems not to have been truly comforted by the contact, nevertheless he shows his desire to maintain contact by clinging markedly.

(c) The baby, having been picked up when crying, quiets, perhaps with some clinging; after having been held for less than one minute, he is put down; he either makes no protest, or the protest is both considerably delayed and minimal. He may,

however, signal briefly by reaching that he would like to maintain contact, but he makes no more effective effort than this to do so.

(d) The baby, having been held, is released; he resists release briefly, by attempting to hold on or by clinging briefly, but when this is ineffective he accepts the release without protest and without further effort to maintain contact.

3 Some apparent desire to maintain physical contact but relatively little active effort to do so.

(a) The baby initiates contact twice or more during the episode--by approaching and by touching, or by clambering up--but each contact is held only briefly, and then broken either by the baby himself, or by the adult with no protest or resistance from the baby.

(b) The baby initiates contact once during the episode and shows some additional active attachment behavior (beyond that necessary to achieve contact), e.g., clutching, burying the face, reclining against the adult, but does not persist in the contact for more than a few moments, and spontaneously breaks away.

(c) The adult initiates the contact, picking the baby up or holding him, with perhaps a signal from the baby (cry or reach); the baby accepts the contact but does not cling; when he is put down he protests briefly with a cry (and not with a mere unhappy noise or cry face).

(d) The adult initiates the contact, perhaps after a signal from the baby; the contact persists for a minute or more; the baby accepts the contact passively and gives the impression of liking it; but when he is put down he makes no protest.

2 Physical contact, but apparently little effort or desire to maintain it

(a) The baby initiates contact no more than once during the episode, and either breaks it off himself after a few seconds, or , if the adult makes the break, the baby makes no effort to maintain the contact.

(b) The adult initiates contact and either the baby accepts it briefly then breaks it, or he gives a brief minimal protest (unhappy noise or cry face) when put down.

(c) The adult picks up the baby who is very distressed; the baby accepts the contact, but, although his crying may diminish, he is not really comforted. When he is put down, he cries and may cry more intensely, but this does not seem so much a definite protest against the cessation of contact as a response to the whole distressing situation. The point is, however, that even though he is very distressed he seems somewhat less distressed when in contact with the adult than when he is not.

1 Either no physical contact or no effort to maintain it.

(a) Either the baby is not held or touched.

(b) Or, if picked up, he neither clings nor holds on, and when he is put down he makes no protest; if he is not put down he may still be coded "1" if he seems indifferent to being held. Furthermore, he has taken no initiative himself in making the contact in the first place.

III. CONTACT-AND INTERACTION-RESISTING BEHAVIOR

This variable deals with the intensity and frequency or duration of resistant behavior evoked by the person who comes into contact or proximity

with the baby, or who attempts to initiate interaction or to involve him in play. The mood is angry--pouting, petulance, cranky fussing, angry distress or full blown temper tantrums. The relevant behaviors are: pushing away, throwing away, dropping, batting away, hitting, kicking, squirming to be put down, jerking away, stepping angrily, resistance to being picked up or moved or restrained. More diffuse manifestations are angry screaming, throwing self about, throwing self down, kicking the floor, pouting, cranky fussing, or petulance. These behaviors may alternate with active efforts to achieve or maintain contact (or proximity) with the person who is being rejected. If both kinds of behavior are marked, the baby's behavior could be scored high in both variables.

One is reminded of the "weaning tantrums" of infant monkeys. The implication is that the baby rejects his mother, being angry with her for having left (rejected, abandoned) him. Often enough it is clear that he rejects toys that are offered to him as a redirection (displacement) of rejection of or anger toward the person who offers them. It seems likely that the rejection of the stranger is either a redirection of anger at the mother or anger at the stranger because she is not the mother. This latter point raises the question of distinguishing "fear" of strangers from this kind of rejection. For the sake of consistency, all instances of resistance to the stranger have been included in this scale, including clear protest at the entrance of the stranger (in Episode 7), or her approach, or her attempt to make contact. Similar protests at the return or approach of the mother are also included here.

7 Very intense and persistent resistance. The baby shows two or more of the following behaviors in the episode being coded:
- (a) Repeated hitting of the person, or other similar directed aggressive behavior;
- (b) Strong resistance to being held, shown by pushing away strongly, struggling, or strongly squirming to be put down;
- (c) A full-blown temper tantrum, with angry screaming--the baby either being rigid and stiff or throwing himself about, kicking the floor, batting his hands up and down, and the like;
- (d) Angry resistance to attempts of the adult to control the baby's posture, location or action;
- (e) Strong and repeated pushing away, throwing down, or hitting at toys offered to him.

6 Intense and/or persistent resistance. Any one of the following behaviors:
- (a) Repeated or persistent temper tantrum, with throwing self about, kicking, and/or rigid, stiff, angry screaming;
- (b) Very strong and/or persistent struggle against being held;
- (c) Definite and repeated rejection of the person, even in the absence of directed aggression or angry screaming;
- (d) Repeated, strong rejection of toys--pushing away, throwing down--accompanied by an angry cry or fuss;
- (e) A combination of less intense manifestations of resistance, including squirming to be put down, resistance to interference, refusal of contact, rejection of toys, and petulance.

5 Some resistance, either less intense, or, if intense, more isolated and less persistent than the above. Any one of the following:
- (a) Repeated rejection of toys, e.g., dropping or throwing down, but with no strong pushing away or batting away. The rejection

does not seem as angry as in scores of "6" or "7". At least three such behaviors.

(b) Persistent resistance to the adult when she seeks interaction-but without the intensity of struggling, pushing away, hitting, etc. of the higher scores. An example would be a fuss or increased intensity of crying whenever the adult approaches, offers a toy, etc.

(c) Resistance to being held by the mother shown by squirming immediately to be put down, but without the intense struggling implied in the higher scores.

(d) Persistent low-intensity pouting or cranky fussing, with at least one other manifestation of rejection such as protesting interference, rejection of a toy, etc.

4 Isolated but definite instances of resistance in the absence of a pervasive angry mood. Any one of the following:

(a) Refusal of contact with the stranger. One definite, initial refusal, but without any implications of intense struggle.

(b) Two refusals of toy, or kicking movements, or resistance to interference, accompanied by a cry, but without any other manifestations of rejection or angry mood.

(c) One strong but isolated behavior, accompanied by a cry. For example, angry stepping when put down, one strong refusal of toy (strong push or batting away) stiff steps when approaching as though showing bodily resistance, and the like.

(d) One manifestation of resistance to being held by the mother, less definite than above. For example, a slight jerk or push away in the context of apparent "wanting to be held," or a definite squirm to be put down after having accepted contact for at least 15".

3 Slight resistance. Any one of the following:

(a) Two instances of resistant (or aggressive) behavior that is neither intense nor strong and is not accompanied by crying. For example, little kicks of the feet, dropping toys, and the like.

(b) One instance of resistant (or aggressive) behavior if accompanied by a pout or protest, or in itself fairly intense (and yet not covered by higher scoring categories).

(c) A marked pout, not prolonged enough to warrant a score of "5", and not accompanied by other manifestations of resistance or aggression.

2 Very slight resistance. Any one of the following, with no other manifestations of resistance:

(a) One isolated instance of not-intense resistance, for example, a little kick of the legs when being picked up.

(b) One brief, slight protest noise when the adult enters, or advances, or picks the baby up.

1 No resistance .

None of the above behaviors. The baby either accepts or is unresponsive to proximity, contact or interaction offered by the adult--or he may merely avoid it. He may be occupied with other things, or he may be crying and not increase the intensity of his cry when approached by the adult.

IV. PROXIMITY-AND INTERACTION-AVOIDING BEHAVIOR

This variable deals with the intensity, persistence, duration and promptness of the baby's avoidance of proximity and of interaction even across a distance. The relevant behaviors are: increasing distance between self and the person whether through locomotion or by leaning away from; turning the back on the person; turning the head away; averting the gaze; avoidance of meeting the person's eyes; hiding the face; or simply ignoring the person. Ignoring the person does not refer, however, to mere exploration of the environment, especially in Episodes 2 and 3. Ignoring or avoiding the person is most marked when she is trying to gain the attention of the baby or to get a response from him. It also may be considered avoidance if the baby ignores the mother's entrance to the room after an absence, whether or not she seeks a response from him, or if he does not respond to the entrance of the stranger or to her attempt to engage him in play or interaction.

This variable deals chiefly with interaction across a distance whereas the resistance variable is concerned with interaction in contact or in close proximity. The two sets of behaviors are usually easy to distinguish, since resistance is so frequently tinged with anger or aggressive movement, while avoidance seems either to be neutral in tone or perhaps to reflect apprehension. The more neutral the tone of the avoidance, however, the more likely it seems to be defensive in character--a defense which hides feelings, perhaps including feelings of resentment.

Although in the case of the other variable, behavior in interaction with mother or stranger could be comprehended in the same categories, in this coding it seems necessary to distinguish between mother and stranger.

7 Very marked and persistent avoidance.
Of mother: The baby does not greet the mother upon her return in a reunion episode (Episode 5 or 8)--neither with a smile nor with a protest. He pays little or no attention to her for an extended period despite the mother's efforts to attract his attention. He ignores her, and may turn his back on her. If his mother nevertheless picks him up, he remains unresponsive to her while she holds him, looking around, interested in other things.
Of stranger: The baby repeatedly and persistently avoids the stranger, by some kind of strong behavior--either locomotor withdrawal, or by hiding the face, perhaps combined with looking away. In Episode 3 the baby may go to his mother in his repeated withdrawals from the stranger.

6 Marked and persistent avoidance.
Of mother: (a) The baby behaves as above, giving the mother no greeting, except perhaps an initial look, and paying little or no attention to her for an extended period, but in this case the mother does not persist in her attempt to gain the baby's attention--she merely greets him and then sits quietly. Or (b) The baby greets his mother, perhaps with a smile or a fuss or with a partial approach, and then behaves as above, paying little or no attention to the mother for an extended period, despite the mother's efforts to attract his attention.
Of stranger: This score is reserved for an episode in which the end of the episode comes before it is confirmed that the baby's avoidance would have been repeated and persistent. The baby strongly withdraws from the stranger with behavior and in a context that makes it seem very probable that the avoidance would have been persistent had the episode not ended.

5 Clear-cut avoidance but less persistent

Of mother:

(a) The baby may look, but gives the mother no greeting, then looks away, or turns away and ignores the mother for about 30" during which time the mother makes no special effort to gain his attention; then he looks again and seems more responsive to her, but he does not seek contact and may even avoid it if it is offered.

(b) The baby gives the mother no greeting; the mother strives to gain his attention; after about 15" he gives her his attention but he is fairly unresponsive even then.

(c) The baby greets his mother or starts to approach her, but then he either markedly turns away (or looks away) or tries to go past her out the door, and ignores her efforts to gain his attention for an appreciable time, although he may then respond by approaching, reaching, or accepting a toy.

Of stranger: The baby repeatedly and persistently avoids the stranger, but without the intensity of the avoidance implicit in a coding of "7". In Episode 3 the baby may retreat to his mother, but without apparent intense anxiety, and then later show some other clear-cut manifestation of avoidance of the stranger. Regardless of the episode, the baby clearly does not want to have anything to do with the stranger--neither contact nor interaction--but his efforts to avoid her do not have the frantic persistence of those coded "7".

4 Brief but clear-cut avoidance OR persistent low-keyed avoidance.

Of mother:

(a) The baby greets his mother or starts to approach her; he then clearly turns away or looks away as in "5c". In this instance, however, the mother goes to her chair and sits, without making any effort to elicit responsiveness in the baby. The baby goes on playing, perhaps with occasional looks and smiles at the mother; both behave (in a reunion episode) much as the average couple do in Episode 2. In view of the mother's lack of participation, one can be justified in counting only the initial avoidance behavior (i.e., that following greeting) as avoidance on the baby's part. It is assumed that he is not ignoring his mother, and that he would approach her or respond to her if given a cue.

(b) The baby "snubs" the mother at first by failing to greet her and either by being slow to look at her or by looking away or both (or perhaps by trying to go out the door), but then after this initial avoidance behavior the baby responds by reaching to the mother's outstretched hands and/or by regaining responsiveness after having been picked up.

(c) The baby fails to greet his mother and ignores her for a time (15" to30") and then takes the initiative in making contact or undertaking interaction, even though the mother has not sought his attention.

Of stranger:

(a) The baby shows one clear-cut avoidance or several slight ones, but does at least look at the stranger and at what she is doing for part of the episode even though there is no positive response to her.

(b) The baby persistently avoids meeting the stranger's eyes with his. He may watch her, but as soon as she looks at him he averts his gaze. But no stronger instance of avoidance than this.

3 Slight, isolated avoidance behavior

Of mother:

(a) The baby is distressed and is either slow in looking at his mother or slow in responding to her overtures--but then he does, either crying more loudly or reaching or both.

(b) The baby is not distressed; he looks up at his mother when she arrives, perhaps greeting her, then looks away briefly; then he is responsive either interacting with her or exchanging looks and smiles in the course of play. He does not, however, take the initiative in seeking contact.

Of stranger:

(a) In Episode 3 the baby at one point retreats from the stranger to his mother, but without apparent anxiety. He does not approach the stranger, but on the other hand he does not further avoid the stranger's advances in this episode.

(b) One isolated but clear-cut instance of avoidance of the stranger, by twisting away, turning away, moving back a little, but for the rest of the episode the baby accepts the stranger's advances, and may be fairly friendly, or, if the episode ends soon, there is no implication that the avoidance will be persistent.

2 Very slight avoidance.

Of mother: The baby may delay very briefly in responding to his mother's return or may give her a brief snub by looking away, but very soon he takes the initiative in seeking contact, proximity or interaction with her.

Of stranger: One slight instance of avoidance of the stranger. The baby who is not distressed (because of separation) may look away coyly, or turn away momentarily as the stranger approaches, or perhaps he may seem to avoid her eyes for a while. The baby who is distressed by separation may not be responsive to the stranger, but he shows only one slight instance of avoidance--looking away or moving his hands away.

1 No avoidance

Of mother: The baby responds appropriately to his mother and to her behavior neither avoiding her overtures nor ignoring her return after an absence. In Episode 2, however, he may be quite preoccupied with exploration while she sits quietly, and in Episode 3, he may be absorbed either with continuing exploratory play or with staring at the stranger.

Of stranger: The baby may be friendly with the stranger. He may be too distressed by his mother's absence to be friendly. He may angrily resist the stranger or the toy she offers. He may continue playing, paying little spontaneous attention to the stranger. But he does not avoid the stranger, and he at least watches her when she tries to interest him in toys.

V. SEARCH BEHAVIOR DURING THE SEPARATION EPISODES

This variable deals with the degree of activity and persistence of behavior which may be interpreted as an attempt to search for and to regain the mother during the episodes when she is absent from the room. Of these behaviors the most obviously appropriate, even though necessarily ineffective, is following the mother to the door and trying to open it. The efforts to open it--or get someone to open it--include trying to insert the fingers in the crack of the door or under it, trying to reach the knob or looking up at the knob which is beyond reach, or banging on the door. Also relevant to a desire

to regain the mother is merely looking at the door or at the mother's chair or handbag, or going to one of these locations associated with the mother and remaining oriented to it for longer or shorter periods of time. Crying may also be interpreted as behavior which signals the baby's desire for his mother to return, but it is not included in the present scoring system, but rather it is dealt with in a separate analysis.

7 Very active and persistent search behavior

The baby goes to the door without substantial delay (within 45"). He either tries to open it, or reaches for the knob, or bangs on the door. Either he remains at the door and oriented to it for 30" or more after his initial effort to open it, or he returns again to the door after having left it.

6 Active and persistent search behavior. Any one of the following:

(a) The baby goes promptly to the door and stays there persistently. He either looks up at the knob or touches the door but he does not try to open it or reach for the knob or bang on the door. Even though he may be crying hard he remains oriented to the door.

(b) The baby delays in going to the door (i.e., for over 45") but then tries to open it or reaches for the knob or bangs on the door, and he remains at the door for 30" or more or returns to the door after having left it. (i.e., the same behavior that is scored "7" except for the initial delay.)

(c) The baby makes an active effort to reach the door but is prevented from actually reaching it or staying there either because he is picked up and held by the stranger or because the episode is curtailed. It is assumed that he would have displayed "6a" behavior had the intervention not occurred.

(d) The baby repeatedly goes to the door and touches it at least once, although he neither tries to open it nor remains near the door for an extended time.

5 Some active search. Any one of the following:

(a) The baby goes to the door across a fair distance (i.e., he is not already within a couple of steps of the door) but, either because of delay or because of absence of active effort to open the door or because he does not remain near the door and oriented to it, his behavior cannot be scored "6" or "7".

(b) In Episode 7 the baby is at the door when the stranger enters and he tries to go out the door and/ or helps to open the door.

(c) The baby struggles hard to go to the door but he is so distressed that his locomotion is too inefficient for him to be able to get to the door.

(d) The baby is held by the stranger and therefore cannot go to the door, but nevertheless he strongly and persistently leans toward or reaches toward the door out of the stranger's arms.

4 Obvious desire to regain the mother but the "search" behavior is incomplete or weak

(a) The baby displays five or more instances of "weak" search behavior, i.e., looking at the door, looking at the mother's chair, or going to the mother's chair or to her handbag.

(b) The baby begins to approach the door but goes only part way.

(c) The baby is near the door and goes the whole way to the door,

but he does not touch the door and he does not remain there for more than a few seconds.

(d) The baby goes to the mother's chair in a purposeful way (i.e., he does not merely happen to get there in pursuit of a toy or in the course of exploration) and in addition he shows one other instance of weak search behavior.

3 Some apparent desire to regain the mother but the search behavior is weak. Any one of the following:

(a) The baby displays three or four instances of "weak" search behavior, as defined above.

(b) The baby looks at the door and continues doing so for at least 30" or for all of a curtailed episode of less than 30" duration.

(c) The baby goes to the mother's chair in a purposeful way, and this is the only instance of search behavior he displays.

2 Very slight effort to search for the mother

The baby displays only one or two instances of weak search behavior, which includes looking at the door, looking at the mother's chair, or at her handbag, or making a mere intention movement toward the door (e.g., taking one or two steps toward the door when at a distance from it,) or going to the mother's chair in such a way that it is doubtful that the approach was purposeful.

] No search for the mother

Episodes will be scored "1" in which the baby does not go to or look at the door and does not go to or look at the mother's chair or handbag. He may, however, show any one of the following behaviors which are not identified as search behavior; watching the mother leave and continuing to look at the door for a few seconds after it has closed, or, in Episode 4 looking at the mother's chair as the first perception of her absence (i.e., the baby has not seen the mother leave the room), or looking at the door at the very end of a separation episode in probable response to hearing a person outside and about to enter. In other words, "search behavior" is that which occurs after the baby perceives hes mother's departure or absence and before the mother (or stranger) gives an auditory cue of her impending entrance.

VI. DISTANCE INTERACTION

This variable deals with positive social behaviors such as smiling, vocalizing, intent looking, showing of toy, and play which indicate that a baby is interested in the adult, although he may not be in close proximity to her. The term "distance interaction" is defined to include behaviors which can occur across the room from the adult or in the course of a partial approach to her, but not those which occur immediately preceding or in the course of a full approach.

In the scoring and in defining distance interaction, distinction has been made between mother and stranger in some cases. Interaction which occurs between mother and infant in Episodes 2, 5, and 8, and is instigated by the mother upon instructions to engage or re-engage the baby in play is not scored as distance interaction because it is not spontaneous and because it occurs when mother and infant are in close proximity. (Otherwise, contingencies both of maternal and infant behavior have been taken into account in the coding.) On the other hand, the responses to the stranger's systematic approaches in

Episode 3 have been coded as distance interaction, since it is of interest to note how readily and enthusiastically the baby will accept and respond to the social overtures of an unfamiliar person. Separate provision has also been made for distance interaction which may occur immediately following reunion with the mother in Episodes 5 and 8.

7 Very active and persistent distance interaction

(a) The baby and the adult establish a reciprocal interaction which last for 45 seconds or longer; or they establish briefer reciprocal interactions twice in the course of the episode.

(b) The baby offers or shows a toy to the adult two or more times in the course of the episode, although he does not seek proximity to her in order to do so.

(c) The baby appears to pause and attend to what the adult is saying for 45 seconds or more; or he does so twice in the course of the episode for briefer periods. This is reported as attending by the observers, and is clearly more than mere occasional looking at the adult when she speaks.

Reunions only

The baby does not make an immediate approach to his mother, but he greets her within 15 seconds by smiling, showing a toy, or vocalizing; and he is responsive to her in the course of the episode. That is, he smiles and vocalizes to her and engages in a reciprocal interaction with her at least once in the course of the episode.

6 Very active and fairly persistent distance interaction

The baby engages in a reciprocal interaction, briefer than the above. He pushes a toy back and forth to the adult in play, or he takes a toy and gestures to the adult about it. Or he engages in a brief reciprocal vocalization or smiling exchange.

Reunions only

The baby does not make an immediate full approach to his mother, but he greets her within 15 seconds with a smile, a show of toy, or a vocalization and is responsive to her in the course of the episode. He smiles and vocalizes to her five or more times, or he may offer the mother a toy or otherwise attempt to communicate with her about his environment. However, no reciprocal interactions occur.

5 Active distance interaction

Mother

The baby smiles and vocalizes to his mother four or more times in the course of the episode.

Reunions only

The baby does not make an immediate full approach to his mother but instead greets her within 15 seconds with a smile, a show of toy, or a vocalization; he makes other distal bids (smiles, vocalizations, show of toy) three or four other times in the course of the episode.

Stranger

The baby takes a toy directly from the stranger and offers her a toy once in the course of the episode; or he indicates a toy to her by pointing or trying to communicate to her about it.

4 Moderate distance interaction

Mother

(a) The baby smiles or vocalizes to his mother two or three times in the course of the episode.

(b) The baby gestures about a toy or points out something in the room to his mother once in the course of the episode.

Reunions only

The baby does not make an immediate full approach to his mother, but greets her with a smile or a vocalization within 15 seconds, and also smiles or vocalizes to her twice subsequently in the course of the episode.

Stranger

(a) The baby accepts a toy that the stranger offers more or less readily, perhaps smiling at her, but he shows no tendency to reciprocate by engaging her in further play.

(b) The baby vocalizes and/or smiles to the stranger three times during the episode.

3 Little distance interaction

Mother

(a) The baby looks at the mother frequently in the course of his exploration (these are described as more than glances or very brief looks); and he orients to her for more than 15 seconds at least once during the episode, perhaps smiling at her.

(b) The mother initiates an interaction across the distance with the baby by smiling at or vocalizing to the baby, and she receives a smile or two in the course of the episode. But the baby takes no initiative in interactive bids during the episode.

Reunion only

(a) The baby may smile at his mother when she enters initially and he may be happy to see her but he does not make an immediately full approach. Either because he later achieves contact or because he glances at his mother, or vocalizes to her only once in the course of the ensuing episode, he does not get a higher score.

(b) The baby greets his mother with a smile upon reunion, but he shows no tendency to seek her proximity. However, the mother picks him up. Since one can infer that we would have made more distal bids had the mother not intervened, the baby receives this score.

Stranger

(a) If the stranger approaches the baby, he may look at her attentively as well as at the toy that she is offering. However, he does not directly take the toy that she brings, although he may make an "intention movement" towards it. This score is different from a score of "2" because in this case, the baby is obviously more directly interested in the stranger.

(b) The baby smiles and/or vocalizes to the stranger twice in the course of the episode.

2 Very little distance interaction

Mother

The baby glances at the mother four or more times in the course of the episode and he might vocalize and/or smile to her once, but he engages in no more active type of distance interaction.

Reunion only

The baby does not make an immediate full approach. He may look at his mother initially, twisting around briefly to see her, and he may be described as having a pleasant expression on his face. If he is not picked up, he may occasionally look at her (five or fewer times), but he engages in no more active types of behavior.

Stranger

(a) The baby may pause and stare at the stranger with obvious curiosity or he may glance at her frequently (five or more times). But beyond this, he shows no tendency to engage her socially.

(b) If the stranger offers the baby a toy, he may focus his attention on it, perhaps making a slight intention movement toward it; or he may pick it up after the stranger has put it down. Hence he is interacting with her indirectly, but he will give her no more direct attention than a few brief glances.

1 No distance interaction

Mother and Stranger

(a) The baby makes no bids for distance interaction with the adult. He may glance briefly at her (two or three times) or if she attempts to engage his attention, he may look at her at least part of the time. However, he shows no further tendency to interact with her.

(b) The baby may be distressed and seeking proximity and/or contact with the adult. He may look at the adult a few times before approaching, but he seems to want physical closeness. Although he may be highly responsive to the adult while in contact or while standing by her chair, he shows no desire to increase the distance between them.

Stranger

(a) The baby is distressed when the stranger approaches. He may accept her or prefer to ignore her. He may look briefly at a toy which she offers, but he is completely unwilling to become involved with it. Note: If the baby responds positively to what the stranger is doing for at least part of the time, he receives a higher score than "1".

(b) The stranger does not approach the baby. He confines himself to giving her a few brief glances which do not linger on her face and which are not meant to evoke a social response from her; or he gives her one or two more prolonged looks with no interactive tendencies.

Criteria for Classification

Group A:

Conspicuous avoidance of proximity to or interaction with the mother in the reunion episodes. (Either the baby ignores his mother on her return, greeting her casually if at all, or, if there is approach and/or a less casual greeting, the baby tends to mingle his welcome with avoidance responses--turning away, moving past, averting the gaze, and the like.)

Little or no tendency to seek proximity, interaction, or contact with the mother, even in the reunion episodes.

If picked up, little or no tendency to cling, or to resist being released.

On the other hand, little or no tendency toward active resistance to contact or interaction with the mother, except for probable squirming to get down, if indeed the baby is picked up.

Tendency to treat the stranger much as the mother is treated, although perhaps with less avoidance.

Either the baby is not distressed during separation, or the distress seems to be due to being left alone rather than to his mother's absence. For most, distress does not occur when the stranger is present, and any distress upon being left alone tends to be alleviated when the stranger returns.

Subgroup A_1

Conspicuous avoidance of the mother in the reunion episodes, which is likely to consist of ignoring her altogether, although there may be some pointed looking away, turning away, or moving away.

If there is a greeting when the mother enters, it tends to be a mere look or smile.

The baby either does not approach his mother upon reunion, or the approach is "abortive" with the baby going past his mother, or it tends to occur only after much coaxing.

If picked up, the baby shows little or no contact-maintaining behavior. He tends not to cuddle in; he looks away; and he may squirm to get down.

Subgroup A_2

The baby shows a mixed response to his mother on reunion, with some tendency to greet and to approach, intermingled with a marked tendency to turn or move away from her, move past her, avert the gaze from her, or ignore her. Thus there may be moderate proximity seeking combined with strong proximity avoiding.

If he is picked up, the baby may cling momentarily; if he is put down he may protest or resist momentarily; but there is also a tendency to squirm to be put down, to turn the face away when being held, and other signs of mixed feelings.

Group B

The baby either wants proximity and contact with his mother, or he wants interaction with her, and he is active in seeking it, especially in the reunion episodes.

If he achieves contact, he seeks to maintain it, and either resists release or at least protests if he is put down.

The baby responds to his mother's return in the reunion episodes with more than a casual greeting--either with a smile or a cry or a tendency to approach.

Little or no tendency to resist contact or interaction with his mother.

Little or no tendency to avoid his mother in the reunion episodes.

He may or may not be friendly with the stranger, but he is clearly more interested in interaction and/or contact with his mother than with the stranger.

He may or may not be distressed during the separation episodes, but if he is distressed this is clearly related to his mother's absence and not merely to being alone. He may be somewhat comforted by the stranger but it is clear that he wants his mother.

Subgroup B_1

The baby greets his mother, smiling, upon her return, and shows strong initiative in interaction with her across a distance, although he does not especially seek proximity to her or physical contact with her.

If picked up, he does not especially seek to maintain contact.

He may mingle some avoiding behavior (turning away or looking away) with interactive behavior, but he shows little or no resistant behavior, and, in general, seems not to have feelings as mixed as does an A_2 baby.

He is likely to show little or no distress in the separation episodes.

Subgroup B_2

The baby greets his mother upon reunion, tends to approach her, and seems to want contact with her, but to a lesser extent than does a B_3 baby. Some B_2 babies seek proximity in the pre-separation episodes, but not again until Episode #8, and then perhaps only after some delay.

The B_2 baby may show some proximity avoiding, especially in Episode #5, but this gives way to proximity seeking in Episode #8, thus distinguishing him from the A_2 baby.

Although he accepts contact if he is picked up, he does not cling especially, and he does not resist release conspicuously.

On the other hand, he shows little or no resistance to contact or to interaction, and in general shows less sign of mixed feelings than do A_2 babies.

He tends to show little distress during the separation episodes.

He resembles a B_1 infant except that he is more likely to seek proximity to his mother.

Subgroup B_3

The baby actively seeks physical contact with his mother, and when he gains it he is conspicuous for attempting to maintain it, actively resisting her attempts to release him. Most B_3 babies show their strongest proximity-seeking and contact-maintaining behavior in Episode #8, but some do so in Episode #5, and are so distressed in the second separation thay they cannot mobilize active proximity seeking and resort to signalling. Occasionally, a baby who seems especially secure in his relationship with his mother will be content with more interaction with her and proximity to her, without seeking to be held.

At the same time, the B_3 baby may be distinguished from other groups and subgroups by the fact that he shows little or no sign of either avoiding or resisting proximity, contact, or interaction with his mother.

He may or may not be distressed in the separation episodes, but if he shows little distress then, he clearly is more active in seeking contact and in resisting release than are B_1 or B_2 babies.

Although his attachment behavior is heightened in the reunion episodes, he does not seem wholly preoccupied with his mother in the pre-separation episodes.

Subgroup B_4

The baby wants contact, especially in the reunion episodes, and seeks it approaching, clinging, and resisting release; he is, however, somewhat less active and competent in these behaviors than are most B_3 babies, especially in Episode #8.

He seems wholly preoccupied with his mother throughout the strange situation. He gives the impression of feeling anxious throughout, with much crying. In the second separation particularly he seems entirely distressed.

He may show other signs of disturbance, such as inappropriate, stereotyped, repetitive gestures or motions.

He may show some resistance to his mother, and indeed he may avoid her in the sense of drawing back from her or averting his face when held by her. Since he also shows strong contact-seeking behavior the impression is of some ambivalence, although not as much as is shown by Group C infants.

Group C

The baby displays conspicuous contact--and interaction-resisting behavior, perhaps especially in Episode #8.

He also shows moderate to strong seeking of proximity and contact and seeking to maintain contact once gained, so that he gives the impression of being ambivalent to his mother.

He shows little or no tendency to ignore his mother in the reunion episodes, or to turn or move away from her or to avert his gaze from her.

He may display generally "maladaptive" behavior in the strange situation. Either he tends to be more angry than infants in other groups, or he may be conspicuous for passivity.

Subgroup C_1

Proximity seeking and contact maintaining is strong in the reunion episodes, and is more likely to occur also in the pre-separation episodes than in the case of Group B infants.

Resistant behavior is particularly conspicuous. The mixture of seeking and yet resisting contact and interaction has an unmistakably angry quality, and indeed an angry tone may characterize behavior even in the pre-separation episodes.

Angry, resistant behavior is likely to be shown toward the stranger as well as toward the mother.

The baby is very likely to be extremely distressed during the separation episodes.

Subgroup C_2

Perhaps the most conspicuous characteristic of C_2 infants is their passivity. Their exploratory behavior is limited throughout the strange situation, and their interactive behaviors are relatively lacking in active initiative.

Nevertheless in the reunion episodes they obviously want proximity and contact with their mothers, even though they tend to use signalling behavior rather than active approach, and protest against being put down rather than actively resist release.

Resistant behavior tends to strong, particularly in Episode #8, but in general the C_2 baby is not as conspicuously angry as the C_1 baby.

PLEASE NOTE:

Pages 187 to 189 "Barley Scales of Infant Development" and "Motor Scale Record Form" and "The Fling Security Scale" not microfilmed at the request of the author. Available for consultation at the University of Houston Library.

UNIVERSITY MICROFILMS

BAYLEY SCALES OF INFANT DEVELOPMENT

MENTAL SCALE RECORD FORM

NAME _____ AGE _____ SEX _____

	Year	Month	Day
Date Tested			
Date of Birth			
Age			

	Raw Score	Development Index*
Mental Scale		(MDI)
Motor Scale		(PDI)

* The standard score for the Mental Scale is called the MDI (for Mental Development Index); for the Motor Scale it is the PDI (for Psychomotor Development Index). See Manual for discussion.

NOTES:

Note.—If both the MENTAL SCALE and the MOTOR SCALE are administered to the child, the information below need only be filled in on the Record Form for the MENTAL SCALE.

ADDRESS _____

BIRTHPLACE _____

BIRTH WEIGHT _____ BIRTH ORDER _____

PRENATAL OR BIRTH DIFFICULTIES _____

_____

CHILD'S HEALTH _____

_____

PARENT'S NAME _____

FATHER: EDUCATION _____ OCCUPATION _____

MOTHER: EDUCATION _____ OCCUPATION _____

HOUSEHOLD COMPOSITION

	Father	Mother	Siblings								Other Children		
			1	2	3	4	5	6	7	8	1	2	3
Check if Present in Household													
Approximate Age													
Sex (M for Male, F for Female)													
Comments:													

PLACE OF TESTING _____

TESTED BY _____

The Psychological Corporation, New York

Printed in U. S. A.

69-101AS

To score: Check P (Pass) or F (Fail). If "Other," mark O (Omit), R (Refused), or RPT (Reported by mother).

Item No.	Age Placement and Range (Months)	Situation	Item Title	Score			Notes
				P	F	Other	
1	0.1	A	Responds to sound of bell				
2	0.1	B	Quiets when picked up				
3	0.1 *(.1-3)*	C	Responds to sound of rattle				
4	0.1 *(.1-4)*		Responds to sharp sound: click of light switch				
5	0.1 *(.1-1)*	D	Momentary regard of red ring				
6	0.2 *(.1-1)*	E	Regards person momentarily				
7	0.4 *(.1-2)*	D	Prolonged regard of red ring				
8	0.5 *(.1-2)*	D	Horizontal eye coordination: red ring				
9	0.7 *(.3-3)*	F	Horizontal eye coordination: light				
10	0.7 *(.3-2)*	E	Eyes follow moving person				
11	0.7 *(.3-2)*	E	Responds to voice				
12	0.8 *(.3-3)*	F	Vertical eye coordination: light				
13	0.9 *(.5-3)*	G	* Vocalizes once or twice				
14	1.0 *(.5-3)*	D	Vertical eye coordination: red ring				
15	1.2 *(.5-3)*	F	Circular eye coordination: light				
16	1.2 *(.5-3)*	D	Circular eye coordination: red ring				
17	1.3 *(.5-3)*	G[1]	* Free inspection of surroundings				
18	1.5 *(.5-4)*	E	Social smile: E talks and smiles				
19	1.6 *(.7-4)*	D	Turns eyes to red ring				
20	1.6 *(.5-4)*	F	Turns eyes to light				
21	1.6 *(.5-5)*	G	* Vocalizes at least 4 times				
22	1.7 *(1-4)*	B	Anticipatory excitement				
23	1.7 *(.5-5)*		Reacts to paper on face				
24	1.9 *(1-4)*		Blinks at shadow of hand				
25	2.0 *(1-5)*	E	Visually recognizes mother				

* May be observed incidentally.

To score: Check P (Pass) or F (Fail). If "Other," mark O (Omit), R (Refused), or RPT (Reported by mother).

Item No.	Age Placement and Range (Months)	Situation	Item Title	Score P	Score F	Score Other	Notes
26	2.1 *(.7-6)*	E	Social smile: E smiles, quiet				
27	2.1 *(1-6)*	E	* Vocalizes to E's social smile and talk				
28	2.2 *(.7-5)*	AC	Searches with eyes for sound (Specify)				_____Bell _____Rattle
29	2.3 *(.7-5)*		Eyes follow pencil				
30	2.3 *(1-5)*	G	* Vocalizes 2 different sounds				
31	2.4 *(1-5)*	E	Reacts to disappearance of face				
32T‡	2.5 *(1-5)*	H	Regards cube				
33	2.6 *(1-5)*	D^1	Manipulates red ring				
34	2.6 *(1-5)*	AC	Glances from one object to another				
35	2.6 *(1-6)*	B	Anticipatory adjustment to lifting				
36	2.8 *(2-5)*	C	Simple play with rattle				
37	3.1 *(1-5)*	D^1	Reaches for dangling ring				
38T	3.1 *(2-5)*		Follows ball visually across table				
39	3.2 *(1-6)*	G^1	* Fingers hand in play				
40T	3.2 *(1-5)*	D^1	Head follows dangling ring				
41T	3.2 *(1-6)*	I	Head follows vanishing spoon				
42	3.3 *(2-6)*	G^1	* Aware of strange situation				
43T	3.3 *(2-6)*	G^2	* Manipulates table edge slightly				
44	3.8 *(2-6)*	D^1	Carries ring to mouth				
45	3.8 *(2-6)*	G^1	* Inspects own hands				
46	3.8 *(2-6)*	D^1	Closes on dangling ring (Check hand preference)				_____Right _____Left _____None
47	3.8 *(2-6)*	A	Turns head to sound of bell				
48	3.9 *(2-6)*	C	Turns head to sound of rattle				
49	4.1 *(2-6)*	H	Reaches for cube				
50	4.3 *(2-7)*	G^2	* Manipulates table edge actively				

* May be observed incidentally.

‡ See Manual, Chapter 4, for explanation of "T."

To score: Check P (Pass) or F (Fail). If "Other," mark O (Omit), R (Refused), or RPT (Reported by mother).

Item No.	Age Placement and Range (Months)	Situation	Item Title	Score			Notes
				P	F	Other	
51	4.4 *(2-6)*	H	Eye-hand coordination in reaching				
52	4.4 *(2-7)*	J	Regards pellet				
53	4.4 *(2-7)*	K	Mirror image approach				
54	4.6 *(3-7)*	H	Picks up cube (Check hand preference)				_____Right _____Left _____None
55	4.6 *(3-8)*	G^3	* Vocalizes attitudes (Describe)				Pleasure: Displeasure: Eagerness: Satisfaction:
56	4.7 *(3-7)*	H	Retains 2 cubes				
57	4.8 *(3-7)*		Exploitive paper play				
58	4.8 *(3-8)*	E^1	* Discriminates strangers				
59	4.9 *(4-8)*	C	Recovers rattle, in crib				
60	5.0 *(3-8)*	H	Reaches persistently				
61	5.1 *(3-8)*	E^1	Likes frolic play				
62	5.2 *(4-8)*	I	Turns head after fallen spoon				
63	5.2 *(4-8)*	L	Lifts inverted cup				
64	5.4 *(4-8)*	H	Reaches for 2nd cube				
65	5.4 *(3-12)*	K	Smiles at mirror image				
66	5.4 *(4-8)*	G^2	* Bangs in play				
67	5.4 *(4-8)*	D^2	Sustained inspection of ring				
68	5.4 *(4-8)*	D^2	Exploitive string play				
69	5.5 *(4-8)*	G^2	* Transfers object hand to hand				
70	5.7 *(4-8)*	H	Picks up cube deftly and directly				
71	5.7 *(4-8)*	D^2	Pulls string: secures ring				
72	5.8 *(4-8)*	G^2	* Interest in sound production				
73	5.8 *(4-11)*	L	Lifts cup with handle				

* May be observed incidentally.

To score: Check P (Pass) or F (Fail). If "Other," mark O (Omit), R (Refused), or RPT (Reported by mother).

Item No.	Age Placement and Range (Months)	Situation	Item Title	Score			Notes
				P	F	Other	
74	5.8 *(4-10)*	M	Attends to scribbling				
75	6.0 *(5-10)*	I	Looks for fallen spoon				
76	6.2 *(4-12)*	K	Playful response to mirror				
77	6.3 *(4-10)*	H	Retains 2 of 3 cubes offered				
78	6.5 *(5-10)*	A^1	Manipulates bell: interest in detail				
79	7.0 *(5-12)*	G^3	* Vocalizes 4 different syllables				
80	7.1 *(5-10)*	D^2	Pulls string adaptively: secures ring				
81	7.6 *(5-12)*	E^1	Cooperates in games				Note skill at pat-a-cake for Motor Scale item 44
82	7.6 *(5-14)*	H	Attempts to secure 3 cubes				
83	7.8 *(5-13)*	A^1	Rings bell purposively				
84	7.9 *(5-14)*	N	* Listens selectively to familiar words				
85	7.9 *(5-14)*	G^3	* Says "da-da" or equivalent				
86	8.1 *(6-12)*	H^1	Uncovers toy				
87	8.9 *(6-12)*	O	Fingers holes in peg board				
88	9.0 *(6-14)*	L	Picks up cup: secures cube				
89	9.1 *(6-14)*	N	Responds to verbal request				
90	9.4 *(6-13)*	L	Puts cube in cup on command (Note number placed)				Items 90, 100, 114 _____No. of cubes
91	9.5 *(8-14)*	P	Looks for contents of box				
92	9.7 *(8-15)*	L	Stirs with spoon in imitation				
93	10.0 *(7-16)*	Q	Looks at pictures in book				
94	10.1 *(7-17)*	M	Inhibits on command				
95	10.4 *(7-15)*	M	Attempts to imitate scribble				
96	10.5 *(8-17)*	H^1	Unwraps cube				
97	10.8 *(8-17)*	E^1	* Repeats performance laughed at				
98	11.2 *(8-15)*	M	Holds crayon adaptively				

* May be observed incidentally.

To score: Check P (Pass) or F (Fail). If "Other," mark O (Omit), R (Refused), or RPT (Reported by mother).

Item No.	Age Placement and Range (Months)	Situation	Item Title	Score			Notes
				P	F	Other	
99	11.3 *(8-15)*		Pushes car along				
100	11.8 *(9-18)*	L	Puts 3 or more cubes in cup				
101	12.0 *(9-18)*	G[3]	* Jabbers expressively				
102	12.0 *(9-17)*	P	Uncovers blue box				
103	12.0 *(8-18)*	Q	Turns pages of book				
104	12.2 *(8-19)*		Pats whistle doll, in imitation				
105	12.4 *(7-18)*	D[2]	Dangles ring by string				
106	12.5 *(9-18)*	N	* Imitates words (Record words used)				
107	12.9 *(10-17)*	P	Puts beads in box (6 of 8)				
108	13.0 *(10-17)*	O	Places 1 peg repeatedly				
109	13.4 *(10-19)*	J	Removes pellet from bottle				
110	13.6 *(10-20)*	R	Blue board: places 1 round block (Specify)				Items 110, 121, 129, 142, 155, 159, 160 _____No. round placed _____No. square placed _____Completion time
111	13.8 *(10-19)*	H[1]	Builds tower of 2 cubes (Note number of cubes)				Items 111, 119, 143, 161 _____No. of cubes
112	14.0 *(10-21)*	M	Spontaneous scribble				
113	14.2 *(10-23)*	G[3]	* Says 2 words (Note words)				Heard: Reported:
114	14.3 *(11-20)*	L	Puts 9 cubes in cup				
115	14.6 *(10-20)*	P	Closes round box				
116	14.6 *(11-19)*		* Uses gestures to make wants known				
117	15.3 *(11-23)*	N	Shows shoes or other clothing, or own toy				
118	16.4 *(13-20)*	O	Pegs placed in 70 seconds (Note times)				Items 118, 123, 134, 156 Trial 1 2 3 Time ____ ____ ____
119	16.7 *(13-21)*	H[1]	Builds tower of 3 cubes				
120	16.8 *(12-26)*	S	Pink board: places round block (Specify)				Items 120, 137, 151 _____Round placed _____All placed _____All placed (reversed board)
121	17.0 *(12-26)*	R	Blue board: places 2 round blocks				

* May be observed incidentally.

To score: Check P (Pass) or F (Fail). If "Other," mark O (Omit), R (Refused), or RPT (Reported by mother).

Item No.	Age Placement and Range (Months)	Situation	Item Title	Score P	Score F	Score Other	Notes
122	17.0 *(12-24)*		Attains toy with stick				
123	17.6 *(14-22)*	O	Pegs placed in 42 seconds				
124	17.8 *(13-27)*	T	Names 1 object (Check objects named)				Items 124, 138, 146 ____Ball ____Scissors ____Watch ____Cup ____Pencil
125	17.8 *(13-26)*	M	Imitates crayon stroke				
126	17.8 *(14-26)*	U	Follows directions, doll (Check parts passed)				____Chair ____Cup ____Handkerchief
127	18.8 *(14-27)*	G[3]	* Uses words to make wants known				
128	19.1 *(15-26)*	U	Points to parts of doll (Check parts recognized)				____Hair ____Eyes ____Mouth ____Feet ____Ears ____Nose ____Hands
129	19.3 *(14-30+)*	R	Blue board: places 2 round and 2 square blocks				
130	19.3 *(14-27)*	V	Names 1 picture (Check list)				Items 130, 132, 139, 141, 148, 149 Names / Points Dog ____ ____ Shoe ____ ____ Cup ____ ____ House ____ ____ Clock ____ ____ Flag ____ ____ Star ____ ____ Leaf ____ ____ Purse ____ ____ Book ____ ____ No. Named____ ____No. Pointed
131	19.7 *(14-30+)*		Finds 2 objects (Check successful trials)				Trial 1 2 3 Ball ____ ____ ____ Rabbit ____ ____ ____
132	19.9 *(16-28)*	V	Points to 3 pictures (Check list at item 130)				
133	19.9 *(15-27)*	W	Broken doll: mends marginally				
134	20.0 *(16-29)*	O	Pegs placed in 30 seconds				
135	20.5 *(14-30+)*	M	Differentiates scribble from stroke				
136	20.6 *(16-30)*	G[3]	* Sentence of 2 words				
137	21.2 *(16-30+)*	S	Pink board: completes				
138	21.4 *(16-30)*	T	Names 2 objects				
139	21.6 *(17-30+)*	V	Points to 5 pictures (Check list at item 130)				

* May be observed incidentally.

To score: Check P (Pass) or F (Fail). If "Other," mark O (Omit), R (Refused), or RPT (Reported by mother).

Item No.	Age Placement and Range (Months)	Situation	Item Title	Score			Notes
				P	F	Other	
140	21.9 *(15-30)*	W	Broken doll: mends approximately				
141	22.1 *(17-30+)*	V	Names 3 pictures (Check list at item 130)				
142	22.4 *(16-30+)*	R	Blue board: places 6 blocks				
143	23.0 *(17-30+)*	H[1]	Builds tower of 6 cubes				
144	23.4 *(16-30+)*	X	Discriminates 2: cup, plate, box (Check which)				Items 144, 152 _____Cup _____Box _____Plate _____All
145	23.8 *(17-30+)*	Y	Names watch, 4th picture (Check at which named)				Items 145, 150 _____5th picture _____3rd picture _____4th picture _____2nd picture
146	24.0 *(17-30+)*	T	Names 3 objects				
147	24.4 *(19-30+)*	M	Imitates strokes: vertical and horizontal				
148	24.7 *(19-30+)*	V	Points to 7 pictures (Check list at item 130)				
149	25.0 *(19-30+)*	V	Names 5 pictures (Check list at item 130)				
150	25.2 *(18-30+)*	Y	Names watch, 2nd picture				
151	25.4 *(18-30+)*	S	Pink board: reversed				
152	25.6 *(18-30+)*	X	Discriminates 3: cup, plate, box				
153	26.1 *(16-30+)*	W	Broken doll: mends exactly				
154	26.1 *(19-30+)*	H[1]	Train of cubes				
155	26.3 *(19-30+)*	R	Blue board: completes in 150 seconds				
156	26.6 *(19-30+)*	O	Pegs placed in 22 seconds				
157	27.9 *(22-30+)*	M	Folds paper				
158	28.2 *(22-30+)*	Z	Understands 2 prepositions				
159	30.0 *(22-30+)*	R	Blue board: completes in 90 seconds				
160	30+ *(22-30+)*	R	Blue board: completes in 60 seconds				
161	30+ *(22-30+)*	H[1]	Builds tower of 8 cubes				
162	30+ *(21-30+)*	H[1]	Concept of one				
163	30+ *(23-30+)*	Z	Understands 3 prepositions				

BAYLEY SCALES OF INFANT DEVELOPMENT

MOTOR SCALE RECORD FORM

NAME _____ AGE _____ SEX _____

	Year	Month	Day
Date Tested			
Date of Birth			
Age			

	Raw Score	Development Index*
Mental Scale		(MDI)
Motor Scale		(PDI)

* The standard score for the Mental Scale is called the MDI (for Mental Development Index); for the Motor Scale it is the PDI (for Psychomotor Development Index). See Manual for discussion.

Note.—If both the MENTAL SCALE and the MOTOR SCALE are administered to the child, the information below need only be filled in on the Record Form for the MENTAL SCALE.

NOTES:

ADDRESS _____

BIRTHPLACE _____

BIRTH WEIGHT _____ BIRTH ORDER _____

PRENATAL OR BIRTH DIFFICULTIES _____

_____

CHILD'S HEALTH _____

_____

PARENT'S NAME _____

FATHER: EDUCATION _____ OCCUPATION _____

MOTHER: EDUCATION _____ OCCUPATION _____

HOUSEHOLD COMPOSITION

	Father	Mother	Siblings 1	2	3	4	5	6	7	8	Other Children 1	2	3
Check if Present in Household													
Approximate Age													
Sex (M for Male, F for Female)													

Comments:

PLACE OF TESTING _____

TESTED BY _____

The Psychological Corporation, New York

Printed in U. S. A.

71-220AS

To score: Check P (Pass) or F (Fail). If "Other," mark O (Omit), R (Refused), or RPT (Reported by mother).

Item No.	Age Placement and Range (Months)	Situation	Item Title	Score			Notes
				P	F	Other	
1	0.1	A	Lifts head when held at shoulder				
2	0.1	A	Postural adjustment when held at shoulder				
3	0.1	B	Lateral head movements				
4	0.4 *(.1-3)*	B	Crawling movements				
5	0.8 *(.3-3)*	C	† Retains red ring				
6	0.8 *(.3-2)*	C	* Arm thrusts in play				
7	0.8 *(.3-2)*	C	* Leg thrusts in play				
8	0.8 *(.3-3)*	A	Head erect: vertical				
9	1.6 *(.7-4)*	A	Head erect and steady				
10	1.7 *(.7-4)*	C	Lifts head: dorsal suspension				
11	1.8 *(.7-5)*	C'	Turns from side to back				
12	2.1 *(.7-5)*	B	Elevates self by arms: prone				
13	2.3 *(1-5)*	D	Sits with support				
14	2.5 *(1-5)*	A	Holds head steady				
15	2.7 *(.7-6)*		* Hands predominantly open				
16	3.7 *(2-7)*	E	† Cube: ulnar-palmar prehension				
17	3.8 *(2-6)*	D	Sits with slight support				
18	4.2 *(2-6)*	A	Head balanced				
19	4.4 *(2-7)*	C'	* Turns from back to side				
20	4.8 *(3-8)*	F	Effort to sit				
21	4.9 *(4-8)*	E	† Cube: partial thumb opposition (radial-palmar)				
22	5.3 *(4-8)*	F	Pulls to sitting position				
23	5.3 *(4-8)*	D	Sits alone momentarily				
24	5.4 *(4-8)*	G	* Unilateral reaching				
25	5.6 *(4-8)*	H	† Attempts to secure pellet				
26	5.7 *(4-8)*	G	* Rotates wrist				
27	6.0 *(5-8)*	D	Sits alone 30 seconds or more				
28	6.4 *(4-10)*	C'	* Rolls from back to stomach				

* May be observed incidentally. † May be presented during administration of Mental Scale.

To score: Check P (Pass) or F (Fail). If "Other," mark O (Omit), R (Refused), or RPT (Reported by mother).

Item No.	Age Placement and Range (Months)	Situation	Item Title	Score			Notes
				P	F	Other	
29	6.6 *(5-9)*	D	Sits alone, steadily				
30	6.8 *(5-9)*	H	† Scoops pellet				
31	6.9 *(5-10)*	D	Sits alone, good coordination				
32	6.9 *(5-9)*	E	† Cube: complete thumb opposition (radial-digital)				
33	7.1 *(5-11)*	B	Prewalking progression (Check method)				____On abdomen ____Hands and knees ____Hands and feet ____Sits and hitches ____Other (Describe):
34	7.4 *(5-11)*	I	Early stepping movements				
35	7.4 *(6-10)*	H	† Pellet: partial finger prehension (inferior pincer)				
36	8.1 *(5-12)*	F	Pulls to standing position				
37	8.3 *(6-11)*	J	Raises self to sitting position				
38	8.6 *(6-12)*	J	Stands up by furniture				
39	8.6 *(6-12)*	G	† Combines spoons or cubes: midline				
40	8.8 *(6-12)*	I	Stepping movements				
41	8.9 *(7-12)*	H	† Pellet: fine prehension (neat pincer)				
42	9.6 *(7-12)*	I	Walks with help				
43	9.6 *(7-14)*	I	Sits down				
44	9.7 *(7-15)*	G	† Pat-a-cake: midline skill				
45	11.0 *(9-16)*	I	Stands alone				
46	11.7 *(9-17)*	I	Walks alone				
47	12.6 *(9-18)*	K	Stands up: I				
48	13.3 *(9-18)*		†Throws ball				
49	14.1 *(10-20)*	L	Walks sideways				
50	14.6 *(11-20)*	L	Walks backward				
51	15.9 *(12-21)*	M	Stands on right foot with help				
52	16.1 *(12-23)*	M	Stands on left foot with help				
53	16.1 *(12-23)*	N	Walks up stairs with help				
54	16.4 *(13-23)*	N	Walks down stairs with help				

† May be presented during administration of Mental Scale.

To score: Check P (Pass) or F (Fail). If "Other," mark O (Omit), R (Refused), or RPT (Reported by mother).

Item No.	Age Placement and Range (Months)	Situation	Item Title	Score			Notes
				P	F	Other	
55	17.8 *(13-26)*	O	Tries to stand on walking board				
56	20.6 *(15-29)*	O	Walks with one foot on walking board				
57	21.9 *(11-30+)*	K	Stands up: II				
58	22.7 *(15-30+)*	M	Stands on left foot alone				
59	23.4 *(17-30+)*	P	Jumps off floor, both feet				
60	23.5 *(16-30+)*	M	Stands on right foot alone				
61	23.9 *(18-30+)*	Q	Walks on line, general direction				
62	24.5 *(17-30+)*	O	Walking board: stands with both feet				
63	24.8 *(19-30+)*	R	Jumps from bottom step				
64	25.1 *(18-30+)*	N	Walks up stairs alone: both feet on each step				
65	25.7 *(16-30+)*	Q	Walks on tiptoe, few steps				
66	25.8 *(19-30+)*	N	Walks down stairs alone: both feet on each step				
67	27.6 *(19-30+)*	O	Walking board: attempts step				
68	27.8 *(20-30+)*	Q	Walks backward, 10 feet				
69	28.1 *(21-30+)*	R	Jumps from second step				
70	29.1 *(22-30+)*	R	Distance jump: 4 to 14 inches (Note distance)				Items 70, 76, 78 Trial 1 2 3 Distance ____ ____ ____
71	30+ *(22-30+)*	K	Stands up: III				
72	30+ *(23-30+)*	N	Walks up stairs: alternating forward foot				
73	30+ *(20-30+)*	Q	Walks on tiptoe, 10 feet				
74	30+ *(24-30+)*	O	Walking board: alternates steps part way				
75	30+ *(23-30+)*	Q	Keeps feet on line, 10 feet				
76	30+ *(25-30+)*	R	Distance jump: 14 to 24 inches				
77	30+ *(24-30+)*	P	Jumps over string 2 inches high				
78	30+ *(28-30+)*	R	Distance jump: 24 to 34 inches				
79	30+ *(30+)*		Hops on one foot, 2 or more hops				
80	30+ *(30+)*	N	Walks down stairs: alternating forward foot				
81	30+ *(28-30+)*	P	Jumps over string 8 inches high				

The Flint Infant Security Scale

BETTY M. FLINT

for infants aged 3 to 24 months

Scoring Booklet

Name: Date:

Address: Birthdate:

Referring Agency: C. A. (in months):

Security Scores

A

	Secure	D.A. and Regressive
Eating		
Unfamiliar Situation		
Sleeping		
Toileting and Bathing		
Physical Experiences		
Changing Environment		
Social		
Playing		
Total Endorsed	−	
Total Applicable	+	
Security Score		

× 100

B

%	Dependence	Effort
Acceptance		
Refusal		

Summary

Guidance Centre Faculty of Education University of Toronto

Examiner's Notes

Reaction to examiner:
Attention and persistence:
Level of responsiveness:
Intensity of approach:
Characteristic mood:
Explanatory notes regarding item endorsement:
Attitude of mother to baby:
Examiner:

Name: Date: Age:

		Secure			Deputy Agent and Regression
D		**Eating** **Accepts new foods readily** eats them with enjoyment eats them with caution eats them despite dislike of them	D		**Protests when new foods are offered** refuses to taste turns away pushes mother's hand spits out cries
	E	**Enthusiastic about food (bottle, solids)** squeals gurgles slaps table smacks lips		E	**Uninterested in food** avoids cries frets does not finish
	E	**Accepts opportunity to feed self (cup, spoon)** tries when urged tries spontaneously		E	**Refuses to feed self when expected to do so** refuses when urged makes no spontaneous effort
D		**Waits patiently when reassured that meal is coming** relaxed contented	D		**Impatient despite reassurance that meal is coming** whines cries
		Total			
D		**Unfamiliar Situation** **Co-operates when unfamiliar person is in charge at meal time (baby-sitter, visitor)** eats with caution eats with usual appetite	D		**Unco-operative unless familiar person is in charge at meal time** refuses to eat whines and protests
	E	**Sleeps readily in new bed or in new surroundings** settles down within a few minutes goes to sleep in normal time		E	**Objects when placed in unfamiliar bed or new surroundings** cries frets wakeful
D		**Co-operates when put to bed by an unfamiliar person (baby-sitter, visitor)** accepts with caution accepts bed as usual		D	**Unco-operative when put to bed by unfamiliar person** whines cries remains awake

		Secure			Deputy Agent and Regression
D		**Relaxed when bathed, washed, or toileted by unfamiliar person (visitor, baby-sitter)**	D		**Tense and uncertain when bathed, washed, or toileted by unfamiliar person**
D		**Can accept the sudden advances of a stranger**	D		**Apprehensive of sudden advances from strangers**
D		**Accepts being left alone with people other than family** **(neighbour, baby-sitter, infrequent visitor)** co-operates enjoys	D		**Unhappy when left alone with people other than family** cries or whines refuses to co-operate
		Total			
D		**Sleeping** **Accepts without protest when put to bed**	D		**Protests when put to bed** fusses cries
	E	**Adjusts easily to a new position for sleep**		E	**Content only in familiar position for sleep, e.g., back or stomach**
	E	**A sound sleeper (seldom wakes)**		E	**A fitful sleeper (wakes often)**
	E	**A relaxed sleeper** sprawls moves infrequently		E	**A restless sleeper** cries out twitches jumps turns
		Total			
D		**Toileting and Bathing** **Co-operates when being changed (diapers, sleepers, panties)** accepts does what is expected of him does as directed (e.g., "Lie still a moment.")	D		**Unco-operative when being changed** kicks rolls over cries protests pinches, hits
	E	**Relaxed when having bowel movement**		E	**Cries or tense when having bowel movement**

		Secure			Deputy Agent and Regression
	E	**Relaxed about toilet needs** unconcerned if wet or soiled indicates need for dry clothes by pointing, clutching self, grunting asks to go to toilet when needed		E	**Apprehensive about toilet needs** must be changed at once constantly demands to go wakens crying for toilet
	E	**Enjoys bath** kicks and splashes plays squeals		E	**Apprehensive about bath** cries becomes tense stiffens
		Total			
D		**Physical Experiences** **Enjoys rough play (bouncing, dandling, tossing, pushing)** giggles, laughs anticipates with delight asks for more	D		**Dislikes rough play** cries or screams becomes tense runs away
	E	**Recovers readily when physically hurt or if feelings are hurt** can be comforted cheers up in short time		E	**Upset for a long while if physically hurt or if feelings are hurt** sobs, cries, or pouts despite adult reassurance
D		**Enjoys being cuddled** snuggles in feels at ease	D		**Dislikes being cuddled** squirms restless pushes away
	E	**Enjoys physical activity** kicks rolls over bounces crawls climbs		E	**Little spontaneous physical activity** seems listless seems apathetic
	E	**Amuses self happily in fairly restricted play area (playpen, part of room)**		E	**Cries or whines when in restricted play area**

		Secure			Deputy Agent and Regression
D		**Accepts interference with his own physical activity (being picked up, being dressed)** co-operates	D		**Unhappy when his physical activity is interfered with** cries whines kicks
	E	**Enjoys car rides**		E	**Restless or becomes ill when riding in cars**
	E	**Enjoys a crowd** squeals, smiles, gurgles moves about freely		E	**Unhappy in a crowd** cries clings to mother
	E	**Generally relaxed**		E	**Generally tense** frequently sucks thumb or fingers frequently rocks frequently pulls own hair frequently has temper tantrums
		Total			
		Changing Environment			
	E	**Enjoys a change of environment (outside, shopping, visiting)** watches with interest vocalizes happily		E	**Unhappy when environment is changed** apparently indifferent tense cries
	E	**Amuses self with vocal play**		E	**Rarely vocalizes**
	E	**Enjoys unusual tone of voice (noisy, rough)** interested laughs		E	**Upset by unusual tone of voice** whines cries
D		**Is willing to give up toys** to parents to other children	D		**Clings to own toys** from parents from other children
	E	**Eager for NEW toys**		E	**Withdraws from or ignores NEW toys**
		Total			

		Secure			Deputy Agent and Regression
		Social			
	E	**Enjoys the presence of people other than his family** approaches plays with		E	**Uncomfortable in the presence of other people** turns to mother frets or cries
	E	**Enjoys the company of children** watches with interest enters into play		E	**Uncomfortable in the company of other children** whines or cries wants mother
D		**Can accept shared attention with other children** aware but unperturbed	D		**Unhappy when other children receive attention** cries pushes them away
D		**Likes to "converse" with others (vocalizing)**	D		**Apprehensive when talked to by strangers** "clams up" tense cries
		Total			
		Playing			
	E	**Manipulates play materials** watches clutches mouths examines bangs explores possibilities enjoys noise keenly interested		E	**Restricted manipulation of play materials** ignores apathetic towards seldom mouths seldom examines seldom bangs listless use little variety in use quickly loses interest
		Total			

Guidance Centre
Faculty of Education
University of Toronto
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Appendix G

(Home Observation for Measurement of the Environment)

Child's Name _____ Date of Interview _____

Child's Birthdate _____ Interviewer _____

Relationship of Person interviewed to child _____ Place of Interview _____

Family Composition _____
(Indicate persons living in household, including sex and age of children)

Persons present in home at time of interview _____

Comments _____

STANINES (N = 124)

RAW SCORES	1	2	3	4	5	6	7	8	9	Mean	S.D.
I	1-3	4	5-6	7	8	9	10	11	-	7.8	2.3
II	1-2	3	4	5	-	6	7	8	-	5.5	1.5
III	1-2	3	-	4	5	-	6	-	-	4.8	1.2
IV	1	2	3-4	5	6	7	8-9	-	-	6.1	2.5
V	-	1	2	-	3	4	5	6	-	3.4	1.7
VI	-	1	-	2	3	-	4	5	-	2.8	1.3
Total	20	20-21	22-24	25-28	29-32	33-36	37-40	41-43	44-45	30.4	7.7

Factor	Raw Score	Stanine
I Emotional and Verbal Responsivity of Mother		
II Avoidance of Restriction and Punishment		
III Organization of Environment		
IV Provision of Appropriate Play Materials		
V Maternal Involvement with the Child		
VI Opportunities for Variety in Daily Routine		
Total		

From the Center for Early Development and Education
814 Sherman, Little Rock, Arkansas 72202

	YES	NO
I. EMOTIONAL AND VERBAL RESPONSIVITY OF MOTHER		
1. Mother spontaneously vocalizes to child at least twice during visit (exclude scolding).		
2. Mother responds to child's vocalizations with a vocal or verbal response.		
3. Mother tells child the name of some object during visit or says name of person or object in a "teaching" style.		
4. Mother's speech is distinct, clear, and audible to interviewer.		
5. Mother initiates verbal interchanges with observer -- asks questions, makes spontaneous comments.		
6. Mother expresses ideas freely and easily and uses statements of appropriate length for conversation (e.g., gives more than brief answers).		
**7. Mother permits child occasionally to engage in "messy" types of play.		
8. Mother spontaneously praises child's qualities or behavior twice during visit.		
9. When speaking of or to child, mother's voice conveys positive feeling.		
10. Mother caresses or kisses child at least once during visit.		
11. Mother shows some positive emotional responses to praise of child offered by visitor.		
SUBSCORE		
II. AVOIDANCE OF RESTRICTION AND PUNISHMENT		
12. Mother does not shout at child during visit.		
13. Mother does not express overt annoyance with or hostility toward child.		
14. Mother neither slaps nor spanks child during visit.		
* 15. Mother reports that no more than one instance of physical punishment occurred during the past week.		
16. Mother does not scold nor derogate child during visit.		
17. Mother does not interfere with child's actions or restrict child's movements more than three times during visit.		
* 18. At least ten books are present and visible.		
* 19. Family has a pet.		
SUBSCORE		

* May require an interview probe unless can be observed.
** Will require interview probe unless mother mentions spontaneously.

		YES	NO
	III. ORGANIZATION OF PHYSICAL AND TEMPORAL ENVIRONMENT		
**20.	When mother is away, care is provided by one of three regular substitutes.		
**21.	Someone takes child into grocery store at least once a week.		
**22.	Child gets out of house at least four times a week.		
**23.	Child is taken regularly to doctor's office or clinic for check-ups and preventive health care.		
*24.	Child has a special place in which to keep his toys and "treasures."		
25.	Child's play environment appears safe and free of hazards.		
	SUBSCORE		
	IV. PROVISION OF APPROPRIATE PLAY MATERIALS		
*26.	Child has one or more muscle activity toys or pieces of equipment.		
*27.	Child has push or pull toy.		
*28.	Child has stroller or walker, kiddie car, scooter, or tricycle.		
29.	Mother provides toys or interesting activities for child during the interview.		
*30.	Provides learning equipment appropriate to age -- mobile, table and chairs, high chair, play pen.		
*31.	Provides learning equipment appropriate to age -- cuddly toy or role-playing toy.		
*32.	Provides eye-hand coordination toys -- items to go in and out of receptacle, fit together toys, beads.		
*33.	Provides eye-hand coordination toys that permit combinations -- stacking or nesting toys, blocks or building toys.		
*34.	Provides toys for literature and music (books, records, toy musical instruments).		
	SUBSCORE		
	V. MATERNAL INVOLVEMENT WITH CHILD		
35.	Mother tends to keep child within visual range and to look at him often.		
**36.	Mother "talks" to child while doing her work.		
*37.	Mother consciously encourages developmental advance.		
*38.	Mother invests "maturing" toys with value via her attention.		
**39.	Mother structures child's play periods.		
*40.	Mother provides toys that challenge child to develop new skills.		
	SUBSCORE		
	VI. OPPORTUNITIES FOR VARIETY IN DAILY STIMULATION		
**41.	Father provides some caregiving every day.		
**42.	Mother reads stories to child at least three times weekly.		
**43.	Child eats at least one meal per day with mother and father.		
**44.	Family visits or receives visits from relatives approximately once a month.		
**45.	Child has three or more books of his own.		
	SUBSCORE		

Child's Name:_____

Date:_____

NEONATAL PERCEPTION INVENTORY

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

Child's Name:_____

Date:_____

NEONATAL PERCEPTION INVENTORY

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